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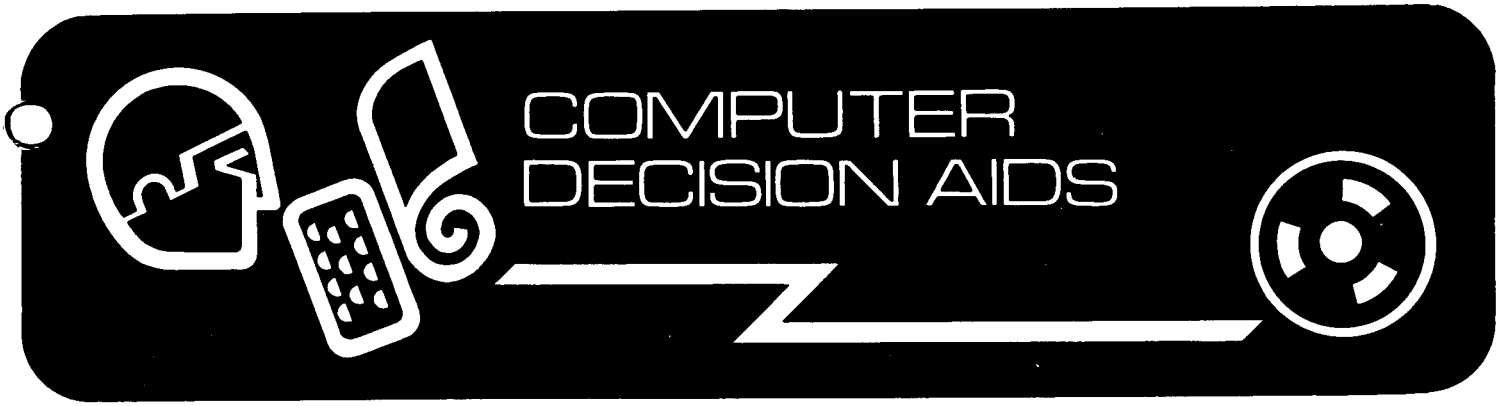

USER'S GUIDE FOR

FINLRB

A Computerized Long-Range Budgeting Procedure

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St. Paul, Minnesota 55101

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Dear Mr. Farm Manager,

One of the basic questions you must continually ask yourself as you attempt to compete in today's agriculture is, Where do I want to be? FINLRB, a computerized long-range budgeting procedure is designed to help you take a first step toward answering this question. Once you have the budgeting results from the computer you should then compare the various alternatives and decide which plan will meet most effectively the competitive demands of your fellow farmers and your own business expectations.

This User's Guide is designed to assist you in doing an accurate job of gathering the necessary information to be analyzed and in making a correct interpretation of the analysis results printed out from the computer. A brief index to major portions of the guide follows:

There are two other major questions the manager must ask about his business: Where am I? and How can I best get there from here? Three similar computerized analysis procedures are available for answering these questions.

CDA-201-FINAN - A Computerized Farm Financial Analysis Procedure
CDA-203-FINTRAN - A Computerized Three-Year Transition Budgeting Procedure
CDA-204-FINFLO - A Computerized Monthly Cash Flow and Financial Budgeting Procedure

We hope this kit of computerized tools proves useful to you as you attempt to improve your competitive position in today's agriculture.

With best regards,

The Authors

UNIVERSITY OF MINNESOTA, U.S. DEPARTMENT OF AGRICULTURE, AND MINNESOTA COUNTIES COOPERATING

Introduction[1/]

FINLRB is a computerized budgeting procedure for comparing the physical and financial characteristics of alternative long-range farming programs.

It permits you to size up the future profitability, debt servicing ability, and solvency characteristics of your present farming programs so that you can determine the impact of changes in efficiency, enterprise selection and quantity of resources on the longer range profitability and financial soundness of your business.

Since computers are little more than high-speed calculating machines, you can make wrong decisions based on information from computer printouts if (1) the computer is not given correct and accurate information to work with or (2) the meaning of the figures on the computer printout are not interpreted correctly.

Therefore, the purpose of this User's Guide is to help you complete the FINLRB computer input form accurately and to interpret the printout you will get from the computer correctly. Part I provides a detailed set of instructions for gathering and inputting the information properly in the input form. Part II interprets the resultant printout in terms of "How was it computed?" and "What does it really mean?".

PART I

Instructions for Completing FINLRB Input Form - Computer Decision Aid 202

A Brief Look at the Input Form

To use the FINLRB computer decision aid in planning the long-range future of your farm business, you, the farm manager, must provide certain physical and financial information. Form CDA-202 is designed so that you can gather this information in an orderly fashion. The form is divided into three major sections:

1. Crop and Livestock Data Banks (pages 2-4);
2. Specifying Crop and Livestock Alternatives (page 5);
3. Supplementary Information Worksheet (page 6).

Special Note: Since the input form calls for the information in a summary form, you should keep notes of the assumptions and detailed calculations underlying this input information.

1/ The authors, Kenneth H. Thomas, Charles H. Cuykendall, Richard O. Hawkins, are Extension Economists at the University of Minnesota and William S. Penning is an Area Extension Agent-Farm Management. They wish to thank Paul R. Hasbargen and Earl I. Fuller, Extension Economists in Farm Management, and Lawrence M. Christenson and Mervin L. Freeman, Area Extension Agents-Farm Management, of the University of Minnesota for their assistance in the development of the FINLRB computer program and this User's Guide.

Step #1 - Your Name and Address (cover)

First, enter your name and mailing address in the appropriate box on the cover page of the input form.

