ΝΟΤΙCΕ

THIS DOCUMENT HAS BEEN REPRODUCED FROM MICROFICHE. ALTHOUGH IT IS RECOGNIZED THAT CERTAIN PORTIONS ARE ILLEGIBLE, IT IS BEING RELEASED IN THE INTEREST OF MAKING AVAILABLE AS MUCH INFORMATION AS POSSIBLE U LARS Contract Report 071580

"Made available under NASA sponsorship in the interest of early and wide dissemination of Earth Resources Survey Pogram information and without liability for any use made thereof." 81--10.0.0.4 CR-143553

FOREST RESOURCE INFORMATION SYSTEM

Phase III Quarterly Report

for the period

1 April 1980 to 30 June 1980

Prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Johnson Space Center Earth Observations Division Houston, Texas 77058

ې. Contract: NAS 9-15325 Technical Monitor: R. E. Joosten/SF5

Submitted by:

The Laboratory for Applications of Remote Sensing Purdue University West Lafayette, Indiana 47906

Principal Investigator: R. P. Mroczynski

(E81-10004) FOREST RESOURCE INFORMATION SYSTEM Quarterly Report, 1 Apr. - 30 Jun. 1980 (Purdue Univ.) 20 p HC A02/MF A01 CSCL 02F N81-12481

Unclas G3/43 00004

Star Information Form

	an de la companya de	
1 Report No	2 Government Accession No	3 Recipient's Catalog No
4 Title and Sublitle	an an ann an ann an ann ann ann ann ann	5 Report Date
		18 July 1980
Forest Resource Informatic Phase III Quarterly Report		6 Performing Organization Code
7 Author(s)	n yn enem de fylgt yn en yn er ac en fer fan yn er an a Sanner yn yn ar er ar ser yn yn yn yn ar an af af yn a Yn er ar ferner yn gener ar ferner yn gener ar ser ar gener ar gener ar gener ar gener ar ar ar ar ar ar ar ar a	8 Performing Organization Report No
R. P. Mroczynski and D. Fr	eeman	071880
9 Performing Organization Name and Address		10 Work Unit No
Laboratory for Application	s of Remote Sensing	
Purdue University		11 Contract or Grant No
West Lafayette, IN 47906		NAS 9-15325
12. Sponsoring Agency Name and Address	i na produkcija na produkcija poslate poslate poslate na produkcija poslate poslate poslate poslate poslate pos	13 Type of Report and Period Covered Quarterly
NASA/Johnson Space Center		1 Apr 80 to 30 Jun 80
Earth Observation Divisior Houston, TX 77058	k	14 Sponsoring Agancy Code
15 Supplementary Notes		a Anne an air air an Annaichte an tha an tha an tha an annaichte annaichte annaichte ann an tha ann an tha anna
	$\frac{T}{Q}$	
16 Abstract	a an	an de la companya de
TO ADSTRACT		
This report covers th	e fifth quarter of the fifte	en-month System
Transfor Phase of the Ford	st Resource Information Syst	on Application Pilot
Test. The principle activ	rities during this quarter re	volved around the
documentation of software	systems. Timelines and a sh	ort description of
the poftware documentation	process is given.	
		1.3 1.
17 - Maria Marda (Origonia) and his Asshmetal)	18 Distribution Statemen	ey a new construction of the state of the st
17 Key Words (Suggested by Author(s)) LARSYS Remote	Terminal	
Preprocessing LARSYSI		
Management		
327		
	<u> </u>	
19 Security Classif (of this report)	20 Security Classif. (of this page)	21 No. of Pages 22. Price*
		L
*For sale by the National Technical Information Se	rvice, Shrmofield, Virginia 22161	NASA - J

LARS Contract Report 071880

FOREST RESOURCE INFORMATION SYSTEM

Phase III Quarterly Report

for the period

1 April 1980 to 30 June 1980

Prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Johnson Space Center Earth Observations Division Houston, Texas 77058

Contract: NAS 9-15325 Technical Monitor: R. E. Joosten/SF5

Submitted by:

