

CONTRACTOR FINANCIAL DATA
RETRIEVAL & ANALYSIS SYSTEM
(FINANDAS)

LMI Task 75-11

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I. INTRODUCTION

This report presents the Contractor Financial Data Retrieval & Analysis System (FINANDAS), a computerized system designed to assist Department of Defense (DoD) financial analysts. FINANDAS is the product of Task 75-11, "Analysis of Contractor Financial Capability," conducted by LMI for the Assistant Secretary of Defense (Installations and Logistics) under Department of Defense Contract SD-321.

OBJECTIVES

The objective of Task 75-11 was to develop an analytical model or methodology for assessing a contractor's financial condition and how it might be affected by a major contract award, by changes in the type and volume of the contractor's workload, and by changes in Government financing policy.

BACKGROUND

This task was performed in two phases. In the initial phase, LMI reviewed current DoD practice in analyzing the financial capability of contractors.¹ This review identified the need for an expanded analysis capability. The existing DoD process, including the Pre-Award Survey, does not employ an adequate analytical methodology, and the directives provide little guidance for a more thorough effort. Commercial financial institutions, on the other hand, have a far more advanced methodology, often supported by computerized systems of data retrieval and analysis. LMI therefore recommended that a customized, comprehensive system be developed to assist DoD analysis efforts. LMI was asked to proceed with development of the methodology for such a system, including selection of a data base, establishment of analytical measures, production of computer software, and planning for implementation.

¹"Analysis of Contractor Financial Capability, LMI Task 75-11, Phase 1" report, Logistics Management Institute, April 1976.

ORGANIZATION OF THIS REPORT

The focus of this report is the Contractor Financial Data Retrieval & Analysis System (FINANDAS), and how it can contribute to improved DoD analysis of contractor financial capability. Section II describes FINANDAS in general, and Section III describes the analytical reports it provides. The applications of FINANDAS to contracting decisions and policy analysis are discussed in Section IV. The steps required for its implementation are presented in Section V.

Sample reports from FINANDAS are shown in Appendix A. The detailed functions and uses of each system routine are described in Appendix B and the analytical methods used are discussed in Appendix C. Finally, a selected bibliography is given in Appendix D.

II. FINANDAS - A Computerized System for Contractor Financial Analysis

FINANDAS is a computerized system for obtaining and analyzing financial statements from a large number of corporations. It now includes a data bank of approximately 900 publicly-owned companies. The data bank can be expanded to 2700 companies.

The DoD users will access FINANDAS through a time-sharing computer terminal, retrieve stored contractor data and select the desired analysis reports. Output is printed on the user's time-sharing terminal by a telephone link with the General Electric (G.E.) computer network. In addition, users can easily input data on companies not in the data bank and then obtain the analysis reports. A projection/simulation capability is also included in the system. The cost of a typical analysis is expected to be approximately \$15 per company.

DATA AND ANALYSIS

The financial information stored in the data bank is obtained primarily from Investors Management Sciences, Inc., a subsidiary of Standard & Poor's Corporation. This information, called "Compustat," includes annual and quarterly data, as well as sales and profit data by line of business. LMI has also loaded into the data bank DoD data on contract awards.

Five years of financial statements, including historical trends, are available through FINANDAS. Several ratio analysis reports also are available. Furthermore, the system, with user input of assumptions, provides five-year financial projections, including cash flow trends. The Z-Score test for bankruptcy is calculated for both history and projections.¹

¹The Z-Score measures a company's potential for bankruptcy and is discussed further on pages 11 and C-2.

The coverage of DoD contractors in the Compustat annual and quarterly data bank is quite good. There are 83 publicly-held companies on the list of contractors receiving the largest volume of DoD prime contract awards in 1975.² Of these 83 companies, 71 are included in the 900-company data bank.

USERS AND BENEFITS

Potential users of FINANDAS include persons and groups responsible for contractor financial analysis in pre-award reviews, post-award monitoring, and special studies of contractor financial capability. Some of these users would be:

- financial analysts
- contracting officers
- source selection committees
- major commands
- program managers
- contract pricing staffs

The system will give them:

- an inexpensive, ready source of data
- extensive analysis of financial condition
- help in assessing the impact of an award
- capability for projecting financial condition
- documentation for the contract file

The system will also be useful in training financial analysts, contracting officers, and program management personnel.

²"Index of 100 Parent Companies Which With their Subsidiaries Received the Largest Dollar Volume of Military Prime Contract Awards in Fiscal Year 1975," Companies Receiving the Largest Dollar Volume of Military Prime Contract Awards, Fiscal Year 1975, Office of Assistant Secretary of Defense (Comptroller), Directorate for Information Operations, 21 November 1975, p. 7.

USER IMPLEMENTATION

When FINANDAS is available for general application, DoD users can have access to it merely by obtaining a terminal and a user number. Procedures for the latter will be developed as part of the implementation effort proposed in Section V). Users would provide their own funding. A training program is contemplated to help users expand their financial analysis skills as well as learn how to use the system.

SYSTEM STRUCTURE

FINANDAS is a unified system of computer routines to analyze the financial capability of companies. These routines are available on the G.E. computer network. A controlled access system will limit usage to DoD components.

The structure and routines of the system are shown below in Exhibit 1. The main function of each routine, including the various utility routines, is described in Exhibit 2. The main control routine, like the system, is called FINANDAS. After a user signs on to the G.E. network through a terminal, he uses this routine to initiate the system. The user then enters a special password, followed by commands to call in other routines to perform the desired functions.

The main analysis routine is ANALYZET, which retrieves contractor data from the Compustat data bank, or from a user-created data file. ANALYZET then prints, at the user's terminal, selected historical financial statements and analytical reports. If projections are desired, ANALYZET calls PROFORMA. PROFORMA makes projections from the historical data, based on user selection and input of assumptions. The same basic financial statements and analysis reports are available from both PROFORMA and ANALYZET. These financial statements and analytical reports are described in detail in Section III.

EXHIBIT 1
FINANDAS
SYSTEM STRUCTURE

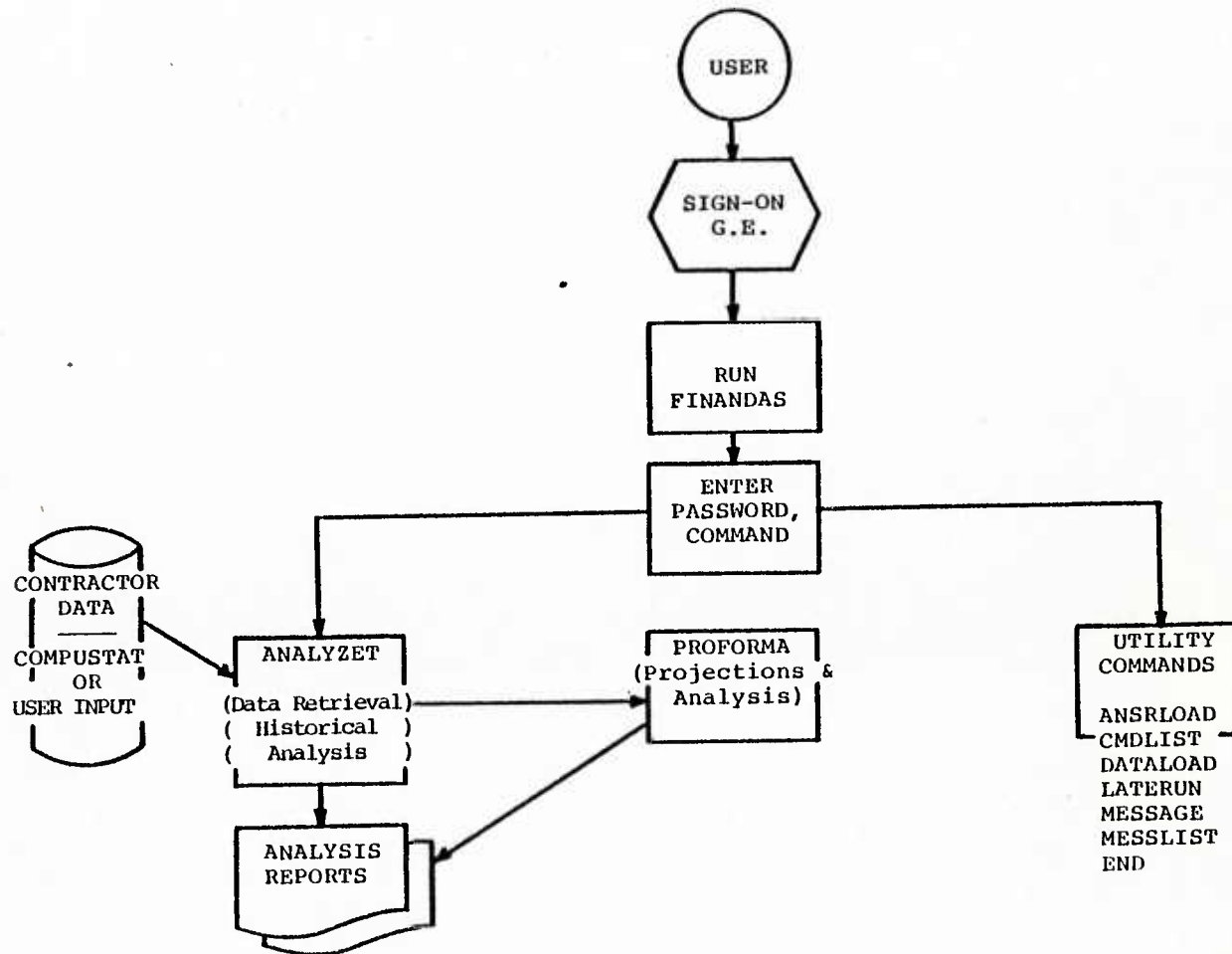


EXHIBIT 2
SYSTEM ROUTINES

<u>Routine Name</u> <u>(Also Command)</u>	<u>Function</u>
FINANDAS	Master routine to control usage of the system. Other routines are accessed through FINANDAS.
ANALYZET	Data retrieval and analysis routine—prints historical reports with analysis, calls PROFORMA to make projections.
ANSRLOAD	Loads a file of answers to control analysis when LATERUN is used. Must be used before LATERUN is called.
CMDLIST	Lists commands available with a description of each.
DATALOAD	Loads a file with contractor financial data for analysis by ANALYZET. Used when contractor data are not in Compustat file.
LATERUN	Sets up an analysis to be run at night at reduced rates.
MESSAGE	Records a user's message to the System Monitor requesting assistance or making suggestions.
MESSLIST	Prints the messages written by users with MESSAGE. Available only to the System Monitor.
PROFORMA	Projects the financial activity of a contractor and prints proforma statements and analysis reports for future years. Can only be accessed through ANALYZET.
END	Terminates the session.

III. SYSTEM ANALYTICAL OUTPUT

FINANDAS gives users a variety of reports analyzing a company's financial condition. In this section, the various output reports are reviewed to demonstrate the system capabilities. The data items on these reports are discussed and related in importance to the general subject of corporate financial analysis. Appendix A offers sample output reports that may help in understanding these discussions.

SYSTEM ANALYTICAL REPORTS

The various analytical reports available for historical data (from ANALYZET), and for projected data (from PROFORMA), are listed in Exhibit 3 and described below. All data reports contain pre-defined rows of financial accounts or ratios, with up to five years of data (except for quarterly data). A trend column indicates the extent of change in the data and its significance.

All data in the reports are scaled to be easily readable. A scale of "Thousands" is used unless Net Sales exceed a billion dollars; then the scale is converted to "Millions." For easy interpretation, each report is clearly identified by title, company, industry, date of preparation, page, and scale factor. Each set of reports contains a header page and a list of all the Compustat footnotes for the subject company.

Balance Sheet

The Balance Sheet, often called the "Statement of Financial Position," identifies the year-end amounts of a company's assets and liabilities. Its format is relatively standard and includes the essentials for analysis. Accounts Receivable and Inventories are stated net of any reserves.

