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DRA

COSMIC

APRIL
MONTHLY REPORT

Computer Software Management and Information Center
112 Barrow Hall — University of Georgia — Athens, Georgia 30602

UNIVERSITY OF GEORGIA

COMPUTER SOFTWARE MANAGEMENT

AND

INFORMATION CENTER

MONTHLY PROGRESS REPORT

April, 1983

UNDER CONTRACT

NASW-3247

May 15, 1983

TABLE OF CONTENTS

1. GENERAL INFORMATION

In April, COSMIC responded to the additional information requests gathered at the Design Engineering Show in Chicago. Approximately 185 information packets were sent in response to these requests. The new NASTRAN promotional brochure was completed and copies were sent to interested customers.

All of the pre-colloquium activities for the Eleventh NASTRAN Users' Colloquium were completed. Invitations to the Colloquium were mailed to 104 persons.

On April 22, Air Marshall Krishnamurtly and Captain Ray of the Indian Ministry of Defense visited COSMIC. They were primarily interested in programs related to aerodynamics.

2. INVENTORY

The current inventory of programs available from COSMIC is the sum of the Class 1 and Class 2 programs in TABLE 1. "Issuability Status Summary." The total number of items submitted from each source since COSMIC began is given in the right hand column of TABLE 1. Numbers listed under the "Withdrawn" column reflect those packages for which return or discard authorization has been provided by the appropriate Technology Utilization Office.

TABLE 1. ISSUABILITY STATUS SUMMARY
July 1966 to Date

Center Mnemonic	Class 1	Class 2	Class 3	Class 4	In Process	Withdrawn	Total
ARC	33	10	9	3	0	28	83
COS	0	17	0	1	0	65	83
DOD	0	47	5	0	0	30	82
ERC	0	0	0	0	0	13	13
ERL	6	7	0	0	0	1	14
FRC	5	6	0	0	0	4	15
GSC	83	41	4	3	0	221	352
HQN	15	10	0	0	0	72	97
KSC	5	22	0	1	0	81	109
LAR	170	60	0	5	2	81	318
LEW	139	77	0	2	0	87	305
MFS	96	109	4	7	1	1121	1338
MSC	86	140	3	0	3	793	1025
NPO	83	50	4	1	2	250	390
NUC	9	6	0	0	0	60	75
WLP	0	0	0	0	0	11	11
WSO	0	0	0	0	0	3	3
Totals	730	602	29	23	8	2921	4313

The number of submittals for the current month is below average. COSMIC received four initial packages (program and documentation). Also, COSMIC received one update package, one additional document, and one additional program. The total number of receipts for this month is seven. A summary of the total number of receipts by submittal site is shown in TABLE 2.

TABLE 2. SUMMARY OF TOTAL RECEIPTS 1983

Submittal Site	This Month	Year to Date
ARC	0	0
COS	0	0
DOD	0	0
ERL	0	1
GSC	0	7
HQN	1	7
KSC	0	0
LAR	4	10
LEW	0	12
MFS	1	2
MSC	1	6
NPO	0	5
Total	7	50

3. EVALUATION AND PUBLICATION

The program processing activities can be viewed as a three step process, although the steps are not necessarily done in sequence. These steps are program verification, program evaluation, and abstract preparation and publication.

Program verification represents the machine processing phase of evaluation and typically includes the compilation or assembly of supplied code using standard programming language translators followed by loading or linkage editing of the generated object code to insure completeness of the submitted code. This month COSMIC processed nine programs through verification.

Program Evaluation involves the review of programs and supporting documentation following the machine processing phase to determine their suitability for public release relative to the standards of completeness and content specified in the COSMIC Submittal Guidelines. Prices for distributed materials are also established during package evaluation. Factors considered in establishing the price charged for program code include the program source instruction counts as a gross measure of development effort, the machine independence or vintage, the quality of the supporting documentation, the known or assumed sales potential for the package, the functionality of the program relative to comparably classified packages, and the demonstrated level of developer programming support.

