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SPECIAL REPORT WRITER: A FLEXIBLE
INFORMATION MANAGEMENT SYSTEM -

Documentation and Users Manual

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NASA Headquarters
Washington, D.C. 20546

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16. Abstract

NASA's Office of University Affairs (OUA) receives frequent requests for university-related information on a quick response basis. Analyses must be in a tabular form suitable for direct use by the requester. To fill this need, OUA had developed a Special Report Writer (SRR) which performs multiple correlations on files containing several data hierarchies. Output reports are specified in a simple notation, readily learned by persons having limited familarity with ADP.

The SRR system now installed at NASA Headquarters can be adopted by other NASA installations while the basic techniques themselves are compatible with the information management needs of a wide range of organizations. Specifically, the program lends itself to generalization and can be readily adapted for other file management purposes. This report contains extensive details on the characteristics of the SRR program, thus serving both as an operator's manual for present users and as a full explanation of the system for those contemplating its application to other data bases. The complete COBOL program and documentation are available.

17. Key Words (Suggested by Author(s)) Report Generator Report Writer Data Retrieval Users Manual System Documentation ADP Program Management Information Systems Information Management Systems	18. Distribution Statement Unclassified-Unlimited Category 61

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PREFACE

The Special Report Writer (SRR) concept originated in the Office of University Affairs (OUA) as a means for obtaining greater usefulness from its Management Information System. An extensive, well-organized and well-edited data base of university information existed in OUA's MIS, built and operated for the Office by NASA's Ames Research Center between 1967 and 1970. The first version of the SRR was ready in the Spring of 1971. In 1973 it was transferred to Headquarters for incorporation in the newly programmed OUA-MIS. At that time the SRR was also expanded to handle twice the number of data elements in keeping with a planned expansion of the OUA data base.

Use of the SRR capabilities have increased sharply as more NASA installations and offices have become familiar with it. In addition to meeting outside requests, OUA uses it extensively for making management analyses requisite to the Office's university activity overview responsibilities. Utilization of the SRR and, indeed, the OUA-MIS, is greatly enhanced by virture of the pre-development planning processes. The nature of the required outputs was determined before the data base was constructed or data collection started. Its cost effectiveness is well demonstrated by the wide range and diversity of the more than 175 reports required each year. Without the SRR, special programming would be needed to meet each of these requests.

Numerous comments have been received from those in the ADP field on the general uniqueness of the SRR and of its design and

execution. One purpose, therefore, of this report is to provide insight to the SRR and allow its adaption by others. Indeed the present program may be used almost as is by NASA Installations, taking their FACS submissions as a starting point. There is no comparable system in general NASA use for rapid retrieval and analyses of information on other than educational institutions. NASA centers, other agencies or outside organizations desiring further information on the Special Report Writer should contact:

        National Aeronautics & Space Administration

        Office of University Affairs, Code P

        Washington, DC 20546

Copies of the Programmers Manual and Source Programs are available for sale from NASA's Computer Software Management and Information Center (COSMIC). Information regarding price and order forms may be obtained by contacting:

        COSMIC

        Suite 112 Barrow Hall

        The University of Georgia

        Atlanta, Georgia 30602

        404/542-3265

ACKNOWLEDGMENTS

ABBREVIATIONS AND ACRONYMS

AI	– Accounting Installation
A.T.O.	– Alternate Technical Officer
C of F	– Construction of Facilities
C.A.S.E.	– Committee on Academic Science and Engineering
CFY	– Current Fiscal Year
COG	– Cognizant Office
Cong. Dist. No.	– Congressional District Number
CUM	– Cumulative
FACS	– Financial and Contractual Status ADP System
FFRDC	– Federally Funded Research and Development Center
FICE	– Federal Interagency Committee on Education
FMM	– Financial Management Manual
FPN	– Facilities Project Number
FY	– Fiscal Year
HQ	– NASA Headquarters
ID	– Identification
MSFC	– Marshall Space Flight Center
NASA	– National Aeronautics and Space Administration
OUA	– Office of University Affairs
OUA–MIS	– Office of University Affairs Management Information System
P.I.	– Principal Investigator
R & D	– Research and Development
RCF	– Report Control Form (NASA Form 520)
SR	– Special Report

SRR	- Special Report Writer
T.O.	- Technical Officer
TRANS.	- Transaction
UNICODE	- Standard University Name and Code List
UPN	- Unique Project Number
WFC	- Wallops Flight Center

Chapter I

INTRODUCTION

The Office of University Affairs

The Special Report Writer (SRR) was developed to meet the unique operational requirements of the Office of University Affairs (OUA). This office, reporting directly to the Associate Administrator, is the agency's principal advisor in NASA's overall relationships with universities.

Broad OUA responsibilities include: developing agency objectives and policies and prescribing procedure applicable to NASA activities involving relationships with universities; participating in the planning and review of activities involving relationships with universities that are sponsored by other NASA organizational elements; ensuring the availability of information required within NASA and by members of the public and private sectors on all aspects of NASA's activities involving relationships with universities; evaluating and reporting on the agency-wide conduct of university relationships including the achievement of objectives and the effectiveness of applicable policies and regulations, and taking or recommending required actions; and representing NASA with other public and private agencies or groups on matters related to governmental relationships with universities.

This overview function is agency-wide, involving the activities of some 25,000 government employees and 17 agency installations throughout the United States. The external overview involves a

large segment of the university community, viz., over 500 schools,

conducting research on more than 6,000 projects valued at some

$1.5 billion. To fulfill its responsibilities, OUA must maintain

timely and accurate information, both quantitative and qualitative,

on the total NASA-university relationship. For this reason the

office developed the extensive NASA-University Management Informa-

tion System (OUA-MIS). The Special Report Writer part of that

system is a particularly powerful tool; therefore, it is being

documented separately both to aid OUA users and to give others the

opportunity of adapting it to their own purposes. It is primarily

designed for manipulating financially oriented data. (Other OUA-MIS

outputs emphasize the technical aspects.)

Special Report Writer Data

Data available to the SRR fall into three broad categories:

financial data; data descriptive of the performing institution;

and data descriptive of a particular grant or contract. The

financial data, in particular, contain numerous sub-categories for

sources of funds within NASA. A listing of the individual data

elements appears in Chapter IV.

The function, then, of the SRR is to provide speedy answers to

non-standard questions by allowing easy access to any specified

combination of data elements in the system. Careful attention has

been paid to the appearance of the reports produced. Thus, they

may be sent directly to a requester without the need for re-typing,

manual editing or other time-consuming procedures.

Typical questions are:

1. "What were FY 74 obligations to public schools?"

2. "How many projects in small schools will end in the month of December 1975?"

3. "List the individual FY 75 contracts for basic research made by NASA's Langley Research Center in the states of Virginia, Maryland, North Carolina and Kentucky?"

4. "What schools received funding from the Apollo Program and how much money came from each NASA installation?"

All of these can be handled easily by the system. Setting up the inquiry for any one can be done in 10-15 minutes. Only a few minutes of IBM 360/65 Central Processor time is required for execution. (A smaller machine may be used. The core requirement is less than 180K bytes.)

Cross-Correlation

One of the major information system problems is the actual development of 'information' from the available stored data. Little success, at least from an economic standpoint, is realized by advance programming of output reports to meet all situations. Someone will always ask the unforseen question! Thus, the SRR was specifically designed with this situation in mind. Given the range of data elements available, the theoretical number of factors which can be simultaneously cross-correlated to produce a report is almost without limit. For example, in the preceeding section the third question requires a 5-way correlation. The report would

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include projects which meet all of the following criteria:

1.   FY 75 obligation

2.   Contract instrument used

3.   Basic research

4.   Funded by Langley Research Center

5.   Institution located in one of four states

A practical limit to the number of possible correlations has been found. After about 10 criteria, the selection requirement becomes too narrow for any projects to meet. Hence, there is just a negative output report.

Further flexibility is gained through range specification capabilities on dollar amounts and dates. Thus, the five criteria in the previous example could be increased to seven:

6.   Obligations between $50,000 and $150,000

7.   Ending date during FY 75

Families of output reports are easily produced. "Family" here is used in the mathematical sense, i.e., all the parameters which define a specific family member – a specific output report in this case – are identical, except one. Thus, in the previous example criteria #4 limited everything in the report to activity at Langley Research Center. Rewriting

"4a Langley Research Center"
"4b Ames Research Center"
"4c Lewis Research Center"

will produce three separate output reports. The one for Langley is the same. The only difference is that similar reports are produced for the two other Centers during the same production run.

Report Formats

The format of the report has been designed with the user in mind. It follows the standard rules of good book design, including proper layout and typography. "ADPized" spellings and abbreviations are non-existent. Each 8" x 10½" report contains three sections: (1) a first page tells the user exactly what is in the report and notes any significant assumptions or limitations in its compilation; (2) the body pages of the report list schools alphabetically within state (or country); and, (3) a final page summarizes the data in the body. If a family of reports is specified, each report has the same three sections. Each section has a unique title for identification purposes. The user may vary the format slightly by options governing single or double spacing, selecting several types of data for inclusion in a "spare" column or by specifying an 11" x 15" questionnaire format.

Simplified System Flow

The basic system flow is shown in Figure 1. It begins with the main OUA-MIS data base which is outside of the SRR. It is only necessary to know that the OUA-MIS base is fully edited and contains all of the information needed for the SRR. The SRR described in this report thus begins with an extracted file containing just data of interest. From this data base, the user, in essence, creates an extract containing only the information required for the report desired. This is accomplished through the report specifications. If only a single output report is required all of the data in the user-specified extract goes into that single report. Alternately,

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Figure 1. Basic Special Report Writer System Flow

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if a family of reports is wanted, as noted by the dotted lines in Figure 1, then only that part of the extract required to produce a particular member of the family is used for each report.

Presentation Scheme

The main body of this report is devoted to a detailed description of the Special Report Writer. There are three interwoven approaches or levels in the discussion. First, are the detailed operational procedures required by OUA personnel who actually generate specific reports and prepare them for customers. Next, is the information on the construction, contents and behavior of all elements within the data base; this knowledge is essential for obtaining maximum system usage, whether by OUA operators or other NASA or non-NASA users.

Finally, various conceptual aspects and systems techniques are explored where such information would be helpful to the advanced user or designer. This category covers the generic behavior of the data elements, i.e., how they behave as result of system design, rather than the NASA-related nature of the data, per se.

It is unlikely that any particular user will be interested in all three of these levels. However, the casual reader will find that the more complex technical aspects can generally be skipped without serious loss in the continuity needed for general comprehension of the material.

Chapter II

OUTPUT CONFIGURATIONS

General Appearance

An appreciation of what the output reports look like will make it much easier for the reader to follow the various steps and considerations in their production. A report on work in Alabama will be used to illustrate the four main format variations. (The same reports will be used later to illustrate the request process and transcript preparation.) The first three are "normal" (8" x 10½") reports, while the last one is in questionnaire format (11" x 15"). It is important to remember that all of the reports are very similar in appearance. The important differences occur in the data used for their preparation, as will be described later.

Reports to be described are:

1. Normal – Single Section

2. Normal – Single Section, Rolled-up

3. Normal – Multiple Section (Family)

4. Questionnaire

Normal – Single Section

The normal, single section report is one of the most commonly requested varieties. Figure 2 presents a typical first page of all reports. The first, third and fourth lines in the heading are automatically printed on all reports. The Special Report (SR) number, 404, and the "as-of" date are specified by the user.

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```
SELECTED NASA OBLIGATIONS TO EDUCATIONAL  INSTITUTIONS  10UMIS00133

SPECIAL REPORT 404          AS OF JANUARY 31, 1975          PAGE      1

OFFICE OF UNIVERSITY AFFAIRS

NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM

NASA GRANTS & CONTRACTS


SPECIAL REPORT FOR MR. GREENE.

THIS REPORT LISTS ALL PAST AND PRESENT PROJECTS IN THE STATE OF

ALABAMA. THE FINAL PAGE SUMMARIZES NUMBERS CF PROJECTS AND AMOUNTS

OBLIGATED.
```

Figure 2. SR 404—Explanatory Page

The fifth heading line, "NASA Grants & Contracts", is the unique identifier for this particular report, while the remainder of the information on the page is devoted to any additional, user provided text explaining the report contents.

The body of this example begins on Page 2, shown in Figure 3, and would extend until all schools in Alabama are covered. This layout is produced automatically; no special instructions are required. The "NASA Grants & Contracts" identifier line appears on every page of the report.

The final page of each report provides totals of awards and funds in various categories subject to frequent examination. An example of this page is shown in Figure 4. The distinction between contracts awarded by Centers and those awarded by Headquarters is made for historical reasons; currently a single contracts category would suffice. "Purchase orders" include cooperative agreements and contracts transferred from other agencies with no change in contract identification number. "Current Fiscal Year Obligations" mean obligations made during the fiscal year into which the as-of date falls. "Cumulative obligations" cover the total time period from the beginning of the contract to the as-of date.

Normal – Single Section, Rolled-up

Frequently, information on individual grants and contracts is not required. In this situation a "rolled-up" version is available. SR 405 Figure 5 presents the same data used in SR 404 (Figure 3), however, without the detail. Note the same current fiscal year and

NASA GRANTS & CONTRACTS

STATE INSTITUTION & CONG DIST NO GRANT/CONTRACT NUMBER	CURRENT FY OBLIGATICNS ($1000)	CUMULATIVE OBLIGATIONS ($1000)
ALABAMA		
ALABAMA A&M UNIV − 05		
NAS 8 11365		29
NGR 1 1003		54
NGR 1 1006		14
NGR 1 1007		61
NGR 1 1012		27
NGR 1 1013		38
NGR 1 1014		40
NGR 1 1017		16
NGR 1 1018		20
NGR 1 1020		31
NGR 1 1021		21
NGR 1 1023		44
NGR 1 1024		21
NGR 1 1025	24	47
NSG 8001		17
NSG 8011		20
NSG 8013		24
NSG 8022	24	24
INSTITUTION TOTALS 18 PROJECTS	48	548
ATHENS COLLEGE − 05		
NAS 8 28058		73
NAS 8 30561		22
NAS 8 30813	12	12
NAS 8 30880	16	16
INSTITUTION TOTALS 4 PROJECTS	28	123
AUBURN UNIV−AUBURN − 03		
NAS 8 33		297
NAS 8 1548		105
NAS 8 2411		48
NAS 8 2484		354
NAS 8 2520		128
NAS 8 5154		53

Figure 3. SR 404—Body Page