The Laboratory for Applications of Remote Sensing Purdue University West Lafayette, Indiana 47906

Principal Investigator: R. P. Mroczynski

Index

FRIS Project Overview	1
1.0 INTRODUCTION	1
2.0 SYSTEM TRANSFER TASKS	2
2.1 Preprocessing Software	2
2.2 Image Classification Software	3
2.2.1 Software Modifications	3
3.0 MANAGEMENT	5
Appendix A.I. Preprocessing Software	7
Appendix A.I.a. Preprocessing COSMIC Package	8
Appendix A.II. FRIS Software Development	9
Appendix A.III. FRIS LARSYSDV Documentation	11
Appendix A.IV. FRIS "LARSYS Documentation"	12
Appendix A.V. St. Regis COSMIC Package	13

 $\langle \hat{Q} \rangle$

FRIS PROJECT OVERVIEW

The Forest Resource Information System Project (FRIS) is a cooperative effort between the National Aeronautics and Space Administration (NASA) and St. Regis Paper Co. (STR). Purdue University's Laboratory for Applications of Remote Sensing (LARS), under contract to NASA, will supply technical support to the project.

FRIS is an Application Pilot Test (APT) Project funded by NASA. The project is interdisciplinary in nature involving expertise from both the public and private sectors. FRIS also represents the first APT to involve a large broad base forest industry (STR) in a cooperative with the government and the academic communities.

Purpose

The goal of FRIS is to demonstrate the feasibility of using computeraided analysis techniques applied of Landsat Multispectral Scanner Data to broaden and improve the existing STR forest data base, thereby creating the foundation of a dynamic information system. The successful demonstration of this technology during the first half of the project will lead to the establishment by STR of an independently controlled operational forest resource information system in which Landsat data is expected to make a significant contribution. FRIS can be viewed by the user community as a model of NASA's involvement in practical application and effective use of space technology. Additionally, FRIS will serve to demonstrate the capability of Landsat MSS data and machine-assisted analysis technology to private industry by:

o Determining economic potentials,

o Providing visibility and documentation, and

o The ability to provide timely information

and thus serve management needs,

The ultimate long term successfulness of FRIS can be measured through future development of remote sensing technology within the forest products industry.

Scope

FRIS is funded as a modular or Phase project with an anticipated duration of three years. The original project concepts were developed in 1973, and a formal project plan was submitted to NASA by STR in 1976. The project officially began in October 1977 after the signing of a cooperative agreement between NASA and STR; and after the compeltion of contractual arrangements with Purdue University. Organization

The organization of FRIS is depicted in the chart that follows. Since FRIS is a cooperative involving three independent agencies, a steering committee consisting of a project manager from each institution was formed to provide for overall guidance and coordination. Operationally, both STR and LARS have project managers and project staff to insure for the timely completion of activities within the project. The NASA technical coordinator monitors project activities and provides a liaison between the STR and LARS staffs. The solid lines on the chart indicate the flow of management responsibility. The dash lines reflect the technical and scientific inter-changes between operating units.

.

FRIS Organization

Ste	ering Committee	
	ASVT Project Manager NASA Technical Monitor FRIS Project Manager	
Resource and Technology	NASA	LARS/
Department/ STR	Johnson Spacecraft Cente	r Purdue University I
Computer Systems	Syst	ems Design ——
- Cartographic Systems -	Марг	ing light
- Callographic Systems -	map	
- Forest Sampling System	s Clas	sification Unit -
L Cost Analysis	Cost	Unit

1.0 INTRODUCTION

The material which appears in this report is a reflection of the FRIS Project Staff activities for the period 1 April 1980 to 30 June 1980. This time frame encompasses the fifth quarterly reporting period for Phase III of the Forest Resource Information System (FRIS) Applications Pilot Test (APT). Phase III or the System Transfer Phase of FRIS is directed at meeting the overall Project goal:

> To document and transfer remote sensing technology developed throughout the project that will provide St. Regis with an independent operational system, having Landsat data as a significant and viable contributor.