The program evaluation activity for the current month totaled 13 packages; eleven Class 1, zero Class 2, zero Class 3, and two Class 4.

A cumulative tabulation of COSMIC evaluations since January 1, 1983, is given in TABLE 3.

TABLE 3. SUMMARY EVALUATION TOTALS

January 1983 to Date

Submittal Site	Class 1	Class 2	Class 3	Class 4
ARC	0	0	3	0
COS	0	0	0	0
DOD	0	0	3	0
ERC	0	0	0	0
ERL	1	0	0	0
GSC	6	0	3	2
HQN	7	0	0	0
KSC	0	0	0	1
LAR	7	0	0	0
LEW	9	0	0	4
MFS	1	0	4	2
MSC	2	1	3	0
NPO	5	0	4	0
NUC	0	0	0	0
WLP	0	0	0	0
Totals	38	1	20	9

Publication activities carried out by COSMIC include the preparation of descriptive abstracts for all new submittal and updated Class 1 and 2 items evaluated each month as well as the preparation of Tech Briefs for the Class 1 packages for publication in the NASA Tech Brief Journal.

Publication category codes and index terms are assigned to abstracts prepared by the activity. This month COSMIC prepared 7 abstracts and 7 Tech Briefs. A list of the titles for which Tech Briefs were prepared is given below:

TECH BRIEF ITEMS

GSC-12768 - ERODYN - Orbital and Geodetic Error Analysis Program

GSC-12861 - Library Information Processing System

GSC-12876 - Theoretical Investigation of Dielectric Horn Antennas

LAR-13143 - ARCEM - ARINC Research Concept Evaluation Methodology Program

LEW-13726 - TETRA - Turbine Engine Transient Response Analysis

LEW-13874 - Heat Exchanger Computational Procedure with Temperature Dependent Fouling

NPO-16159 - OMEGA - An Owner Dependent Methodology for Energy Generation Assessment

COSMIC
PROGRAM ABSTRACT

GSC-12768

ERODYN - ORBITAL AND GEODETIC ERROR ANALYSIS PROGRAM
(BUSINESS TECHNOLOGICAL SYSTEMS)

ERODYN is an orbital and geodetic error analysis program designed specifically to be operated as a companion program to GEODYN (COSMIC program GSC-12014). In order to perform an error analysis of a proposed or actual GEODYN parameter estimation run, ERODYN requires as input the normal ("E") matrix and the variational partials ("V") matrix as computed within GEODYN. To examine various partitionings of the total parameter set into adjusted and unadjusted parameters, the initial GEODYN run must have all parameters of interest adjusted. However, only one estimator iteration is required using "nominal" initial conditions to generate the required normal matrix and variational partials matrix. These matrices are subdivided within ERODYN into the appropriate adjusted and unadjusted partitions as specified by the ERODYN user.

The ERODYN approach has proved to be extremely efficient. A typical analysis problem requires multiple runs of an error analysis program using the same tracking schedule and problem geometry but with different partitionings of the parameter set. With the ERODYN approach, the operations that are common to these multiple runs are performed only once with GEODYN and stored on tape. ERODYN then performs the matrix partitioning and linear algebra required for each individual error analysis run. In some cases, the iteration feature of ERODYN can be used to achieve results in a single run which would otherwise require several error analysis runs.

The ERODYN program is written in FORTRAN IV and OS Assembler for batch execution and has been implemented on an IBM 370 series computer with an overlayed central memory requirement of approximately 140K of 8-bit bytes. ERODYN was developed in 1981.

LANGUAGE: FORTRAN IV (80%); ASSEMBLER (20%)

MACHINE REQUIREMENTS: IBM 370 Series

PROGRAM SIZE: Approximately 12,430 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI EBCDIC Card Image Format
                      Magnetic Tape

PROGRAM NUMBER: GSC-12768

DOCUMENTATION PRICE: $27.00   PROGRAM PRICE: $1,260.00

COSMIC
PROGRAM ABSTRACT

ORIGINAL PAGE IS
OF POOR QUALITY

GSC-12861

LIBRARY INFORMATION PROCESSING SYSTEM
(INFORMATICS INC.)

