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Radiation Laboratory

THE SAPIR PROGRAM
OF AUTOMATIC PROCESSING SYSTEM
AND INDEXING OF REPORTS

Livermore, California

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UCRL-6523
Mathematics and
Computers, UC-32
TID-4500 (17th Ed.)

UNIVERSITY OF CALIFORNIA
Lawrence Radiation Laboratory
Livermore, California

Contract No. W-7405-eng-48

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SYSTEM OF AUTOMATIC PROCESSING AND
INDEXING OF REPORTS

Lester Douglas Turner

May 27, 1961.

Printed in USA. Price 75 cents. Available from the
Office of Technical Services
U. S. Department of Commerce
Washington 25, D.C.

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ABSTRACT

The rapidly increasing volume of new data in scientific and technical fields demands faster and better ways to communicate the new information to those concerned. This report describes a working system, System of Automatic Processing and Indexing of Reports (SAPIR), for doing this. SAPIR makes use of the Keyword-in-Context Index principle, by which certain keywords, together with surrounding words that act as modifiers, are selected from the titles of the technical publications. These keywords with their modifiers serve as index entries from each title, therefore, there will be as many index entries generated as there are keywords contained in the title.

The index entries are sorted alphabetically by the keywords. The first letters of the keywords in each of the index entries form a column in the printed format, which makes scanning for the sought-after item easier. The SAPIR system is automatic and the list of citations is machine-generated on an IBM 1401 Computer.

THE SAPIR PROGRAM
SYSTEM OF AUTOMATIC PROCESSING AND INDEXING OF REPORTS*

Lester Douglas Turner¹

Lawrence Radiation Laboratory, University of California
Livermore, California

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INTRODUCTION

The Technical Information Division of the University of California, Lawrence Radiation Laboratory publishes a biweekly list of report citations (Unclassified Reports Title List). These reports are concerned with nearly every branch of science and technology. Each list contains an average of 500 citations of technical reports and papers. (See sample page in appendix II.) In each citation all or part of the following items are contained:

(1) report number, (2) classification, (3) corporate author(s), (4) title, (5) author(s), (6) date, (7) number of pages, (8) secondary report no.(s), and (9) abstract.

These citations are grouped by subject category. The degree of usefulness of such a list is in inverse relation to the amount of effort required to find items of interest. Subject grouping usually required considerable time and effort by the user, because, unfortunately, subject material never fits into any one preassigned category, but may justifiably be located in several subject categories, depending on the user's and indexer's viewpoint.

In areas of new information, however, relatively rough clues can answer the user's needs. Such clues can be generated entirely by machine in the form of a series of extractions, each containing a keyword as its nucleus. To facilitate quick reference to the sought-after information from the great volume of new reports, an indexing system was designed which makes use of this machine approach. This system has been named "SAPIR" (System of Automatic Processing and Indexing of Reports). SAPIR was designed to produce an easily used index to a list of documents.

* * Work performed under the auspices of the U. S. Atomic Energy Commission.

¹ Now at Bank of America, NT & SA, San Francisco, California.

INDEX TO REPORTS

The alphabetical listing of keywords might be the simplest format for an index. The mere listing of keywords alone, however, would necessitate on the part of the user repeated reference to the item from which the keyword was originally extracted. This unsatisfactory procedure can be eliminated almost entirely by listing the selected keywords together with surrounding words that act as modifiers pointing up the more specific sense in which a keyword was used. This type of index has been called "Keyword-In-Context Index" or KWIC Index,* and can be provided by automatic computers.

KWIC indexing may be done using the keywords in a title, abstract, or the complete text. Keywords are those words that define or characterize the subject or subjects of a document.

The LRL Unclassified Reports Title List is made up of two sections. The first contains the grouped citations of the reports, with the title indented. The citations can be grouped alphabetically, by subject, or in any other manner desired. At LRL they are grouped under broad subject headings such as chemistry, physics, etc. The SAPIR program assigns a seven-digit number to each citation. The first three digits of this identification number are the sequence number for a particular report in the issue. The final four digits of the identification number indicate the volume and issue of the Unclassified Reports Title List (the first two are the volume number and the last two are the issue number). For example, 099 0314 is the reference number for the 99th report listed in Part I of Vol. 3, issue 14 of the Unclassified Reports Title List. The last four digits of the identification number will also be used to identify the reports at a later date in the cumulative SAPIR index. Thus, each report is uniquely identified.