Most of the accounts shown on the Balance Sheet are significant, and their trends should be reviewed. Trends for several key accounts are flagged with a "P" or an "N," for important Positive or Negative indicators of financial health. The key accounts

EXHIBIT 3
ANALYTICAL REPORTS AVAILABLE

<u>Report</u>	<u>Historical Data</u>		<u>Projected Data</u>
	<u>Compustat¹</u>	<u>User Input¹</u>	
Balance Sheet	Yes ²	Yes	Yes
Income & Retained Earnings	Yes	Yes	Yes
Changes in Working Capital	Yes	Yes	Yes
Restated & Supplementary Data	Yes	X ³	X
Annual Ratios	Yes	Yes	Yes
Relative Balance Sheet	Yes	Yes	Yes
Relative Income Statement	Yes	Yes	Yes
Line of Business Data	Yes ⁴	X	X
Quarterly Data	Yes	X	X
Forecasting Factors	Yes	Yes	X
Projection Assumptions	X	X	Automatic ⁵

¹Indicates data source.

²A "yes" indicates that users may select the report.

³An X indicates that the report is not available.

⁴Not all companies in the Compustat data bank have line of business data recorded.

⁵"Automatic" indicates that this output is produced without user selection.

are: Cash, Net Plant Total Assets, Retained Earnings and Stockholders' Equity. Three other key totals added at the bottom of this report are: Working Capital, Long-Term Capital, and Tangible Net Worth. (See TREND ANALYSIS, Appendix C, for information on calculation of trends.)

Income and Retained Earnings

The Income and Retained Earnings Statement is another traditional analytical report. It has a standard format, except that, wherever possible, Depreciation is reported separately from Cost of Sales, to facilitate funds flow analysis.

Key data for trend review in the income section are: Net Sales, Gross Income, Operating Income, Income Before Tax, Income Before Extras (extraordinary items) and Net Income. Many financial analysts believe that Income Before Extras is most important, along with Net Sales, because it indicates the profitability of ongoing operations. Key accounts in the retained earnings section are Net Income and Retained Earnings.

Changes in Working Capital

The accounting name for the Changes in Working Capital report is the Statement of Changes in Financial Position, but it is often referred to as the "Sources and Applications of Funds," or "Funds Flow" statement. The Changes in Working Capital report is oriented more toward the total net working capital rather than to cash. Such an orientation reflects the need for working capital to fund sales (through accounts receivable), provide sufficient work-in-process inventory for production, and maintain finished goods inventory to meet sales commitments. In government contracting, working capital is required to complete the product before settlement at delivery or at certain milestones.

Because working capital is critical to a business operation, the trends calculated by the system for the Changes in Working Capital report contribute significantly to the total analysis. Key items on this report are: Income Before Extras, Total from Opns (operations), Total Sources, Net Increase/-Decrease, and Cash Flow.

Restated and Supplementary Data

The Restated and Supplementary Data report shows how key data have been affected by changes in accounting procedures and also presents important non-accounting data. Because fully restated reports are not available, only selected accounts are restated. The system compares these data with the amounts originally reported, and calculates the percentage difference caused by restatement. If this percentage has an absolute value of 5% or more in any year, restatement is concluded to have had a material effect on the account, which is marked with an asterisk (*) every time it appears.

The "Supplementary" portion of this report also is useful. Stock price data are included to demonstrate the investment community's evaluation of the company's prospects. Other indicators of financial health, when related to other data, are the Number of Employees and the Order Backlog. Debt maturing (2, 3, 4, and 5 years) is listed because it is a particularly important indicator of a company's financial condition. Unusually large maturities in any one year may foretell difficulties, especially for a company with strained credit.

Annual Ratios

The Annual Ratios report, one of the most useful in the system, presents a series of critical ratios categorized to analyze performance, capitalization, liquidity, and debt payment coverage. These ratios in the Annual Ratios report and important ratios from other reports are discussed further under RATIO ANALYSIS, Appendix C. Also included is the Z-Score¹ which measures overall financial strength. The Z-Score was developed to predict a company's potential for bankruptcy, and it has been found effective in identifying companies with significant financial problems.

¹E. I. Altman, "Financial Ratios, Discriminant Analysis, and the Prediction of Bankruptcy," Journal of Finance, September 1968, pp. 589-609.

All the ratios in the Annual Ratios report are keyed for trend review. The trends calculated are flagged with appropriate indicators. The trend in the Z-Score is also calculated, but the flag is applied based on the value of the Z-Score for the latest year.

Relative Balance Sheet

The Relative Balance Sheet is another ratio report, showing each Balance Sheet amount expressed as a percentage of total assets. This report is often called a "common size" report, because it facilitates the comparison of different sized companies. Trends in Relative Balance Sheet ratios are calculated, and flagged when they refer to key accounts on the Balance Sheet.

Relative Income Statement

The Relative Income Statement is useful in analyzing the relative performance of the company over time. It expresses each amount on the Income and Retained Earnings Statement as a percentage of Net Sales. The trends of key income accounts are appropriately flagged as indicators of financial health.

Line of Business Data

For most of the large corporations in the data bank, data on sales and income by line of business are available. The system offers this information to show the trends and profitability of a company's various sales components. While DoD business seldom is identified as a line of business, the items procured can be related to specific lines. This may be helpful in evaluating a subsidiary.

Also included in this report are data on DoD contract awards (available only for selected companies by Federal fiscal year). This information offers a useful perspective on DoD as a customer of the company and on the total DoD contracts in relation to the contracts awarded by a particular DoD component. It is contemplated that the DoD contract information will be expanded to include total contracts outstanding and work completed on them when these data become available.

Quarterly Data

The Quarterly Data report provides the latest published data for a company. Only a few key variables are shown, but general financial trends will be apparent. The quarterly data are shown for the current year, plus the three prior years. A weighted average ratio of the current quarter to the year total is used to project the current year total. This simple approach helps place the current quarter in perspective. Current stock market data are also shown to indicate the investment community's view of current trends within the company. Whenever the Quarterly Data report is selected, the footnotes for the data are provided automatically.

Forecasting Factors

The Forecasting Factor report aids in projecting a company's financial position. This report contains factors useful in specifying assumptions for the PROFORMA projection routine. Most of the ratios shown on the Forecasting Factors report are unique to it, but others are repeated to show the weighted average used in PROFORMA for some accounts.²

Projection Assumptions

This report is included in PROFORMA output to make explicit the assumptions used. All assumptions appear by account projected, and are identified by source: "input" (provided by the user) or "default" (provided automatically when no user assumption is input).

²The average is exponentially weighted with a latest year weight of .5. This was selected in part because the latest year is by far the most important. Furthermore, a lower weight would give the earliest year a weight exceeding that of later years.

IV. APPLICATIONS OF THE SYSTEM

FINANDAS is a general-purpose tool for DoD use in analyzing contractor's financial condition. It has many uses in making contracting and policy decisions. These uses are presented in this section.¹

CONTRACTING DECISIONS

FINANDAS has many applications for contracting decisions. Mainly, it is a source of financial data and extensive analysis for pre-award reviews and source selection. Other contracting applications include negotiations and contract monitoring.

Pre-Award Reviews

In pre-award financial reviews, FINANDAS is a ready source of information on the corporations included in its data bank. For smaller companies not in the data bank, financial data can be fed into the system to perform the same analysis (with a few limitations) done for the large corporations. Using the output reports, financially-trained personnel in DoD procurement organizations can quickly review the financial position of a potential contractor and decide whether additional analysis is needed.

If a Pre-Award Survey is required, the contract administration office responsible can obtain a complete set of FINANDAS analysis reports. These reports contain far more financial data and analysis than was typically collected or prepared in the surveys we reviewed. With the PROFORMA projection option, the user conducting the survey can easily simulate cash flow and other factors that may affect the determination of financial responsibility.

Source Selection

The financial condition of offerors under consideration for major contract awards has been a matter of increasing concern in recent years. Widely publicized cases have

¹One use of the system not discussed below is in the training of financial analysts and program management personnel. The Defense Systems Management College has already expressed an interest in using the system in its training programs.

made it clear that even well-known firms with long and distinguished experience in defense business can develop financial problems which put programs in jeopardy. Consequently there have been attempts to elevate the role of financial capability analysis. Such analysis sometimes has been advanced to the time of source selection, when it can be more intensive and can more easily alter a decision, rather than being part of a subsequent Pre-Award Survey. In some instances financial capability has been made an explicit source selection criterion.

The following steps incorporate the main components of an intensive financial analysis effort for source selection. They include the role FINANDAS can play. Such an analysis should provide a complete profile of an offeror's financial condition, taking into account past trends and the company's current and projected financial position.

First, the corporate financial statements should be analyzed in detail using FINANDAS output reports as the primary resource. This analysis should, however, be supplemented by the company reports to the SEC (the 10K and 10Q's) to provide qualitative information.

Second, an analysis should be made of the financial statements of the offering subsidiary and/or division, with particular attention to assets available and the record of profitability. Such statements are not likely to be public information, and hence, would not be available in the data bank. The analyst could still secure them from the company and put them into the system to obtain the desired analysis reports.

Third, the credit standing of the company should be intensively analyzed. FINANDAS could identify amounts of debts outstanding, payments due, and, with PROFORMA projections, potential repayment problems. To assess current repayment problems, however, the analyst would have to examine the company's existing sources and lines of credit.

Fourth, the bidder's projections should be compared with independent projections. The analyst could use the PROFORMA routine to prepare such independent projections.

The financial capability of an offeror to perform the contract could thereby be gauged. With PROFORMA, comparative projections can be developed assuming a full or partial award or no award at all.

Finally, a thorough evaluation program should also include analysis of current contracts and claims. PROFORMA's projection capability could perform helpful what-if simulations in these areas, based on the current status of contracts and claims.

Negotiations

The system will be useful in planning negotiation strategy for contract financing arrangements. Knowledge of a company's financial position may influence how the DoD pricing team approaches negotiation for a contract likely to have a significant impact on a company. FINANDAS reports can quickly provide the price analysts with that knowledge.

Contract Monitoring

The system will provide quarterly financial status reports for companies in the data bank. Contracting officers, price analysts and program management staff will find these reports helpful in monitoring the progress of prime and subcontractors in a program. Early awareness of financial problems permits prompt action to preserve the Government's interests.

POLICY DECISIONS

FINANDAS can contribute substantially to the analysis of procurement policy. The Directorate of Contract Finance Policy in the Office of the Assistant Secretary of Defense (Installations and Logistics) and the Military Department (MILDEP) organizations responsible for procurement policy would be likely users.

In the LMI report, "Management of Contract Finance Policy," the needs of the Directorate of Contract Finance Policy with respect to financial analysis are discussed.²

²"Management of Contract Finance Policy," Logistics Management Institute, Task 76-10, January 1977, Appendix C.

The Directorate's analytical needs focus on the impact of contract financing changes. The system can assist in this effort. With PROFORMA, THE effects of changes in funds flow can be simulated for selected contractors.

The Directorate also answers questions from others in the Office of the Secretary of Defense regarding the effects of finance policy changes upon major defense contractors. The system could provide data on the contractors' current financial positions and, with PROFORMA, simulate the effects of such changes. Similarly, MILDEP procuring commands could estimate the financial effects of changes in contract finance policy on their major contractors.

V. SYSTEM IMPLEMENTATION PLAN

To make FINANDAS available for DoD use, several implementation tasks must be accomplished. This section identifies these essential tasks and indicates the effort involved in each one. In order of importance, the tasks are as follows:

Develop a users' manual.

Provide for user access to the system.

Develop and conduct a training program for users.

Maintain the system.

Appoint a System Monitor to support it.

Identify future enhancements.

These tasks are discussed in the following paragraphs with our suggestions for accomplishing them.