```
SELECTED NASA OBLIGATIONS TO EDUCATIONAL INSTITUTIONS  IOUMISOO133
SPECIAL REPORT 404        AS OF JANUARY 31, 1975        PAGE    10
OFFICE OF UNIVERSITY AFFAIRS
NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM
NASA GRANTS & CONTRACTS
```

	*** ITEM TOTALS ***			
	NUMBER LISTED		OBLIGATIONS ($1000)	
	CURRENT FY	CUMULATIVE	CURRENT FY	CUMULATIVE
LOCATIONS				
STATES & POSSESSIONS	1	1		
FOREIGN COUNTRIES				
TOTALS	1	1		
PROJECTS				
GRANTS	10	54	421	7,787
HQ CONTRACTS		4		733
CENTER CONTRACTS	29	177	610	13,867
PURCHASE ORDERS				
TOTALS	39	235	1,031	22,387
INSTITUTIONS				
DOMESTIC	8	11		
FOREIGN				
TOTALS	8	11		

Figure 4. SR 404—Final Item Count Page

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```
SELECTED NASA OBLIGATIONS TO EDUCATICNAL  INSTITUTIONS        PAGE    2
OFFICE OF UNIVERSITY AFFAIRS
NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATICN SYSTEM
SPECIAL REPORT 405            AS OF JANUARY 31, 1975

NASA GRANTS & CONTRACTS

STATE                            CURRENT FY   CUMULATIVE   UNDISBURSED
   INSTITUTION AND NUMBER OF     OBLIGATIONS  OBLIGATIONS   BALANCES
   GRANTS AND CONTRACTS            ($1000)      ($1000)      ($1000)



ALABAMA

ALABAMA A&M UNIV        -   18         48          548          128
ATHENS COLLEGE         -    4         28          123           57
AUBURN UNIV-AUBURN     -   57        148        8,381          365
CAKWOOD COLLEGE        -    2         19           44           19
TALLADEGA COLLEGE      -    5         48          236           85
TUSKEGEE INSTITUTE     -    7         53          319           74
UNIV ALA-BIRMINGHAM    -    2                      60           14
UNIV ALA-HUNTSVILLE    -   61        528        4,361          692
UNIV ALA-TUSCALOOSA    -   75        159        8,260          301
UNIV OF MONTEVALLO     -    2                      25
UNIV OF SO ALABAMA     -    2                      30            4
                          ---      -------     --------      -------
     STATE TOTALS        235       1,031       22,387        1,739

     GRAND TOTAL         235       1,031       22,387        1,739
```

Figure 5. SR 405—Rolled-up Report Format

cumulative totals for Alabama A&M and Athens College. SR 405 illustrates another system capability in its use of the optional third column. Here it has been used for undisbursed balances. Other options include: current fiscal year expenditures; cost sharing amount; and ending date. The first page and the final, item count page of SR 405 are similar to those already discussed under SR 404.

Normal - Multiple Section (Family)

SR 406 presents an example of a family report; the members are three NASA installations, Marshall Space Flight Center (MSFC), NASA Headquarters (HQ), and Wallops Flight Center (WFC), as shown on the descriptive page, Figure 6. Two other report writer capabilities are illustrated; projects in two states are included and only awards within a certain cumulative dollar range are listed. The first pages of each of the other two sections are identical except that "HQ" and "WFC" respectively are substituted for "MSFC" in the heading.

The first page of the MSFC section, shown as Figure 7, displays the heading identification and the effect of selecting only MSFC projects within a dollar range. This effect is readily apparent by comparing Alabama A&M in Figures 3 and 7, recalling Figure 3 includes all NASA projects regardless of cumulative amount.

The Headquarters section, illustrated in Figure 8, is similar. In this example, Arkansas projects meeting the selection criteria will be printed following the Alabama listing. The last section, WFC, depicted as Figure 9, page 18, is a negative report.

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```
SELECTED NASA OBLIGATIONS TO EDUCATIONAL INSTITUTIONS  IGUMISGC133

SPECIAL REPORT 406          AS OF JANUARY 31, 1975          PAGE       1

OFFICE OF UNIVERSITY AFFAIRS

NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM

GRANTS & CONTRACTS - MSFC




ALL PROJECTS IN ALABAMA & ARKANSAS WITH CUMULATIVE OBLIGATIONS
BETWEEN $25,000 AND $100,000 ARE LISTED. SEPARATE SECTIONS
ARE PRESENTED FOR THREE NASA INSTALLATIONS: MSFC, HQ AND WFC.
```

Figure 6. SR 406—Family Report Explanatory Page

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SELECTED NASA OBLIGATIONS TO EDUCATIONAL INSTITUTIONS      PAGE    2
OFFICE OF UNIVERSITY AFFAIRS
NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM
SPECIAL REPORT 406           AS OF JANUARY 31, 1975

GRANTS & CONTRACTS - MSFC

STATE                        CURRENT FY  CUMULATIVE
   INSTITUTION & CONG DIST NO  OBLIGATIONS OBLIGATIONS
        GRANT/CONTRACT NUMBER   ($1000)     ($1000)

ALABAMA

  ALABAMA A&M UNIV      - 05

             NAS 8 11365                        29
             NGR 1  1023                        28
             NGR 1  1025          24            47
                                -------      -------
        INSTITUTION TOTALS       24            104
           3 PROJECTS

  ATHENS COLLEGE        - 05

             NAS 8 28058                        73
                                -------      -------
        INSTITUTION TOTALS                      73
           1 PROJECT

  AUBURN UNIV-AUBURN    - 03

             NAS 8   2411                       48
             NAS 8   5164                       53
             NAS 8 11116                        80
             NAS 8 11279                        72
             NAS 8 18049                        50
             NAS 8 20061                        55
             NAS 8 20175                        84
             NAS 8 21368                        38
             NAS 8 24818                        51
             NAS 8 26579                        44
             NAS 8 26580                        85
             NAS 8 26760                        25
             NAS 8 26930          10            71
             NAS 8 27664                        70
             NAS 8 28110                        30
             NAS 8 29852                        74
             NAS 8 29856                        30
             NAS 8 29881                        74
             NAS 8 30248                        26
             NAS 8 30654                        30
             NGR 1  3011                        51
                                -------      -------
        INSTITUTION TOTALS       16           1,141
          21 PROJECTS
```

Figure 7. SR 406—Body Page, First Family Member

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```
SELECTED NASA OBLIGATICNS TO EDUCATIONAL INSTITUTIONS     PAGE    2
OFFICE OF UNIVERSITY AFFAIRS
NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM
SPECIAL REPORT 406          AS OF JANUARY 31, 1975

GRANTS & CONTRACTS - HQ

STATE                      CURRENT FY   CUMULATIVE
  INSTITUTION & CONG DIST NO  OBLIGATIONS UBLIGATIONS
       GRANT/CONTRACT NUMBER   ($1000)      ($1000)

ALABAMA

  ALABAMA A&M UNIV     - 05

                NGR 1   1003                      54
                NGR 1   1007                      58
                NGR 1   1013                      32
                NGR 1   1014                      40
                NGR 1   1020                      31
                                        --------    --------
           INSTITUTION TOTALS                   215
               5 PROJECTS

  OAKWOCC COLLEGE      - 05

                NGR 1   6001                      25
                                        --------    --------
           INSTITUTION TOTALS                    25
               1 PROJECT

  TALLADEGA COLLEGE    - 03

                NGR 1   7001                      63
                NGR 1   7004                      47
                                        --------    --------
           INSTITUTION TOTALS                   110
               2 PROJECTS

  TUSKEGEE INSTITUTE   - 03

                NGR 1   5003                      39
                NGR 1   5004                      25
                NGR 1   5010                      46
                NGR 1   5012                      42
                                        --------    --------
           INSTITUTION TOTALS                   152
               4 PROJECTS

  UNIV ALA-BIRMINGHAM  - 06

                NGR 1 10001                       45
                                        --------    --------
           INSTITUTION TOTALS                    45
               1 PROJECT
```

Figure 8. SR 406— Body Page, Second Family Member

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```
SELECTED NASA OBLIGATIONS TO EDUCATIONAL INSTITUTIONS      PAGE   2
OFFICE OF UNIVERSITY AFFAIRS
NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM
SPECIAL REPORT 406            AS OF JANUARY 31, 1975

GRANTS & CONTRACTS - WFC

STATE                              CURRENT FY   CUMULATIVE
   INSTITUTION & CONG DIST NO    OBLIGATIONS  OBLIGATIONS
         GRANT/CONTRACT NUMBER      ($1000)      ($1000)




NO CUA RECORD MEETS THE ESTABLISHED CRITERIA
NECESSARY TO APPEAR IN THIS REPORT.
```

Figure 9. Negative Results Report

since no projects in Alabama or Arkansas meet the user specified criteria on page 1 of the report, (the WFC version of Figure 6 in this case).

Questionnaire Version

The questionnaire or data sheet version of the report uses the entire computer sheet, rather than just the left-hand side as do the other reports. Even so, it still consists of the same three sections: descriptive page, body and final item count page. It may be produced as a single section or as a family. The first page, shown in Figure 10, illustrates two additional system capabilities. The text is centered on the page and, as noted in the text, a selection criterion of projects having current fiscal year obligations has been imposed.

Figure 11, presenting an example of page 2 of this report, shows the capability for dealing with the right half of the page. Any type of text may be used for headers in the upper right. A space 60 characters long and 9 lines deep is available. Likewise, any material may be placed following each grant/contract (or institution in the rolled-up version); the only constraint is the same line must be used. This format is employed when a user needs a convenient mechanism for querying knowledgeable individuals or when a report with a built-in "work sheet" is desired. Two other system options are illustrated: the grants and contracts are double-spaced and the third column uses the ending date mentioned in the discussion of SR 405.

SELECTED NASA OBLIGATIONS TO EDUCATIONAL INSTITUTIONS

SPECIAL REPORT 407   AS OF JANUARY 31, 1975

OFFICE OF UNIVERSITY AFFAIRS — NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATION SYSTEM

PROJECT QUESTIONNAIRE

THIS QUESTIONNAIRE LISTS ALL PROJECTS WITH CURRENT FISCAL YEAR

OBLIGATIONS IN THE STATE OF ALABAMA. PLEASE PROVIDE THE

INFORMATION REQUESTED ON THE RIGHT-HAND SIDE OF THE PAGE AND

RETURN ALL MATERIAL TO THE OFFICE OF UNIVERSITY AFFAIRS NO LATER

THAN MARCH 15, 1975.

Figure 10. SR 407—Questionnaire Report, Explanatory Page

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SELECTED NASA OBLIGATIONS TO EDUCATIONAL INSTITUTIONS
OFFICE OF UNIVERSITY AFFAIRS
NASA UNIVERSITY PROGRAM MANAGEMENT INFORMATICA SYSTEM
SPECIAL REPORT 407   AS OF JANUARY 31, 1975

PROJECT QUESTIONNAIRE

STATE INSTITUTION & CONG DIST NO GRANT/CONTRACT NUMBER	CURRENT FY OBLIGATIONS ($1000)	CUMULATIVE OBLIGATIONS ($1000)	CURRENT ENDING DATE	DO YOU PLAN TO RENEW THIS PROJECT?		WHAT IS THE APPROX. RENEWAL DATE ? (MONTH & YEAR)	WHAT IS THE APPROX. FUNDING LEVEL PLANNED? ($1000)	OTHER COMMENTS
				YES	NO			
ALABAMA								
ALABAMA A&M UNIV - 05								
NGR I 1025	24	47	10/01/75	----	----	-------	-------	-----------
NSG 8022	24	24	09/01/75	----	----	-------	-------	-----------
INSTITUTION TOTALS 2 PROJECTS	48	71						
ATHENS COLLEGE - 05								
NAS 8 30813	12	12	12/23/74	----	----	-------	-------	-----------
NAS 8 30880	16	16	01/31/76	----	----	-------	-------	-----------
INSTITUTION TOTALS 2 PROJECTS	28	28						
AUBURN UNIV-AUBURN - 03								
NAS 8 24930	16	71	09/15/75	----	----	-------	-------	-----------
NAS 8 31190	7	7	07/10/75	----	----	-------	-------	-----------
NGT I 3044	116	695	03/31/76	----	----	-------	-------	-----------
NSG 1002	9	19	07/31/75	----	----	-------	-------	-----------
INSTITUTION TOTALS 4 PROJECTS	148	792						
OAKWOOD COLLEGE - 05								
NSG 8017	19	19	10/30/75	----	----	-------	-------	-----------
INSTITUTION TOTALS 1 PROJECT	19	19						

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Figure 11. SR 407—Questionnaire Report, Body Page

Cutting and Binding

The reports are designed to be stapled or bound on the left margin, resembling normal books in appearance and ease of use. To do this, reports are run on single-copy paper with careful placement of the text on the paper. The unburst report is placed on a large commercial paper cutter of the type used in a printing plant. It is cut vertically 8" from the left-hand margin, then $\frac{1}{4}$" is cut from both top and bottom. When the alternate pages are reversed a normal appearing 8" x $10\frac{1}{2}$" stack of pages results. (The program card list which appears at the beginning of each report should be removed before cutting.) Where multiple copies are required, the original should be xeroxed before binding.