The second section of the List contains the index. Each index entry is preceded by the same seven-digit identification number that was assigned to the citation from whose title the index entry was taken. This machine-prepared index provides the individual user with a subject-searching tool, something that has never been possible before.

The index entries in the Unclassified Reports Title List are in alphabetical order, using the first letter of the keyword, and are in the title's

* "Keyword-In-Context Index for Technical Literature (KWIC)," International Business Machine Corporation, Advanced System Development Division, H. P. Luhn, Yorktown Heights, New York, August 1959.

context, as shown in appendix I. This facilitates locating any reports with relevance to the user's field of interest. After locating a keyword which, along with the modifying words, indicates a report of possible interest, the user notes the sequence number (first three digits of the identification number). The user then turns to this sequence number in the first section of the list and there reads the complete report citation.

The SAPIR system for generating an index to reports also incorporates part of the activities required for generating library cards. This is accomplished on the Flexowriter and the punched paper tape by-product of this action serves as basic input media for the SAPIR program. The operation of SAPIR is described in succeeding sections.

Although Flexowriter card reproduction has many advantages over other methods, the punched paper tape is not compatible with IBM equipment. Therefore, time-consuming conversion steps (paper-tape-to-paper-tape, and paper-tape-to-magnetic-tape) are required before the tape can be used in a computer program. This disadvantage can be corrected in one of three ways: (1) by changing the bit configuration of the Flexowriter to that of the IBM 1401 computer; (2) by using a computer program to, in effect, perform the bit configuration change; or (3) punch the citation on IBM cards, thus eliminating the use of punched paper tape.

THE SYSTEM

The essential elements of this system (see flow chart, appendix III) are:

1. Flexowriter* or key punch operation
 - a. Generation of library cards
 - b. Generation of punched paper tape with control symbols for computer operation
2. IBM 1401 computer operation
 - a. First phase
 1. Citation list printing on continuous multilith masters
 2. Title records generation (tape)
 - b. Second phase

* Trademark of Friden, Inc., San Leandro, California.

#2.b. - cont'd:

1. Title records processing
 - a. Nonsignificant word table
 - b. Table search
 - c. Index entry extraction
 - d. Card punching (per index entry)
- c. Index entry tape sorting
- d. Print sorted index entries on continuous multilith masters
3. Reproduce, collate, and distribute list with the SAPIR index.

INPUT DATA FOR THE IBM 1401

Paper Tapes

The generation of the punched paper tape on the Flexowriter is merely a by-product of typing the library catalog card for each report, and requires no added effort. After the report is received by the Technical Information Division, the edited citation is given to the Flexowriter typist who prepares the library card as before, except for using a special symbol key immediately before typing the title and after the last valid character (period) of the title. Also, another special symbol key is used at the end of that position of the citation that constitutes the listing. Since the entries will be grouped in their respective categories, it is necessary that each be on a separate paper tape to accomplish the grouping. Just before publishing time the grouped paper tape will be fed through the Flexowriter, thus producing one continuous paper tape, which will contain all the citations of the individual tapes and a hard copy which is used for editing purposes. This paper tape, with the use of a specially wired board, is converted on the paper-tape-to-paper-tape converter LE 5369-1, and LE 4984-1 a new paper tape whose punched hole configurations are compatible with the 1401 bit configurations. The second paper tape is then converted on the Tally paper-tape-to-magnetic-tape converter to a magnetic tape.

Punched Cards

If key punch equipment is used instead of the Flexowriter, there is a service routine for transferring data from the IBM punched cards to magnetic tape on the 1401. However, various control symbols have to be punched on each card in addition to the report citations. The control symbols are

punched in column 1.