USERS' MANUAL

A manual should be developed which describes FINANDAS, shows what output can be obtained, and provides instructions for getting the desired results.¹ The following contents are suggested:

- General Information

General description of the system

Use of the system in the procurement function

Main components of system structure

Access to the system

Use of the System Monitor

¹It is recommended that the Users' Manual be loose-leaf and that procedures be established to assure that it is promptly updated for system changes.

- System Output and Interpretation

Descriptions of the output reports available (see Section III) and information on interpretation.

- Sign On/Off

Procedure for signing on (and off) the G.E. computer network for use of the system.

- Descriptions of the FINANDAS Routines

One section for each routine, describing what it is, how it is used, and what can be done with it.

- List of Companies in Data Bank

List of the companies and their stock ticker symbols used to access the company data.

For those managing the system, sections should be included on:

- System Monitor

Identification of responsibilities (see "System Monitor" below).

- System Files

Description of the system files and procedures for updating them.

- Administrative Routines

Explanation of their use.

USER ACCESS

User access to FINANDAS must be established by coordination with representatives of the G.E. computing network. Two steps have to be taken:

1. A series of user numbers in the G.E. MAP Catalog must be obtained.
2. The user numbers must be validated for the Compustat data bank.

The obtaining of user numbers could be the responsibility of each user, but the process could be simplified by letting a single DoD component coordinate the effort. The Air Force Systems Command (AFSC) presently is coordinating the usage of the G.E.

network; they are thus well equipped to provide user access to FINANDAS. Users could simply get a pre-assigned number from the AFSC.

The validation of the user numbers for access to the Compustat Data also could be coordinated through the AFSC.

TRAINING PROGRAM

In launching a new system, it is important to provide for user training. Although a financially-oriented person should be able to use FINANDAS with the help of the Users' Manual alone, a good training program will probably be necessary to stimulate usage and reduce apprehension.

Furthermore, a training program to introduce the system will bring together financial analysts from various organizations within DoD. The program can then be a vehicle to improve the technical skills of these analysts, and to discuss the current problems and issues of DoD financial analysis.

We suggest that the training program be a four-day session with the following allocation of time by topic:

- | | |
|--|-----------|
| - Instruction on use of the system | - 6 hours |
| - Introduction to computers and time-sharing terminals | - 3 hours |
| - Hands-on utilization of the system | - 8 hours |
| - Instruction in financial analysis methods | - 3 hours |
| - Discussion of ASPR and current problems in financial analysis | - 4 hours |
| - Financial analysis case studies (analysis using system output, and presentations of results) | - 8 hours |

Ideally, the training program will not treat each topic separately. It will instead cover the topics in an integrated fashion, using the system and its output as the main vehicles for conducting the training.

We suggest that this training program be presented in several metropolitan centers around the country to make it easy for analysts to attend.

SYSTEM MAINTENANCE

To keep FINANDAS functioning well, system maintenance is extremely important. It requires two basic tasks.

One task is the updating of the data bank. The corporate annual data will be regularly updated by the G.E. MAP Services, but other data files will require special procedures. The quarterly and line of business data must be periodically reloaded from updated tapes supplied by Compustat, using special routines. The DoD contract data must be reloaded annually.

The other important system maintenance task is user interface. Users must be able to obtain assistance. Such assistance is necessary for: getting started, providing answers to questions, resolving problems, and, if necessary, correcting system errors. Maintenance of the Users' Manual is another essential user interface function.

To fulfill the ongoing needs of system maintenance, we suggest that a System Monitor be appointed. The role and responsibilities of the System Monitor are described below.

SYSTEM MONITOR

The System Monitor will be a key functionary in the operation of FINANDAS. The Monitor should interface with five types of organizations as follows:

(1) Users

The System Monitor should assist users by

- Maintaining the user validation file
- Maintaining the Users' Manual
- Updating the system title file with important messages to users
- Maintaining other program files to ensure satisfactory operation
- Answering user questions promptly.

(2) AFSC

The System Monitor should cooperate with the AFSC, assuring their participation, maintaining user access and issuing new user numbers.

(3) G.E. network sales representatives

The System Monitor should maintain contact with appropriate G.E. sales representatives to provide local field support for users on the G.E. network.

(4) G.E. technical groups

The System Monitor should coordinate the maintenance of the system and its data bank with the various G.E. technical groups, including MAP Services.

(5) DoD contract data sources

The System Monitor should maintain contact with the DoD sources of contract data for annual updating.

FUTURE ENHANCEMENTS

As a system begins to be used by a variety of analysts, ideas for improvements are generated. It is important to collect and evaluate these ideas and develop them into proposals for implementation.

To begin the list of future enhancements, we offer several ideas that come to mind during the system design but were not practical to implement initially:

- Expand the data bank with more companies and more detail on DoD contracts
- Develop the capability to create an industry composite for comparison with a given company
- Develop and implement a telephone-oriented retrieval and analysis program
- Develop the capability for user specification of special analysis
- Update and improve the prediction of bankruptcy and contract failures
- Provide for expansion of existing user-created data files.

APPENDIX A. SAMPLE REPORTS

The sample reports in this appendix have been prepared for selected companies to demonstrate FINANDAS capabilities. They should not be used for analysis. The reports included are as follows:

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CONTRACTOR FINANCIAL DATA RETRIEVAL & ANALYSIS SYSTEM
REPORT ON

NORTHROP CORP

PREPARED 11 JAN. 77
BASED ON COMPUSTAT DATA

ANALYZED BY _____

ON (DATE) _____

RE CONTRACT/IFB NO. _____

ANALYST'S SUMMARY & CONCLUSIONS: _____

CONTRACTOR FINANCIAL DATA RETRIEVAL & ANALYSIS SYSTEM

11 JAN 77 P1

ANNUAL FINANCIAL FOOTNOTES OF NORTHROP CORP

INDUSTRY: AEROSPACE

DATA ITEM	YEARS	FOOTNOTE
COST OF SALES	71-75	REDUCED BY DEPRECIATION—ALLOCATED TO SG & A
INVESTMENT TAXCREDIT	71-75	COMPUTED USING FLOW-THROUGH METHOD
EPS PRIMARY	71-75	EARNING/SHARE BASED ON COMMON STOCK EQUIVALENT
	71-75	INC.EQUITY EARNINGS NON-CONSOLIDATED SUBSIDIARY
NET PLANT	71-75	COMBINATION OF ACCELERATED AND STR.-LINE METHODS
OTHER CURRENT LIAB.	71-75	INCLUDES DEFERRED TAXES
TOTAL SOURCES	71-75	SOURCES OF CASH ONLY
NET SALES	71	CHECK RESTATED DATA FOR MATERIAL CHANGES
INCOME BEFORE EXTRAS	71	CHECK RESTATED DATA FOR MATERIAL CHANGES
WORKING CAPITAL	71	CHECK RESTATED DATA FOR MATERIAL CHANGES
INVENTORY METHOD(S)	74	FIFO/AVG COST/
	75	FIFO/AVG COST/

BALANCE SHEET OF LOCKHEED AIRCRAFT CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN: MILLIONS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
<u>ASSETS</u>						
CASH & EQUIVALENTS	101.7	89.0	76.1	122.2	58.3	-7.7%
ACCOUNTS RECEIVABLE	181.5	174.9	170.0	174.9	209.8	2.9%
INVENTORIES	851.4	1065.8	1291.9	892.5	387.5	-16.1%
OTHER CURRENT ASSETS	30.4	31.5	25.3	88.1	110.8	43.5%
TOTAL CURRENT ASSETS	1165.1	1361.2	1563.2	1277.7	766.4	-8.6%
GROSS PLANT	660.5	661.6	707.8	709.1	732.6	2.8% ^S
ACCUM. DEPRECIATION	360.9	393.8	429.1	451.2	476.6	7.2% ^S
NET PLANT	299.5	267.8	278.7	257.9	256.0	-3.5% ^N
INVESTMENTS	1.5	1.4	1.7	-0.0	-0.0	-0.0%
INTANGIBLES	0.	0.	0.	0.	0.	-0.0%
OTHER ASSETS	5.1	1.8	10.9	98.5	551.0	280.1% ^S
TOTAL ASSETS	1471.2	1632.2	1854.5	1634.1	1573.4	1.4%
<u>LIABILITIES & EQUITY</u>						
ACCOUNTS PAYABLE	187.5	229.2	233.5	260.8	220.4	4.6%
MATURING NOTES & DEBT	0.	0.	16.6	16.5	18.4	-0.0%
INCOME TAXES PAYABLE	1.3	0.6	1.0	5.8	7.1	74.1%
OTHER CURRENT LIAB. *	324.7	375.3	467.1	492.8	423.5	8.4%
TOTAL CURRENT LIAB.	513.5	605.2	718.1	775.9	669.4	8.1%
LONG TERM DEBT	707.5	760.6	853.2	831.7	813.0	3.7%
OTHER L-T LIAB.	0.	0.	0.	0.	15.7	-0.0%
TOTAL LIABILITIES	1221.0	1365.8	1571.3	1607.6	1498.1	5.9%
MINORITY INTERESTS	0.	0.	0.	0.	0.	-0.0%
PREFERRED STOCK	0.	0.	0.	0.	0.	-0.0%
COMMON STOCK	11.4	11.4	11.4	11.4	11.4	0.1% ^S
CAPITAL SURPLUS	79.0	79.0	79.0	79.0	82.5	0.9% ^S
RETAINED EARNINGS	159.8	176.0	192.8	-63.9	-18.6	-0.0%
SHAREHOLDERS EQUITY	250.2	266.4	283.2	26.5	75.3	-37.6%
TOTAL LIAB. & EQUITY	1471.2	1632.2	1854.5	1634.1	1573.4	1.4%
WORKING CAPITAL	651.6	756.0	845.1	501.8	97.0	-34.4%
LONG TERM CAPITAL	957.7	1027.0	1136.5	858.2	888.3	-3.2%
TANGIBLE NET WORTH	250.2	266.4	283.2	26.5	75.3	-37.6%

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS AND CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

INCOME & RETAINED EARNING STATEMENT OF LOCKHEED AIRCRAFT CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN: MILLIONS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
<u>INCOME</u>						
NET SALES	2852.4	2472.7	2756.8	3279.1	3387.2	6.5%
COST OF SALES *	2745.6	2356.5	2629.5	2872.2	2961.1	3.6%
GROSS INCOME	106.8	116.3	127.3	406.9	426.1	49.5%P
SELLING, GEN & ADMIN	0.0	0.0	-0.0	238.0	239.0	-0.0%
DEPRECIATION	54.6	47.8	45.2	42.4	39.8	-7.2%S
OPERATING INCOME	52.2	68.5	82.1	126.5	147.3	30.8%P
INTEREST EXPENSE	33.3	47.5	69.3	102.7	67.5	24.5%
SPECIAL ITEMS	0.	0.	0.	0.	0.	-0.0%
OTHER INCOME/-EXP	6.4	6.7	6.8	11.1	10.4	15.7%
INCOME BEFORE TAX	25.4	27.7	19.6	34.9	90.2	31.9%
INCOME TAXES	13.8	14.7	5.5	11.7	44.9	23.8%
MINORITY INTERESTS	0.	0.	0.	0.	0.	-0.0%
INCOME BEFORE EXTRAS	11.6	13.0	14.1	23.2	45.3	39.1%P
EXTRAORDINARY ITEMS	3.8	3.2	2.7	0.	0.	-0.0%
NET INCOME/-LOSS	15.4	16.2	16.8	23.2	45.3	28.6%P
<u>RETAINED EARNINGS</u>						
BEGINNING BALANCE	144.4	159.8	176.0	192.8	-63.9	-0.0%
RESTATEMENT	0.	0.	0.	-279.9	0.	-0.0%
AS RESTATED	144.4	159.8	176.0	-87.1	-63.9	-0.0%
PLUS NET INC/-LOSS	15.4	16.2	16.8	23.2	45.3	28.6%P
LESS DIVIDENDS	0.	0.	0.	0.	0.	-0.0%
OTHER CHANGES	0.0	-0.0	0.0	-0.0	0.	-0.0%
ENDING BALANCE	159.8	176.0	192.8	-63.9	-18.6	-0.0%
INCREASE/-DECREASE	15.4	16.2	16.8	23.2	45.3	28.6%P