The Library Information Processing System was developed to support the library facilities at the NASA Goddard Space Flight Center. The system is composed of a number of subsystems which provide a wide range of library information processing capabilities. The system is designed to work with data in the Library of Congress MARC II communications format, which is the American National Standards Institute (ANSI) format for machine-readable bibliographic data. This library information processing system should be adaptable to any medium-to-large library situation.

The Bibliographic Products Subsystem provides library users and staff with in-depth, easy access to the library's collection through a variety of catalogs, keyword indexes, and control tables. Several different methods of information access are provided including call number, author/title, subject, keyword, and control field. Output from this subsystem includes both hardcopy reports and tapes for computer-output-microfilm (COM). These output products direct users and staff to items contained in the library book collection and to other products from the system. This subsystem also generates the catalogers shelf list which provides a working tool for the cataloging staff. MARC II compatible data records can be added, changed, or deleted at the word, subfield, tagged field, or record level.

The Book Acquisition Subsystem provides a front-end tracking system for materials ordered by the library but not yet on the shelves. Order status is tracked from order placement through the cataloging operation. The subsystem provides both financial accountability and order follow-up mechanisms. Staff can quickly ascertain the status of individual orders and verify items on-order, thus avoiding duplication. The Journal Acquisition Subsystem provides similar tracking procedures for journal orders. Additional reports include a master vendor list which serves as a backup to individual purchase orders. The Journal System provides brief cataloging records for journals acquired and held by the library, and provides an inventory of all bound journal volumes in the collection.

The Library Statistics Subsystem provides the library with management information relating to holdings and use, as well as aging characteristics, of the book collection. Reports generated by this subsystem include the Circulation/Holding Report, the

GSC-12861

Holdings Profile, and the Call Number/Imprint Report. The
Audit Subsystem can be used to track the work done by the
library staff. It generates reports that display types of
requests, how and where material is obtained, completion time,
and source of requests for various types of materials. This
subsystem utilizes SAS, a commercial software system, to generate
cross-tabulated and graphical displays.

The programs in the Library Information Processing System
are written in ANS COBOL (Level 3 or 4) and OS ASSEMBER. The
system is designed for batch execution and has been implement on
an IBM 370 series computer with OS/MVT or OS/MVS and has a minimum
central memory requirement of approximately 150K of 8-bit bytes.
This library system was last updated in 1982.

LANGUAGE: COBOL (99%); ASSEMBLER (1%)

MACHINE REQUIREMENTS: IBM 370 Series

PROGRAM SIZE: Approximately 53,000 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI IBM IEHMOVE Format Magnetic
                       Tape

PROGRAM NUMBER: GSC-12861

DOCUMENTATION PRICE: $45.00   PROGRAM PRICE: $4,800.00

5/5/83

COSMIC
PROGRAM ABSTRACT

GSC-12876

THEORETICAL INVESTIGATION OF DIELECTRIC HORN ANTENNAS
(TECHNOVATORS)

A mathematical model applicable to both solid and hollow dielectric horn antennas has been implemented in a computer program. Conventional hollow metal horns have several disadvantages. Metal horns are difficult to fabricate at short wavelengths because the interior walls must be very smooth for efficient operation and the conducting properties of metal tend to deteriorate with increasing frequency. In addition to simply avoiding the disadvantages of hollow metal horns, dielectric horns appear to provide some unique advantages such as significant improvements in directivity. This computer program permits the user to investigate the potential of various dielectric antenna designs.