The major staff effort during this reporting period have been directed at software documentation. Primary emphasis has been placed on documenting developmental LARSYS (LARSYSDV) software modules. These are modules, subroutines, that currently do not exist in the LARSYS ver. 3.1 software available through COSMIC.

Noteworthy project accomplishments for this last quarterly reporting period include:

- LARSYS software installed and operational at the St. Regis
 National Computer Center.
- o Decision as to the content of the LARSFRIS modules that will be documented for COSMIC.
- o Disconnecting the ROSCOE remote terminal link to Jacksonville.
- Decision to develop the concept of and produce a FRIS color brochure.
- o Growth of the concept to conduct a FRIS end-of-project symposium.

The remainder of this report will discuss the System Transfer activities in more detail. Appendix A contains updated timeline charts for these activities.

2.0 SYSTEM TRANSFER TASKS

ÏÌ

The System Transfer activities consist of documenting and transferring two major image processing elements; preprocessing software, and classification software. A discussion of the status of these activities are contained in the subsections that follow.

2.1 Preprocessing Software

Preprocessing transfer consists of four main tasks. The first three tasks involve the completion of the major systems of preprocessing programs known as Landsat Reformatting, Geometric Correction, and Image Registration. The last task is creation of the Preprocessing Cosmic Package. Documentation is an important part of all these tasks. Both programmer and user documentation is included.

The Landsat reformatting task is designed to deliver a system of programs which convert digital Landsat data to LARSYS format. Specifically the input of EDIPS "F" band interleaved format to LARSYS multispectral image tape format. Planning for this program has been completed as has all programming efforts. Test data has been assembled and all program abstracts have been generated. User documentation is scheduled for completion as of September 30, 1980.

Geometric correction is a modified system of programs designed to rotate EDIFS "P" format Landsat data to true north or other orientation as required. Actual inputs and outputs to and from the processor are in LARSYS format. Planning for this series of programs was completed in May with implementation of programs scheduled for completion at the end of August, 1980. Test data will be generated during program implementation. Abstracts and user documentation will be completed in parallel by the end of September, 1980.

Image registration is the third preprocessing software task. This processor provides the tool to register two coincident scenes of Landsat or other image data. Input images are assumed to be in LARSYS format. Planning for this processor will be completed in August, 1980. The main image registration programmed have been functionally specified and three-fourths of the units have passed the design stage. Over onethird have been implemented at this time. The second major section,

the coincident cross-correlation and the third multifit least squares analysis will be modifications of current program implementations. Program abstracts and user documentation for all sections are scheduled for completion as of October 31, 1980.

The final task is the creation and submission of a package of the above processors to COSMIC. Compiled listings of computer tapes containing all programs will be put together as of late October, 1980. All documentation for the package will be gathered and the package will be created and sent to COSMIC by mid-November, 1980. Detailed timeline charts for these activities appear in Appendix A.

2.2 Image Classification Software

The image processing software that St. Regis will use for classifying Landsat data will be called LARSFRIS. The modules that comprise this software currently exist as LARSYS ver. 3.1 and LARSYSDV, see Table 2.2.1 . LARSYS ver. 3.1 currently exists as a completely documented software package available through COSMIC. LARSYSDV contains experimental modules that represent a logical development of new software capability. LARSYSDV is not available through COSMIC.

The principle project activity during this past quarter has been completing the documentation of LARSYSDV software. A secondary activity involves updating the software elements of LARSYS ver. 3.1 that are transferred to St. Regis. The end result of these activities will be a completely documented software package called LARSFRIS. This software will be available to interested users through COSMIC. Timeline charts for the various image processing components of LARSFRIS appear in Appendix A.

2.2.1 Software Modifications

LARSYS software that would support the FRIS image processing requirements was identified early during the preliminary system design task in Phase II. A re-evaluation of these software modules as the documentation process began indicated that some software was inappropriate to transfer to St. Regis. The GDATA, GRESULTS, and BROWSE modules are specific software unique to the LARS computer configuration and, therefore, have been deleted from the software listed in Table 2.2.1.