Handling of the questionnaire version depends upon the customer's needs. The following methods are commonly employed:

- o Not bound
- o Xerox-reduced and bound on left-edge
- o Top bound, unburst
- o Burst, bound on left edge

Chapter III

REPORTS PRODUCTION

This section describes the detailed operational steps by which OUA personnel request special reports. It may be of interest to the general reader to the extent that it catalogs items which must be considered. Three documents are required to request a report run:

1. Form 519, "Transcript No. 17 - Ames Special Reports".

2. Form 520, "Report Control Form (RCF)".

3. Form 35, "External Source Data Input Submittal".

Form Preparation

Transcript No. 17 defines the contents of the report. Figure 12, a typical transcript, was the one used to produce SR 404 (Figures 2-4). (Occasional use of the term "Ames" in the transcript heading and elsewhere in the documentation reflects the initial system development for OUA by NASA's Ames Research Center.) Several steps are common to the preparation of all Form 519's. Assignment of an identifying serial number is the first step; this number should also be used for the run number, "report info designator", on the transcript. Next, the desired as-of-date is specified (see line 2 of the example). The NASA HQ tape library contains files for the end of each month of the current fiscal year, for the end of each quarter for the immediate past fiscal year, and an aggregate for each prior year back to fiscal year 1970. Finally,

23

24

OUA-MIS TRANSCRIPT NO.17 - AMES SPECIAL REPORTS

III Z00001   4/1/75   1 - 1

SERIAL NO.

TRANS TYPE COUNTER / ACTION CODE

CODE AS SPECIFIED

REPORT INFO DESIGNATOR — D CARDS

LO DOLLARS ENROLLMENT   P/ HI DOLLARS ENROLLMENT — SPECIAL X CARDS

CARD NO.

404 A01 RN 404	S B
A02 RD JANUARY 31, 1975	
D01 NASA GRANTS & CONTRACTS	
E05 LL SPECIAL REPORT FOR MR. GREENE	
E08 LL THIS REPORT LISTS ALL PAST AND PRESENT PROJECTS IN THE STATE OF	
E10 LL ALABAMA. THE FINAL PAGE SUMMARIZES NUMBERS OF PROJECTS AND AMOUNTS	
E12 LL OBLIGATED.	
S01 LC 01	

M M D D Y Y   M M D D Y Y   NOTES
M M Y Y   M M Y Y
SPECIAL DATE X CARDS

NHQ DIV FORM 519   NASA-HQ

Figure 12

the instructions for the desired report are written, as fully discussed in later sections. All cards must carry the identification "SB" in the last two positions to prevent confusion with other OUA-MIS input cards.

If the card deck for a report has been keypunched in advance, it may be substituted for the Transcript No. 17. For reports that are run every month, a combination of a transcript and previously used cards may be submitted. Thus, if an updated version of SR 404 is desired at the end of February, the transcript would have only two cards, one with the new serial/run number and the other with the February 28, 1975 date. The remaining SR 404 cards would just be attached to the transcript.

The next action is the preparation of an OUS-MIS Report Control Form (RCF) to identify which OUA-MIS output programs and data files will be needed. Thus, in Figure 13 the date of the file required is entered in the upper left block, while the bottom entry in the middle column requests the SRR program. The serial number is entered from Transcript 17. Where cards from a previous month are being submitted there may be more than one serial number, but the first serial number is always the same as the run number. Listing the numbers enables the computer preparation staff to properly separate the input cards if several reports are requested simultaneously.

Last of all, a Form 35 (Figure 14) is required to notify the machine room that the report writer segment of the OUA-MIS is to be activated for this request. As block 4 indicates, an RCF form is always required while the other areas should be checked to

OUA - MIS REPORT CONTROL FORM (RCF)

ALL REPORTS

As-of-Date 0.1./3.1./7.5
Run Date ./././

UNIVERSITY REPORTS (UNICODE/UNILIST)

UNICODE

___ 1. Regular Run

UNILIST
Report Type: (Check One)
___ 1. List
___ 2. Mailing Labels

Addressee: (Check One)

___ 1. Presidents
___ 2. Research Coordinators
___ 3. Business Officers
___ 4. Special Input

Special Name:

Special Title:

Status Selection Option

___ 1. All Addresses
___ 2. Active or Active FY [___] Only
___ 3. Obligation or Obligation FY [___] Only
___ 4. Mailing List Subscribers Only
___ 5. All Universities (Default)

Type of Institution Option

___ 1. Foreign
___ 2. Foreign and Domestic
___ 3. Domestic Only (Default)

* Mutually Exclusive

NHQ DIV FORM 520   APR 74   PREVIOUS EDITIONS ARE OBSOLETE.

NASA's UNIVERSITY PROGRAM (GREENBOOK)

___ 1. Tape for Publication

Internal Reports

___ 2. Standard Report
___ 3. Installation Reports
___ 3A. Ames Research Center
___ 3B. Flight Research Center
___ 3C. Goddard Space Flight Center
___ 3D. Kennedy Space Center
___ 3E. Langley Research Center
___ 3F. Lewis Research Center
___ 3G. Marshall Space Flight Center
___ 3H. Johnson Space Center
___ 3I. Wallops Station
___ 3J. NASA Headquarters
___ 4. Program Office Reports
___ 4A. OA
___ 4B. OAST
___ 4C. OSS
___ 4D. OMSF
___ 4E. Staff Offices
___ 4F. OUA

Internal Report Condition Options

___ 5. Active Projects Only ←
___ 6. Projects with CFYOBS Only ← *
___ 7. Completed Projects Only ←
___ 8. Grants Only ← *
___ 9. Contracts Only ←
___ 10. Include FFRDC's

AMES OBLIGATION REPORT OPTIONS

___ 1. Cumulative Reports
___ 2. Fiscal Year Reports

AMES SPECIAL REPORT (T.17)

X 1. Standard Report: Serial Numbers:
404 __ __ __ __

C.A.S.E. REPORT

___ 1. Midques Report
___ 2. Field-of-Science Report
___ 3. R&D Report
___ 4. NSF Report (6-YY Only)
___ 5. Disbursements
___ 6. Report Year [___] (YY or NO)

DANALYST REPORT (Dates Inclusive)

1. From Month [___]
2. From Year [___]
3. To Month [___]
4. To Year [___]

REPORT TITLE

FACS 1356 SUBMISSION DELINQUENCY REPORT

___ 1. Standard Report

RTOP ANALYSIS REPORT

1. ___ A. Raw Obligations ←
   ___ B. Edited Obligations ← *
   ___ C. Expenditures ←

___ 2. UPN 501-503 Only

HQ RENEWAL REPORT

Renewal Selection (Inclusive)

1. From Month [___]
2. From Year [___]
3. To Month [___]
4. To Year [___]

Due Selection (Inclusive)

1. From Month [___]
2. From Year [___]
3. To Month [___]
4. To Year [___]

NASA-HQ

Figure 13

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
EXTERNAL SOURCE DATA INPUT SUBMITTAL

SECTION I TO BE COMPLETED BY THE SUBMITTING OFFICE *(See instructions on reverse)*

1. SUB-SYSTEM TITLE		2. AS/OF DATE	3. FILE I.D.
OFFICE OF UNIVERSITY AFFAIRS MANAGEMENT INFORMATION SYSTEM		--	UZ01

4. TYPE OF INPUT *(Card, tape, form, etc.)*	5. CONCERNING THE DATA NOW BEING SUBMITTED AS INPUT ON THIS FILE I.D. FOR THIS AS/OF DATE:			
___ Transcripts X Cards X RCF	*(Check one column on each item)*	YES	NO	5C. IF NO IS CHECKED ON ITEM 5., INDICATE BELOW WHEN REMAINDER OF SUB-MISSION CAN BE EXPECTED.

6. NO. OF ITEMS OF INPUT	A. WERE PARTIAL SUBMISSIONS MADE PRIOR TO THIS ONE?	--	--	
--				

7. DISPOSITION OF INPUT ITEMS	B. DOES THIS SUBMISSION COMPLETE THE TOTAL INPUT?	--	--	TIME --	DATE --
Return to Submitter					

8. REMARKS

RUN 7 REPORT SERIES (Check Only One Item)   Request No. ____ of ____
(Report Control Form Must Be Attached)

a. ____   UNICODE/UNILIST (UH01)   f. ____   DANALYST   (UH06)
b. ____   GREENBOOK   (UH02)   g. ____   FACS 1356 SUBMISSION DELINQUENCY
c. ____   AMES OBLIGATION (UH03)   (UH07)
d. _X_   AMES SPECIAL   (UH04)   h. ____   RTOP ANALYSIS REPORT (UH08)
e. ____   C.A.S.E.   (UH05)   i. ____   HQ RENEWAL REPORT   (UH09)

SPECIAL INSTRUCTIONS:

9. SIGNATURE OF SUBMITTING OFFICIAL	10. OFFICE CODE	11. TIME AND DATE SUBMITTED
	P	4/1/75

SECTION II TO BE COMPLETED BY DATA PREPARATION SECTION

12. ROUTING	13. LINE ITEM COUNT	14. LOG NO.	15. PRODUCT CODE	16. PRIORITY	17. DUE DATE
18. RECIPIENT	19. ACTUAL COUNT	20. RELEASED TO		21. TIME AND DATE RELEASED	

22. REMARKS

Figure 14

indicate whether a transcript, cards or both are attached. The

Form 35 is an agency data processing requirement.

Internal Edits

Extensive validity and logic checks are performed by the
computer upon the input cards. If there is an error in the as-of-
date, viz. the date on the transcript and the RCF form is different
or there are two date cards, computer processing will be discontinued.
Other conditions such as missing or multiple run number cards will
also abort computer processing. In either event the output will
be a one or two line error message on an unheaded page. When this
happens, appropriate corrections should be made and the entire job
re-submitted as though it were new; the same run number should be
retained.

Once past this point, a series of detailed edits are performed
on the input cards for detectable conditions which will prevent
proper execution of the run. Typical errors include: keypunch,
blank mandatory fields, non-existent codes and improper input code
formats. If any errors are found, the contents of the erroneous
card are printed out at the beginning of the report under an "error
listing" heading. All of the cards are then printed on the next
page under a "program card listing" heading and, once again,
computer processing is terminated. Correction and re-submittal as
outlined above is required. If no logical errors are discovered,
a negative error listing, a list of the selection cards, and the
resulting data report will be produced in that order.

Upon receipt of the report it should be reviewed for obvious problems and applicability of the data. Improper operation of the SRR program is rare. However, certain types of malfunctions are evident from three checking counters on an unnumbered page at the end of each report section. For example, the checking counters which would appear following the page illustrated in Figure 4 are:

ACTUAL FY-OBLIG	1,031,987
ACTUAL CUM-OBLIG	22,356,128
ACTUAL RECORD COUNT	235

The dollar value totals marked "Actual FY-oblig" are taken from the basic extract from which the report is written. These should be reasonably close to the totals on the last item count page of the report. Some variation is to be expected as the values for each project in the report are rounded to thousands and then added to produce a file total while checking counters are actual, accumulated file totals in dollars. The "Actual Record Count" should agree with the cumulative number of projects listed. A small difference indicates the number of projects with obligations less than $500. These are rounded to zero and are not tallied on the last report page, but are tallied by the checker counter.

When a multi-section report is run which uses all of the data selected, the sum of the dollar totals in each section should equal the dollar totals in a section which includes the entire data base. The numbers of projects rarely add to the comparable total in this situation since one project may appear in more than one report section.

If satisfactory, the report is then bound and distributed or otherwise treated according to the wants of the requester. The Program Card List should be filed for future reference. Figure 15 shows an actual list resulting from the transcript (Figure 12) used in processing SR 404. The program cards themselves may also be saved and filed in sequence by run numbers. They are then readily available for future use.

```
P R O G R A M     C A R D     L I S T I N G


404 A01 RN 404                                                                    SB

404 A02 RD JANUARY 31, 1975                                                       SB

404 D01                    NAFA GRANTS & CONTRACTS                                 SB

404 F05 LL SPECIAL REPORT FOR MR. GREENE.                                          SB

404 E08 LL THIS REPORT LISTS ALL PAST AND PRESENT PRCJECTS IN THE STATE OF    SB

404 E10 LL ALABAMA. THE FINAL PAGE SUMMARIZES NUMBERS OF PROJECTS AND AMOUNTSSB

404 E12 LL OBLIGATED.                                                              SB

404 S01 LC 01                                                                      SB




NOTE       TO EXPEDITE UPDATED RERUNS RETURN
           THIS LISTING TO U.U.A. WITH YOUR REGUEST.
```

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Figure 15. SR 404, Program Card Listing

Chapter IV

DATA BASE

Origin

For purposes of using the SRR it is only necessary to be familiar with the contents of the data base available for preparing reports. However, the more familiar operating personnel are with the origin and behavior of material in the data base, the greater the capability for exercising the system. In addition, those who wish to adapt the SRR to non-NASA uses should know how the nature and configuration of the original data has affected aspects of the system design and file layout.

The OUA-MIS is a batch-process system, updated monthly from two sources: (1) Agency-wide data collected by the Financial and Contractual Status (FACS) system operated jointly by the Procurement and Financial Management Offices; and (2) additional data on schools and projects collected and input directly by OUA. The FACS files are organized to facilitate accounting requirements, hence, the main OUA file is necessarily structured similarly even though the OUA-MIS is not an accounting system. Each month the data base file for the SRR is in turn extracted from the main OUA-MIS file. At this time some data files are combined or rolled-up to simplify the SRR data base by eliminating many of the special accounting features which are not needed. This flow from the OUA-MIS data base to the SRR was previously shown in Figure 1.

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The following discussion summarizes the information in the
data base and includes a description of each data element. System
operators should be familiar with the names and definitions of the
data elements, while designers adapting the system to other purposes
will find the section an invaluable description of the generic
behavior of each field on the data base file. An understanding of
certain aspects of NASA's accounting records is also necessary to
fully appreciate the rationale for the arrangement of the financial
fields. This material appears in the "Financial Records" section.