Some of the antenna performance characteristics of chief interest, such as directivity and side lobe levels, follow from the electromagnetic radiation pattern. Also, that pattern in itself is of interest. As a central part of the mathematical model, general formulas for the electromagnetic radiation were derived and applied in the computer program. Input parameters consist of frequency, relative permittivity, relative permability, and horn dimensions. Horn flare may be specified as E-plane, H-plane, or pyramidal and either the TM or TE mode type may be selected. Choices of polarization include X-directed electric field, Y-directed electric field, theta-directed electric field, and radially directed poynting vector. For parametric studies, the user can indicate that one of the input parameters is to be varied over a specified range by specified increments. Output includes radiation pattern and directivity data. Printer plots can be generated to display the radiation patterns and directivity.

This program is written in FORTRAN IV for interactive execution and has been implemented on a DEC VAX series computer. This program was developed in 1983.

LANGUAGE: FORTRAN IV

MACHINE REQUIREMENTS: DEC VAX Series

PROGRAM SIZE: Approximately 900 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI ASCII Card Image Format
                     Magnetic Tape

PROGRAM NUMBER: GSC-12876

DOCUMENTATION PRICE: $34.50   PROGRAM PRICE: $350.00

ORIGINAL PAGE IS
OF POOR QUALITY

COSMIC
PROGRAM ABSTRACT

LAR-13143

ARCEM - THE ARINC RESEARCH CONCEPT EVALUATION METHODOLOGY PROGRAM
(ARINC RESEARCH CORPORATION)

The ARINC Research Concept Evaluation Methodology (ARCEM) program was developed to assist in the rank-ordering of research concepts in terms of their potential benefit-to-cost ratios. In particular, ARCEM resulted from the development of a planning methodology that provides NASA with a framework for generating and analyzing control and guidance system concepts and for selecting concepts which maximize the benefits to the aviation community. The ARCEM program and the methodology it supports can provide a powerful tool for the organization and planning of research activities. It can indicate which concepts should provide the greatest benefit for the investment and it can determine the number of concepts that must be implemented to ecomomically justify expenditures for development of generic technologies.

Input to ARCEM consists of a list of concepts, each described in term of expected costs, expected benefits, and their technology lines. The technology line indicates which generic technologies are needed for concept execution. ARCEM can accept up to 100 concepts and 20 generic technologies. ARCEM examines the benefits and costs of each concept, including the costs of required technology, and ranks them in order of descending benefits-to-cost ratio. ARCEM can then compute the cumulative benefits-to-cost ratios associated with implementing the concepts in order (the ranked order or a user specified order). Thus the computed ratio associated with the fifth concept is the cumulative ratio for the first five concepts. ARCEM results can be printed in tabular or bar-graph form.

The ARCEM is written in BASIC for the TRS80 Model III microcomputer with a minimum configuration requirement of 48K of memory and one disk drive. Program use also requires a light-pen input device such as the 3-G Company unit. The ARCEM program was developed in 1983.

LANGUAGE: BASIC

MACHINE REQUIREMENTS: TRS 80 MOD III

PROGRAM SIZE: Approximately 460 Source Statements

DISTRIBUTION MEDIA: 5 1/4" Flexible Diskette in TRSDOS Format

PROGRAM NUMBER: LAR-13143

DOCUMENTATION PRICE: $36.00   PROGRAM PRICE: $100.00

COMPUTER SOFTWARE MANAGEMENT AND INFORMATION CENTER

COSMIC
PROGRAM ABSTRACT

LEW-13726

TETRA - TURBINE ENGINE TRANSIENT RESPONSE ANALYSIS
(GENERAL ELECTRIC CO.)

The Turbine Engine Transient Response Analysis program, TETRA, was developed to predict the structural dynamics of a gas turbine engine rotor system subjected to sudden unbalance. TETRA has been used to predict the transient structural response of turbine engines due to blade loss or other time dependent events. A blade loss at operating speeds is usually the primary initiator of the types of failures that could ultimately lead to engine shutdown. In the event of engine damage, shutdown, or failure, a damage assessment cannot discriminate which damage was primarily due to the transients and which was caused by steady-state operation after the blade loss and before shutdown. TETRA should help the turbine engineer in understanding the basic transient response of the whole structure and in identifying the crucial problem areas. This could lead to turbine designs which are more tolerant of blade loss or similar occurences.