Table 2.2.1. Software modules that comprise LARSFRIS and their origin, either LARSYS ver. 3.1 or LARSYSDV.

LARSYS ver. 3.1 Modules

SEPARABILITY

LARSYSDV Modules

PICTUREPRINT

STATISTICS

IDPRINT

LISTRESULTS

PUNCHSTATISTICS

LINEGRAPH

COLUMNGRAPH

HISTOGRAM

GRAPHHISTOPAAM

COPYRESULTS

EXCOMAND

SEPARABILITT PRINTRESULTS CHANNELTRANSFORM* SECHO* MERGESTATISTICS RATIOMEANS* BIPLOT COMFARERESULTS*

SMOOTHRESULTS

1

*Indicates a module name change, refer to sec. 2.2.2 of text.

In addition to deleting the three modules, four modules were renamed. Renaming was deemed appropriate because the new module name better represented the functions that the software performed. The following module names were changed:

New Name	Old Name
CHANNELTRANSFORM	DUPLICATERUN
SECHO	Есно
RATIOMEANS	RATIO
COMPARERESULTS	CHANGE

3.0 MANAGEMENT

During the quarterly reporting period both the LARS/NCC and LARS/JAX remote terminals were disconnected. The FRIS terminal network was intended to augment the technology transfer activities and assist with the system transfer. The LARS/JAX proved valuable during on-site training sessions at Jacksonville. The LARS/NCC terminal link was not extensively used because StR staff involved in software implementation had fewer problems than anticipated.

The FRIS Steering committee has developed a concept to produce a color brochure, and conduct an end-of-project symposium. Planning for both these activities began during this quarter.

Ş*

Appendix Λ

Timelines

I.	Preprocessing Software
I.a.	Preprocessing COSMIC Package
II.	FRIS Software Development
III.	FRIS LARSYSDV Documentation
IV.	FRIS "LARSYS Documentation"
۷.	St. Regis COSMIC Package

13

Ĵ.

T Prenrocessing Software	Apr May June July Aug Sept Oct Nov	
Landsat Reform		
1. Plan Processor		
2. Implementation		
5. User Documentation		
B. Geometric Correction		
1. Plan Processor		
2. Implementation		
3. Test Deck		
4. Program Abstracts		
C. Image Registration		
1. Plan		
2. Implementation		
4. Program Abstracts		
5. User Documentation		

ORIGINAL PAGE IS OF POOR QUALITY

10

T & Drenroneesing COSMIC Parkage	Apr	May	June	July I I I	Aug	Sept	- Sc	AOX				
•									 			
2. Greate tape (Document format)						1-12-1-1	<u>⊿</u>					
1									 			
4. Create new listing + abstract						2		2	 			
1									 			
B. Send Package to COSMIC								<u> </u> <u> </u> - -				
X									 -			
a a succession of the second												
									-4			
and a second									 			
na na na na bana na ina mana amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'ny faritr'o amin'ny faritr												
and a second a									 		- 100 Jan 19 	
		<u> </u>							 			
and a second												
							 				анан алан Сум јанин 1 ј / Баланба	
en en de la companya												
				∮ ∤ (∮ √ 								
		4)							 			
)			•;••••	 			
JSC Form 1958C (Rev Jun 88)									ĺ	:	ž	MASA-JSC