Step #2 - Developing Crop and Livestock Data Banks For Your Farm (pages 2-4)

The second step in completing the input form for FINLRB is to develop data banks for those crop and livestock enterprises you might want to consider as part of your future farming system. Typical crop and livestock enterprise data banks for a given geographic area are found on pages 2 thru 4 of the input form.

Examples of corn and dairy cow budgets for a given geographic area are shown below. The information regarding gross income, direct costs, interest on direct expenses, labor requirements, as well as corn, hay and pasture equivalents indicated in the "typical" column under each enterprise, is already stored in the computer. Your task as farm manager is to review this information for each enterprise you wish to consider and decide whether any of the numbers need to be changed to fit your situation. If a change is needed, you merely fill in the appropriate blanks in the "Your Farm" column. This new information will then be fed into the computer and it will be used rather than that which was originally stored in the computer.

Enterprise	Corn Grain	
Code Number	1	50 DATA
	Typical	Yours
Yield per acre	100	
Price per unit	$ 1.00	
Income	$ 0 *	$,
Seed	$ 6.00	
Fertilizer	15.50	
Chemicals	7.00	
Crop insurance	0	
Custom hire	0	
Direct costs	$28.50	$,
Interest	$ 1.20	$,
Labor hours	6	,
Corn equiv.	100*	,
Hay equiv.	0	,
Pasture equiv.	0	

Enterprise	Dairy "A"	
Code Number	14	65 DATA
	Typical	Yours
Production	12,000	
Price	$ 5.00	
Culls, other sales	$ 85.00	
Income	$685.00	$,
Purch. feed	$ 40.00	
Breeding/feeder	10.00	
Death loss, shrink	0	
Health	14.00	
Supplies	10.00	
Marketing	31.00	
Direct costs	$105.00	$,
Interest	$ 1.00	$,
Labor hours	80	,
Corn equiv.	80	,
Hay equiv.	8.5	,
Pasture equiv.	0	

* Provides feed grain as corn equivalent rather than sales income. For further explanation see page 4.

General Instructions on Developing Data Banks

1. Time period under consideration.

With this planning procedure you are taking a longer range look at your business. Therefore, yield, price and cost information in your data banks should reflect what you expect will happen over, say, the next 3 to 5 or 5 to 10 years, depending upon what time span you are considering.

2. Income defined.

The income line in the data banks for any given enterprise should include only the gross income from sales of products from that enterprise. Other farm income, such as custom work done or government payments received should be inputed in the bottom portion of page 5 of the input form.

3. Direct costs defined.

Direct costs for a given enterprise should include only those cost items which vary directly with the number of acres or units produced (i.e. seed, fertilizer, purchased feed, etc.). Other cash costs of operation should be recorded on page 6 of the form under related operation expenses. You will note that some of those items on page 6 are marked optional (fuel and oil for example). This means that the manager can handle the item as a direct expense on a per unit basis in the data banks, or as a lump item on page 6. The key thing is that all expenses be included, but that you not get so eager as to start double counting.

4. Interest defined.

The interest line in the data banks should reflect only the cash interest expense the manager will likely incur because he has to borrow money to cover some portion of the direct costs noted on the preceding line. Interest on related operating expenses and other debts will be accounted for later on page 6.

5. Labor hours defined.

The labor hours recorded in the typical budgets are for well mechanized moderate sized units for that enterprise and include both direct and overhead labor. If you are considering a large scale, specialized operation, per unit labor requirements would be less than suggested. Conversely, a small operation with little mechanization will require more time.

Instructions for Developing Crop Data Banks

1. Income: Cash vs. Feed Situations

If the whole crop from a given enterprise is to be sold as a cash crop, then the value of the crop produced should be entered on the income line. For example, in the typical budget for cash grains, such as wheat or soybeans, it is expected the whole crop will be sold and, thus a gross dollar amount would appear in the budget on the income line.

However, if any part of the crop is to be fed, then the whole crop should be included as corn or hay equivalents. In such cases a zero would appear on the income line. The corn grain budget shown earlier provides a good example of this situation. The income line shows 0; the corn equivalent is equal to the yield.

The computer program is written to compare the grain, hay and pasture needs of livestock with the supply available. If excess grain or hay is available, then it will be sold using the prices noted in DATA line 77, page 4 (see below). If there is a shortage, feeds will be purchased using the prices noted. These purchase or sale prices can be changed by making changes in the appropriate blank lines at 77 DATA.

Feed Prices		77 DATA	
Corn	- if purchased	$1.10	_____,
	- if sold	$1.00	_____,
Hay	- if purchased	$20.00	_____,
	- if sold	$18.00	_____

For pasture, the computer merely indicates in the summary whether it is in excess or deficit supply relative to livestock needs. For some geographic areas pasture is not included in the Data Banks. As a result, it will not indicate a pasture balance in the printout summary.

If you want to handle part of your crop on a cash basis (eg. malting barley) and part on a fed basis (feed barley), then you should set up two data banks for that crop. The malting barley budget would show a sale on the income line, a zero on the corn equivalents line. The feed barley budget would have a zero on the income line and a yield amount adjusted to corn equivalents on the corn equivalents line.

2. Corn and Hay Equivalents

The following conversion factors can be used in calculating corn and hay equivalents:

	Corn Equivalent		Hay Equivalent
Corn	1.0	Hay	1.0
Barley	.8	Haylage	.6
Oats	.5	Corn Silage	.33 to .4
Wheat	1.1		

Corn or hay equivalents for a given crop can be calculated by multiplying the projected yield per acre by the appropriate factor.

3. Other Crops, Yields, Shares, Summer Fallow

If you have several crops other than those shown in the data banks that you want to consider, you can use any of the blank enterprise code columns. You can also cross out the names on any of the other listed crops that you do not wish to consider and put the

relevant information in the "Yours" column for the new crop you want to consider. You can include 12 different crop alternatives in a given computer run.