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS & CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

CHANGES IN WORKING CAPITAL OF NORTHROP CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN: THOUSANDS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
SOURCES						
INCOME BEFORE EXTRAS*	14077.	11136.	11608.	18136.	24732.	17.5%
DEPRECIATION	10897.	11670.	12173.	12914.	14642.	7.2%
OTHER OPNS SOURCES	-7079.	-664.	3466.	10603.	8113.	-0.0%
TOTAL FROM OPNS	17895.	22142.	27247.	41653.	47487.	29.5%
SALE OF PLANT, ETC.	1534.	812.	484.	3162.	2851.	29.7%
SALE OF STOCK	12.	36.	13.	33.	3224.	203.4%
NEW LONG TERM DEBT	-0.	6110.	4822.	8381.	8865.	18.2%
OTHER SOURCES	119036.	64574.	46209.	119220.	68256.	-4.9%
TOTAL SOURCES *	138477.	93674.	78775.	172449.	130683.	5.1%
APPLICATIONS						
DIVIDENDS	5141.	4588.	4243.	5373.	6515.	6.5%
CAPITAL EXPENDITURES	11902.	16242.	12676.	32008.	25074.	24.2%
INVESTMENTS&ACQ	-0.	-0.	-0.	24416.	-0.	-0.0%
DEBT MATURITIES	126778.	6671.	17350.	25050.	4016.	-42.8%
TREASURY STOCK PURCH	4867.	9373.	3608.	4200.	318.	-46.5%
OTHER APPLICATIONS	5670.	61887.	36452.	79151.	100189.	62.0%
TOTAL APPLICATIONS	154358.	98761.	74329.	170198.	136112.	3.0%
NET INCREASE/-DECR	-15881.	-5087.	4446.	2251.	-5429.	-0.0%
SUMMARY OF CHANGES						
CASH & EQUIVALENTS	-15882.	-11336.	4446.	26667.	-3327.	-0.0%
ACCOUNTS RECEIVABLE	-29797.	-74570.	27233.	-19692.	22984.	-0.0%
INVENTORIES	-76154.	12875.	5452.	21019.	12857.	-0.0%
OTHER CURRENT ASSETS	2802.	-5010.	-1108.	202.	-844.	-0.0%
CUR ASSET INCR/-DECR	-119030.	-75042.	36023.	28196.	31670.	-0.0%
ACCOUNTS PAYABLE	719.	15640.	-27602.	5421.	-223.	-0.0%
MATURING NOTES&DEBT	-78150.	-61212.	8040.	-18328.	-2095.	-0.0%
INCOME TAXES PAYABLE	3230.	-4086.	-3767.	-425.	18440.	-0.0%
OTHER CURRENT LIAB. *	2057.	-3600.	61495.	42002.	-799.	-0.0%
CUR LIAB. INCR/-DECR	-72144.	-53258.	38166.	28670.	15323.	-0.0%
DUE TO RESTATEMENT	31005.	19697.	6589.	2725.	-21776.	-0.0%
NET INCREASE/-DECR	-15881.	-5087.	4446.	2251.	-5429.	-0.0%
CASH FLOW	17391.	21717.	26806.	41241.	47201.	30.2%

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS AND CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

CONTRACTOR FINANCIAL DATA RETRIEVAL & ANALYSIS SYSTEM

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RESTATED & SUPPLEMENTARY DATA OF NORTHROP CORP

INDUSTRY: AEROSPACE		DATA PRINTED IN: THOUSANDS					
MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS	
<u>NET SALES</u>							
AS RESTATED	573943.	573749.	698967.	853293.	988123.	16.0%P	
AS FIRST REPORTED *	605077.	573749.	698967.	853293.	988123.	14.8%P	
PERCENT DIFFERENCE	-5.	0.	0.	0.	0.	1.0	
<u>INCOME BEFORE EXTRAS</u>							
AS RESTATED	10995.	11136.	11608.	18136.	24732.	23.5%P	
AS FIRST REPORTED *	14077.	11136.	11608.	18136.	24732.	17.5%	
PERCENT DIFFERENCE	-22.	0.	0.	0.	0.	4.4	
<u>WORKING CAPITAL</u>							
AS RESTATED	114857.	100120.	97977.	97503.	113850.	-0.4%	
AS FIRST REPORTED *	124904.	100120.	97977.	97503.	113850.	-2.1%	
PERCENT DIFFERENCE	-8.	0.	0.	0.	0.	1.6	
<u>TOTAL ASSETS</u>							
AS RESTATED	-0.	-0.	-0.	-0.	-0.	-0.0%	
AS FIRST REPORTED	409931.	347173.	380493.	424029.	464197.	4.6%	
PERCENT DIFFERENCE	-0.	-0.	-0.	-0.	-0.	-0.0	
<u>SUPPLEMENTARY DATA</u>							
<u>COMMON STOCK PRICE:</u>							
YEAR HIGH(ADJ)	28.750	27.500	26.625	27.875	24.625	-0.8	
YEAR LOW(ADJ)	16.500	21.250	14.000	15.500	14.875	-0.9	
MKT VALUE EQUITY	109347.	101617.	75754.	95317.	125630.	2.2%	
EMPLOYEES(THOUSANDS)	15.	22.	25.	26.	23.	11.4%	
ORDER BACKLOG	619139.	768600.	1165500.	1122900.	1166200.	17.9%P	
DEBT MATURING 2YRS	-0.	-0.	-0.	3466.	4791.	-0.0%	
3YRS	-0.	-0.	-0.	4588.	4729.	-0.0%	
4YRS	-0.	-0.	-0.	4580.	4292.	-0.0%	
5YRS	-0.	-0.	-0.	4163.	3896.	-0.0%	

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS & CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

ANNUAL RATIOS FOR ANALYSIS OF NORTHROP CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN PERCENTS*

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
PERFORMANCE						
INCOME/AVG EQUITY	9.1	7.2	7.6	11.3	14.2	1.4
INCOME/SALES	2.3	1.9	1.7	2.1	2.5	0.1
INC BIT/AVG CAPITAL	14.2	11.5	12.9	17.5	23.7	2.5 P
INC BIT/ASSETS Z	5.9	7.6	7.5	9.1	12.0	0.6
RET EARN/ASSETS Z	27.3	30.9	29.3	28.3	29.4	0.2
SALES/ASSETS Z	147.6	165.3	183.7	201.2	212.9	16.6 P
SALES/AVG EQUITY	390.7	371.7	454.6	533.7	565.5	51.2 P
SALES/WORKING CAP.	484.4	573.1	713.4	875.1	867.9	106.9 P
SALES/NET PLANT	705.4	614.5	748.5	780.6	645.3	44.6 P
APPROX. P/E RATIO R	6.9	8.2	5.6	4.8	4.8	-0.8 N
CAPITALIZATION						
L-T DEBT/EQUITY	49.3	48.0	39.0	36.0	34.5	-4.2 P
LIAB./EQUITY	131.2	126.7	144.6	158.3	150.5	0.8
L-T DEBT/L-T CAPITAL	33.0	32.4	28.0	26.5	25.6	-2.1 P
MKT EQUITY/TOT DEBT Z	70.7	114.2	89.4	147.1	166.2	26.4 P
LIQUIDITY						
CURRENT RATIO	171.1	181.8	161.0	151.5	155.7	-6.1
ACID TEST	112.5	91.3	89.3	79.5	83.1	-7.1 N
DAYS RECEIVABLES R	106.3	64.7	67.3	46.7	48.8	-13.3 P
RECEIVABLES/WORK CAP	141.1	101.5	131.5	112.0	116.1	-4.0
INVENTORY TURNS R	6.4	5.4	5.4	5.5	5.7	-0.1
INVENTORIES/WORK CAP	72.1	102.3	110.6	132.7	125.0	13.6 N
DAYS PAYABLES R	34.3	45.6	22.6	20.7	18.2	-5.7
WORKING CAP/ASSETS Z	30.5	28.8	25.8	23.0	24.5	-1.8 N
L-T DEBT/WORKING CAP	62.0	72.8	61.9	60.6	56.1	-2.4
CSH FLO/TOT LIAB	6.9	11.1	11.9	15.9	16.9	2.5 P
COVERAGE						
INC BIT/INTEREST	509.9	451.3	340.6	769.6	921.0	114.0
CSH FLO/DBT MAT+C.E.	12.5	94.8	89.3	72.3	162.3	27.7 P
OVERALL STRENGTH						
Z- SCORE TOTAL Z	2.94	3.37	3.34	3.86	4.35	0.3 P

* EXCEPT WHERE MARKED R(RATIO) OR Z-SCORE TOTAL

Z THESE ARE THE COMPONENTS & TOTALS OF THE Z SCORE-SEE MANUAL FOR EXPLANATION
SEE RELATIVE INCOME STATEMENT AND RELATIVE BALANCE SHEET FOR OTHER KEY RATIOS

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS AND CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

RELATIVE BALANCE SHEET OF UNITED TECHNOLOGIES CORP

INDUSTRY: AEROSPACE

DATA ARE PERCENT OF TOTAL ASSETS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
ASSETS						
CASH & EQUIVALENTS	4.7	4.9	6.4	8.6	7.5	0.9 P
ACCOUNTS RECEIVABLE	40.2	35.6	34.0	25.2	27.5	-3.6 S
INVENTORIES	25.2	28.4	29.8	36.6	33.8	2.5 S
OTHER CURRENT ASSETS	0.	0.	0.	0.	3.3	0.7
TOTAL CURRENT ASSETS	70.1	68.9	70.2	70.5	72.1	0.6
GROSS PLANT	66.4	75.0	73.7	67.9	59.8	-2.0
ACCUM. DEPRECIATION	44.1	53.8	54.7	45.5	36.2	-2.4
NET PLANT	22.3	21.2	19.1	22.4	23.6	0.4
INVESTMENTS	7.0	9.5	10.0	6.1	3.7	-1.0
INTANGIBLES	0.	0.	0.	0.	0.	0. S
OTHER ASSETS	0.6	0.4	0.7	1.0	0.6	0.1
TOTAL ASSETS	100.0	100.0	100.0	100.0	100.0	0. S
LIABILITIES & EQUITY						
ACCOUNTS PAYABLE	6.0	8.5	9.6	10.6	10.6	1.1 S
MATURING NOTES & DEBT	18.3	0.4	0.4	4.0	3.1	-2.7
INCOME TAXES PAYABLE	0.	1.8	1.9	3.9	2.1	0.6
OTHER CURRENT LIAB.	22.4	26.7	26.9	21.9	17.7	-1.4
TOTAL CURRENT LIAB.	46.7	37.3	38.7	40.3	33.5	-2.4
LONG TERM DEBT	16.4	16.3	16.8	11.6	23.6	0.8
OTHER L-T LIAB.	0.7	0.6	0.5	0.4	2.0	0.2
TOTAL LIABILITIES	63.8	56.3	56.0	52.3	59.0	-1.3
MINORITY INTERESTS	0.	0.	0.	0.	5.5	1.1
PREFERRED STOCK	0.	0.	0.	14.1	9.7	3.3
COMMON STOCK	15.3	17.6	15.8	11.0	8.0	-2.1 S
CAPITAL SURPLUS	-0.0	0.	0.	0.0	0.0	0.0 S
RETAINED EARNINGS	20.9	26.2	26.2	22.6	17.8	-1.0
SHAREHOLDERS EQUITY	36.2	43.7	44.0	47.7	35.5	0.2
TOTAL LIAB. & EQUITY	100.0	100.0	100.0	100.0	100.0	0. S
WORKING CAPITAL	23.4	31.5	31.5	30.2	38.6	2.9 P
LONG TERM CAPITAL	52.6	62.1	60.8	59.3	64.5	2.1
TANGIBLE NET WORTH	36.2	43.7	44.0	47.7	35.5	0.2