Ħ

AFA Arr Arr May June Jul Aug S FRIS Software Development Arr May June Jule Jule Jule Jule S CONFARERESULTS Image Arr May June Jule Jule Jule S 2. User Documentation Image Arr May June Jule S S 2. User Documentation Image Arr Arr Arr S <td< th=""><th>tion Task</th><th></th><th></th></td<>	tion Task		
FRIS Software Development Apr May June Jule	Mug Sept Oct I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I		
• FKLS SOLTWARE Development • FKLS SOLTWARE Development • COMPARENDITS • • • • • • • • • • • • • • • • • • •			
1. Programming (completed 6/79) 7 7 -			
2. User Documentation 9 7 9			
3. Program Abstracts P P P P 4. System Manual Flowchart P P P P 5. Test Procedures P P P P P 7. Test Procedures P P P P P P 7. Programming (completed 3/79) P			
4. System Manual Flowchart 4. -	Image: second		
5. Test Procedures P P P P 1. Programming (completed 3/79) P P P P 2. User Documentation P P P P P 3. Program Abstracts P P P P P P 3. Program Abstracts P <t< td=""><td></td><td></td><td></td></t<>			
CIASSIFYPOINTS (MiniDistance) I. Programming (completed 3/79) I. Programming (completed 3/79) 1. Programming (completed 3/79) I. Programming (completed 3/79) I. Programming (completed 3/79) 2. User Documentation I. Program Abstracts I. Program (completed 3/79) I. Program (completed 3/79) 3. Program Abstracts I. Programming I. Programming I. Programming 5. Test Procedures I. Programming I. Programming I. Programming 1. Programming I. Programming I. Programming I. Programming 2. User Documentation I. Programming I. Programming I. Programming 2. User Documentation I. Programming I. Programming I. Programming 3. Program Abstracts I. Programming I. Programming I. Programming 4. System Manual Flowchart I. Programming I. Programming I. Programming 5. Test Procedures I. Programming I. Programming I. Programming 7. System Manual Flowchart I. Programming I. Programming I. Programming 6. Test Procedures I. Programming I. Programming I. Programming I. Programming 7. System Manual Flowchart	Image Image <th< td=""><td></td><td></td></th<>		
1. Programming (completed 3/79) 1 2. User Documentation 7 3. Program Abstracts 7 4. System Manual Flowchart 7 5. Test Procedures 7 SMOOTHRESULTS 7 1. Programming 7 2. User Documentation 7 7 7 6. Test Procedures 7 7 7 9. Programming 7 1. Programming 7 2. User Documentation 7 3. Program Abstracts 7 4. System Manual Flowchart 7 7 7 9. Program Abstracts 7 7 7 9. Program Abstracts 7 9. Program Abstracts 7 9. Program Abstracts 7 1. Programming 1 1. Programming 1 2. Test Procedures 1 3. User Documentation 1 4. System Manual Flowchart 1 7 7 9. User Documentation 7 1. Programming 7	Image: second		
2. User Documentation 1			
3. Program Abstracts 9 9 -			
4. System Manual Flowchart 4. System Manual Flowchart 5. Test Procedures 7			
5. Test Procedures 7. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.			
SMOOTHRESULTS I. Programming I. Programming 1. Programming P P P 2. User Documentation P P P 3. Program Abstracts P P P 4. System Manual Flowchart P P P 5. Test Procedures P P P 1. Program Abstracts P P P 6. System Manual Flowchart P P P 7. System Manual Flowchart P P P 7. Program Abstracts P P P 7. Program Moutes P P P P 7. Programming 1. Programming P P P 7. Program Abstracts 1. P P P P 7. Program Abstracts 1. P P P P 7. Program Abstrects	┝╾╂╸┠╺╂╸╂╸╂╸╂╸╂╺╂╺╂╺┨╺┨╴┨╺┨╺┨	╾╂╼┋╾┠┵┿╍╂╼╂╺┠╍┧╍	
1. Programming 1. Programming 2. User Documentation 7 3. Program Abstracts 7 6. System Manual Flowchart 7 6. System Manual Flowchart 7 7. Test Procedures 7 7. Programming 7 7. Programming 7 7. System Manual Flowchart 7			
2. User Documentation 0			
3. Program Abstracts V			
4. System Manual Flowchart 9			
5. Test Procedures 7 7 7 PRINTRESULTS (Combine versions) 1 7 7 1. Programming 2. Programming 7 7 3. User Documentation 4. System Manual Flowchart 7 7 5. Test Procedures 5. Test Procedures 7 7			
PRINTRESULTS (Combine versions) 1. Programming 1. Programming 1. Programming 2. Program Abstracts 1. Program Abstracts 3. User Documentation 1. Procedures 4. System Manual Flowchart 1. Procedures 5. Test Procedures 1. Procedures			
Programming Program Abstracts User Documentation System Manual Flowchart			
Program Abstracts Program Abstracts User Documentation Image: state in the st			
User Documentation System Manual Flowchart Test Procedures			
System Manual Flowchart Test Procedures			
Test Procedures			