TETRA is based on a component element method using a modal synthesis approach. The component elements consist of elastic and rigid body elements described by generalized coordinates, and physical connecting elements that model bearing/frame springs and dampers, rotor-case hub springs, and gyroscopic cross-axis coupling effects. The generalized coordinates are based on the free-free modes and partially constrained modes associated with engine subsystem structures. The component element method extends the conventional modal analysis procedure to account for physical damping and symmetric stiffness terms, and rotor-case rubs including the effects of the force deadband associated with the structural clearance. The resulting reduced system of second order differential equations is solved by an explicit numerical integration scheme to obtain the transient response.

The input to TETRA consists of a description of the various structural subsystems of which the structure is comprised and their connecting elements. The normal modes of each subsystem must be calculated outside the TETRA program, usually by a structural analysis program such as NASTRAN (available from COSMIC). Modal input to TETRA includes the modes and the number of modes used to represent each subsystem. The user also specifies the engine operating conditions such as speed, amount and location of unbalance, and time interval. Output from TETRA consists of time histories of deflections and loads at user selected points.

LEW-13726

     The TETRA program is written in FORTRAN 77 for batch execution and has been implemented on a UNIVAC 1100 series computer with a central memory requirement of approximately 65K of 36-bit words. The TETRA program was developed in 1981.

LANGUAGE: FORTRAN 77

MACHINE REQUIREMENTS: UNIVAC 1100 Series

PROGRAM SIZE: Approximately 5,450 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI UNIVAC FURPUR Format Magnetic
                        Tape

PROGRAM NUMBER: LEW-13726

DOCUMENTATION PRICE: $56.00   PROGRAM PRICE: $855.00

COSMIC
PROGRAM ABSTRACT

LEW-13874

HEAT EXCHANGER COMPUTATIONAL PROCEDURE WITH TEMPERATURE DEPENDENT
FOULING
(UNITED TECHNOLOGIES RESEARCH CENTERS)

A new heat exchanger computational procedure with temperature
dependent fouling has been developed for the design of heat exchangers
used for the vaporization of aircraft gas turbine fuel. The
new procedure was needed to account for deposit formation which
causes fouling. This procedure is able to predict fouling
resistance based on temperature dependent deposit formation.
It also permits consideration of the variation in fluid properties
including a rapid change in liquid viscosity with temperature
change. This computer program provides a rapid means of calculating
the distribution of fluid and wall temperatures, deposit formation,
and pressure losses for a variety of heat exchangers.

This program can be used for the analysis of a wide range
of heat exchanger types including co-flow, counter flow, cross
flow, and various combinations. For purposes of analysis, the
heat exchanger is modeled by a two-dimensional array of elements
of equal size. Each element is treated as a miniature heat
exchanger consisting of a tube bundle with, or without, external
fins. The receiving fluid may make multiple passes through the
tube bundles. By properly selecting the characteristics of
these equivalent heat exchangers and the fluid paths, any two-
dimensional heat exchanger geometry can be simulated. The
procedure has been adapted to the special case of a phase change
in the fluid and to the evaluation of the effect of transient
inflow conditions on heat exchanger performance.

This program is written in FORTRAN V for batch execution
and has been implemented on a UNIVAC 1100 series computer with
a central memory requirement of approximately 52K of 36-bit
words. This program was developed in 1983.