If you wish to specify two levels of yields for the same crop enterprise, reflect crop share as well as ownership or cash rent arrangements, the use of summer fallow on selected acreages and/or diverted acres, etc., you must develop separate data banks to reflect each situation. Remember that crops grown following fallow acres usually require less cash inputs than continuous cropping.

Instructions for Developing Livestock Data Banks

The livestock data banks are similar to the crop data banks. The "typical" column is stored in the computer and should be used as a guide in establishing income and cost estimates for "Your Farm". The accounting procedure for livestock enterprises should normally be set up on a per head, per litter or per breeding unit basis.

Per head is self-explanatory and is often used for feeding livestock situations. Per litter is usually used for the raising feeder pigs alternative because production systems vary from one farrowing per sow per year to more than two per year. A breeding unit in the complete hog enterprise is usually the sow farrowing two times per year plus her share of the boar and gilt replacement costs.

A breeding unit in dairy is usually the cow, her bull calf sold at a few days of age and her share of the replacement heifer costs. A breeding unit in the beef cow herd is usually the cow, her calf and her share of the bull and heifer replacements. Sheep are often accounted for on a per 100 head breeding unit basis. A breeding unit is the ewe, her lambs and share of the ram and replacement costs.

Up to 9 livestock enterprises can be analyzed at any given time. Therefore, the manager may want to establish data banks which reflect different efficiency levels for the same enterprise. He may also want to separate the breeding and replacement growing phases.

Step #3 - Specifying the Farming Alternatives to be Studied (page 5, top portion)

The next step is to decide what alternative farming systems you want to study (page 5, top portion). This involves deciding which crop and livestock enterprises from your data banks are to be included in each alternative and the acres or units to be considered. Up to 3 alternative farming systems can be analyzed at any one time by the computer program. If you wish to consider only two alternatives, place a zero in the blanks for alternative 3.

Alternative #1 should reflect the present farming program, projected into the future. This then becomes the base point, with the other alternatives being compared to this plan. The remaining alternatives can be developed to reflect alternative systems that you may be considering including improvements in efficiency, changes in enterprise combination or in size of business (see example).

CROPS		Enterprise Code	Alt. #1 Acres	Alt. #2 Acres	Alt. #3 Acres
Corn for grain	80 DATA	1 ,	68 ,	39 ,	100
	81 DATA	,	,	,	

LIVESTOCK		Enterprise Code	No. Units	No. Units	No. Units
Dairy	90 DATA	14 ,	50 ,	80 ,	50
	91 DATA	,	,	,	

Name and Size of Major Enterprise	100 DATA			
		DC 50 ,	DC 80 ,	FPIG 850

The example shows that this farmer plans to have 68 acres of corn for grain in his first alernative, 39 in the second and 100 in the third. The enterprise code for corn is 1, taken from the data bank on page 2 of the input form. The farmer also wants to consider a dairy herd (enterprise code 14) expansion from 50 to 80 cows or expansion to feeding out 850 feeder pigs.

The description section of the output calls for the name and size of the major enterprise in each alternative. To facilitate this the manager must complete 100 DATA. Entries for each alternative may not exceed a total of 8 alphabetic and numeric characters, the first of which must be an alphabetic character. If no description is required, put an X in that alternative.

Step #4 - Gathering Investment, Expense and Other Relevant Information (bottom, page 5)

Once the data banks have been adjusted (step #2) and the farming alternatives specified (step #3), the final step is to gather the information required to complete the bottom portion of page 5 of the input form.

1. Information Gathered on Page 6 of Input Form

DATA lines 101 to 103 at the bottom of page 5 of the input form call for information on changes in investment and borrowings, depreciation, related operating expense and farm interest charges for each alternative (see below).

From Page 6

Change in farm investment	101 DATA		51000 ,	43000 ,
Change in farm nonreal estate borrowings			51000 ,	23000 ,
Change in farm real estate borrowings			0 ,	20000
Depreciation or replace. allowance - P & L	102 DATA	5900 ,	8050 ,	7860 ,
Depreciation for tax purposes		5900 ,	8050 ,	7860 ,
Related operating expense		8500 ,	10935 ,	10100
Interest on related operating expense	103 DATA	170 ,	218 ,	190 ,
Interest on R.E. and non R.E. debt		2333 ,	5393 ,	4593

This information can best be gathered by using the supplementary worksheet contained on page 6 of the input form. Transfer the resultant totals to the appropriate blanks on page 5 of the form. The following instructions should help in gathering this information.

a. Change in Farm Investment and Borrowings

First, determine the anticipated changes in investment in crop, livestock, machinery, buildings and land that would be incurred to put alternatives 2 and 3 into operation. These changes may be a positive amount (capital resources being added) or a negative amount, (where capital items are being sold off). If the change is a negative amount, be sure to put a minus sign in front of the amount at 101 DATA, page 5. Also, estimate the expected change in real and non real estate borrowings.

No change in investment can be inserted for alternative #1, as it is the base plan. Because of this, the Farm Assets reported at 107 DATA should reflect the total investment needed to make the basic farm unit operational over time. This amount may differ from that reported on your present financial statement.

b. Total Depreciation or Replacement Allowance for Business Analysis and Tax

Next, estimate the annual depreciation or replacement allowance that should be charged against each alternative for business analysis purposes. Remember, this is longer-range planning, and that over time replacement costs may tend to be above or below depreciation amounts used for tax purposes. For the first alternative this amount can be estimated by taking the firm's present depreciation amount and adjusting it for inflation, etc. For the other two alternatives report the total depreciation or replacement allowance. To do this, add the additional amount associated with the new investments noted above to the base amount for alternative #1. If depreciable assets are being sold off, thus resulting in a reduction in total depreciation, the base amount should be adjusted accordingly for those alternatives.