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS AND CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

RELATIVE INCOME STATEMENT OF UNITED TECHNOLOGIES CORP

INDUSTRY: AEROSPACE

DATA ARE PERCENT OF NET SALES

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
<u>INCOME</u>						
NET SALES *	100.0	100.0	100.0	100.0	100.0	0. S
COST OF SALES *	72.5	69.7	70.6	72.8	71.5	0.1
GROSS INCOME	27.5	30.3	29.4	27.2	28.5	-0.1
SELLING, GEN & ADMIN	27.6	21.9	22.0	18.6	20.0	-1.8 S
DEPRECIATION	3.7	3.7	2.6	2.4	2.1	-0.5 S
OPERATING INCOME	-3.9	4.8	4.8	6.3	6.3	2.2 P
INTEREST EXPENSE	1.1	0.7	0.5	0.7	1.0	-0.0
SPECIAL ITEMS	0.	0.	0.	0.	0.	0. S
OTHER INCOME/-EXP	0.4	0.3	0.3	0.5	0.6	0.1
INCOME BEFORE TAX	-4.6	4.4	4.6	6.0	6.0	2.3
INCOME TAXES	-2.4	1.9	2.1	2.9	2.9	1.1 S
MINORITY INTERESTS	0.	0.	0.	0.	0.1	0.0
INCOME BEFORE EXTRAS	-2.2	2.5	2.5	3.1	3.0	1.1
EXTRAORDINARY ITEMS	0.	0.	0.	0.	0.	0. S
NET INCOME/-LOSS	-2.2	2.5	2.5	3.1	3.0	1.1
<u>RETAINED EARNINGS</u>						
BEGINNING BALANCE	16.9	14.4	14.0	10.7	10.6	-1.6 N
RESTATEMENT	0.7	0.	0.	0.	0.	-0.1
AS RESTATED	17.6	14.4	14.0	10.7	10.6	-1.6 N
PLUS NET INC/-LOSS	-2.2	2.5	2.5	3.1	3.0	1.1
LESS DIVIDENDS	1.1	1.1	0.9	1.3	1.2	0.1
OTHER CHANGES	-0.0	-0.0	0.	-0.2	-0.0	-0.0
ENDING BALANCE	14.4	15.8	15.6	12.4	12.4	-0.7
INCREASE/-DECREASE	-3.2	1.4	1.6	1.6	1.8	1.0

* SEE FOOTNOTE REPORT FOR ACCOUNTING METHODS & CHANGES

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

LINE OF BUSINESS DATA OF A-T-O INC

INDUSTRY: MACHINERY GENERAL INDUSTRIAL

DATA PRINTED IN: THOUSANDS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	TRENDS
FOREIGN						
SALES	-0.	-0.	-0.	-0.	-0.	-0.0%
OPERATING INCOME	-0.	-0.	-0.	-0.	-0.	-0.0%
% INCOME/SALES	-0.00	-0.00	-0.00	-0.00	-0.00	-0.0
FIRE PROTEC						
SALES	98741.	106310.	128678.	149768.	170250.	15.4% S
OPERATING INCOME	4527.	6754.	8277.	9452.	6774.	12.1%
% INCOME/SALES	4.58	6.35	6.43	6.31	3.98	-0.1
FLUID CONTR						
SALES	20466.	19294.	23722.	28394.	23716.	7.0%
OPERATING INCOME	1212.	155.	566.	1556.	-688.	-0.0%
% INCOME/SALES	5.92	0.80	2.39	5.48	-2.90	-1.3
INDL EQUIP						
SALES	119690.	127995.	148122.	148063.	154310.	6.8%
OPERATING INCOME	7215.	9007.	5953.	7190.	11648.	7.6%
% INCOME/SALES	6.03	7.04	4.02	4.86	7.55	0.1
ELEC-ELECTR						
SALES	33330.	33213.	35804.	41880.	53746.	12.6% S
OPERATING INCOME	1681.	2089.	2493.	3342.	5481.	32.8% S
% INCOME/SALES	5.04	6.29	6.96	7.98	10.20	1.2 P
RECREATION						
SALES	-0.	-0.	-0.	-0.	79762.	-0.0%
OPERATING INCOME	-0.	-0.	-0.	-0.	371.	-0.0%
% INCOME/SALES	-0.00	-0.00	-0.00	-0.00	0.47	-0.0
RECREATION						
SALES	59234.	66181.	68199.	75726.	-0.	8.0% S
OPERATING INCOME	1799.	2450.	637.	-506.	-0.	8.0% S
% INCOME/SALES	3.04	3.70	0.93	-0.67	-0.00	-1.4 S
OTHER						
SALES	26239.	28625.	31233.	31944.	-0.	7.0% S
OPERATING INCOME	-2824.	-3925.	1791.	1279.	-0.	7.0% S
% INCOME/SALES	-10.76	-13.71	5.73	4.00	-0.00	6.4 P
TOTALS						
SALES	357700.	381618.	435758.	475775.	480482.	8.4% S
OPERATING INCOME	16956.	20647.	26738.	34495.	32532.	19.9% S
% INC/SALES	4.74	5.41	6.14	7.25	6.77	0.6 P
DEFENSE BUSINESS						
DOD CONTRACT AWARDS	-0.	-0.	-0.	-0.	48503.	-0.0%

FOOTNOTES: CODE

DEFINITION

A	THIS PRODUCT CATEGORY NOT CONSOL. IN FINANCIAL STATEMENTS
B	OPERATING INCOME IS AFTER TAXES
U	OTHER INCOME INCLUDED IN SALES
E	OTHER OPERATING INCOME EXCLUDED FROM SALES
F	INCLUDES INTRA COMPANY SALES
H	INCLUDES EXCISE TAXES
I	OTHER INCOME INCLUDED IN SALES/INCLUDES EXCISE TAXES
J	INCLUDES INTRA COMPANY SALES/INCLUDES EXCISE TAXES
G	EXCLUDES CANADIAN OPERATIONS
K	EXCLUDES FOREIGN EXPORTS

SEE FOOTNOTE REPORT FOR OVERALL ACCOUNTING METHODS & CHANGES

DATA SOURCES:

DEFENSE BUSINESS - DOD REPORTS - SEE MANUAL

OTHER - INVESTORS MANAGEMENT SCIENCES, INC. LATEST DATA YEAR FINAL

QUARTERLY DATA OF AMAX INC

INDUSTRY: METALS-MISC

DATA PRINTED IN: THOUSANDS

	Q1	Q2	Q3	Q4	YR TOT	YTD% #
<u>NET SALES</u>						
YR ENDING DEC-73 *	199080.	252130.	255330.	257240.	963780.	20.7%
DEC-74 *	298840.	326020.	290650.	261430.	1166940.	24.8%
DEC-75 *	249390.	242440.	218590.	251670.	962090.	25.9%
DEC-76	266630.	-0.	-0.	-0.	1097243. P	24.3%
<u>OPERATING INCOME</u>						
YR ENDING DEC-73	-0.	-0.	-0.	-0.	-0.	-0.0%
DEC-74	-0.	-0.	-0.	-0.	-0.	-0.0%
DEC-75	-0.	-0.	-0.	-0.	-0.	-0.0%
DEC-76	-0.	-0.	-0.	-0.	-0.	-0.0%
<u>INCOME BEFORE EXTRAS</u>						
YR ENDING DEC-73	21870.	24940.	25430.	32880.	105120.	20.8%
DEC-74	39820.	39070.	36490.	29080.	144460.	27.6%
DEC-75	36070.	36220.	29390.	32690.	134370.	26.8%
DEC-76	33840.	-0.	-0.	-0.	132706. P	25.5%
<u>NET INCOME</u>						
YR ENDING DEC-73	21870.	24940.	25430.	32880.	105120.	20.8%
DEC-74	39820.	39070.	36490.	29080.	144460.	27.6%
DEC-75	36070.	36220.	29390.	32690.	134370.	26.8%
DEC-76	33840.	-0.	-0.	-0.	132706. P	25.5%
<u>COM STK PRICE-CLOSE</u>						
YR ENDING DEC-73	33.87	30.75	41.87	51.25		
DEC-74	43.38	39.75	35.38	30.75		
DEC-75	41.00	55.38	49.87	47.25		
DEC-76	55.87	-0.00	-0.00	-0.00		

* YEAR-TO-DATE (FOR THE CURRENT QUARTER) AS A % OF YR TOTAL

* SEE QUARTERLY FOOTNOTE REPORT FOR ACCOUNTING METHODS & CHANGES

P CURRENT YEAR TOTAL IS PROJECTED- SEE MANUAL FOR DETAILS

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC.

QUARTERLY FINANCIAL FOOTNOTES OF AMAX INC

INDUSTRY: METALS-MISC

DATA ITEM	YR-Q#	FOOTNOTE
SALES	73Q1-2-3-4	SALES ARE RESTATED
	74Q2-3-4	SALES ARE RESTATED
	75Q1-2	SALES ARE RESTATED
ALL ACCOUNTS	74Q2	QUARTER DATA INCL. 6 MOS. OF MERGER/ACQUISITION
	73Q1-2-3-4	ACCOUNTING CHANGE
	74Q3-4	RESTATED FOR BUSINESS COMBINATION
	75Q1-2	RESTATED FOR BUSINESS COMBINATION

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC.

CONTRACTOR FINANCIAL DATA RETRIEVAL & ANALYSIS SYSTEM

11 JAN 77 P12

FORECASTING FACTORS OF GRUMMAN CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN PERCENTS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1971	DEC 1972	DEC 1973	DEC 1974	DEC 1975	WTU AVERAGE	TREND
FORECASTED VARIABLE RELATED VARIABLE							
SALES GROWTH							
NET SALES	-19.56	-14.46	58.40	2.30	19.39	15.57	9.51
COST OF SALES							
NET SALES	101.16	112.93	88.75	86.80	87.21	89.78	-5.40
SELLING, GEN & ADMIN							
NET SALES	0.00	0.00	6.25	8.86	8.57	7.28	2.60 S
DEPRECIATION							
PRIOR GROSS PLANT	8.63	7.67	6.66	6.05	5.72	6.22	-0.75 S
INTEREST EXPENSE							
AVG. TOTAL DEBT	5.65	4.29	5.74	7.60	9.69	8.09	1.14 S
OTHER INCOME/-EXP.							
NET SALES	0.23	0.41	0.50	1.52	1.65	1.31	0.40 S
INCOME TAXES							
INCOME BEFORE TAX	50.44	37.07	46.63	44.70	42.01	43.48	-0.92
MINORITY INTERESTS							
INCOME AFTER TAX	-0.59	-0.30	7.47	4.20	4.18	4.02	1.40
CASH							
ACCOUNTS PAYABLE	15.96	40.51	61.72	25.08	49.04	42.28	5.17
ACCOUNTS RECEIVABLE							
NET SALES	14.44	18.86	8.13	11.21	7.78	9.79	-2.10
INVENTORIES							
CS + DEPR	13.16	13.32	10.56	18.56	21.18	18.21	2.13
OTHER CURRENT ASSETS							
CS+SGA+CAP EXP	0.41	0.31	0.26	0.26	0.65	0.46	0.04
ACCOUNTS PAYABLE							
CS+SGA+CAP EXP	7.46	7.73	6.83	7.01	5.75	6.43	-0.41 S
INCOME TAXES PAYABLE							
INCOME TAXES	-12.49	-2.89	0.	99.07	106.79	77.20	34.05 S
OTHER CURRENT LIAB.							
CS+SGA+CAP EXP	4.91	11.60	5.39	4.78	2.39	4.35	-1.08
PLT SOLD&RETIRED							
PRIOR GROSS PLANT	5.17	3.24	1.62	1.99	2.81	2.63	-0.60
ACC DEPR. SOLD&RET.							
PLT SOLD&RETIRED	56.77	64.38	73.70	87.17	60.79	68.97	3.06
DIVIDENDS							
COM + PREF STOCK	21.87	5.36	3.21	9.27	12.21	10.53	-1.54
CAPITAL EXPENDITURES							
PRIOR GROSS PLANT	6.59	3.94	3.67	6.55	9.86	7.69	0.92