LANGUAGE: FORTRAN V

MACHINE REQUIREMENTS: UNIVAC 1100 Series

PROGRAM SIZE: Approximately 1,920 Source Statements

DISTRIBUTION MEDIA: 9 Track 800 BPI UNIVAC FURPUR Format Magnetic Tape

PROGRAM NUMBER: LEW-13874

DOCUMENTATION PRICE: $39.50   PROGRAM PRICE: $545.00

COSMIC
PROGRAM ABSTRACT

NPO-16159

OMEGA – AN OWNER-DEPENDENT METHODOLOGY FOR ENERGY GENERATION
          ASSESSMENT
(CALTECH/JPL)

     An Owner-Dependent Methodology of Energy Generation Assess-
ment, OMEGA, has been developed to provide for the economic
evaluation of energy generation systems. OMEGA can be used to
find normative prices and break-even values of system parameters.
OMEGA is applicable to the evaluation of the economics of
electrical and thermal energy generation systems owned by a
utility, a business, or a consumer. The systems under evaluation
may be new construction or retrofit construction. Also, systems
may be grid-connected or stand-alone. Grid-connected systems
have the option of selling all of the electricity generated
and buying electricity back at utility rates, or of selling
excess electricity and buying back-up power as needed. OMEGA
can be used to perform parametric studies and compare various
systems.

     The OMEGA approach is a straight-forward modeling of all
the financial benefits and costs throughout the system life and
beyond, assuming that system components are replaced when
necessary and that system performances follow a predictable
pattern. Capital expenditures on system components are assumed
to recur at the end of component lifetimes. The system performance
pattern is assumed to repeat with a known period. Most of the
cost elements are derived from the capital expenditures, while
others are supplied from outside sources. Financial benefits are
assumed to grow at the rate of energy price escalation. Thus
an OMEGA assessment of a system produces time sequences of
benefits and costs, expressed in nominal dollars.

     The OMEGA program is written in Microsoft BASIC-80 for
interactive execution and has been implemented on a Z80-based
microcomputer with CP/M. The program requires 64K of memory
and about 200K bytes of disk storage. The OMEGA program was
developed in 1982.

LANGUAGE: BASIC

MACHINE REQUIREMENTS: Z-80-Based Micro-Computer with CP/M

PROGRAM SIZE: Approximately 2,000 Source Statements

DISTRIBUTION MEDIA: 8" Single-Side Single-Density Flexible Diskette
                      in CP/M Format

PROGRAM NUMBER: NPO-16159

DOCUMENTATION PRICE: $41.00   PROGRAM PRICE: $220.00

4. MARKETING

The marketing activities performed by COSMIC involve: solicitation of gratis advertisement of computer programs available from COSMIC in the technical press and trade journals; attendance at trade shows and professional society meetings to promote the services and software available from COSMIC; utilization of various media for the general promotion of COSMIC; utilization of benefits analysis reports to highlight COSMIC's technology transfer function; and preparation of abstract collections and program summaries.

A continuing marketing activity emphasized by COSMIC is the solicitation of gratis announcements of selected COSMIC programs in trade and technical publications. In April announcements about COSMIC products were published in:

Computer Graphics World	General Information
Datamation	MSC-20423 VAX Security Package
Astronautics and Aeronautics	LEW-12761 SHABERTH, LEW-13393
	CYBEAN, LEW-13626 SPHERBEAN
HARDCOPY	MSC-20423 VAX Security Package

Updated information on COSMIC programs were sent to two catalogs this month. We sent information to <u>Data Decisions</u> for their Data Base Management System section on the following programs:

LAR-12943	RIM5	(DEC VAX Version)
LAR-12944	RIM5	(PRIME Version)
LAR-12945	RIM5	(CDC Version)
GSC-12684	SPIRE DBMS	
GSC-12861	Library Information Processing System	

We also sent information to <u>Engineering and Scientific Programs Available from non-IBM Sources</u> (3rd Edition) on the following programs:

MFS-25122	AGGIE I
HQN-10952	NASTRAN
NPO-15108	BLAS

LAR-12822	PLANS
GSC-12326	Wolf Plotting and Contouring
MSC-20456	RMS2
MFS-25234	DESAP2
LAR-12927	ACTION
LAR-13107	ACCESS 3

A news release for the three programs in COSMIC's inventory which were developed on microcomputers was sent to LIST, The Software Resource Book for Personal Computer Users. The three programs are:

NPO-15862	SOFTCOST
NPO-16202	SDDL
NPO-16234	CRISP80

Additional information requests from attendees at the Design Engineering Show were mailed out this month. There were 185 requests received at the Design Engineering Show. Also, the preparations for the pre-show mailing for the DEXPO EAST 83 show are underway.