Contents

The SRR data base contains extensive information on each grant,
contract or other agreement awarded to an educational institution.
Each agreement may contain one or more separate records; the factors
determining the number of records per agreement are described in
the section on "Financial Records". All other information concern-
ing a particular agreement is "attached" to each financial record.
This additional information falls into two groups: items relating
to the performing institution and descriptive material related to
the specific contract.

The three segments for each award and the data contained in
each segment appear below in summary form. A detailed description
of each of the items, including record positions and notes on
retrieval, is presented in Figure 16, page 36.

   1.   Data Fields in Financial Segment

       A.   Accounting Installation (AI)

       B.   Cognizant Office (COG)

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C. Unique Project Number/Facilities Project Number (UPN/FPN)

D. Current Fiscal Year Obligations (Raw FACS data)

E. Current Fiscal Year Obligations (Edited OUA data)

F. Cumulative Obligations (FACS data)

G. Cumulative Disbursements (FACS data)

H. Current Fiscal Year Disbursements (FACS data)

I. Procuring Installation

J. Current Fiscal Year Cost Sharing amount

2. Data Fields on Performing Institution

A. Institution Name (and I.D. code)

B. Location (state, country, congressional district)

C. Type (Public, Private, Minority)

D. Enrollment

3. Data Fields in Descriptive Segment

A. Grant/Contract number

B. Field of Science or Engineering (C.A.S.E.)

C. Type of Effort (Basic/Applied/Dev/Other)

D. Technical Status (Active or Completed)

E. Procurement/Fiscal (FACS) status

F. Ending Date

G. Medical School Identifier

H. Primary NASA Technical Officer's Installation

I. Alternate NASA Technical Officer's Installation

J. Mail Codes for Headquarters Technical Officers

K. Security Classification

L. Status of step funding (if any)

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M. Plans for and anticipated date of new funding

N. Date continuation funding initiated

O. FFRDC (Federally Funded R&D Center) identifier ("Excluded" project)

P. Employee training identifier ("Excluded" project)

Q. Purchase order or other problem identifier ("Excluded" project)

Item Number	Standard Label*	Location		Name	Size	NASA Definition	Special Features of Data Element	Comments on Generic Aspects of Data Element
		Begin	End					
1.	SEQUENCE							
1.A	GCNO	1	11	Grant/Contract Number	11	Unique identifier for all records associated with an individual grant, contract, cooperative agreement or Purchase Order.	Prefix (first 5 positions) defines type of instrument. Program recognizes grants as beginning with NGR, NGL, NGT, NGF and NSG. Contracts begin with NAS and NSR. Everything else falls under Purchase Order.	This is the file identifier. Any 11-position alphanumeric may be used, with special access to the prefix. Hard coded grant/contract identification affects only the "item totals" on the last page of each report section.
1.B	ACINSTC	12	13	Accounting Installation Code	2	NASA installation responsible for segment of funds contained in a particular record. (See Figure 17 for English equivalents of codes.)	Part of composite data element (data chain) which includes all information related to a single financial/procurement transaction. Level is one below GCNO (Item 1.A). See textual discussion on "Financial Records."	Legal data items are 01-99.
1.C	COGC4							
1.C.1	COGC	14	16	Cognizant Office Code	3	NASA program office division which supplied a segment of funds. (See Figure 18 for English equivalents of codes.)	Part of data chain, as above. Access to individual cognizant office division is by entire 3-digit number. All division codes with the same first number collectively form a Program Office which may be accessed *in toto*.	Legal cognizant office data items are 000-999. There are 10 legal Program Offices, viz., 0XX-9XX.
1.C.2	COGCFILL	17	17	Blank	1			
1.D	FPN	18	21	FPN Number	4	Facilities Project Number. Identification of funding accounts authorized for construction of facilities (C of F).	Always subordinate to Cognizant Office Code. Shares file field with UPN (1.E).	Should not be used in non-NASA systems.
1.E	UP							
1.E.1	FILLER	18	18	Blank	1			
1.E.2	UPN	19	21	UPN Number	3	Unique Project Number. Identification of funding accounts authorized for R&D. (See Figure 19 for a typical UPN list.)	Part of data chain noted in 1.C.1. In NASA usage, one or more UPNs are permanently assigned subordinates of Cognizant Office Codes.	The hierarchy established for a particular segment of funds at this point is Grant/Contract, Program Office, Program Office Division (Cognizant Office), and UPN. Each funding segment, in addition, carries its accounting (and procuring) installation codes.

*All labels have "AMES-" prefix.

Figure 16. Special Report Writer Data Base

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Item Number	Standard Label*	Location Begin	Location End	Name	Size	NASA Definition	Special Features of Data Element	Comments on Generic Aspects of Data Element
2	PJSW	22	22	UPN/FPN Code Switch	1	Internal system flag; not a data element. Indicates whether positions 18-21 contain a UPN or FPN number.		Should not be used in non-NASA systems.
3	CST	23	23	Contract Status—OUA	1	Indicates grant/contract is technically active or technically completed.	Data items generated through algorithm each month: 1 = active, 3 = completed. See "Status Codes" section for further details.	Algorithm for code generation should be developed to meet the needs of non-NASA users.
4	EXCWDE	24	26	Exclude Flag	....	Identifies project for training of NASA employees, work at FFRDC (Federally Funded R&D Center), non-R&D purchase order, or project of debatable validity. Such projects are not normally included in output reports.	The "exclude flag" operates at the file identifier level. In the normal mode the report writer will not access a file with an exclude flag set; a specific request to include the flagged files may be made. The three types of flags and several possible data items are rolled to a single flag for purposes of report writer interrogation.	May be used for any type of "bookkeeping" or special notation purposes.
4.A	PURORD	24	24	Purchase Order Flag	1	Denotes project is a purchase order or any other type of project not normally desired for report writer access.	Data items now in use: 2 = purchase order 3 = disputed school 4 = disputed project 5 = other	Legal data items 2-9. Data item 1 does not generate a flag.
4.B	TRAINING	25	25	Training Flag	1	Project is for training of NASA employees.	Data item is X.	
4.C	FFRDC	26	26	FFRDC Flag	1	Project is conducted in a Federally Funded Research and Development Center.	Data item is X.	Included in 4, above, but may be accessed separately.
5	REGC	27	28	Region Code	2	Standard U.S. Dept. of Commerce Geographic Region Code. (See Figure 20.)	Used in item counter to separate foreign and domestic institutions.	
6	STC	29	31	Location Code	3	State or country code. (See Figure 20.)	Major sort key for report writer.	
7	ALPHAC	32	38	Alphabetical Code	7	Code equivalent of university name. (See Figure 21 for typical code list.)	Sorts universities alphabetically. First position is alphabetic, next four are numeric. Sort is not made on last two positions, which are usually zero-filled.	Any 5-position coding which allows universities to be sorted in desired order may be used. A 7-position field may be used if program is modified to sort on the entire field.
8	CONGD	39	40	Congressional District	2	Standard Congressional District.		

*All labels have "AMES-" prefix.

Figure 16 (Continued)

Item Number	Standard Label*	Location Begin	Location End	Name	Size	NASA Definition	Special Features of Data Element	Comments on Generic Aspects of Data Element
9	SUN-20	41	65	University Name	25	University Name.	Standard name, not exceeding 20 positions. English is left-justified in 25-position field. Report format has space for only 20 characters.	
10	REGN	66	85	Region Name	20	English equivalent for REGC (5, above).	Not used by report writer.	
11	STCD-N	86	105	State/Territory/Country Name	20	English equivalent for STC (6, above).		
12-17	(Various)	106	213	English Equivalents			Not used by report writer.	
18	CFYOBL	214	221	Current Fiscal Year Obligations	8	CFY obligations as shown in FACS.	Includes both positive and negative values, i.e., deobligations of prior year funds and data on transfers between accounts. Funds associated with data chains are described in 1.B through 1.E.2 above.	
19	OUAOBL	222	229	Adjusted Current Fiscal Year Obligations	8	Actual obligations made during current fiscal year.	Data adjusted to show obligations as received by institutions. Nonprogrammatic actions, viz., deobligations of prior-year money, fund transfers between accounts, transfers between installations, and other accounting-type data, are adjusted to present a clear picture of the effect of technical decisions on the distribution of funds. See also 1.B through 1.E.2 above; these form the current fiscal year "segment of funds" used in the report writer.	The difference between OUAOBL and CFYOBL (18, above) is solely in how the data base tape is prepared. For external users, data should be entered in the OUAOBL field, which is used in the normal mode. CFYOBL can be used only as a specified program option.
20	CUOBL	230	237	Cumulative Obligations	8	Obligations since origin of funding segment. Source is FACS.	As in 18, above, except for cumulative obligations.	Cannot be specified directly. Data are taken from this field whenever CFYOBL (18, above) is a specified option.
21	OUAOBC	238	245	Adjusted Cumulative Obligations	8	Same as above.	System which creates data base allows for correction of cumulative data. As a matter of practice, this is not done. For all intents and purposes CUOBL and OUAOBC contain the same data.	The relationship between CUOBL and OUAOBC is similar to that between CFYOBL and OUAOBL. The normal mode is OUAOBC.

*All labels have "AMES-" prefix.

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Figure 16 (Continued)

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Item Number	Standard Label*	Location Begin	Location End	Name	Size	NASA Definition	Special Features of Data Element	Comments on Generic Aspects of Data Element
22	CFYDISB	246	253	Current Fiscal Year Disbursements	8	Net funds actually paid out by Treasury during current fiscal year.	Data source is FACS. No adjustments are made.	See note below.
23	CUDISB	254	261	Cumulative Disbursements	8	Net funds actually paid out by Treasury since beginning of the funding segment.	Data source is FACS. No adjustments are made.	All money fields have now been listed. Each data chain, described in 1.B through 1.E.2 above, contains each money field, viz., CFYOBL, OUAOBL, CUOBL, OUAOBC, CFYDISB and CUDISB.
24	SCHYTPE	262	263	Type of Institution	2	Office of Education classification for public and private schools. (See Figure 28 for types and coding.)		Data items are arbitrarily assigned two-position alphabetic.
25	PTOINST	264	265	Primary Technical Officer's Installation Code	2	Code for physical location of primary Technical Officer. (See Figure 17 for English equivalents.)		Legal data items are 01-99.
26	ATOINST	266	267	Alternate (ATO) Technical Officers Installation Code	2	As above, for ATO.		As above.
27	PTOMC	268	278	Primary Technical Officer's Mail Code	11	Mail code assigned by installation.	No more than 11 characters, including spaces, can be used regardless of the length of the complete mail code. Only HQ codes are kept current.	Alphanumeric.
28	ATOMC	279	289	Alternate (ATO) Technical Officer's Mail Code	11	As above, for ATO.	As above.	As above.
29	MISCF	290	290	Minority School Flag	1	Institution determined to have predominately minority enrollment. (See Figure 29 for list of current flags.)		Legal data items are any alphas or numerics.
30	RESERVE	291	292	(Blank)	2			
31	STPOP	293	298	Student Population	6	Enrollment from latest Office of Education Directory.		Legal data items are any numerics.
32	CASESF	299	300	C.A.S.E. Field of Science Code	2	Field of science or engineering classification as specified by the Committee on Academic Science and Engineering (C.A.S.E.). (See Figure 23 for codes in use and English equivalents.)		Data items are 2-position numeric.

*All labels have "AMES-" prefix.

Figure 16 (Continued)

Item Number	Standard Label*	Location Begin	Location End	Name	Size	NASA Definition	Special Features of Data Element	Comments on Generic Aspects of Data Element
33	CASEOJ	301	302	C.A.S.E. Objective	2	C.A.S.E. objective, i.e., type of project. (See Figure 22 for codes in use and English equivalents.)		As above.
34	MEDFL	303	303	Medical School Flag	1	Project is conducted in a medical school, or Principal Investigator's chief affiliation is with medical school.	Flag = X.	
35	STATU	304	304	FACS Status	1	Contract status as shown in FACS system. (See text "Status Codes" for derivation of status codes.)	Numeric.	
36	ENDDATX							
36.A	FILLER	305	305	Blank	1			
36.B	ENDDAT	306	311	Ending Date	6	Current ending date of agreement.		
37	PRINST	312	313	Procuring Installation Code	2	Each segment of funds described in 1.B through 1.E.2 has an associated procuring installation, i.e., the installation which physically accomplishes the procurement. See Figure 17 for English equivalents of codes.	While the procuring installation number appears in a data chain, it does not give rise to a unique chain as does, for instance, the accounting installation number (1.B, above).	
38	CSAMT	314	321	Cost Sharing Amount	8	Amount of money, above and beyond obligation by NASA, which institution contributes to a project.	Cost sharing amount should be used only in those output reports which roll-up all financial data to at least the project level. See full discussion in textual section, "Cost Sharing."	This is a highly specialized field, requiring some programmed approximations. Its use is best avoided in non-NASA systems.
39	STFUC	322	322	Step Funding Code	1	Arbitrary alpha or numeric coding indicating status of step-funded grants.	Reserved for future use. No codes have been defined or assigned. Any alphas or numerics are suitable as data items.	Can use as any attribute of contract.
40	FUFUC	323	324	Future Funding Code	2	indicates renewal plans. Data item "NN" means project will not be renewed.	This data element is not in full use. Only a few OSS NGL grants and former SUP projects have been coded "NN." Other codes must be defined to fully use this field.	As above.

*All labels have "AMES-" prefix.

Figure 16 (Continued)

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Item Number	Standard Label*	Location Begin	Location End	Name	Size	NASA Definition	Special Features of Data Element	Comments on Generic Aspects of Data Element
41	FUFUD	325	328	Future Funding Date	4	Data associated with entry in 40, above.	Month and year.	As above.
42	PTDAT	329	334	Pass-Through Date	6	Date OUA becomes aware renewal funding action has been initiated.	Reserved—not in current use.	As above.
43	SEC	335	335	Security Classification	1	Standard security classifications. (See Figure 30 for codes.)	Not in current use; field will accept any data items.	As above.
44	FILLER	336	350	(Blank)	15			

*All labels have "AMES-" prefix.