III. FRIS LASS'SW Documentation Arr May June July Aug Sept Sept Arr May June July Aug Sept 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 2. User Documentation 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 3. System Flowchart 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 3. System Flowchart 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 2. User Documentation 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 3. System Flowchart 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 0. Stored 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts 1. Frogram Abstracts	I. FXIS LARSYSUY Documentation Apr May June July Aug Sept MERGESTATTISS I. Frogram Abstracts IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII				
I. FRIS LARSYSDY Documentation Apr May June	I. FRIS LARSYSDY Documentation Apr May June				The second se
MERGESTATISTICS I. Program Abstracts I. Program Abstracts 2. User Documentation I. Program Abstracts I. Program Abstracts 3. System Flowchart I. Program Abstracts I. Program Abstracts 4. Test Procedures I. Program Abstracts I. Program Abstracts 1. Program Abstracts I. Program Abstracts I. Program Abstracts 2. User Documentation I. Program Abstracts I. Program Abstracts 3. System Flowchart I. Program Abstracts I. Program Abstracts 4. Test Procedures I. Program Abstracts I. Program Abstracts 1. Program Abstracts I. Program Abstracts I. Program Abstracts 2. User Documentation I. Program Abstracts I. Program Abstracts 3. System Flowchart I. Program Abstracts I. Program Abstracts 4. Test Procedures I. Program Abstracts I. Program Abstracts 5. User Documentation I. Program Abstracts I. Program Abstracts 3. System Flowchart I. Program Abstracts I. Program Abstracts 4. Test Procedures I. Program Abstracts I. Program Abstracts 5. User Documentation I. Program Abstracts I. Program Abstracts	merclessmitsricts mercless	E.	May June July Aug		
1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 3. System Plowchart 1. Program Abstracts 1. Program Abstracts 3. System Plowchart 1. Program Abstracts 1. Program Abstracts 3. System Plowchart 1. Program Abstracts 1. Program Abstracts 3. System Plowchart 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 5. System Plowchart 1. Program Plowchact 1. Program Abstracts	1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. System Flowchart 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 3. System Plowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 3. System Plowchart 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Procedures 1. ProgramAbstracts <t< td=""><td>۶ ۲</td><td></td><td></td><td></td></t<>	۶ ۲			
2. User Documentation 9 1 <td>2. User Documentation 9 1<td>-</td><td></td><td></td><td></td></td>	2. User Documentation 9 1 <td>-</td> <td></td> <td></td> <td></td>	-			
stem Flowchartist Proceduresist Procedures	3. System Flowchart $\bullet \bullet $				
4. Test Procedures 1	4. Test Procedures 4. Test Procedures 4. Test Procedures BIPLOT 1. Program Abstracts 9	1			
BIPLOT I. Program Abstracts P P - - P	BIPLOTI. Frogram AbstractsI. Frogram Abstracts1. Frogram AbstractsI. Frogram Abstracts2. User DocumentationI. Program Abstracts3. System FlowchartI. Program Abstracts4. Test FroceduresI. Program Abstracts1. Program AbstractsI. Program Abstracts5. System FlowchartI. Program Abstracts6. Test FroceduresI. Program Abstracts7. Program AbstractsI. Program Abstracts1. Program AbstractsI. Program Abstracts2. User DocumentationI. Program Abstracts3. System FlowchartI. Program Abstracts4. Test ProceduresI. Program Abstracts5. User DocumentationI. Program Abstracts6. Test ProceduresI. Program Abstracts7. Test ProceduresI. Program Abstracts7. System FlowchartI. Program Abstracts8. System FlowchartI. Program Abstracts9. System FlowchartI. Program Abstracts9. System Flowchart	1			T