5. CUSTOMER SERVICE

Customer Service provided by COSMIC, in addition to the distribution of program code and documentation, includes responding to requests for information. These requests may be in the form of telephone calls, letters, TECH BRIEF cards, mini-brochure cards, or trade show return cards. Generally the requested information concerns the services provided by COSMIC, or information on specific programs or groups of programs which may be available from COSMIC. During April, a total of 380 information requests were processed. This was divided into 350 domestic requests and 30 international requests.

One other area of Customer Service is the response to requests for information relevant to problems associated with a particular program product installation. These requests are usually handled jointly with the Technical Service Staff. After the customer problems have been resolved, a Problem Report Sheet is processed and added to the program package file for future reference. No problem reports were processed this month.

During the month of April, a total of 181 customers representing 169 organizations received materials (programs, documentation, or catalogs) from COSMIC. Customers represent individuals, whereas, organizations represent corporations or institutions. These customers are located in 39 different states or territories. Both NASA and non-NASA disseminations are reflected in these statistics.

6. BENEFITS IDENTIFICATION

COSMIC follows an active campaign of interviewing previous customers in order to ascertain the utility of distributed programs and identify specific benefits accruing to users of these programs. Additionally, contact with customers is used to evaluate the services provided by COSMIC. When notable benefits are identified, they are documented in reports written by COSMIC staff which are then approved for public release by the customers. Two benefits reports are in the process of being authorized for release. No benefits reports were released for publication this month.

7. MAINTENANCE AND SUPPORT

Sperry completed the SYSGEN and testing of the April 1983 release of NASTRAN on the CDC version at Langley Research Center. The SYSGEN and testing of the IBM and UNIVAC versions were completed on a Sperry furnished UNIVAC and DEC VAX. The SYSGEN of the DEC VAX version is complete and the testing is nearing completion. A total of seventy-two (72) SPR's have been incorporated into this release of NASTRAN. Sperry has also incorporated the following new capabilities into NASTRAN:

- BANDIT
- NSRDC Stress Averaging Capability
- MSFC Hydroelastic Capability
- Hidden Line Capability
- Elbow Element

This release of NASTRAN is scheduled for completion during May 1983. Copies of this release will be shipped to all current lessees during the month of May.

All of the pre-colloquium activities for the Eleventh NASTRAN Users' Colloquium in San Francisco were completed. Invitations to attend the Colloquium were mailed to 104 persons.

During the month, assistance was given to several lessees on problems encountered with NASTRAN.

TABLE __4__ TOTAL DISSEMINATIONS

ITEM	Current Month		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
A. ITEMS INVOICED				
1. Programs	32	$25,186.25	150	$135,271.25
2. Documentation	130	5,053.50	545	21,485.00
3. Leases (Initial)	8	31,080.00	23	84,670.00
4. Leases (Renewals)	9	28,770.00	21	77,490.00
5. Leases (Misc.)	-	-	7	1,901.14
6. Catalogs	95	2,350.00	619	14,260.00
7. Miscellaneous	13	463.03	67	2,634.87
TOTAL INVOICED		$92,902.78		$337,712.26
B. NASA (No Charge)				
1. Programs	2	$ 1,065.00	16	$ 14,060.00
2. Documentation	64	4,352.00	100	6,303.50
3. Leases (Initial)	1	5,000.00	2	6,800.00
4. Leases (Renewals)	-	-	12	41,340.00
5. Leases (Misc.)	-	-	-	-
6. Catalogs	22	220.00	47	550.00
7. Miscellaneous	-	-	1	100.00
TOTAL NASA		$10,637.00		$ 69,153.50
C. OTHER (No Charge)				
1. Catalogs	1	$ 10.00	15	$ 280.00
2. Replacements	3	463.00	4	1,608.00
3. Miscellaneous	-	-	-	-
TOTAL OTHER		$ 473.00		$ 1,888.00
GRAND TOTAL DISSEMINATION		$104,012.78		$408,753.76