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Figure 16 (Continued)

The SRR has the capability of selecting records based on the presence and/or value of any of the items on these three lists. Where several factors are specified, only those records are selected which meet all of the individual specifications. Thus, multiple correlation criteria are readily accommodated. Regardless of the selection criteria, all of the information associated with a record is preserved and is, therefore, available for subsequent use. For example, records selected on the basis of a certain accounting installation _and_ ending date still carry with them all of the data noted in the three lists.

Financial Records

The configuration of NASA's accounting system for grant and contract records guided the basic design criteria for the SRR. The result, in one respect, is an extremely complex program; on the other hand, adaption to non-NASA uses becomes more attractive, as these very complexities require a design capability for manipulating a wide range of data conditions.

For every university project it is essential to have purely financial information or current obligations, total (or cumulative) obligations, costs and disbursements (or outlays or expenditures). In addition to these "money fields" there is a requirement for accounting identification of the monies. Thus, in the simplest situation a contract will have a single financial record consisting of the accounting or identifying fields and the associated money fields. In the examples which follow only a few data items are given for illustrative purposes.

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With reference to the previous "Contents" section, the money or financial fields have some 10 items per record while the identification field is an abbreviated form of items 2 and 3 in that section.

Identification Fields		Money Fields	
Name	Data	Name	Data
Contract	NAS2-12345	CFY Obs.	100,000
Accounting Install. (AI)	21	Cum. Obs.	300,000
COG Office	870	CFY Exp.	60,000
UPN	189	Cum. Obs.	180,000

From this single record it may be determined that a total of $300,000 has been obligated on Contract NAS2-12345; $100,000 was obligated in the current fiscal year. Looking within NASA, it can be seen that the funds were provided by Ames Research Center (Accounting Installation 21). Ames in turn received the money from the Headquarters Bioscience Programs Division (Cog. Office 870), Biosciences Supporting Research and Technology (Unique Project Number 189) account. For purposes of illustration, now assume contract NAS2-12345 was funded jointly between two NASA installations, Ames, as above, and Goddard Space Flight Center (Accounting Installation 51).

Also, assume a 50/50 split on all monies involved. This same contract would now have two records:

Identification Fields		Money Fields	
Name	Data	Name	Data
Contract	NAS2-12345	CFY Obs.	50,000
Accounting Installation	21	Cum. Obs.	150,000
COG Office	870	CFY Exp.	60,000
UPN	189	Cum. Exp.	90,000

Identification Fields		Money Fields	
Name	Data	Name	Data
Contract	NAS2-12345	CFY Obs.	50,000
Accounting Installation	51	Cum. Obs.	150,000
COG Office	870	CFY Exp.	60,000
UPN	189	Cum. Exp.	90,000

The money fields in these two records still come to the same totals as in the one-record case. The equal division of funds in the expenditures column is arbitrary. In practice, the amount charged against each record is dependent upon the detailed billing and accounting techniques used by both NASA and the contractor.

As a final example consider the same case where Goddard (51) funds its share from two different accounts. The same $300,000 project would then have three records:

Identification Fields		Money Fields	
Name	Data	Name	Data
Contract	NAS2-12345	CFY Obs.	50,000
Accounting Installation	21	Cum. Obs.	150,000
COG Office	870	CFY Exp.	60,000
UPN	189	Cum. Exp.	90,000
Contract	NAS2-12345	CFY Obs.	20,000
AI	51	Cum. Obs.	100,000
COG	870	CFY Exp.	60,000
UPN	189	Cum. Exp.	60,000
Contract	NAS2-12345	CFY Obs.	30,000
AI	51	Cum. Obs.	50,000
COG	870	CFY Exp.	0
UPN	883	Cum. Exp.	30,000

Note that in the third record 30,000 was derived from the Biosatellite project (UPN 883) account. This process operates such that large contracts of long-standing may have dozens of

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individual records. Split funding between installations is not infrequent, but differing cognizant offices and Unique Project Numbers (UPN) cause most of the multiple record situations. There are approximately 30 cognizant offices which may appear in university contracts and over 125 UPN's. (Each COG Office has one or more UPN's to further define its areas of responsibility).

It cannot be overemphasized that the successful use of the SRR is rooted in a firm grasp of the reasons for and nature of the multiple financial records for each grant or contract. Such knowledge enables the operator to properly phrase inquiries such that all the records of interest - which may include all or only a few for a particular contract - are selected. When any one (or combination) of identifying financial fields are selected, all of the information associated with that field is made available. In addition, data from non-financial fields is also carried along; these data and the associated non-financial identifying fields are discussed elsewhere.

Readers familiar with NASA's accounting system will note the records used in the above examples and in the SRR are actually "rolled up". That is, the single record used in the first example might actually be multiple records in the detailed accounting records where the identification fields include Program Year, Fund Source, Method of Authorization, Object Class and Procurement Placement Code. In addition, the UPN used here is actually the first part of a 4 segment code - the Agency-Wide Coding Structure. The SRR specifically does not carry data at this level of detail

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as it is primarily a management information tool, rather than an accounting tool.

Special Coding

Two types of coding are used for general identification purposes: (1) variable codes established by look-up tables within the main OUA-MIS data base and (2) arbitrarily defined fixed codes. In the first category, the codes of tabular origin are, of course, carried over to the SRR data base as it is created. Samples of these codes are given here for illustrative purposes only. Non-NASA users may adopt their own codes, while NASA users should consult the most recent OUA-MIS code tables. It is important to note that once an SRR tape for a particular month has been created, it can never be modified. Thus, in working with a year-old tape, the codes current at that time must be used. In actual operation this causes few problems, as most code changes occur when universities merge or change status, or NASA reorganizes. The effect of such changes are generally well-known and any resultant difficulties usually are readily solved by inspection.

Typical accounting and procuring installation codes appear in Figure 17. Each installation has two numbers, one identifying it as an installation responsible for accounting on a grant or contract and the other indicating its responsibility for actually procuring the grant or contract work. The same number is used for both designations at a particular NASA installation (Center) with one exception: NASA Headquarters is accounting installation 10, but it is procuring installation 03, 04 or 10.

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Code Number	Installation	Abbreviation
21	Ames Research Center	ARC
62	Marshall Space Flight Center	MSFC
76	Kennedy Space Center	KSC

Note: Code numbers are from OUA-MIS Table 01.

Figure 17. Accounting and Procuring Installation Coding

COG	Program Office	Division
780	Aero & Space Tech.	Research Division
840	Space Science	Planetary Programs
850	Space Science	Physics & Astronomy
930	Manned Space Flight	Apollo/Soyuz Project

Note: Code numbers are from OUA-MIS Table 08.

Figure 18. Program and Cognizant Office Coding

UPN	Name
192	Planetary Biology
193	Planetary Quarantine
196	Planetary Astronomy
384	Planetary Data Analysis

Note: These are typical unique projects subordinate to COG 840, Planetary Programs, from NASA's Financial Management Manual.

Figure 19. Unique Project (UPN) Coding

NASA Program Offices are identified by a 3-digit number, the
first digit indicating the Office itself, while the last two denote
the Division within the Office. See Figure 18. The entire number
is called the Cognizant Office Code. Each COG has one or more
Unique Project Numbers (UPN) which identify the accounting category
of funds to be applied to for certain purposes. These codes are
defined within the NASA's accounting system and used by the OUA-MIS,
as received. Complete listings appear in the agency's Financial
Management Manual. Figure 19 shows a few of the accounts assigned
to COG 840.

Typical codes for states, U. S. outlying territories and
standard U. S. regions appear in Figure 20. State Codes are com-
patible with government-wide coding set forth in "Federal Informa-
tion Processing Standard 5-1", June 15, 1970. University name codes
are taken from the main OUA-MIS UNICODE table which relates
university name codes used in several agency and interagency systems,
including both the Office of Education and National Science Foundation
versions of the Federal Interagency Committee on Education (FICE)
Code. The schools will arrange alphabetically when sorted on the
code illustrated in Figure 21.

The C.A.S.E. (Committee on Academic Science and Engineering)
"Objective of Study" codes appear in full in Figure 22. The
C.A.S.E. Fields of Science and Engineering codes have been specified
for government-wide use in OMB Circular A-46, Exhibit J. For
convenience they are set forth in full in Figure 23. They also
appear in OUA-MIS Table 05.

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Code	Name	Code	Name
06	East South Central	001	Alabama
09	Pacific	002	Alaska
08	Mountain	004	Arizona
07	West South Central	005	Arkansas
11	Foreign Countries	840	Ireland

Note: Code numbers are from OUA-MIS Tables 06 and 07.

Figure 20. State and Regional Coding

Code	School Name
A043500	Abiline Christ College
A081000	Adelphi University
A170500	Alabama A&M University
A177000	Alabama Medical College

Note: Alphanumeric codes are from OUA-MIS UNICODE.

Figure 21. University Name Coding

Code	Name
11	Basic research
12	Applied research
13	Development
02	Training (NGT) grants
03	R&D facilities and equipment
04*	Facilities and equipment for instruction in science and engineering
05*	General support for science and engineering
06	Other activities related to science and engineering
07*	All other activities

*Not used by NASA—see text.

Figure 22. C.A.S.E. Objective Codes

PHYSICAL SCIENCES	ENVIRONMENTAL SCIENCE (Terrestrial and extraterrestrial)	ENGINEERING	LIFE SCIENCES	SOCIAL SCIENCES
11 ASTRONOMY		41 AERONAUTICAL	51 BIOLOGY	71 ANTHROPOLOGY
12 CHEMISTRY		42 ASTRONAUTICAL	52 CLINICAL MEDICAL	72 ECONOMICS
13 PHYSICS		43 CHEMICAL	53 OTHER MEDICAL	73 HISTORY
19 PHYSICAL	31 ATMOSPHERIC SCIENCES	44 CIVIL	59 LIFE SCIENCES, NEC*	74 LINGUISTICS
SCIENCES, NEC*	32 GEOLOGICAL SCIENCES	45 ELECTRICAL		75 POLITICAL SCIENCE
	33 OCEANOGRAPHY	46 MECHANICAL	PSYCHOLOGICAL	76 SOCIOLOGY
MATHEMATICS	39 ENVIRONMENTAL	47 METALLURGY	61 BIOLOGICAL	79 SOCIAL SCIENCE
	SCIENCES, NEC*	AND MATERIALS	62 SOCIAL ASPECTS	NEC*
21 ANY DISCIPLINE(S)		49 ENGINEERING, NEC*	69 PSYCHOLOGICAL, NEC*	OTHER SCIENCES * *
				99 ALL DISCIPLINE(S)

* Not Elsewhere Classified (For interdisciplinary projects and others not listed by discipline name)

* * For interdisciplinary projects which cannot be classified within any of the preceding main fields

Figure 23. C.A.S.E. Field of Science Codes

Items marked with an asterisk can be used within the government-
wide C.A.S.E. System, but are not used by NASA, as no NASA activities,
by definition, can fall in the marked categories.

Status Codes

For each grant/contract contained in the system, there exist
two status codes -- the OUA status code and the FACS status code.
_ne OUA status code is defined as a function of the FACS status
code; the relationship of grant/contract end date to the current
file date (as-of-date); the grant/contract; and the current fiscal
year obligations and disbursements.

The determination of whether a grant or contract is active at
any moment in time is at best an estimate. "Active" has different
meanings to technical officers, procurement people, lawyers, property
people, etc. Furthermore, the data elements necessary to determine
the status of a project are not always available or, if available,
may be incorrect or misleading.

Nevertheless a definition, suitable for use with the available
data base, is required to present the best selection of active
projects from a programmatic, i.e., science and engineering,
standpoint.

Thus, the designation "active" is a compromise based on an
optimization considering all variables. Where the status is
ambiguous or debatable, projects are designed "active" rather than
"completed". As coded in the OUA-MIS, Status 1 projects are those
active at some time during the fiscal year of the report. All

other projects are coded as "Status 3" (Completed). An "active" designation is assigned if:

- o The ending date has not passed. (Since projects are rarely fully completed from a technical standpoint by the ending date, a grace period is allowed. Thus, grants are listed as active for 6 months past their nominal ending date; for contracts the grace period is 4 months.)

- o There has been an obligation or disbursement of funds during the fiscal year. (This compensates for erroneous ending dates. This rule does not operate if the ending date is 2 or more years past. In this manner, adjustments during closeout will not cause a project to appear as active.)

All other grants and contracts are listed as "completed".

If the procurement office has reported a project in the FACS System as "physically completed", it is carried as completed in the OUA system regardless of the results of the criteria for assigning the active designation.

The FACS status codes are also available within the SRR.

FACS Status Code	Name	Definition
1	Active	Obligations, costs and disbursements are not equal or there are current fiscal year obligations, either negative or positive.
2	Inactive	Obligations, costs, and disbursements are equal and there are no negative or positive current fiscal year obligations.
3	Completed	Contract meets status 2 criteria on the last day of a fiscal year. It becomes status 3; effective with the new fiscal year.

In these definitions amounts are considered to be equal if they are within $10 of one another. These codes are generated by the accounting aspect of FACS. In the procurement side of FACS the

question "physically completed?" is asked. Depending on the answer

a flag is set to "N" (NO) or "Y" (YES) based on periodic information

provided by installation procurement offices. (In the OUA system

"Y" is entered into the data base as FACS Code "4". It replaces

1-3, if present. "N" is ignored in the OUA data base.)

Chapter V

OVERVIEW OF REQUESTING REPORTS

With a firm knowledge of the SRR data base as background, requesting reports from the SRR is relatively simple. The operator actually writes a brief ADP program on making a request. No knowledge of program languages or ADP expertise is required. The program consists only of a few codes and plain English statements. Typical programs require 10-15 lines of coding, while complicated ones may need up to 50 or so lines. Transcript No. 17 is used.