Since the depreciation or replacement allowance used in calculating income taxes may differ from that used in business analysis, report the amount you want used for tax purposes on the next line for each alternative.

c. Related Operating Expenses and Associated Interest

In the crop and livestock data banks those operating expenses that could be readily allocated to a given enterprise were included as part of the direct cost item for each enterprise. However, there are other operating expenses that are difficult to allocate to each enterprise. These related operating expenses should be accounted for on page 6 of the input form. The interest on related operating expense needs to be calculated and inputted. It should reflect the amount of money that would normally have to be borrowed during the year to cover these expenses in a timely manner. Remember, interest on funds borrowed to cover direct operating expenses has already been accounted for in the data banks.

d. Interest on Real Estate and Nonreal Estate Debt

In estimating the amount of interest to be paid in a typical year on existing and new real and nonreal estate debt, first determine the length of your long-range planning horizon -- eg. 5 or 10 years. Then estimate the size of each type of debt at the mid-point of the period and multiply it by the expected interest rate. Such an approach should give the most accurate estimate of the amount of interest expense which will subsequently be used in calculating profit and loss and in estimating income tax and income available for debt servicing.

However, some managers may want to "really put the business up against the gun" to test its future viability. In this instance, they will likely use the interest on the full amount of debt at present. Care should be exercised in interpreting the output from such an approach as it will tend to reduce income taxes while increasing farm interest paid by a greater amount. This, in turn, will reduce reported profits and increase the years required to repay debt.

2. Information Gathered from Other Sources

DATA lines 104 to 106 require information which must be gathered from other sources. Government payments and other farm income should reflect the payments from participation in the wheat and feed grain programs, storage payments, custom work done, etc. Capital gains income associated with the livestock enterprises considered in each of the alternatives should be entered next. This should be the full amount of capital gains income. The computer will divide this amount in half in calculating the income tax. Next, record the estimated net income before taxes that you expect to earn from nonfarm jobs or businesses for each alternative.

From Other Sources

Government payments & other farm income	104 DATA	0 ,	0 ,	0 ,
Capital gains income		4026 ,	5826 ,	5190 ,
Net nonfarm income		0 ,	0 ,	0
Value operator's labor and management	105 DATA	16000 ,	16000 ,	16000 ,
Family living expense		16000 ,	16000 ,	16000
Number of families involved	106 DATA	2 ,	2 ,	2 ,
Total number tax exemptions (all families)		6 ,	6 ,	6

The value of operator's labor and management should reflect what you would expect to receive in wages for doing a similar managerial job in a nonfarm business. The family living expense should be the desired amount to be spent annually for current living, savings and other household purposes, excluding income tax and social security. In setting these amounts, consider the impact of inflation and rising living standards over the planning period.

The number of families involved in the business should be noted (eg. partnership). Then indicate the total number of exemptions normally claimed for tax purposes by the families involved.

3. From Net Worth Statement

To complete the required portion of page 5 of the input form, input at 107 DATA information from your net worth statement.

From Financial Statement

Farm assets	107 DATA	128100,
Nonfarm assets		11560,
Farm nonreal estate liabilities		16350,
Farm real estate liabilities		20440,
Nonfarm liabilities		11560

Farm assets should reflect your estimate of the value of crops, livestock, machinery, facilities and land owned by the parties involved that will be required to maintain the present level of operation over the planning period. This may, in some instances, require an upward adjustment in the present inventory of such assets as machinery. On the next line, record the present value of any nonfarm assets you own. Finally, input the amount of liabilities presently owed against these assets. The farm portion of these liabilities must be divided between real and nonreal estate. Note: If farm assets were adjusted from the amount shown in your net worth statement then the farm liabilities should be adjusted by a like amount. The nonfarm portion of total liabilities must also be noted.

4. Debt Servicing Analysis Option

When provided the information noted at 108 and 109 DATA, the computer will calculate your debt servicing capacity on a payback and on an amortized basis. This analysis is optional. Therefore, if you do not want this analysis, leave this portion of the form blank.

Debt Servicing Analysis Option

Annual real estate principal pay. (exist & new)	108 DATA	2000,	2000,	4000
Desired amount of debt to be paid off ($)	109 DATA	40000,	60000,	60000,
Desired number of years to pay off		20,	30,	30,
Interest rate on this debt (%)		6.75,	7,	7

First, record the estimated annual real estate principal payment on existing and new real estate debt. The level of these principal payments should be consistant with the amount of interest on real estate debt charged at 103 DATA. That is principal payments and interest should equal your normal yearly real estate payments (amortized loan basis). This information will be used in calculating the years required to repay the nonreal estate debt of the farm business. (Payback basis).

To calculate the debt servicing capacity on an amortized basis, the remaining three lines must be completed at 109 DATA. The desired amount of debt to be paid off should be the actual dollars of debt you wish to pay off in the desired number of years specified on the next line. The interest rate should reflect the rate of interest that these funds have been or would be borrowed at.

Once the information you have just gathered on the FINLRB input form has been inserted into the computer, it is analyzed by the computer in about 3 seconds. The results of the calculations are then printed out using a teletype machine linked to a computer via telephone. Part II of this User's Guide provides a detailed interpretation of the computer printout.