TABLE 5 NASTRAN DISSEMINATIONS

Item	Current Month		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
A. ITEMS INVOICED				
1. Leases Initial	8	$31,080.00	13	$ 52,920.00
2. Leases Renewals	5	20,160.00	17	68,880.00
3. Leases Misc.	-	-	2	793.03
4. Documentation	17	945.00	83	4,330.00
5. Miscellaneous	-	-	3	161.20
TOTAL NASTRAN INVOICED		$52,185.00		$127,084.23
B. NASA (No charge)				
1. Leases Initial	-	-	-	-
2. Leases Renewals	-	-	11	$ 38,640.00
3. Leases Misc.	-	-	-	-
4. Documentation	57	3,955.00	71	4,845.00
5. Miscellaneous	-	-	-	-
TOTAL NASA NASTRAN		$ 3,955.00		$ 43,485.00
GRAND TOTAL NASTRAN		$56,140.00		$170,569.23

TABLE 6 DISSEMINATION OF DOD SUBMITTALS

Item	Current		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
1. Programs	1	$ 825.00	10	$ 7,150.00
2. Documentation	7	182.50	23	534.50
TOTAL DISSEM. DOD SUBMITTALS		$1,007.50		$ 7,684.50

TABLE 7 FOREIGN DISSEMINATIONS

Item	Current		Year to Date	
	VOLUME	VALUE	VOLUME	VALUE
1. Programs	6	$8,150.00	33	$52,450.00
2. Documentation	14	897.00	70	5,377.00
3. Leases Initial	-	-	1	7,000.00
4. Leases Renewal	-	-	-	-
5. Leases Misc.	-	-	1	35.70
6. Catalogs	9	450.00	79	3,700.00
7. Miscellaneous	8	204.63	37	1,297.35
TOTAL FOREIGN DISSEM.		$9,701.63		$69,860.05

9. BUDGET SUMMARY

CONTRACT NASW-3247

APRIL 1983

	ESTIMATED EXPENDITURES		ACTUAL EXPENDITURES	
	Current Mo.	Cumulative	Current Mo.	Cumulative
PERSONNEL	20,673.00	82,692.00	22,461.70	86,138.25
OVERHEAD	19,584.00	78,336.00	12,557.90	49,592.61
STAFF BENEFITS	4,942.00	19,768.00	5,454.35	20,890.46
TRAVEL	1,719.00	6,876.00	3,719.98	6,482.54
EQUIPMENT PURCHASE	400.00	1,600.00	-0-	4,613.36
EQUIPMENT RENTAL				
Computer Usage	8,000.00	32,000.00	3,201.39	17,064.79
Misc. Equipment	1,853.00	7,412.00	128.91	2,523.81
MATERIALS & SUPPLIES	6,421.00	25,684.00	5,021.12	32,185.47
COMMUNICATIONS	1,206.00	4,824.00	1,459.14	5,666.90
OTHER				
Duplicating Expenses	-0-	-0-	-0-	-0-
Promotional Expenses	688.00	2,752.00	1,159.00	8,716.98
Microfiche Expenses	599.00	2,396.00	-0-	1,133.05
TOTALS	66,085.00	264,340.00	52,163.49	232,008.22
MAINTENANCE & SUPPORT EXPENSE	27,448.00	109,792.00	49,139.26	144,482.50
GRAND TOTALS	93,533.00	374,132.00	104,302.75	379,490.72

	ESTIMATED		ACTUAL	
	Current Mo.	Cumulative	Current Mo.	Cumulative
INCOME	65,145.00	260,580.00	65,721.75	358,703.04