A good introduction to program preparation may be had by following the development of SR 406 Figures 6-9, pages 15-18. The actual transcript (T-17) appears in Figure 24, while the resultant program card list produced with the report is shown in Figure 25. The key machine instructions are the Transactions, Columns 6-8 on T-17. They do not have to be put on T-17 in any particular order. Indeed, in the present illustration they were purposely mixed up on the transcript. However, on the program card list (Figure 25) it will be noted that they have been properly sorted, i.e., alpha-numerically by transaction type and counter, as a normal part of SRR operation. For convenience, a line on the transcript is usually called a "card" and further identified by the action type (viz., an X card).

Transactions are of several types; SR 406 uses the A, D, E, S and X varieties. (These transactions, plus the F and H, will be discussed in detail in Chapter VI). Decisions and actions in

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SERIAL NO.	TRANS TYPE	COUNTER	ACTION CODE	REPORT INFO DESIGNATOR	CODE AS SPECIFIED	CARD NO.

CODE AS SPECIFIED — D CARDS — SPECIAL X CARDS

REPORT INFO DESIGNATOR: P/N LO DOLLARS ENROLLMENT — P/N HI DOLLARS ENROLLMENT

406	A01	RN	406		S B
	X01	CM	P0000025P0000100	
	D02	IN	10	GRANTS & CONTRACTS - HQ
	D03	IN	53	GRANTS & CONTRACTS - WFC
	D01	IN	62	GRANTS & CONTRACTS - MSFC
	A22	RD	JANUARY 31, 1975	
	S01	LC	01 05	
	E08	LL	BETWEEN $25,000 AND $100,000 ARE LISTED. SEPARATE SECTIONS
	E09	LL	ARE PRESENTED FOR THREE NASA INSTALLATIONS: MSFC, HQ AND WFC.
	E07	LL	ALL PROJECTS IN ALABAMA AND ARKANSAS WITH CUMULATIVE OBLIGATIONS

MMDDYY   MMDDYY   NOTES

MMYY   MMYY

SPECIAL DATE X CARDS

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Figure 24

```
PROGRAM   CARD   LISTING


   406 A01 RN 406                                                               SB

   406 A02 RD JANUARY 31, 1975                                                  SB

   406 D01 IN 62        GRANTS & CONTRACTS - MSFC                               SB

   406 D02 IN 10        GRANTS & CONTRACTS - HQ                                 SB

   406 D03 IN 53        GRANTS & CONTRACTS - WFC                                SB

   406 E07 LL ALL PROJECTS IN ALABAMA & ARKANSAS WITH CUMULATIVE OBLIGATIONS    SB

   406 E08 LL BETWEEN $25,000 AND $100,000 ARE LISTED. SEPARATE SECTIONS        SB

   406 E09 LL ARE PRESENTED FOR THREE NASA INSTALLATIONS: MSFC, HQ AND WFC.     SB

   406 S01 LC 01 05                                                             SB

   406 X01 CM P00050C25P00001D0                                                 SB




   NOTE     TO EXPEDITE UPDATED RERUNS RETURN
            THIS LISTING TO O.U.A. WITH YOUR REQUEST.
```

Figure 25. SR 406, Program Card Listing

preparing the request were actually made in the following or

1. The next available report number, SR 406, was assi̇____
   Entry is by an A-type transaction with an "RN   act.
   code, indicating a report number. The counter, T-1/
   columns 7-8, was set at 01 as the run number is always
   the first "A" card. Note that the same number is used
   for control purposes in the "serial number" column.

2. Upon deciding that data for January 31, 1975, was desired,
   this information was entered as the second "A" transaction
   and so numbered. The date will print out in the report
   exactly as written on the transcript.

3. Next, it was decided that only projects in the states of
   Alabama and Arkansas were needed in the extracted data
   base for this particular report. The "S" card with an
   action code "LC" informs the system it is to select
   projects only in certain locations. Those locations are
   specified by the state codes 01 and 05.*

4. All of the projects in the two states were not wanted,
   just those in an intermediate dollar range. The X cards
   limit the material extracted by the S cards. Thus, the
   X01 transaction directs the program to the cumulative
   obligation value (CM) of the contracts, limiting the
   output to projects with values in the 25-100 thousand
   dollar range.

---

* The system actually uses a 3-position state code as shown in
  Figure 20. This example was prepared prior to expansion of the
  state code field from 2 to 3 positions.

Actions to this point have identified the report, determined the time period and extracted a data base containing just the information needed in the output.

5. The D card provides the command to print a report from the extract just prepared. In this case it is desired to print a family of reports, one for each of three NASA centers. Thus, each D card results in a separate report, which is complete with a descriptive page, a body and a final summary item count page. The action code "IN" indicates each report section shall contain only those funds obligated by a particular accounting installation, while the code numbers 53 and 62 in columns 13-14 designate the particular centers desired. The English description beginning in column 21 appears on each page of the output report in the fifth line of the heading. The counters used with the D cards are important; they sepcify the sequence in which the output report sections will be printed.

6. The final step is supplying an explanation of the report to appear on the first page of each section. This is done with the E (for English) cards. The counter is important as it specifies on which line the text shall appear. For instance, use of only odd numbers in the counter will result in double spaced text. Here the transaction "LL" indicates that both the heading and the

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English should be placed on the left-hand half of the
full-sized computer paper.

All reports are built up in a similar manner as combinations
of transactions, action codes, and specific actions required to
assemble the data needed by the user. The next section presents
a detailed description of all of the Transactions available, how
they may be used to the best advantage and how they are placed
on T-17.

Chapter VI

TRANSACTIONS

This section presents the detailed information needed to complete Transcript No. 17. Use of all or part of the various Transactions enable the user to hand tailor the output reports. The transactions are presented in the order most easily used in defining report contents. They may, however, be put on the transcript in arbitrary sequence. The transactions are: A, S, X, D, E, H and F.

Transaction Type A - Date and Run Number

Two A cards are always required, one to input the run number (RN) and the other to specify the as-of date (RD). If one card is missing or there are more than two cards, the job will abort. The transcript is completed as follows:

Card 1

CC	Content	Comment
1-4	Serial Number	Next unused sequential number
6-8	AØ1	Transaction Type and Number
10-11	RN	Action Code
13-20	Report Number	Number to be used on Report Title Page. Same as first serial number.
79-80	SB	Card ID

Card 2

1-4	Serial Number	Will be the same as Card 1, unless a card from a previous run is re-used.

Card 2 (Cont.)

CC	Content	Comment
6-8	AØ2	Transaction Type and Number
10-11	RD	Action Code
13-32	Report Date	Date to be used on Report (Start in cc 13)
79-80	SB	Card ID

Portion of Figure 12 Repeated (SR 404)

Transaction Type S - Primary Data Extract Criteria

The S cards establish the basic data extract necessary to produce a particular report. They are, therefore, the most important transactions in the system. As a general rule each report must have at least one S card. (In certain instances an X card, to be described later, may be used instead to perform the extract or selection function.)

The S card is completed on the transcript as follows:

CC	Content	Comment
1-4	Serial Number	(See comment on A transaction, Card 2)

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CC	Content	Comment
6	S	Transaction Type
7-8	Ø1, Ø2 ...	Transaction Type Counter
10-11	Action Code	Selection Type (See Figure 26)
13-78	Codes associated with selection type specified in cc 10-11	Selection Codes. A maximum of 99 entries may be made on the cards for all Action codes except AN, which has limit of 200.
79-80	SB	Card ID

The selection type or action code is specified in cc 10-11. (The action codes for S cards are given in Figure 26, p. 63.) The desired codes corresponding to the selection type are coded in cc 13-17, as shown in the transcript for SR 406. That is, if "LC" indicating geographic location is coded in cc 10-11, the desired states, such as 01 and 05, are coded in cc 13-78.

Portion of Figure 24 Repeated (SR 406)

Action Code	Name	Columns	Example of Associated Code	Comment
CG	Cognizant Office	3	840	See Figure 18
IN	Accounting Installation	2	62	See Figure 17
AN	Institution	7	A177000	See Figure 21
UN	UPN	3	384	See Figure 19
LC	State or Country	3	005	See Figure 20
CT	Grant or Contract Prefix	5	NASbb	Five spaces must be allowed; see discussion in text
PG	Program Office	3	800	See Figure 18; each "hundreds series" defines a Program Office
TP	Type of School	2	GF	See Figure 28
MP	First Technical Officer's Installation	2	62	See Figure 17; accounting installation codes are used
MS	Alternate Technical Officer's Installation	2	21	As above; alternate T.O. may be in different installation
CP	First Technical Officer's Mail Code	8	PYbbbbbb	As assigned by individual installation
CS	Alternate Technical Officer's Mail Code	8	IN-CSD-2	As above
DS	Minority School	1	N	See Figure 29
FS	CASE Field of Science	2	21	See Figure 23
BJ	CASE Objective of Study	2	11	See Figure 22
PN	Procuring Installation	2	62	See Figure 17
SC	Security Classification	1	',	See Figure 30
AF	FACS Status	1	3	See textual discussion, "Status Codes"
SF	Step Funding Status	1	—	Alphanumeric codes to be assigned as required
PF	Future Funding Status	2	NN	NN = No further funding planned; additional codes may be assigned

Figure 26. S and D Card Action Codes

The codes in cc 13-78 must be regularly spaced; i.e., there must be one blank space between each entry, except at the end of the line, where any number of blanks may occur. The coding does not have to be entered on the transcript in any particular sequence.

Special care is required in use of the "CT" transaction for selecting on grant/contract prefix. The associated code is defined as having 5 positions even though some may be blank. Selection is made on just that part of the prefix used. For example, the first three positions would be "NAS" (code from Figure 26). Thus, all NAS∅1 through NAS13 plus NASW contracts would be selected. Alternately, if NAS∅2 had been specified, only those contracts with NAS∅2 prefixes would be selected.

Any logical combination of S cards may be used; up to 100 cards may be input. "Selecting oneself out of the picture," i.e., specifying impossibly narrow criteria, is more likely than posing more selection criteria than the system can handle.

For example, four S cards with a total of 18 associated codes are required to select the data base extract for the following question: "What were the FY 74 obligations by the former OAST Centers to public minority schools in the Pacific region?" This question is set up in Figure 27. First of all the as-of-date, "RD", is selected to bring in the file with FY 74 as the current fiscal year. Then, within NASA's organizational structure,

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CODE AS SPECIFIED

| SERIAL NO. | TYPE | TRANS COUNTER | ACTION CODE | REPORT INFO DESIGNATOR | P/N | LO DOLLARS ENROLLMENT | P/N | HI DOLLARS ENROLLMENT | D CARDS — SPECIAL X CARDS | CARD NO. |

409X	A01	RN	409X						S B
	A02	RD	JUNE 30, 1974					
	S01	IN	23 22 21 24					
	S02	TP	GF GS GL GC GR					
	S03	DS	N C A W					
	S04	LC	002 006 015 041 053					
	S05	CT	NGT NSG NGR NGF					
	X01	FY						
	X02	CE						
	X03	ED	070173 063074					

MM DD YY   MM DD YY   NOTES

MM YY   MM YY

SPECIAL DATE X CARDS

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Figure 27

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CODE AS SPECIFIED — D CARDS — SPECIAL X CARDS

SERIAL NO.	TRANS TYPE	COUNTER	ACTION CODE	REPORT INFO DESIGNATOR / LO DOLLARS ENROLLMENT / HI DOLLARS ENROLLMENT	CODE	CARD NO.
409X	D01				ALL PROJECTS REQUESTED	S B
	D02	IN	21		AMES RESEARCH CENTER PROJECTS ONLY	
	D03	DS	W		WOMAN'S SCHOOL PROJECTS ONLY	
	D04	CG	371		OFFICE OF UNIVERSITY AFFAIRS FUNDS ONLY	
	E05	LL			PROJECTS IN THIS REPORT – THERE ARE FOUR SECTIONS:	
	E07	LL			–HAD FY74 OBLIGATIONS 1. ALL PROJECTS	
	E09	LL			–WERE FUNDED BY 'OAST' CENTERS 2. ARC PROJECTS ONLY	
	E11	LL			–ARE IN PUBLIC MINORITY SCHOOLS 3. WOMAN'S SCHOOLS	
	E13	LL			–ARE GRANTS ENDING IN FY74 4. OUA FUNDED ONLY	
	E15	LL			–ARE IN THE PACIFIC REGION	

M M D D Y Y   M M D D Y Y   NOTES

M M Y Y   M M Y Y

SPECIAL DATE X CARDS

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NASA-HQ

Figure 27 (Continued)

"former OAST Centers" means Langley, Lewis, Ames and Flight Research. Their accounting installation codes appear on the SØ1 card. Note the arbitrary order of entry. The public school constraint is entered on the SØ2 card, minority schools are specified on SØ3, and the Pacific region states (Alaska, California, Hawaii, Oregon and Washington) are selected by SØ4. (Figures 28 and 29 illustrate the codes used to complete the SØ2 and SØ3 cards.)

If the question is modified to limit obligations to grants only, then an additional S card limiting the selection to projects with grant-type prefixes is required. This is illustrated by the SØ5 card which carries all of the prefixes NASA has ever used on grants. Note that each prefix occupies the required 5 positions, the last two being blank; a required blank space is between entries. In order to be selected, a project must meet one criterion on each of the five S cards. As this is a coincidence-type selection, the order in which the data are entered or in which the program searches is immaterial. The final selection will be the same.

- In summary, S cards are used to select the data base needed for a particular report. Figure 27 illustrates the manner in which several S cards with multiple associated codes can be combined. In the next section the interaction between S and X cards will be discussed.

Public Schools	Private Schools
GF — Federal	PN — Independent non-profit
GS — State	PP — Profit-making
GL — Local	PD — Denominational
GC — State and local	
GR — State-related	

Note: Classification of schools is by type as given in
the Office of Education Directory.

Figure 28. Type-of-School Codes

Predominant Enrollment
N — Black
C — Spanish-speaking
A — American Indian
W — Women (N, C or A take precedence over W for coding purposes. There is no double coding, such as NW.)