WEIGHTED AVERAGE-EXPONENTIAL WEIGHTS, CURRENT YEAR AT .5

DATA SOURCE: INVESTORS MANAGEMENT SCIENCES, INC. FILE DATED FINAL

PROJECTION ASSUMPTIONS FOR GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

PROJECTED VARIABLE	TYPE	PROJECTION METHOD
NET SALES	DEFAULT	GROWS AT 5.00% FROM LATEST YEAR
COST OF SALES	DEFAULT	90.90% OF NET SALES (PRIOR YEAR)
SELLING, GEN.&ADMIN.	DEFAULT	0. % OF NET SALES (PRIOR YEAR)
DEPRECIATION	DEFAULT	6.48% OF PRIOR GROSS PLANT (PRIOR YEAR)
INTEREST EXPENSE	DEFAULT	9.91% OF AVG. TOTAL DEBT (PRIOR YEAR)
SPECIAL ITEMS	DEFAULT	SET TO ZERO
OTHER INCOME/-EXP.	DEFAULT	0.57% OF NET SALES (MTD.AVG.)
INCOME TAXES	DEFAULT	35.77% OF INCOME BEFORE TAX (MTD.AVG.)
MINORITY INTERESTS	DEFAULT	6.09% OF INCOME AFTER TAX (MTD.AVG.)
EXTRAORDINARY ITEMS	DEFAULT	SET TO ZERO
DIVIDENDS	DEFAULT	* NOT PROJECTED-HISTORY ZERO OR NOT AVAIL.
OTH.RET.EARNS.CHGS.	DEFAULT	SET TO ZERO
MINIMUM CASH BALANCE	DEFAULT	14.75% OF ACCOUNTS PAYABLE (MTD.AVG.)
ACCOUNTS RECEIVABLE	DEFAULT	10.57% OF NET SALES (MTD.AVG.)
INVENTORIES	DEFAULT	25.79% OF COST SALES + DEPR. (PRIOR YEAR)
OTHER CURRENT ASSETS	DEFAULT	0.31% OF CS + SGA + CAP. EXP.(MTD.AVG.)
INVESTMENTS	DEFAULT	ROLLED FORWARD, ADDING INVESTMENTS & ACQ.
INTANGIBLES	DEFAULT	* NOT PROJECTED-HISTORY ZERO OR NOT AVAIL.
OTHER ASSETS	DEFAULT	SAME AS PRIOR YEAR-OTHER ASSETS
ACCOUNTS PAYABLE	DEFAULT	9.20% OF CS + SGA + CAP. EXP.(MTD.AVG.)
MATURING NOTES&DEBT	DEFAULT	TAKEN FROM HISTORICAL DATA
INCOME TAXES PAYABLE	DEFAULT	54.24% OF INCOME TAXES (MTD.AVG.)
OTHER CURRENT LIAB.	DEFAULT	10.56% OF CS + SGA + CAP. EXP.(PRIOR YEAR)
OTHER L-T LIAB.	DEFAULT	SAME AS PRIOR YEAR OTHER L-T LIAB.
MINORITY INTERESTS	DEFAULT	SAME AS PRIOR YEAR MINORITY INTERESTS
PREFERRED STOCK	DEFAULT	* NOT PROJECTED-HISTORY ZERO OR NOT AVAIL.
COMMON STOCK	DEFAULT	SAME AS PRIOR YEAR COMMON STOCK
CAPITAL SURPLUS	DEFAULT	SAME AS PRIOR YEAR CAPITAL SURPLUS
DEPRECIATION	DEFAULT	PROJECTED LIKE DEPRECIATION ABOVE
OTHER OPNS. SOURCES	DEFAULT	35.04% OF NET INCOME (MTD.AVG.)
PLT. SOLD & RETIRED	DEFAULT	2.00% OF PRIOR GROSS PLANT (MTD.AVG.)
ACC.DEPR.-SOLD&RET.	DEFAULT	62.59% OF PLT. SOLD & RETIRED (MTD.AVG.)
SALE OF PLANT, ETC.	DEFAULT	18.91% OF PLT. SOLD & RETIRED (MTD.AVG.)
SALE OF STOCK	DEFAULT	SET TO ZERO
NEW LONG-TERM DEBT	DEFAULT	SET TO ZERO
OTHER SOURCES	DEFAULT	SET TO ZERO
CAPITAL EXPENDITURES	DEFAULT	14.43% OF PRIOR GROSS PLANT (MTD.AVG.)
INVESTMENTS & ACQ.	DEFAULT	SET TO ZERO
DEBT MATURITIES	DEFAULT	TAKEN FROM HISTORICAL DATA
TREASURY STOCK PURCH	DEFAULT	SET TO ZERO
OTHER APPLICATIONS	DEFAULT	CALC - BALANCE CHANGE IN L/T ACCOUNTS
PREFERRED DIVIDENDS	DEFAULT	* NOT PROJECTED-HISTORY ZERO OR NOT AVAIL.

NOTE: WHERE TYPE IS 'DEFAULT', USER GAVE NO ASSUMPTION
THEREBY ACCEPTING THE DEFAULT METHOD

USER PROJECTED
BALANCE SHEET OF GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN: MILLIONS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1976	DEC 1977	DEC 1978	DEC 1979	DEC 1980	TRENDS
ASSETS						
CASH & EQUIVALENTS	30.0	31.7	33.4	35.2	37.2	5.5% S
ACCOUNTS RECEIVABLE	239.8	251.8	264.4	277.6	291.5	5.0% S
INVENTORIES	548.7	577.3	607.5	639.3	672.9	5.2% S
OTHER CURRENT ASSETS	6.8	7.2	7.6	8.0	8.5	5.5% S
TOTAL CURRENT ASSETS	825.4	868.0	912.8	960.2	1010.0	5.2% S
GROSS PLANT	1142.8	1278.0	1429.2	1598.2	1757.3	11.8% S
ACCUM. DEPRECIATION	586.2	635.0	690.9	752.3	822.0	8.8% S
NET PLANT	556.6	642.3	738.2	845.4	965.3	14.8% P
INVESTMENTS	42.9	42.9	42.9	42.9	42.9	0. % S
INTANGIBLES	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0% S
OTHER ASSETS	27.5	27.5	27.5	27.5	27.5	0. % S
TOTAL ASSETS	1452.4	1580.7	1721.5	1876.0	2045.8	8.9% S
LIABILITIES & EQUITY						
ACCOUNTS PAYABLE	203.3	214.4	226.2	238.6	251.9	5.5% S
MATURING NOTES & DEBT	19.7	30.6	18.4	13.7	-0.0	-14.7% S
ADDITIONAL BORROWING	114.5	159.3	227.0	296.4	377.7	35.1% N
INCOME TAXES PAYABLE	40.4	41.0	41.0	40.4	39.1	-0.8% S
OTHER CURRENT LIAB.	233.4	246.1	259.6	273.9	289.1	5.5% S
TOTAL CURRENT LIAB.	611.2	691.5	772.2	863.1	957.8	11.9% S
LONG TERM DEBT	98.9	68.3	50.0	36.2	36.2	-23.2% S
OTHER L-T LIAB.	75.5	75.5	75.5	75.5	75.5	0. % S
TOTAL LIABILITIES	785.7	835.4	897.6	974.8	1069.0	8.0% S
MINORITY INTERESTS	44.6	44.6	44.6	44.6	44.6	0. % S
PREFERRED STOCK	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0% S
COMMON STOCK	10.8	10.8	10.8	10.8	10.8	0. % S
CAPITAL SURPLUS	60.6	60.6	60.6	60.6	60.6	0. % S
RETAINED EARNINGS	550.6	629.3	707.8	785.1	860.1	11.8% P
SHAREHOLDERS EQUITY	622.1	700.7	779.2	850.6	931.0	10.6% P
TOTAL LIAB. & EQUITY	1452.4	1580.7	1721.5	1876.0	2045.8	8.9% S
WORKING CAPITAL	214.1	176.4	140.7	97.1	52.2	-29.0% N
LONG TERM CAPITAL	765.6	813.7	873.8	937.4	1012.4	7.3% S
TANGIBLE NET WORTH	622.1	700.7	779.2	850.6	931.0	10.6% P

DATA SOURCE: SEE PRIOR ANALYZET OUTPUT FOR THIS COMPANY

USER PROJECTED
INCOME & RETAINED EARNING STATEMENT OF GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN: MILLIONS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1976	DEC 1977	DEC 1978	DEC 1979	DEC 1980	TRENDS
<u>INCOME</u>						
NET SALES	2208.0	2381.4	2300.5	2625.5	2756.8	5.0%S
COST OF SALES	2001.8	2104.8	2273.1	2380.7	2500.1	5.0%S
GROSS INCOME	206.3	210.0	227.4	238.8	250.7	5.0%S
SELLING, GEN & ADMIN	0.	0.	0.	0.	0.	-0.0%
DEPRECIATION	66.2	74.0	82.8	92.0	103.5	11.8%S
OPERATING INCOME	140.1	142.0	144.7	146.2	147.2	1.3%S
INTEREST EXPENSE	22.6	23.6	20.6	30.8	30.5	13.0%S
SPECIAL ITEMS	0.	0.	0.	0.	0.	-0.0%
OTHER INCOME/-EXP	12.8	13.5	14.2	14.9	15.0	5.0%S
INCOME BEFORE TAX	130.3	132.5	132.2	130.3	126.3	-0.8%N
INCOME TAXES	47.9	48.7	48.0	47.9	45.4	-0.8%S
MINORITY INTERESTS	5.0	5.1	5.1	5.0	4.9	-0.8%S
INCOME BEFORE EXTRAS	77.4	78.0	78.5	77.4	75.0	-0.8%N
EXTRAORDINARY ITEMS	0.	0.	0.	0.	0.	-0.0%
NET INCOME/-LOSS	77.4	78.6	78.5	77.4	75.0	-0.8%N
<u>RETAINED EARNINGS</u>						
BEGINNING BALANCE	473.2	550.0	629.3	707.8	785.1	13.5%P
RESTATEMENT	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0%
AS RESTATED	473.2	550.0	629.3	707.8	785.1	13.5%P
PLUS NET INC/-LOSS	77.4	78.6	78.5	77.4	75.0	-0.8%N
LESS DIVIDENDS	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0%
OTHER CHANGES	0.	0.	0.	0.	0.	-0.0%
ENDING BALANCE	550.6	629.3	707.8	785.1	860.1	11.8%P
INCREASE/-DECREASE	77.4	78.7	78.5	77.4	75.0	-0.8%N