1. Frogram Abstracts1. Frogram Abstracts1. 0 1. 0 3. System Flowchart3. System Flowchart1. 0 1. 0 4. Test Frocedures1. 0 1. 0 1. 0 A. Test Frocedures1. 0 1. 0 1. 0 RATIONEANS1. Frogram Abstracts1. 0 1. 0 1. Frogram Abstracts1. 0 1. 0 1. 0 2. User Documentation1. 0 1. 0 1. 0 3. System Flowchart1. 0 1. 0 1. 0 4. Test Procedures1. 0 1. 0 1. 0 3. System Flowchart1. 0 1. 0 1. 0 4. Test Procedures1. 0 1. 0 1. 0 3. System Flowchart1. 0 1. 0 1. 0 4. Test Procedures1. 0 1. 0 1. 0 3. System Flowchart1. 0 1. 0 1. 0 4. Test Procedures1. 0 1. 0 1. 0 5. -0 1. 0 1. 0 1. 0 6. -0 1. 0 1. 0 1. 0 7. -0 1. 0 1. 0 1. 0 7. -0 1.	1.Frogram Abstracts1.2.User Documentation1.3.System Flowchart1.4.Test Procedures1.4.Test Procedures1.A.Togram Abstracts1.1.Program Abstracts1.2.User Documentation1.3.System Flowchart1.4.Test Procedures1.5.System Flowchart1.6. 7 1.7. 7 1.81.1.7.1.1.7.1.1.7.1.1.7.1.1.7.1.1.7.1.1.7.1.7.1. </td <td>BIPI</td> <td></td> <td>1)</td> <td></td>	BIPI		1)	
2. User Documentation 7 7 7 3. System Flowchart 7 7 7 4. Test Procedures 7 7 7 RATIOMEANS 7 7 7 1. Frogram Abstracts 7 7 7 1. Frogram Abstracts 7 7 7 2. User Documentation 7 7 7 3. System Flowchart 7 7 7 4. Test Procedures 7 7 7 3. System Flowchart 7 7 7 4. Test Procedures 7 7 7 3. System Flowchart 7 7 7 4. Test Procedures 7 7 7 3. System Flowchart 7 7 7 4. Test Procedures 7 7 7 4. Test Procedures 7 7 7	2. User Documentation 7 7 7 3. System Flowchart 7 7 7 4. Test Procedures 7 7 7 RATIOMEANS 7 7 7 RATIOMEANS 7 7 7 1. Program Abstracts 7 7 7 2. User Documentation 7 7 7 3. System Flowchart 7 $$				
3. System Flowchart 1	3. System Flowchart 1	2. User Documentation			
4. Test Procedures4. Test Procedures9999RATIOMEANS1. Program Abstracts1. Program Abstracts2. User Documentation3. System Flowchart4. Test ProceduresSECHO1. Program Abstracts3. System Flowchart4. Test Procedures3. System Flowchart4. Test Procedures3. System Flowchart4. Test Procedures3. System Flowchart4. Test Procedures4. Test Procedures5. System Flowchart4. Test Procedures5. System Flowchart4. Test Procedures5. System Flowchart4. Test Procedures5. System Flowchart6. Test Procedures7. System Flowchart7. System Flowchares7. System Flowchart	4. Test Procedures9NRATIOMEANS1. Program Abstracts1. Program Abstracts2. User Documentation3. System Flowchart4. Test Procedures5. User Documentation1. Program Abstracts3. System Flowchart4. Test Procedures3. System Flowchart4. Test Procedures5. User Documentation1. Program Abstracts1. Program Plowchart1. Progr	3. Svstem Flowchart			
RATIOMEANSRATIOMEANS1. Program Abstracts12. User Documentation -1 3. System Flowchart -1 4. Test Procedures -1 5. User Documentation -1 4. Test Procedures -1 5. User Documentation -1 1. Program Abstracts -1 2. User Procedures -1 3. System Flowchart -1 4. Test Procedures -1 5. User Documentation -1 4. Test Procedures -1 4. Test Procedures -1 4. Test Procedures -1 4. Test Procedures -1 5. User Documentation -1 4. Test Procedures -1 4. Test Procedures -1 5. System Flowchart -1 6. Test Procedures -1 7.	RATIONEANS1. Program Abstracts1. Program Abstracts2. User Documentation2. User Documentation3. System Flowchart4. Test Procedures1. Program Abstracts1. Program Abstracts2. User Documentation1. Program Abstracts1. Program Abstracts2. User Documentation3. System Flowchart4. Test Procedures4. Test Procedures4. Test Procedures5. User Procedures5. User Procedures5. User Procedures6. Procedures7. Procedures7. Procedures7. Procedures7. Procedures7. Procedures7.				1