Figure 29. Minority School Codes

Code	Classification
U	Unclassified
C	Confidential
S	Secret
T	Top Secret

Figure 30. Security Classification Codes

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Transaction Type X - Secondary Extraction, Limiting and Formatting

As a general rule X cards are designed to impose some sort of limit, such as a dollar range, on data specified for selection by the S cards or to select among available format variations. However, certain X cards will select data in a manner similar to the S card. This capability will be mentioned where it occurs. When an X card with select capability is used, the rule that each report program must have at least one S card does not apply. X action codes are provided in Figure 31.

The program will abort if mutually exclusive X cards are specified. For example, XØ1 = OR and XØ2 = CN. This would require the system to select only new awards and only continuations simultaneously. X cards which conflict may allow the program to run, but usually give misleading or negative results. Thus, if XØ1 = ED is used with a range to select on ending date, XØ2 = UD may still be used to print the undisbursed balances of the selected projects. However, if XØ1 = EP is specified a conflict exists, as the ending date prints in the same column as the undisbursed balances.

The transcript is completed as follows:

CC	Content	Comment
1-4	Serial Number	(See comment on A Transaction, Card 2)
6	X	Transaction Type
7-8	Ø1, Ø2, ...	Transaction Type Counter

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CC	Content	Comment
10-11	Action Code (See Figure 31)	For two or more X cards, avoid use of mutually exclusive or conflicting action codes.
13	N or P	Sign for Lower Bound of Selection Criteria (N = Negative, P = Positive). Use with money amounts and enrollment.
14-20	Money Amount	Lower Bound of Selection Criteria. Value is to be Specified in Thousands, Right Justified, and Left Zero-filled. See discussion in text.
14-20	Enrollment	As above, except value is actual, unrounded.
14-19	MMDDYY	Used where lower limit month/day/year date is required.
14-17	MMYY	Used where lower limit month/year date is required.
21	N or P	Sign for Upper Bound of Selection Criteria (N = Negative, P = Positive).
22-28	Money Amount	Upper Bound of Selection Criteria. See Comment for cc 14-20.
22-28	Enrollment	Upper Bound. See cc 14-20 comment.
22-27	MMDDYY	Upper limit. See cc 14-19 comment.
22-25	MMYY	Upper limit. See cc 14-17 comment.
79-80	SB	Card ID

FY = Fiscal year obligations. Selects only projects which have fiscal year obligations. No S card is required.

CM = Cumulative obligations. Used only with CC 13-28 to select projects with cumulative obligations in a specified range. No S card is required. The CM with a range is used in Figure 24.

CN = Continuations. Selects only projects continued during the current fiscal year. Criteria: FY obligations ≠ cumulative obligations.

OR = New awards. Selects only those projects started during the current fiscal year. Criteria: Current FY obligations = cumulative obligations.

AC = Active projects. Selects only projects with OUA status code equal to 1.

CO = Completed projects. Selects only projects with OUA status code equal to 3.

MD = Medical school. Selects only projects in medical schools. (MEDFL = X).

FF = FFRDC. Selects only projects conducted in Federally Funded Research and Development Centers. (FFRDC=X).

DO = FACS values. Report uses obligations values directly from FACS, rather than adjusted OUA values. Caution: These are accounting values in which annual obligations to schools can go negative.

RU = Roll-up format. Lists only university names, and numbers of projects at each institution. Used when listing each grant and contract separately is not required. Listing is single space. Use in conjunction with F card for double spacing.

UD = Undisbursed amounts. This card puts in the headings for undisbursed balances and prints the undisbursed balance. If this is the only X card, there must be an S card. If UD is used with a range in CC 13-28, then an S card is not mandatory. See Figure 5 for placement of this optional "third column." Transcript and program list entries are shown in Figures 21 and 25 respectively. See also textual discussion on use of ranges.

CE = Current fiscal year expenditures. This card behaves in a fashion identical to UD, except it prints and selects on current fiscal year expenditures.

ED = End date. Selects only projects which carry ending dates within the range specified. Dates are not actually printed in report, therefore third column can still be used for expenditures or undisbursed balances. Use month/day/year for range desired. S card is not required.

EP = End date, listed. Selects the same cards as ED above, however, the end date is printed in the third column. When used without a date range all ending dates are printed for the projects selected by the other cards. In this situation some other S or X card with select capability must be used.

SH = Cost sharing. Selects only projects which carry moneys in cost share fields. If range is input in CC 13-28, the cost share amounts will print in the third column. Use "P" in CC 13 and 21. If range is not used, CE, UD or ED may be used to print information in the third column. See discussion in text on special precautions applicable to cost sharing.

SE = Enrollment. Generally used only with range in CC 13-28. "P" must be put in CC 13 and 21. (Zero fill, as with dollar ranges.) Enrollment figures do not print out. Use of SE without a range selects all projects which have non-zero enrollment figures in the data base.

PT = Pass-through date. Selects only projects which carry pass-through dates within the range specified. However, the dates will not print. Use MMDDYY.

PP = Pass-through date, listed. Selects the same as PT cards, however, the pass-through date is printed in the third column. Use MMDDYY.
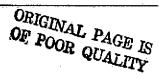
Figure 31. X Card Action Codes

Figure 31 (Continued)

Ranges

As noted above, cc 13-28, when used with the FY, CM, UD or CE condition codes, permit selection of grants/contracts within specified ranges of obligations, disbursements, or unexpended balances. For example, the selection of the range $5,000-$25,000 would look like this:

CC	Content
13	P
14-20	ØØØØØØ5
21	P
22-28	ØØØØØ25

On the transcript it would be written as PØØØØØØ5PØØØØØ25. In a similar fashion, a range of negative $5,000 to positive $25,000 would be written as NØØØØØØ5PØØØØØ25. Negative values for cumulative obligations or undisbursed balances generally indicate accounting adjustments or erroneous data. They are rare. However, both negative and positive values for expenditures are

normal. FY obligations, by definition are positive. PØØØØØØØ is

used to specify a limit (either upper or lower) of zero. A zero

limit "prints" as blanks in the output report. To examine nega-

tive FY obligations, i.e., de-obligations, use a "DO" X card and

a FY X card with an infinite negative lower limit range, N9999999.

The same example of transcript completion holds for the SE

(Enrollment) action code. In this case schools with populations

in the 5-25 student range would be selected. Note that "P" must

still be used in cc 13 and cc 21.

Date ranges are used in a similar fashion, except it is not

necessary to specify negative or positive on the limits. Zero-

fill is used with dates so they are always four or six digits, as

required. When everything after a certain date is desired, the

basic date is used as the lower limit, while a date greater than

any date on the file, say Jan. 1, 2000, is used for the upper

limit.

Whenever any type of range is used, the range includes the

specified end points in the selection.

Cost Sharing

The cost sharing calculation is a particularly difficult one

to make during both data collection and data base preparation.

As a result, the SH action code must be used in a limited way to

avoid misleading information in the output reports.

Each of the records constituting the entire body of informa-
tion on a project carries the cost sharing amount for the entire
project, not just for the record involved. Multiple counting of
the cost sharing amount is avoided in an internal report writer
instruction to take only one cost sharing figure per project.
Thus, the cost sharing listing is fully accurate only in those
reports where the selection criteria include all of the financial
records for each project listed.

Normally the cost sharing instruction should not be used in
any complex analyses, i.e., a simple question is in order: "How
much cost sharing is there on each project funded this fiscal
year?" By accepting a small error percentage the question can be
expanded to split the list by NASA installation. (This is done
with the D cards to produce a family). The error consists of a
doubling of the indicated cost sharing amount in projects funded
jointly by two NASA installations, a rare situation; hence, the
expected error is within the overall tolerances in the cost sharing
data collection system itself. Within this constraint the SH
action code is used with a range in the same manner as the other
money-related ranges.

Example of X Card Use

An expansion of the question posed in the S card section was
illustrated in the SR 409X. First of all the question required
only FY 74 information. The S cards shown will indeed provide the

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FY 74 obligations, but the report will also show all projects, regardless of whether or not FY 74 money is present.

The addition of the XØ1 card with the FY action code limits the report to just projects with FY 74 obligations.

OUA-MIS TRANSCRIPT NO.17 - AMES SPECIAL REPORTS

SERIAL NO.	TYPE	COUNTER	ACTION CODE	REPORT INFO DESIGNATOR / DOLLARS ENROLLMENT (LO)	DOLLARS ENROLLMENT (HI)	CODE AS SPECIFIED / D CARDS / SPECIAL X CARDS
409X	A01		RN	409X		
	A02		RD	JUNE 30, 1974		
	S01		IN	23 22 21 24		
	S02		TP	GF GS GL GC GR		
	S03		DS	N C A W		
	S04		LC	002 006 015 041 053		
	S05		CT	NGT NSG NGR NGF		
	X01		FY			
	X02		CE			
	X03		ED	070173 063074		

Portion of Figure 27 Repeated (SR 409X)

A further request to show expenditures during FY 74 is easily handled by the XØ2 card with the CE action code. The actual expenditures will be printed in the third column.

A further limitation might be that the projects were not only funded in FY 74, but ended in FY 74. The date range on the XØ3 card accomplishes this limitation. Note that only action code ED

which selects dates can be used.   EP which both selects and prints
dates is unavailable as the XØ2 instruction has preempted use of
the "third" column.   SR 409X now has rather complicated criteria,
but they are still well within system capabilities.

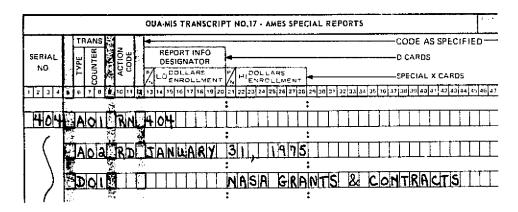## Transaction Type D - Families of Reports

The D cards have two purposes: to put in the English heading
on the fifth line of each report page, and to additionally allow
the creation of families of reports.   That is after the S and X
cards are used to define a report extract, the D cards are used to
produce one report or to split the report into a family.   The
transcript is completed as follows:

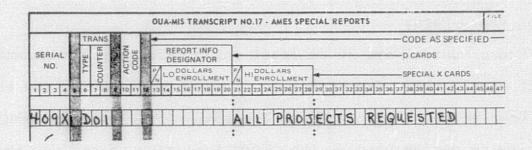| CC	Content	Comment
1-4	Serial Number	(See comment on A transaction, Card 2)
6	D	Transaction Type
7-8	Ø1 through 98	Transaction Counter. The counter number determines the sequence in which individual sections in families are printed out.
10-11	Action Code	Selection Type (See Figure 26)
13-20	Code Associated with selection specified in cc 10-11	Only one Associated Code may be used on the D card. The codes are the same as used with the 3 card. First character of code is placed in cc 13.
21-78	English for 5th line of Heading	Report Heading associated with this particular D card report.
79-80	SB	Card ID

Use of the D Cards

There must always be at least one D card. In this simple use (1) it merely tells the system to print a report using the entire data base selected by the S and X cards, and (2) provides the identifying phrase used on the fifth line of each page of the report. A previous example SR 404 uses the D Card in this manner.

As may be seen from the SR 404 transcript there is only one D card. The action code (cc 10-11) and designation (cc 13-15) are blank and the English for the header line begins in cc 21.

Portion of Figure 12 Repeated (SR 404)

This D card with blank action and designator columns is frequently used even when a family of reports, discussed below, is desired. In the SR 409X example, the DØ1 card illustrates this point. It will produce a report section containing everything selected by the S and X cards. It is not affected by the existence of other D cards on the same input transcript.

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OUA-MIS TRANSCRIPT NO.17 - AMES SPECIAL REPORTS

```
409X  D01                        ALL PROJECTS REQUESTED
```

Portion of Figure 27 Repeated (SR 409X)

The most powerful use of the D card is producing families of reports. That is, once given an extract selected by the S and X cards, the D cards can produce numerous report sections each of which differ from one another in a single criterion. A very common family is that of all NASA installations.

In the SR 406 example, the D cards were submitted with the action code "IN" and the associated accounting installation codes for each of the three installations desired.

OUA-MIS TRANSCRIPT NO.17 - AMES SPECIAL REPORTS

```
406  A01  RN  406
     X01  CM  P00000025P0000100
     D02  IN  10        GRANTS & CONTRACTS - HQ
     D03  IN  53        GRANTS & CONTRACTS - WFC
     D01  IN  62        GRANTS & CONTRACTS - MSFC
```

Portion of Figure 24 Repeated (SR 406)

When the D card is used the report sections are sequenced
by the counter in transcript columns 7-8. In the transcript the
D cards were purposely entered out of order to illustrate the
capability of the program for sequencing them as seen in the pro-
gram card listing below.

```
P R O G R A M    C A R D    L I S T I N G


  406 A01 RN 406

  406 A02 RD JANUARY 31, 1975

  406 D01 IN 62          GRANTS & CONTRACTS - MSFC

  406 D02 IN 10          GRANTS & CONTRACTS - HQ

  406 D03 IN 55          GRANTS & CONTRACTS - AFC
```

Portion of Figure 25 Repeated (SR 406)

D card action codes available for use are identical to those
for the S cards. A full listing appears in Figure 26. Associated
codes are also identical. Unlike the S cards, however, only a
single associated code may be used with each D card. Up to 98 D
cards may be used in the system, thus producing 98 report sec-
tions. As a practical matter, however, reports with more than
10-15 sections become awkward to use and are rarely requested.
One of the largest on record had 33 D cards to provide a separate
section on each UPN at a large NASA installation.

SR 409X illustrates another important property of families; the differing factors among members do not have to be variations within a single action code (i.e., all action codes do not have to be the same). SR 409X shows a family where the members are totally different.