DATA SOURCE: SEE PRIOR ANALYZET OUTPUT FOR THIS COMPANY

USER PROJECTED
CHANGES IN WORKING CAPITAL OF GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN: MILLIONS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1976	DEC 1977	DEC 1978	DEC 1979	DEC 1980	TRENDS
SOURCES						
INCOME BEFORE EXTRAS	77.4	78.6	78.5	77.4	75.0	-0.8%N
DEPRECIATION	66.2	74.0	82.8	92.6	103.5	11.8%S
OTHER OPNS SOURCES	27.1	27.6	27.5	27.1	26.3	-0.8%S
TOTAL FROM OPNS	170.7	180.2	188.8	197.0	204.6	4.6%
SALE OF PLANT, ETC.	5.0	5.6	6.3	7.0	7.9	11.8%S
SALE OF STOCK	0.	0.	0.	0.	0.	-0.0%
NEW LONG TERM DEBT	0.	0.	0.	0.	0.	-0.0%
OTHER SOURCES	0.	0.	0.	0.	0.	-0.0%
TOTAL SOURCES	175.7	185.9	195.1	204.1	212.7	4.9%
APPLICATIONS						
DIVIDENDS	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0%
CAPITAL EXPENDITURES	147.5	164.9	184.4	206.3	230.7	11.8%S
INVESTMENTS&ACQ	0.	0.	0.	0.	0.	-0.0%
DEBT MATURITIES	19.7	30.6	18.4	13.7	-0.0	-14.7%
TREASURY STOCK PURCH	0.	0.	0.	0.	0.	-0.0%
OTHER APPLICATIONS	27.5	28.0	28.0	27.7	26.9	-0.6%S
TOTAL APPLICATIONS	194.7	223.5	230.8	247.7	257.6	6.8%
NET INCREASE/-DECR	-19.0	-37.7	-35.7	-43.6	-44.9	-0.0%
SUMMARY OF CHANGES						
CASH & EQUIVALENTS	-0.9	1.6	1.7	1.8	2.0	-0.0%
ACCOUNTS RECEIVABLE	11.1	12.0	12.6	13.2	13.9	5.6%
INVENTORIES	27.0	28.6	30.2	31.3	33.6	5.6%S
OTHER CURRENT ASSETS	0.4	0.4	0.4	0.4	0.4	1.2%
CUR ASSET INCR/-DECR	37.7	42.6	44.9	47.3	49.9	6.9%
ACCOUNTS PAYABLE	38.6	11.1	11.8	12.5	13.2	-18.3%
MATURING NOTES&DEBT	-99.3	10.9	-12.2	-4.6	-13.8	-0.0%
ADDITIONAL BORROWING	114.5	44.9	67.7	69.4	81.3	-2.4%
INCOME TAXES PAYABLE	-4.3	0.7	-0.1	-0.6	-1.2	-0.0%
OTHER CURRENT LIAB.	7.0	12.7	13.5	14.3	15.2	16.2%
CUR LIAB. INCR/-DECR	56.5	80.3	80.6	90.9	94.5	12.2%
DUE TO RESTATEMENT	0.	0.0	0.	0.	0.	-0.0%
NET INCREASE/-DECR	-19.0	-37.7	-35.7	-43.6	-44.9	-0.0%
CASH FLOW	170.7	180.2	188.8	197.0	204.8	4.6%

DATA SOURCE: SEE PRIOR ANALYZET OUTPUT FOR THIS COMPANY

USER PROJECTED
ANNUAL RATIOS FOR ANALYSIS OF GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

DATA PRINTED IN PERCENTS*

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1976	DEC 1977	DEC 1978	DEC 1979	DEC 1980	TRENDS
PERFORMANCE						
INCOME/AVG EQUITY	13.3	11.9	10.6	9.5	8.4	-1.2 N
INCOME/SALES	3.4	3.3	3.1	2.9	2.7	-0.2 N
INC BIT/AVG CAPITAL	20.8	19.8	18.8	17.8	16.7	-1.0 N
INC BIT/ASSETS Z	10.5	9.9	9.2	8.0	8.0	-0.6 N
RET EARN/ASSETS Z	37.9	39.8	41.1	41.9	42.0	1.0 S
SALES/ASSETS Z	156.2	150.7	145.3	140.0	134.8	-5.4 N
SALES/AVG EQUITY	388.3	360.1	337.9	321.0	308.3	-20.0 N
SALES/WORKING CAP.	1059.2	1349.8	1777.3	2704.4	5282.8	980.2 P
SALES/RET PLANT	407.5	370.7	338.7	310.6	285.0	-30.4 N
APPROX. P/E RATIO R	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
CAPITALIZATION						
L-T DEBT/EQUITY	15.9	9.8	6.4	4.2	3.9	-3.0 P
LIAB./EQUITY	133.5	125.0	120.9	119.0	119.0	-3.4 P
L-T DEBT/L-T CAPITAL	12.9	8.4	5.7	3.9	3.0	-2.3 P
BK EQUITY/TOT DEBT AZ	200.9	271.3	263.8	247.3	225.1	-10.8 N
LIQUIDITY						
CURRENT RATIO	135.0	125.5	118.2	111.2	105.4	-7.3 N
ACID TEST	44.1	41.0	38.0	36.2	34.3	-2.4 N
DAYS RECEIVABLES R	38.6	38.6	38.6	38.6	38.6	-0.0 S
RECEIVABLES/WORK CAP	112.0	142.7	187.9	286.0	558.0	103.6 P
INVENTORY TURNS R	3.9	3.9	3.9	3.9	3.9	-0.0
INVENTORIES/WORK CAP	256.3	327.2	431.8	658.5	1289.4	239.8 N
DAYS PAYABLES R	30.7	30.7	30.7	30.8	30.8	0.0 S
WORKING CAP/ASSETS Z	14.7	11.2	8.2	5.2	2.0	-3.0 N
L-T DEBT/WORKING CAP	46.2	36.7	35.5	37.3	69.4	4.5
CSH FLO/TOT LIAB	21.7	21.6	21.0	20.2	19.1	-0.7 S
COVERAGE						
INC BIT/INTEREST	676.4	661.2	597.2	522.6	445.9	-80.0 N
CSH FLO/DBT MAT+C.E.	102.1	92.2	93.1	89.6	88.8	-2.9 N
OVERALL STRENGTH						
Z- SCORE TOTAL Z	4.22	4.15	4.01	3.81	3.58	-0.2 P

* EXCEPT WHERE MARKED R(RATIO) OR Z-SCORE TOTAL

Z THESE ARE THE COMPONENTS & TOTALS OF THE Z SCORE-SEE MANUAL FOR EXPLANATION

AZ APPROXIMATION TO MARKET EQUITY/TOT DEBT--Z SCORE TOTAL ONLY APPROXIMATE

SEE RELATIVE INCOME STATEMENT AND RELATIVE BALANCE SHEET FOR OTHER KEY RATIOS

DATA SOURCE: SEE PRIOR ANALYZET OUTPUT FOR THIS COMPANY

USER PROJECTED
RELATIVE BALANCE SHEET OF GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

DATA ARE PERCENT OF TOTAL ASSETS

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1976	DEC 1977	DEC 1978	DEC 1979	DEC 1980	TRENDS
ASSETS						
CASH & EQUIVALENTS	2.1	2.0	1.9	1.9	1.5	-0.1 S
ACCOUNTS RECEIVABLE	15.5	15.9	15.4	14.8	14.2	-0.6 S
INVENTORIES	37.8	35.5	35.3	34.1	32.9	-1.2 S
OTHER CURRENT ASSETS	0.5	0.5	0.4	0.4	0.4	-0.0 S
TOTAL CURRENT ASSETS	56.8	54.9	53.0	51.2	49.4	-1.9 S
GROSS PLANT	78.7	80.8	83.0	85.2	87.4	2.2 S
ACCUM. DEPRECIATION	40.4	40.2	40.1	40.1	40.2	-0.0
NET PLANT	38.3	40.6	42.9	45.1	47.2	2.2 S
INVESTMENTS	3.0	2.7	2.5	2.3	2.1	-0.2 S
INTANGIBLES	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
OTHER ASSETS	1.9	1.7	1.5	1.5	1.3	-0.1 S
TOTAL ASSETS	100.0	100.0	100.0	100.0	100.0	0. S
LIABILITIES & EQUITY						
ACCOUNTS PAYABLE	14.0	13.6	13.1	12.7	12.3	-0.4 S
MATURING NOTES & DEBT	1.4	1.9	1.1	0.7	-0.0	-0.3 S
ADDITIONAL BORROWING	0.	7.9	10.1	13.2	15.8	3.7 N
INCOME TAXES PAYABLE	2.8	2.6	2.4	2.2	1.9	-0.2 S
OTHER CURRENT LIAB.	15.1	15.6	15.1	14.6	14.1	-0.5 S
TOTAL CURRENT LIAB.	42.1	43.7	44.9	46.0	46.8	1.2 S
LONG TERM DEBT	6.8	4.3	2.9	1.9	1.8	-1.2 S
OTHER L-T LIAB.	5.2	4.8	4.4	4.0	3.7	-0.4 S
TOTAL LIABILITIES	54.1	52.8	52.1	52.0	52.3	-0.5 S
MINORITY INTERESTS	3.1	2.8	2.0	2.4	2.2	-0.2 S
PREFERRED STOCK	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
COMMON STOCK	0.7	0.7	0.6	0.6	0.5	-0.1 S
CAPITAL SURPLUS	4.2	3.8	3.5	3.2	3.0	-0.3 S
RETAINED EARNINGS	37.9	39.8	41.1	41.9	42.0	1.0 S
SHAREHOLDERS EQUITY	42.8	44.3	45.3	45.7	45.5	0.7 S
TOTAL LIAB. & EQUITY	100.0	100.0	100.0	100.0	100.0	0. S
WORKING CAPITAL	14.7	11.2	8.2	5.2	2.6	-3.0 N
LONG TERM CAPITAL	52.7	51.5	50.8	50.0	49.5	-0.8 S
TANGIBLE NET WORTH	42.5	44.3	45.3	45.7	45.5	0.7 S

DATA SOURCE: SEE PRIOR ANALYZER OUTPUT FOR THIS COMPANY

USER PROJECTED
RELATIVE INCOME STATEMENT OF GENERAL DYNAMICS CORP

INDUSTRY: AEROSPACE

DATA ARE PERCENT OF NET SALES

MONTH FISCAL YR ENDS FISCAL YEAR	DEC 1976	DEC 1977	DEC 1978	DEC 1979	DEC 1980	TRENDS
INCOME						
NET SALES	100.0	100.0	100.0	100.0	100.0	0. S
COST OF SALES	90.9	90.9	90.9	90.9	90.9	-0.0
GROSS INCOME	9.1	9.1	9.1	9.1	9.1	0.0 S
SELLING, GEN & ADMIN DEPRECIATION	0. 2.9	0. 3.1	0. 3.3	0. 3.5	0. 3.8	0. S 0.2 S
OPERATING INCOME	6.2	6.0	5.8	5.6	5.3	-0.2 S
INTEREST EXPENSE	1.0	1.0	1.1	1.2	1.3	0.1 S
SPECIAL ITEMS	0.	0.	0.	0.	0.	0. S
OTHER INCOME/-EXP	0.6	0.6	0.6	0.6	0.6	0. S
INCOME BEFORE TAX	5.7	5.6	5.3	5.0	4.6	-0.3 N
INCOME TAXES	2.1	2.0	1.9	1.8	1.7	-0.1 S
MINORITY INTERESTS	0.2	0.2	0.2	0.2	0.2	-0.0 S
INCOME BEFORE EXTRAS	3.4	3.3	3.1	2.9	2.7	-0.2 N
EXTRAORDINARY ITEMS	0.	0.	0.	0.	0.	0. S
NET INCOME/-LOSS	3.4	3.3	3.1	2.9	2.7	-0.2 N
RETAINED EARNINGS						
BEGINNING BALANCE	20.9	23.1	25.2	27.0	28.5	1.9 P
RESTATEMENT	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
AS RESTATED	20.9	23.1	25.2	27.0	28.5	1.9 P
PLUS NET INC/-LOSS	3.4	3.3	3.1	2.9	2.7	-0.2 N
LESS DIVIDENDS	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0
OTHER CHANGES	0.	0.	0.	0.	0.	0. S
ENDING BALANCE	24.3	26.4	28.3	29.9	31.2	1.7 P
INCREASE/-DECREASE	3.4	3.3	3.1	2.9	2.7	-0.2 N

DATA SOURCE: SEE PRIOR ANALYZET OUTPUT FOR THIS COMPANY

APPENDIX B. SYSTEM COMPONENTS

This appendix presents technical information about how FINANDAS works. Each routine is discussed individually, with descriptions of detail functions, user inputs, and data storage files. In all, there are about 10,000 lines of FORTRAN instructions in the system.