1. Program Abstracts 1. Program Abstracts <t< td=""><td>1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Flowchart 3. System Flowchart 1. Program Flowchart 1. Program Flowchart 1. Program Flowchart 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 5. User Documentation 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 5. Procedures 1. Program Abstracts 1</td><td>RAT</td><td></td><td></td><td></td></t<>	1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Flowchart 3. System Flowchart 1. Program Flowchart 1. Program Flowchart 1. Program Flowchart 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 5. User Documentation 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 5. Procedures 1. Program Abstracts 1	RAT			
2. User Documentation 1 <td>2. User Documentation 3. System Flowchart </td> <td>1.</td> <td></td> <td></td> <td></td>	2. User Documentation 3. System Flowchart	1.			
3. System Flowchart $ -$	3. System Flowchart 4. Test Procedures		1 1 1 1 1		
4. Test Procedures 4. Test Procedures 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Procedures 1. Procedures 4. Test Procedures 1. Procedures 1. Procedures	4. Test Procedures N N SECHO 1. Program Abstracts N 1. Program Abstracts N 2. User Documentation N 3. System Flowchart N 4. Test Procedures N 4. Test Procedures N				-
SECHO 1. Program Abstracts 1. Program Abstracts 2. User Documentation 1. Program Abstracts 1. Program Abstracts 3. System Flowchart 1. Program Abstracts 1. Program Abstracts 4. Test Procedures 1. Program Abstracts 1. Program Abstracts	SECHO 1. Program Abstracts $ P$ $ P$ 2. User Documentation $ P$ $ P$ $ P$ 3. System Flowchart $ P$ $ P$ $ P$ 4. Test Procedures $ P$ $ P$ $ P$				- 1
Program Abstracts Top V User Documentation 7 System Flowchart 7 Test Procedures 7 Image: State of the	Program Abstracts Topological Abstracts User Documentation Image: Comparison Abstract AbstractAbstract Abstract Abstract Abstract Abstract Abstract Abstract Abs	SECH			
User Documentation User Documentation System Flowchart 7 Test Procedures 7 Test Procedures 7 Test Procedures 7 Test Procedures	User Documentation User Documentation System Flowchart 7 System Flowchart 7 Test Procedures 7 Image: Structure struct		1		· · ·
System Flowchart Test Procedures	System Flowchart Test Procedures				
Test Procedures	Test Procedures		1		
		Test Procedures			
					<u> </u>
		and the second secon			
					I

												ſ
	Apr	Мау	June	July	Aug	Sept						
FRIS "LARSYS Documentation"										4		7
Remaining LARSYS Processors								_				
T, *IDF												
									_			
1. Review User Manual (e.g. examples)					9							
2. Review System Manual					2							
					17							
EXCOMD EXEC (+ related EXECs)												
1. Abstracts				1 1 1	F -							
				1	+							
3. Flowchart												
4. Test Procedures					P						1	T
System Manual (Section 2)												
User Manual							+					+
1. Volume 1												
					H							
#s and compile new list												 _
								_				
									 -,			