A "C" precedes a nontitle line or the middle lines of a title with more than 2 lines, e. g., the first line of a report citation containing the report number and classifications. A "B" is inserted at column 1 on the same card that contains the beginning of the title. An "E" indicates to the computer that that card contains the last line of the title. An "R" is inserted at column 1 when the punched card is to contain the last line of the citation. Note that the title appears on a line or lines by itself. The rest of the citation appears on the following lines. If the title is one line in length, i. e., one punched card or less, then the control symbol is a "T". An "F" indicates the end of the group of citations.

COMPUTER OPERATION

Due to the 4K character storage capacity limitation of this 1401 computer model, and because of the large table of nonsignificant words that must be kept stored in the memory during processing, it was necessary to divide the over-all program into three phases: listing, index entry generation, and sorting.

First Phase (Listing)

The carriage return mark of the Flexowriter is converted to an IBM 1401 record mark (§) which facilitates the movement of each line of the citation to the designated print or tape-write area. It is during this phase that the seven-digit reference number is assigned and that the sequence number (three-digit portion of the reference number) is incremented. The last four digits in the reference number are supplied by a data card placed after the last card of the first-phase program deck. The program edits each line, removes the control symbols, indents the title, prints page headings and page numbers, and generates a record gap on the tape after each title is written on tape unit no. 2.

The computer program for this phase also contains subroutines for tape-read and tape-write errors. In case of such error, the first 80 positions of the citation in question are printed so that the citation can be identified, corrected, and included in the next list to be published.

After the last citation is processed, the paper is advanced on the printer (1403) and a caption is printed, which indicates the completion of

the first phase. Tape unit no. 1 (input) rewinds and unloads, tape unit no. 2 rewinds only, and the computer is set for the second phase.

A flow diagram and a listing of SAPIR phase 1 are contained in appendixes IV and V, respectively.

Second Phase (Index Entry Generation)

This program loads the nonsignificant word table (articles, conjunctions, prepositions, etc.). Each word in the title of a citation is compared with the words contained in the nonsignificant word table. Coordinate table search is used in order to reduce the time required for this search, i.e., the title word is compared only with the group of nonsignificant words having the same number of characters. The space (blank) between words is used for control and, through a series of tests, the word lengths are defined. If the title word being searched is determined to be a keyword (i.e., the title word does not match any of the words in the nonsignificant word table), it becomes an index entry. A card is punched for each index entry. This card contains the 7-digit reference number plus 60 characters of the report title, with the keyword displayed in a central position and in the context of the title in which it appears. The punch-console stackers automatically alternate in case one is full so that no interruption of processing will occur. After the last citation is processed, the paper is advanced on the printer and a caption is printed, which indicates the end of the second phase.

A flow chart and a listing of SAPIR phase 2 are contained in appendixes VI and VII, respectively.

Third Phase (Index Entry Sort)

Besides alphabetically sorting the 15 columns of keywords on two tape units (nos. 2 and 3), the computer shifts the first three digits of the reference number so that there is a blank between the first three digits and the last four digits, e.g., 0990311 = 099 0311. This is done in order to make the sequence number easier to remember when referring from the index to the citation. The computer also prints the page numbers and a page caption on each page.

The IBM 1401 SAPIR sort program can be used to sort the punched cards (1200 - 1500 per run) for periodic, quarterly, or semiannual integrated index-entry generation purposes, in addition to its regular use with the

biweekly list. However, since the sorting time increases geometrically with the size of the file to be sorted, an IBM 709 could be used to reduce the time required for the sort operation.

REPRODUCTION

The printed continuous multilith masters are removed from the printer and are forwarded to the Graphic Arts Department for reproduction. The Technical Information Division, upon receipt of the collated, finished product, distributes the issues.

APPLICATIONS

The SAPIR program was originally developed to automatically generate the "Unclassified Reports Title List" as described on the preceding pages. This program, however, with varying degree of modifications may be easily adapted to information dissemination as it applies to industrial (inventory, catalogue, engineering drawing, etc.), commercial, medical, legal and literary information indexing requirements. The writer is currently engaged in further developing the SAPIR system for these additional applications which will be described in a forthcoming paper.