PART II

Interpreting the Computer Printout

The computer printout for FINLRB is divided into five sections: (1) Plan Description and Financial Summary; (2) Projected Profitability; (3) Projected Debt Servicing: Payback Basis; (4) Projected Debt Servicing: Amortized Basis; and (5) Income Tax and Social Security Supplement. This portion of the guide will discuss the method of calculation utilized in each of these sections and how to interpret the results.

Section I - Plan Description and Financial Summary

The first section of the computer printout provides a brief description of the alternative plans being analyzed, a statement of the balance between feed supplies and requirements and a brief financial summary. You can, at this point, decide whether changes need to be made in the information supplied the computer, or you can signal the computer to printout more detailed information on the alternatives under study.

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LONG RANGE PLAN WORKSHEET 2
MINNESOTA COMPUTER PLAN FOR
JOHN DAIRY
DAIRY COUNTY


PLAN DESCRIPTION & FINANCIAL SUMMARY
                                  ALT#1      ALT#2     ALT#3

MAJOR ENTERPRISE AND SIZE         DC50       DC80      FPIG850
TOTAL TILLABLE ACRES               149.       149.       189.
TOTAL HOURS LABOR                 5807.      8319.      6867.
TOTAL FARM INVESTMENT           128100.    179100.    171100.

CORN EQUIVALENT BALANCE            1706.     -3834.      3394.
HAY EQUIVALENT BALANCE              -29.      -103.        22.

PROFIT OR LOSS                    19421.     23319.     23486.
LABOR & MGT EARNINGS              13943.     17840.     18007.
RETURN/$100 FARM INVEST              4.49       7.10       7.06
RETURN/$100 ADDED FARM INVEST                  13.64      14.71
ESTIMATED INCOME TAX & SOC SEC     3454.      4361.      4544.

CASH AVAIL FOR DEBT SERVICE        5868.     11008.     10801.
YEARS TO PAY ADDED NON R.E. DEBT                9.92       7.84
YEARS TO AMORTIZE DEBT              999.       17.        18.
TOTAL DEBT                        48350.     99350.     91350.
PERCENT IN DEBT                     34.62      52.11      50.01
NET WORTH CHANGE PER YEAR           -32.      2958.      2941.