SERIAL NO.	TRANS		ACTION CODE	REPORT INFO DESIGNATOR			CODE AS SPECIFIED — D CARDS — SPECIAL X CARDS	
	TYPE	COUNTER			P/N LO DOLLARS ENROLLMENT	P/N HI DOLLARS ENROLLMENT		

OUA-MIS TRANSCRIPT NO.17 - AMES SPECIAL REPORTS — FILE I.D. BUZ00001 — DATE 4

409X	D01				ALL PROJECTS REQUESTED
	D02	IN	21		AMES RESEARCH CENTER PROJECTS ONLY
	D03	DS	W		WOMAN'S SCHOOL PROJECTS ONLY
	D04	CG	371		OFFICE OF UNIVERSITY AFFAIRS FUNDS ONLY

Portion of Figure 27 Repeated (SR 409X)

The DØ2 - DØ4 cards give rise to a family, but the members are based on Accounting Installation, Type of School, and Cognizant office. Any mixture of action codes listed in Figure 26 may be used. However, in order to end up with a non-negative output report, the S and X card selection process must include the data extract information required for the report section specified by each D card.

Before leaving the topic of the combined selection effects of the S, X and D cards it may be well for the reader to review the earlier chapter on the data base with special emphasis on the financial records chapter. The crucial point to bear in mind

when making S, X and D selections is that each grant and contract generally has several records, sometimes dozens. The selections operate at this record level, NOT at the entire grant/contract level. Thus any particular output report will not necessarily give the actual current fiscal year or cumulative obligation values for a project, but only the sum of the values on those records extracted for use by the selection process. This is a very precise type of presentation, but most customers do not consciously focus on the fact and may be confused or misled by the results. Indeed, most people are not familiar with systems which can answer their questions with such exactness and accuracy. For this reason the SRR operator must question a potential customer closely to determine just what is required and to make sure the customer understands the nature of the output. Discussions of this nature prior to producing a report often lead the customer to pose a better and simpler question and leave him with a greater sense of satisfaction and confidence upon reviewing the resultant report.

Transaction Type E - English Descriptions

The E cards have three uses; the most important one allows placing an explanation of the report on the first page, as the OUA system places great emphasis on each report being complete in itself and highly communicative. The E card also determines the position (left or center) of the heading on each page and the location (right, left or center) of the English text. Each report

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must have at least one E card, although cc 12-78 may be blank. The transcript is completed as follows:

CC	Content	Comment
1-4	Serial Number	(See comment on A Transaction, Card 2)
6	E	Transaction Type
7-8	Ø1 through 5Ø	Print line number. SRR will not accept a number over 50.
10	C or L	Position on page of report heading (C = Center, L = Left) must be present.
11	R, L, or C	Position of English on first page of report (R = Right, L = Left, C = Center) must be present.
13-78	English	English used on page 1 of each Report Card ID. Can be blank.

Using the E Cards

The decisions in placing an English description on the first page of the report are identical to those involved in any writing and subsequent typographical layout. Specifically each report has a 5-line heading, determined in part by the AØ2 and D cards, and desired English in an area 50 lines deep. The lines may be 60 or 120 characters long at the requester's option.

The most common arrangement is in usual, book-type report. Here the heading lines and the text are on the left hand side of the computer page. Thus, the action code is LL. This arrangement is used for the SR 404 explanatory page.

Portion of Figure 2 Repeated (SR 404)

The transcript for SR 404 shows the E Card coding.

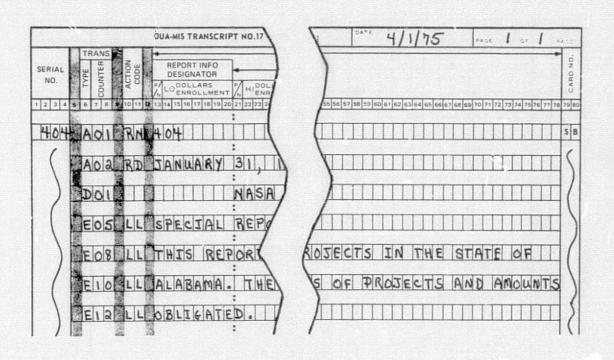Note that EØ1 - EØ4 are skipped to leave 4 blank lines follow-
ing the heading between the heading and the text.   Skipping EØ9
and E11, in effect, double spaces the message.

The transcript for SR 409X, which is repeated as the next
page, illustrates in EØ5 - E15 how special typographical arrange-
ments may be achieved.   The English on these lines will appear in
the final report exactly as shown.

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OUA-MIS TRANSCRIPT NO.1/ - AMES SPECIAL REPORTS   FILE ID. BUZ00001   DATE 4/1/75   PAGE 2 OF 2

SERIAL NO.	TRANS TYPE	TRANS COUNTER	ACTION CODE	REPORT INFO DESIGNATOR	CODE AS SPECIFIED — D CARDS — SPECIAL X CARDS	CARD NO.

409X	D01				ALL PROJECTS REQUESTED	S B
	D02	IN 21			AMES RESEARCH CENTER PROJECTS ONLY	
	D03	DS W			WOMAN'S SCHOOL PROJECTS ONLY	
	D04	CG 371			OFFICE OF UNIVERSITY AFFAIRS FUNDS ONLY	
	E05	LL			PROJECTS IN THIS REPORT -	THERE ARE FOUR SECTIONS:
	E07	LL			-HAD FY74 OBLIGATIONS	1. ALL PROJECTS
	E09	LL			-WERE FUNDED BY 'OAST' CENTERS	2. ARC PROJECTS ONLY
	E11	LL			-ARE IN PUBLIC MINORITY SCHOOLS	3. WOMAN'S SCHOOLS
	E13	LL			-ARE GRANTS ENDING IN FY74	4. OWA FUNDED ONLY
	E15	LL			-ARE IN THE PACIFIC REGION	

LO DOLLARS ENROLLMENT   HI DOLLARS ENROLLMENT

MM DD YY   MM DD YY   NOTES
MM YY   MM YY
SPECIAL DATE X CARDS

NHQ DIV FORM 519 DEC 73 PREVIOUS EDITION IS OBSOLETE.   NASA HQ

Figure 27 Repeated (SR 409X)

Portion of Figure 12 Repeated (SR 404)

The explanatory page of SR 407 (Figure 10) is a question-naire format (11" x 15"). It shows how the heading and English can be placed in the center of the page using action code "CC" on all of the E cards as illustrated in the first page of the transcript, Figure 32. (The second page of the transcript for SR 407 is shown as Figure 33).

A full 120 space line length may be obtained with a centered heading by putting 60 spaces of right-hand English and 60 spaces of left-hand English on the same line. Transactions and action codes to accomplish this on the 5th line would be "E05 CL" and "E05 CR".

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	TRANS																																																																								

OUA-MIS TRANSCRIPT NO.17 - AMES SPECIAL REPORTS   FILE I.D. BUZ00001   DATE 4/1/75   PAGE 1 OF 2

CODE AS SPECIFIED

SERIAL NO. | TRANS TYPE / COUNTER | ACTION CODE | REPORT INFO DESIGNATOR — D CARDS — SPECIAL X CARDS | CARD NO.

P/N LO DOLLARS ENROLLMENT   P/N HI DOLLARS ENROLLMENT

407	A01	RN	407																																								S B
	A02	RD	JANUARY 31, 1975																																
	D01		PROJECT QUESTIONNAIRE																											
	E10	CC	THIS QUESTIONNAIRE LISTS ALL PROJECTS WITH CURRENT FISCAL YEAR											
	E12	CC	OBLIGATIONS IN THE STATE OF ALABAMA. PLEASE PROVIDE														
	E14	CC	INFORMATION REQUESTED ON THE RIGHT-HAND SIDE OF THE PAGE AND								
	E16	CC	RETURN ALL MATERIAL TO THE OFFICE OF UNIVERSITY AFFAIRS NO LATER					
	E18	CC	THAN MARCH 15, 1975.																											
	X01	FY																																						
	X02	EP																																						

MMDDYY   MMDDYY   NOTES

MMYY   MMYY

SPECIAL DATE X CARDS

NHQ DIV FORM 519   DEC 73 PREVIOUS EDITION IS OBSOLETE.   NASA-HQ

Figure 32

To summarize, only certain combinations of headers and English may be specified or the system will abort. These are:

Type	CC-10	CC-11	Meaning
1.	L	L	Left heading and English
2.	C	C	Center heading and English
3.	C	L	Center heading with both left and
	C	R	right English. (Line number is the same for the CL and CR sets.)

The first type is commonly used with book-type reports, while the second type is normally used with questionnaire formats. The 120 space line length is rarely used, as first-page messages ordinarily are kept concise.

Note: SR 409X, illustrating various points in the use of the transactions is a real transcript in the sense that it would produce a report if input. However, it also is a good example of a request with too many selection criteria. It is so narrow that a negative report could result.

Transaction Type H - Questionnaire Headings

The H cards put English headings on the right-hand side of the report. They are used when the "questionnaire" version is desired. Any combination of words, letters, spaces, and numbers may be used in the heading area, which is 60 positions long and 9 lines deep. (Note: If the third, optional column on the left-hand side is used, do not use the first five H-card positions; i.e., reduce the area length to 55 positions.) The program will run without H cards. The transcript is completed as follows:

C·2

CC	Content	Comment
1-4	Serial Number	(See Comment on A Transaction, Card 2)
6	H	Transaction Type
7-8	Ø1 through Ø9	Transaction Type Counter
13-78	English	Any desired headings, numbers, letters, common symbols or spaces may be used.

Using the H Cards

The H cards are similar to the E cards in that they permit information in any typographical style to be entered in the 9-line by 60 position area they control. Here again the counter number on the transcript controls on which line the H card entry will appear.

The SR 407 body page of the questionnaire shows a typical H card application wherein the right-hand column headings are displayed as below.

Portion of Figure 11 Repeated (SR 407)

The second input transcript for SR 407, Figure 33, clearly
shows how the spacing was accomplished. (The first page of the
SR 407 transcript was shown as Figure 32.) When at least one H
card is used it is normal to double space the body of the report
to allow sufficient room to write in information on the right-hand
side. Double spacing requires an F card.

Transaction Type F - Write-in Spacing

The F card has two functions: It puts dots, dashes, or
whatever is specified, following each grant or contract in the
questionnaire version of the report, and it double spaces entries
in the body of the report. If the first function is specified,
the double spacing occurs automatically. Only one F card per run
is allowed. The program will operate with no F card. The
transcript is completed as follows:

CC	Content	Comment
1-4	Serial Number	(See Comment on A Transaction, Card 2)
6-8	F00	Transaction Type and counter.
13-78	Questionnaire Fields	Dots, dashes or any other character desired. Leave blank if standard version is wanted, but report is to be double spaced.
79-80	SB	Card ID

Use of the F card may be seen in the SR 407 transcript (Figure 33).

Combined Operations

Full utilization of the power and flexibility of the SRR
depends very much on the ingenuity the operator exercises in
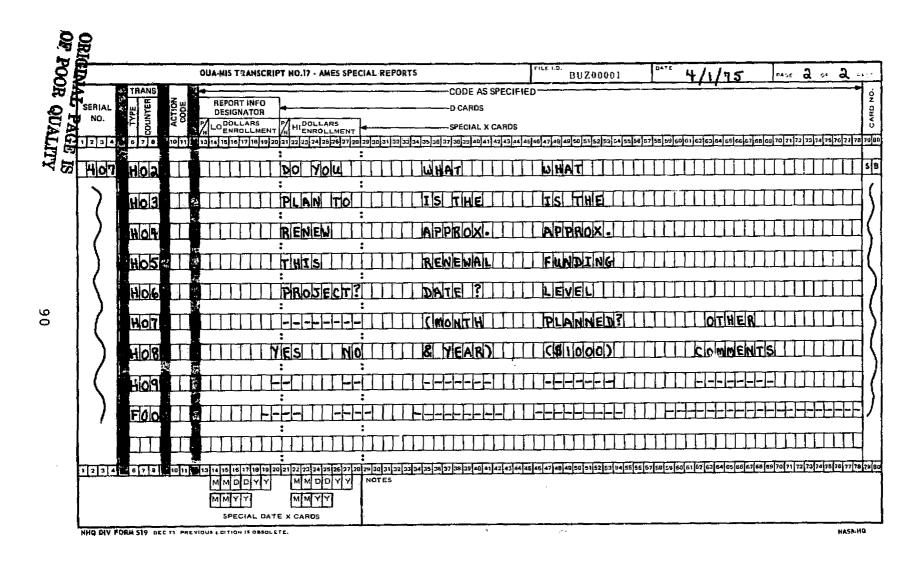
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Figure 33

analyzing the nature of the data base and in selecting S, X and D cards to make the most of inter-relationships in the data base. In short, the SRR has been designed as an information system, not a data system. An operator who has little feel for NASA's dealings with universities, the national research picture and the intrinsic behavior of educational institutions will be able to make use of the SRR at a data level, but will never be able to conduct the in-depth analyses of which the system is capable when operated at the management information level.

There is often more than one way to interrogate the system, i.e., versatility of the SRR is increased by possible alternative use of the D or S card for selection in complex questions. A simple case is shown in the program card list (Figure 34) for SR 405. Here there are no S cards and the XØ2 and XØ3 cards are merely print instructions. Thus, the XØ1 card is used to form a data extract which contains all of the information in the data base. The output report is narrowed down, then by the D card which allows printing of data only in state "Ø1", Alabama. If an Ø1 S card had been used the "AL" would not have been required and the D card could have had blank action and associated coding. Other more complex S-X-D trade-offs will become apparent as the operator's experience grows.

```
P R O G R A M   C A R D   L I S T I N G


  405  A01  PN 405                                                    SB

  405  A02  RD JANUARY 31, 1975                                       SB

  405  001  LC 01        NASA GRANTS & CONTRACTS                      SB

  405  E01  LL                                                        SB

  405  X01  AL                                                        SB

  405  X02  UD                                                        SB

  405  X03  RU                                                        SB




 NOTE       TO EXPEDITE UPDATED RERUNS RETURN
            THIS LISTING TO O.U.A. WITH YOUR REQUEST.
```

Figure 34. SR 405, Program Card Listing