FINANDAS Routine

FINANDAS, the main control routine for the system, serves mainly to validate users and call other routines to perform the analysis.

After sign-on to the G.E. network, the user enters the system through an immediate run of FINANDAS. His user number is then compared with the DoD user numbers. If the user number is valid, a password entered by the user is also checked for validity. This validation procedure will ensure that only authorized DoD analysts can use the system.

On first entering FINANDAS, the user gets a message identifying the system and announcing any new changes. Then the user enters a command to call in one of the other routines to perform the analysis. The commands are the names of the routines. A command input by the user is checked, and if valid, the routine is called.

After a routine is completed, the FINANDAS routine automatically returns for entry of the next command.

Before sign-off from FINANDAS, a record of user activity is added to a system file, to permit the System Monitor to measure overall usage of the system.

ANALYZET

The main analysis routine, ANALYZET, retrieves the contractor's financial data from the data bank and prints the analysis reports. The user controls the analysis through responses to a series of questions asked by ANALYZET. For example, the user is asked "Are you analyzing a Compustat company?" If the answer is "Yes," the user is asked to input the company stock ticker symbol. If the answer is "No," the user must enter the

name of a data file (previously input by the user with DATALOAD), containing the contractor financial data. Other questions inquire about the reports desired and whether projections are wanted. Samples of the questions are shown at the end of the sample output in Appendix A.

After the questions are answered, the historical analysis reports are printed at the user's terminal. Following the reports, ANALYZET does one of several things, based on earlier answers:

- Automatically signs off the G.E. network
- Asks if more reports are needed
- Calls the PROFORMA routine to make projections
- Returns to the FINANDAS routine

PROFORMA

The PROFORMA routine is called by ANALYZET to project the financial activity of a contractor and print proforma financial statements for future years. Projections can be made from historical data supplied by the user, or by Compustat. However, the period of projections will be limited to the number of years of data supplied.

To operate PROFORMA, the user answers a few questions about the source of the projection assumptions and the analysis desired. Projection assumptions are input by the user on-line from the PROFORMA Assumptions Worksheet to be included in the Users' Manual. The assumptions are entered only when the company is first projected, and stored in a user file (stored in the user's catalog) called PROJXXXX, where XXXX is a user-supplied short company name. The projection file is protected by the user's FINANDAS password.

Subsequently, the assumptions can be permanently changed on the file by PROFORMA, or simply modified for a one-time "what if" projection. A default assumption for each detail account is provided in PROFORMA, and it will be effective unless overridden by a corresponding assumption in the projection file.

The output from PROFORMA is similar to that prepared by ANALYZET. The projection reports available are:

- Balance Sheet
- Income and Retained Earnings Statement
- Changes in Working Capital
- Annual Ratios
- Relative Balance Sheet
- Relative Income Statement

A special account reported in PROFORMA, but not on the historical output, is called "Additional Borrowing." This account is used to keep cash above some Minimum Balance, either in Dollars or relative to Accounts Payable. If Cash would otherwise fall below the Minimum Balance, Additional Borrowing would increase. This would also cause an increase in interest expense and a decrease in taxes, minority interest share of income, and net income. All these changes and their effects are simultaneously resolved to arrive at the correct Additional Borrowing.

ANSRLOAD

The routine ANSRLOAD is used to load a file of answers for use in a delayed run of ANALYZET. (If the SYSTEM is used in an overnight run mode, substantial cost savings will result.) The routine LATERUN will set up an overnight run of ANALYZET to retrieve data and prepare reports. The file of answers prepared by ANSRLOAD replaces the terminal input when the program is run at night.

ANSRLOAD asks the same questions as ANALYZET and stores the results in a user file called ANSRXXXX, where XXXX is a user-supplied short name of the company. The file is protected by the user's FINANDAS password. After the file has been used, it can be purged from the users' catalog with ANSRLOAD.

CMDLIST

The CMDLIST routine prints a list of the commands (i.e., routines) with the function of each one identified. The description of the commands is stored in a system file.

DATALOAD

The DATALOAD routine is used to load, edit, and purge files of financial data for contractors not in the data bank. To load a data file, the user records the contractor data in predefined accounts on the DATALOAD Worksheet to be included in the Users' Manual. The data are then entered on-line for checking. When the data are loaded, they are stored in a user file called DATAXXXX, where XXXX is a user-supplied short name for the company. The file is protected by the user's FINANDAS password.

After a data file is loaded, it may be edited to add in the totals not entered or check entered totals. Modification routines are available to change both alphanumeric descriptor lines or numeric data lines. After modifications, the file can be re-edited. When all data reconcile, a message is given that the file is ready for analysis (with ANALYZET). A listing of the completed file is provided for later reference.

LATERUN

The LATERUN routine sets up an overnight run of FINANDAS/ANALYZET to prepare the analysis reports. A file of answers for ANALYZET must have previously been created with ANSRLOAD because the name of this file is an input to LATERUN.

In the process of setting up the overnight run, two new user files are created and stored. One is an instruction file called RUNXXXX, the other is a print file for the output reports called PRNTXXXX (in both cases, the XXXX is a user-supplied short name for the Company). Both files are protected with the user's FINANDAS password. At first, the print file is empty, but after the overnight run is completed, it contains the reports prepared by ANALYZET.

On the day after the overnight run, the user returns to LATERUN to list the print file. Then all these files - the answer file, the instruction file, and the print file should be purged by the user with LATERUN.

MESSAGE

The MESSAGE routine enables users to leave messages on the system for the System Monitor. Ideally, it would be used for low-priority assistance requests and suggestions for

improvements. (High-priority requests would most likely be handled by calls directly to the System Monitor.)

After giving the command MESSAGE, the user simply types in the message, line by line. The first lines should identify the user by name, organization, location, and Autovon number. A line with the single word "end" will terminate the message and return to the FINANDAS routine.

MESSLIST

The MESSLIST routine is used by the System Monitor to print the messages prepared by users with MESSAGE. After the messages are printed, the SYSTEM file of messages can be cleared by MESSLIST.

END

The END routine creates an exit from the system. As mentioned earlier under the FINANDAS routine, a log of user activity is generated. After this has been accomplished, control returns to the G.E. System Command level. The user then signs off with a BYE command.

APPENDIX C. ANALYTICAL METHODS USED

This appendix describes the technical aspects of the analytical methods used. The areas included are ratio analysis, trend analysis, and projections.

RATIO ANALYSIS

Ratio analysis continues to be the most useful tool for financial analysis. Its utility lies in the capacity of ratios to scale measures of performance and financial position so that meaningful comparisons among companies can be made.

FINANDAS includes several reports devoted to ratio analysis. The ratios selected for use were drawn from the authoritative sources listed in Appendix D.

The Annual Ratios report contains key ratios to evaluate performance, capitalization, liquidity and debt coverage. The performance ratios measure the return (income) on equity, sales, capital and assets. In some cases, income before interest and taxes (BIT) is used to avoid the effects of the capital structure and industry-related tax rates. The amount of retained earnings in relation to assets is used as a measure of cumulative performance. Sales performance is also a useful financial indicator, because income cannot be derived without sales, and profitable use of capital requires good sales volume.

The capitalization ratios measure the balance between use of debt for leverage and the need for sufficient equity to insure financial soundness. Several ratios are given, using long-term debt, equity, total liabilities, long-term capital, and even the market value of equity.

Because the liquidity of a company is a direct measure of its financial health, a large number of liquidity ratios are provided. In addition to the current ratio (Current Assets/Current Liabilities) and the acid test (Cash & Equivalents & Accounts Receivable/Current Liabilities), the liquidity ratios analyze receivables, inventory,

payables, and working capital. The last ratio (Cash Flow/Total Liabilities) was found by Professor Beaver to be the most significant single predictor of failure among the thirty ratios he studied.¹

The debt coverage ratios indicate the cash cushion available to pay interest on debt, or meet commitments for debt repayment and capital expenditures. These coverage ratios are standard, but valuable, because they are key factors in financial analysis.

As an overall measure of financial health, the system provides the Z-Score, a weighted sum of selected ratios mentioned in Section III.² In researching the prediction of bankruptcy, Professor Altman found the Z-Score a very good predictor for near-term bankruptcies, and a moderately good one for periods up to five years ahead. The criteria for evaluating the Z-Score total are:

- 3.00 or more indicates little chance of bankruptcy
- 1.81 to 2.99 indicates some chance of bankruptcy
- 1.80 or less indicates a large chance of bankruptcy

Among the important ratios on the Relative Balance Sheet, are those concerning the composition of assets, such as the important current assets. The significance of each asset account can be viewed in terms of its percentage of each category. Likewise, the percentages of the various expenses to Net Sales shown on the Relative Income Statement indicate the significance of the expenses. Trends in the asset or sales percentages may provide a means of identifying potential problems.

TREND ANALYSIS

FINANDAS will automatically display account trends when four of five years of data are present. The trends are calculated using a regression formula. For dollar amounts, the calculated trends are compound growth rates. For ratios and other non-dollar data, the trends are linear annual increments with the same units as the data.

¹W. H. Beaver, "Financial Ratios as Predictors of Failure," Empirical Research in Accounting: Selected Studies, 1966, pp. 80-81.

²Altman, op. cit.

All trends calculated are tested for statistical significance. A t-test is applied to the slope coefficient and 80% reliability is used to balance the risk of false vs. missed significance. The test for dollar amounts includes a built-in assumption of a 5% growth rate, which signifies no real growth. (The average inflation rate of Non-Farm Business Sales has been approximately 5% over the period 1970 to 1975, according to data in the Survey of Current Business.) The significance test for other data is made against a change of zero. Where the trends are statistically significant, a letter S appears with the trend figure.

Trends in certain key data are also tested for materiality. A dollar trend is considered material if the trend growth rate is over 10%, or less than 0%. Like the test for statistical significance, this test is non-symmetrical, because a +5% growth rate is considered no real growth. Trends in ratios, and other non-dollar data, are considered material if they exceed 2.5 points a year, or 5% of the latest year figure.

If the trends are both statistically significant and material, a "P" or "N" appears as a Positive or Negative indicator of financial health. For example, an increasing Net Income is a Positive indicator, but a decreasing Current Assets total is a Negative indicator. Conversely, an increase in Days Receivables is a Negative indicator.

PROJECTIONS

Using the PROFORMA routine, an experienced financial analyst can readily develop meaningful projections and obtain valuable analytical reports. With these reports, the basic question of a company's future viability can be approached. The effects of contract awards or financial policy changes can also be estimated, simply by changing assumptions.

The PROFORMA projection routine accepts user input of assumptions for the detail accounts to be projected, and a worksheet is provided for planning these assumptions.

Four projection methods are available to input assumptions. They are as follows:

<u>Projection Method</u>	<u>Method Symbol</u>	<u>Data to Enter</u>
Dollar Input	DOL	Annual amounts for the years projected
Growth	GROW	The percentage growth rate, and either a base amount, or a zero to indicate that the latest amount will be the base amount.
Add a constant Dollar amount	ADD	The constant dollar increment and either a base amount, or a zero to indicate that the latest amount will be the base amount.
Percent relationship to another account	PCT	The percentage factor and the number of the related account on the Assumptions form.

If the user does not provide an assumption for a variable to be projected, PROFORMA will use a built-in (default) one generally appropriate for that variable. The default assumptions are too complex to list, but they basically involve one of the following:

- a growth rate from the latest amount
- preset values of zero in each year
- a percentage relationship to another variable based on (a) the ratio in the latest year or (b) a weighted average of the ratios

Accounts that are totals, or related to past years, are not directly projected, but are calculated from the detail component accounts. For example, the amount of Gross Plant in any year is the amount in the prior year plus additions (Capital Expenditures) less retirements (Plant Sold & Retired). Similarly, Net Income is not directly projected, but is calculated step-by-step, as the Income Statement is calculated.

APPENDIX D. SELECTED BIBLIOGRAPHY OF FINANCIAL ANALYSIS

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