DO YOU WISH FURTHER FINANCIAL ANALYSIS DETAILS?
TYPE 1 FOR YES -- 2 TO STOP
? 1
```

The first four lines of the printout for this section indicate for each alternative the name and size of the major farm enterprise in the alternative, the total tillable acres operated, and the associated labor and capital requirements. The name and size of the major enterprise was inputted at 100 DATA. Its purpose is to aid the manager in identifying each alternative. To calculate the total tillable acres operated, the computer merely adds up the acreages listed for each alternative on DATA lines 80 to 89 on page 5 of the input.

The total hours of labor measure is determined by the computer multiplying the units of each enterprise reported on page 5 of the input form by the units of labor specified for the respective data banks on pages 2 thru 4. For example, if the labor on corn grain is 6 hours per acre and the farmer has 300 acres, then the total hours devoted to corn grain would be 1,800. The manager should check this resultant amount with his anticipated or desired labor load as well as with the amount of hired labor expense included in the related operating expense section. The total farm investment for the first alternative is a print back of the first item in 107 DATA of the input; namely, farm assets. For the other alternatives the change in investment reported at 101 DATA is added to (or subtracted from) farm assets as reported for the first alternative. If this amount looks in error, check the input form.

The feed balance portion of Section I indicates whether supplies of corn, hay and pasture equivalents are in excess (positive) or in deficit (negative) relative to the requirements of the livestock enterprises being considered. The computer calculates the feed supply by multiplying the corn, hay and pasture equivalents for each crop enterprise (see data banks, pages 2 thru 4) by the units of each crop in the alternative farming program (see page 5 of input), and totaling the result. Feed requirements are calculated in a similar fashion, the requirements of each unit as reported in the livestock data banks being multiplied by the number of livestock units included in each alternative. Feed supplies are balanced against requirements, with excesses of corn and hay being sold, and purchases being made to cover deficits. The pasture balance section of the computer program acts merely as a counter -- units available vs. units required. This line is omitted when no pasture units are involved. The manager should review this feed balance section carefully and decide whether a change in the crop and livestock program is warranted.

The farm manager is also concerned with the financial viability of the various alternatives under study. The financial measures shown in the summary capsulize the key profitability, debt servicing and solvency measures. After viewing these results, the manager may decide that an error has been made in inputting, that some of the alternatives need to be revised to make them more viable financially, or he may decide that he wants to see a more detailed printout of the analysis.

The profitability measures shown in the printout summary include profit and loss (return to labor, management and equity), labor earnings, returns per $100 farm investment, and returns per $100 added farm investment. The method of calculating these measures will be detailed in the next section. Since these profitability measures are calculated on a before-tax basis, the Estimated Income Tax and Social Security payment chargeable against each alternative is also shown.

The debt servicing measures include cash available for debt service (and reinvestment), the years required to pay added nonreal estate debt and the years required to amortize a specified portion of total debt. The cash available for debt servicing is calculated by adding net nonfarm income (104 DATA) to net cash farm income (line 3, P & L - next section) and subtracting family living expense (105 DATA, input) and estimated income taxes and social security (see previous paragraph). The method of calculating the latter two measures will be discussed in section III. Special Note: These measures will not appear in this summary section if input information was not provided at 108 and 109 DATA.

Total debt, percent in debt and net worth change per year provide the manager with a picture of the solvency position of his business immediately after the investments were made as well as the extent to which the equity (net worth) position of the business will likely be improved over time. The estimated net worth change per year is calculated by first adding net nonfarm income to farm profit and loss and then subtracting out income tax and social security payments and family living expense. The net nonfarm income item is inputted at 104 DATA of the input form. The farm profit and loss is a complex calculation that will be explained in section II. The income tax and social security payment is a calculated amount, the detailed procedure being outlined in section V. The family living expense is inputted at 105 DATA of page 5 of the input form.

The total debt for the first alternative was inputed at 107 DATA, page 5 of the input form (farm real and nonreal estate liabilities plus nonfarm liabilities). Total debt for the second and third alternative is calculated by adding (or subtracting) the change in real and nonreal estate borrowings reported at 101 DATA to the total liabilities or debt for the first alternative. The percent in debt measure is calculated by dividing total debt (above) by the total assets. For the first alternative it involves the inputed amounts in 107 DATA. For the second and third alternatives the change in investment must be added (or subtracted) to the total assets reported in alternative 1. The resultant total asset amount is divided into the total debt.

If the computer summary results suggest that errors have been made in inputting or that the plans considered were unrealistic, the analysis can be stopped, necessary changes made and the plan rerun. If everything looks reasonable, the computer can then be instructed to continue and a detailed financial analysis of the alternatives printed out.

Section II - Projected Profitability

In appraising your long-range alternatives, you are likely to be keenly interested in the relative profitability of each alternative. The computer prints out a profit and loss statement as well as measures of labor and management earnings, return on farm investment and on added farm investment.

Profit and Loss Statement

The profit and loss statement printed out includes a fairly detailed statement of operator's sales and expenses (see next page).

PROJECTED PROFITABILITY			
1 OPERATOR'S SALES	48508.	69002.	61409.
CASH CROP SALES	0.	0.	0.
EXCESS CORN&HAY SALES	1706.	0.	3791.
LIVESTOCK SALES	46802.	69002.	57618.
GOVT PAYMTS & OTHER FARM	0.	0.	0.
2 CASH OPERATING EXPENSE	23187.	37633.	30063.
DIRECT CROP EXPENSE	3997.	4022.	5160.
DIRECT LIVESTOCK EXPENSE	7309.	10459.	9581.
CORN&HAY PURCHASES	580.	6279.	0.
RELATED OPERATING EXP	8500.	10935.	10100.
TOTAL FARM INTEREST PAID	2801.	5938.	5222.
3 NET CASH FARM INCOME	25321.	31369.	31346.
4 DEPRECIATION OR REPLACEMT	5900.	8050.	7860.
5 PROFIT OR LOSS	19421.	23319.	23486.

Line 1: Operator's sales represents the total gross farm income which the operator can expect from each farming alternative. The sources of this total income are determined as follows: Cash crop sales and livestock sales are calculated by multiplying the income line in the respective data banks (pages 2 thru 4 of the input form) by the number of units of each enterprise specified for each alternative at the top of page 5 of the input form.

Excess corn and hay sales are calculated by multiplying the grain and hay balances noted above in section I by the prices specified at 77 DATA on page 4 of the input form. Government payments and other farm income were inputted at 104 DATA, page 5 of the input form.

Line 2: Cash operating expense, line 2, is derived from the combined total of the expense items listed beneath it. Direct crop and livestock expenses are determined by multiplying the direct expense line in each of the data banks by the units of each enterprise appearing in each alternative. Corn and hay purchases are determined by multiplying negative corn or hay equivalent balances (see section I) by the price listed at 77 DATA, page 4 of the input form. Related operating expenses were inputted at 102 DATA. Farm interest paid represents the total of interest on related operating expense and on real estate and non-real estate debt as inputed at 103 DATA, plus the direct interest expense included in each of the data banks for each of the enterprises included in each of the plans.

Line 3: Net cash farm income is determined by subtracting operating expenses from operator's sales. This is a key measure that is used extensively in debt servicing analysis. It reflects the cash that would be available for family living, income taxes, debt servicing or capital investments. Therefore, the manager should check the detailed sales and expense items in lines 1 and 2 carefully to catch any possible errors before looking further at the analysis.

Line 5: Profit and loss. By subtracting the depreciation or capital replacement allowance (inputted at 102 DATA) from net cash farm income, the manager has a measure of the profit (or loss) for the farm business. This measure is comparable to returns to labor, management and equity capital.

Labor and Management Earnings; Returns/$100 of Investment

Three additional profitability measures are provided in this section of the printout. They include labor and management earnings (line 7), return per $100 of farm investment (line 13), and the added return per $100 added investment (line 16).

6	INTR ON FARM NET WORTH (6)	5479.	5479.	5479.
7	LABOR & MGT EARNINGS	13943.	17340.	18007.
8	RE & NON RE INTR PAID	2333.	5393.	4593.
9	SUB-TOTAL	21754.	28712.	28079.
10	VALUE OPER LABOR & MGT	16000.	16000.	16000.
11	RETURN ON FARM INVESTMENT	5754.	12712.	12079.
12	TOTAL FARM INVESTMENT	128100.	179100.	171100.
13	RETURN/$100 FARM INVEST	4.49	7.10	7.06
14	ADDED RET TO ADD INVEST		6957.	6324.
15	ADDED CAPITAL INVESTED		51000.	43000.
16	ADDED RETURN/$100 ADDED INVES		13.64	14.71

Line 7: Labor and management earnings is determined by subtracting an interest charge (at 6 percent) for the use of the farm net worth (line 6) from the profit or loss (line 5). The farm net worth is calculated by subtracting present farm liabilities from present farm asssets (see 107 DATA). This is a useful profitability measure for the manager who is primarily concerned with the residual earnings of his labor under alternative farming systems.

Line 13: Return per $100 of farm investment is determined by first adding the real estate and nonreal estate interest paid (line 8) to the profit and loss (line 5). The value of operator's labor and management (105 DATA, input form) is then subtracted to give the return on farm investment. This amount is then divided by the total farm investment. Farm investment for the first alternative was inputted at 107 DATA. For alternatives 2 and 3 the change in investment (101 DATA) is added to the farm investment for alternative 1.

Line 16: The added return per $100 added investment is determined by first comparing the returns (line 11) and investment (line 12) in alternatives 2 and 3 with those of alternative 1. These differences are reported at lines 14 and 15, respectively. Line 14 is then divided by line 15 to arrive at the added return per $100 added investment measure, line 16. Note: this measure will likely be unusually high on those alternatives that employ resources on a rental or share arrangement rather than ownership basis.

The return on investment measures are best adapted to the capital-oriented manager, though even the labor-oriented manager should be concerned with how well he can compete with others for the use of capital. Line 16, the added return per $100 added investment, is a particularly useful measure in determining which investment alternative will make most profitable use of the manager's available supply of capital.

With the above information on business profitability, you can size up various farming alternatives using one or more of the 5 profitability measures just discussed. However, you should also consider the debt servicing characteristics of these alternatives (sections III and IV) as well as such unmeasurable factors as risk, effort, managerial stress and personal preference before deciding which alternative farming system to adopt.

Section III - Projected Debt Servicing Capacity - Optional Analysis

The ability of various farming alternatives to service debt is an important characteristic to be analyzed in long-range planning. The debt service analysis option provides two alternative ways of looking at debt servicing; namely, a traditional payback approach and an amortized method. The payback approach is best suited for evaluating new nonreal estate investment projects. The amortization approach is best suited for evaluating the overall debt servicing capacity of a business and for alternatives involving substantial amounts of real estate debt.

Projected Debt Service: Payback Basis

The analysis procedure used here is designed to determine how rapidly the business could pay back nonreal estate debt. It first determines the years required to pay back the total nonreal estate debt for each alternative (line 10, below). It then determines the years required to pay back any additional nonreal estate debt (line 13) associated with alternatives 2 and 3. This latter measure probably represents the point of greatest usefulness of this approach in that it permits you to determine how well a given nonreal estate investment project will be able to service its own debt.

PROJECTED DEBT SERVICE: PAYBACK BASIS

1	NET CASH FARM INCOME	25321.	31369.	31346.
2	NET NON FARM INCOME	0.	0.	0.
3	NET CASH AVAILABLE	25321.	31369.	31346.
4	FAMILY LIVING	16000.	16000.	16000.
5	INC TAX & SOC SEC	3454.	4361.	4544.
6	ANN RE PRINC PAYM EXIST+NEW	2000.	2000.	4000.
7	SUB TOTAL	21454.	22361.	24544.
8	CASH AVAIL FOR NON RE DEBT	3868.	9008.	6801.
9	NON RE DEBT TO BE SERVED	16350.	67350.	39350.
10	YEARS TO PAY BACK NON RE	4.	7.	6.
11	ADDED CASH AVAIL FOR NON RE		5140.	2934.
12	ADDED NON RE DEBT		51000.	23000.
13	YEARS TO PAY ADDED NON RE DEB		9.92	7.84

Line 10: The years to pay back nonreal estate debt measure is determined by first adding any net nonfarm income (line 2) to net cash farm income (line 1) and then subtracting family living (line 4), income taxes (line 5) and annual principal payments on existing and new real estate debt (line 6). These calculations determine the cash available for nonreal estate debt servicing (line 8). Dividing this amount into the nonreal estate debt to be serviced (line 9), determines the years that will be required to repay this debt (line 10).

As a rule of thumb, creditors would normally like to see this type of debt repaid in 5 to 7 years.

Line 13: Where added nonreal estate debt is incurred, such as is possible with alternatives 2 and 3, years required to repay new nonreal estate debt is determined by dividing the added debt (line 12) by the added cash available (line 11). In turn, line 12 was determined by subtracting the total nonreal estate debt for alternative #1 (line 9) from the amounts shown for alternatives 2 and 3, respectively. Line 11 was calculated in similar fashion using information at line 8.

This measure is particularly helpful in appraising new nonreal estate type projects. It indicates how well the new project will be able to service its own debt. If the years required to service the debt appear excessive, then earnings from the rest of the business would be required to service it properly.

It is important to note that this pay back debt servicing analysis does not take into account the investment cost of the continuous replacement of existing depreciable assets such as machinery and buildings. Therefore, when the calculated years required to repay total nonreal estate debt become excessive (say, beyond 7 to 10 years or the normal useful life of most depreciable assets) then it can be anticipated that the business could develop serious capital replacement problems over time.

Also, the debt payback approach does not provide for a direct analysis of alternatives involving land purchase. Rather, it assumes that land repayment schedules have been formalized and placed on a fairly long-term basis. The critical question, then is how will scheduled land payments affect the ability of the farm unit to service existing as well as new intermediate debt over time? The payback analysis approach focuses upon this problem area.

Projected Debt Service: Amortized Basis

The second approach for analyzing the debt servicing capacity of a business utilizes an amortization approach. It terms of measuring the longer-term debt servicing characteristics of alternative farming systems (particularly those involving land purchase), this procedure has much appeal.

Using amortization tables, this approach determines (1) the years required to amortize a loan and (2) the after-tax-dollars needed to amortize the debt within a desired time span. The analysis begins at the same point as payback approach just discussed (see below). Net

nonfarm income (line 2) is added to net cash farm income (line 1). Family living (line 4) and income taxes (line 5) are then subtracted. An amount for depreciation or replacement is also subtracted out (line 6). The remainder (line 8) represents the cash that would be available for covering annual principal payments on both real and nonreal estate debt.

PROJECTED DEBT SERVICE: AMORTIZED BASIS

		ALT#1	ALT#2	ALT#3
1	NET CASH FARM INCOME	25321.	31369.	31346.
2	NET NON FARM INCOME	0.	0.	0.
3	NET CASH AVAILABLE	25321.	31369.	31346.
4	FAMILY LIVING	16000.	16000.	16000.
5	INC TAX AND SOC SEC	3454.	4361.	4544.
6	DEPREC OR REPL ALLOW	5900.	8050.	7860.
7	SUB TOTAL	25354.	28411.	28404.
8	CASH FOR PRIN PAYMTS	-32.	2958.	2941.
9	PREV INTR CHARGED ON DEBT	1930.	3257.	3017.
10	CASH AVAIL FOR AMORT DEBT	1898.	6215.	5958.
11	AMOUNT OF LIAB TO BE PAID	40000.	60000.	60000.
12	AMORTIZATION FACTOR	.0474	.1036	.0993
13	YEARS TO AMORT LOAN	999.	17.	18.
14	CASH NEEDED FOR DEBT SER	3703.	4835.	4835.
15	ADD AFTER TAX $ NEEDED	1805.	-1379.	-1123.

The next step, line 9, involves adding back in the amount of interest that previously had been charged on the portion of total debt that the farm manager wants to amortize. It will be recalled that interest on real and nonreal estate debt has already been subtracted from net cash farm income -- see section II. Since amortization involves payment of both principal and interest, this interest has to be added back in as part of the cash available for amortizing the debt. The computer does this by dividing the amount of debt to be amortized for each alternative (line 109 DATA, input) by the total liabilities for each alternative. The interest on real estate and nonreal estate debt (103 DATA) is then multiplied by this percentage to determine the interest that should be added back in.

By dividing the resultant cash available for amortizing a given portion of the debt (line 10) by the amount of liabilities to be amortized (line 11), an amortization factor is determined. The computer then determines the years required to amortize that portion of the loan (line 13).

The resultant years required to repay the debt (line 13) may be longer than desired by the manager. Line 14 indicates the cash that would be needed to service the debt in the desired time period (see 109 DATA for the desired number of years as specified by the manager). Line 10 is then subtracted from line 14 to determine the additional after-tax-dollars needed to pay off the debt at that rate (line 15). If the debt can be serviced faster than desired, then the computer prints a minus sign in front of the resultant figure on line 15, indicating that more than enough after-tax-dollars are available to amortize the desired number of years.

Section IV - Income Tax and Social Security Supplement (optional)

The computer also provides on an optional basis, a printout of the projected Minnesota state plus Federal income taxes and social security tax. This printout indicates the detailed figures used in calculating the tax obligations as reported on line 5, section III, of the input.

```
TYPE 1 FOR TAX TABLE DETAILS    TYPE 2 TO STOP
? 1

INCOME TAX AND SOCIAL SECURITY SUPPLEMENT

                                ALT#1      ALT#2      ALT#3
1 NET CASH INCOME              25321.     31369.     31346.
2 DEPRECIATION                  5900.      8050.      7860.
3 ONE HALF CAPITAL SALES        2013.      2913.      2595.
4 SUB TOTAL                     7913.     10963.     10455.
5 ADJUSTED INCOME              17408.     20406.     20891.
6 EXEMPTIONS & DEDUCTIONS       7111.      7561.      7634.
7 TAXABLE INCOME               10297.     12845.     13257.
8 TOTAL STATE & FED TAX         2253.      2997.      3117.
9 SOC SEC INCOME               15395.     17493.     18296.
10 SOC SEC TAX                  1201.      1364.      1427.
11   TOTAL TAX                  3454.      4361.      4544.
*END*
```

Line 7: To obtain the taxable income for each alternative, the computer first determines the total net cash income (line 1) available by adding net nonfarm income to net cash farm income. It then subtracts out depreciation plus one-half the capital gain sales to arrive at an adjusted income figure. From this amount is subtracted the exemptions and deductions. Total exemptions are determined by multiplying the number of exemptions reported at 106 DATA by the amount allowable per exemption. Deductions are calculated by dividing adjusted gross income (line 5) by the number of families reported at 106 DATA, input form. This amount is multiplied by 15% (the standard rate). This amount or $2,000 (the maximum deduction), which ever is smaller, is then multiplied by the number of families involved to arrive at the total deductions. The resultant total is the taxable income for each alternative.

Line 8: To calculate the total state and federal tax due, the program uses the 1972 federal income tax rates for a married couple filing a joint return. In addition to federal taxes, the computer calculates the Minnesota State tax amount using the 1972 Minnesota State tax rate for individuals. The resultant state tax is a close approximation as not all of the federal deductions claimed are allowable on the state tax form.

In cases where more than one family is listed as operators (106 DATA) the taxable income is divided by that number and the resultant tax liability calculated. The computer then multiplies this tax obligation by the number of families inputted. This calculation is assumed to keep the taxable income for each family in a more appropriate marginal tax bracket than if all income was charged to one individual.

Lines 9 & 10: Social security income is calculated by subtracting one-half the capital gains sales (line 104 DATA, input) from the adjusted income (line 5 of tax supplement). The social security tax for each family is calculated using the 1974-1977 tax rate on self-employed tax payers of 7.8% of your first $12,000 of self-employment earnings. This results in a maximum tax of $936 per family. Also the computer calculates the optional method for farmers when actual net earnings from farming is less that $1,600. This amounts to a minimum farm self-employment tax of $125.

Line 11: The total tax for each alternative is determined by adding line 8 (total State and Federal tax) and line 10 (social security tax) together.