ACKNOWLEDGMENT

The writer is grateful for the assistance of Clarence Badger, Gale G. Marshall, and Joseph L. Brady, Jr., of the Computation Division, who gave their time generously, Robert L. Swenson, Electronics Engineering Department, ably assisted in the tape conversion phases.

APPENDIX I.

SAPIR Index Page

002 0426 MMONIUM DIURANATES PART A. THE UO₃ HYDRATES PART B. THE AMMO
 003 0426 THOD FOR MONITORING THE ACTIVITY OF OXYGEN IN A HOT TRAPPED
 004 0426 ALIGNMENT CHARTS FOR TRANSPORT PROPE
 002 0426 D URANIUM TRIOXIDES AND AMMONIUM DIURANATES PART A. THE UO₃
 002 0426 O₃ HYDRATES PART B. THE AMMONIUM DIURANATES.
 006 0426 ER TYPE-REACTOR COOLANT ANALYTICAL REQUIREMENTS AND PROBLEMS
 007 0426 TABLE OF ATOMIC MASSES.
 002 0426 . THE UO₃ HYDRATES PART B. THE AMMONIUM DIURANATES.
 001 0426 FOR USE IN CRITICALITY CALCULATIONS.
 006 0426 CALDER TYPE REACTOR COOLANT ANALYTIC
 003 0426 A POSSIBLE GALVANIC CELL METHOD FOR MONITORING THE ACTIV
 004 0426 ALIGNMENT CHARTS FOR TRANSPORT PROPERTIES VISC
 003 0426 TRAPPED SODIUM COOLANT CIRCUIT.
 004 0426 UCTIVITY, AND DIFFUSION COEFFICIENTS FOR NONPOLAR GASES AND
 009 0426 ADIONUCLIDES PRESENT IN COLLING WATER FROM THE NRX REACTOR.
 008 0426 LUORIDE-SODIUM FLUORIDE COMPLEX.
 004 0426 TIES VISCOSITY, THERMAL CONDUCTIVITY, AND DIFFUSION COEFFICI
 012 0426 F SOME PRPELLANT FLUIDS CONTAINING HYDROGEN.
 006 0426 CALDER TYPE REACTOR COOLANT ANALYTICAL REQUIREMENTS AND
 003 0426 IN A HOT TRAPPED SODIUM COOLANT CIRCUIT.
 001 0426 AND HYDROGEN FOR USE IN CRITICALITY CALCULATIONS.
 001 0426 ESTIMATED DENSITIES OF PLUTONIUM AND HYDROGEN
 004 0426 AND GAS MIXTURES AT LOW DENSITY.
 004 0426 ERMAL CONDUCTIVITY, AND DIFFUSION COEFFICIENTS FOR NONPOLAR
 011 0426 DIFFUSION-CONTROLLED DISSOLUTION OF
 008 0426 MEASUREMENT OF DISSOCIATION PRESSURE OF MOLYBDENUM
 011 0426 DIFFUSION-CONTROLLED DISSOLUTION OF ZIRCONIUM IN MOLTEN U
 002 0426 TRIOXIDES AND AMMONIUM DIURANATES PART A. THE UO₃ HYDRATES
 002 0426 ES PART B. THE AMMONIUM DIURANATES.
 001 0426 ESTIMATED DENSITIES OF PLUTONIUM AND
 012 0426 RTIES OF SOME PRPELLANT FLUIDS CONTAINING HYDROGEN.
 008 0426 YBDENUM FLUORIDE-SODIUM FLUORIDE COMPLEX.
 010 0426 AN OXIDATION-REDUCTION FLUORIDE PRECIPITATION METHOD.
 008 0426 PRESSURE OF MOLYPDENUM FLUORIDE-SODIUM FLUORIDE COMPLEX.
 003 0426 A POSSIBLE GALVANIC CELL METHOD FOR MONITORING
 004 0426 FOR NONPOLAR GASES AND GAS MIXTURES AT LOW DENSITY.
 004 0426 EFFICIENTS FOR NONPOLAR GASES AND GAS MIXTURES AT LOW DENSIT
 003 0426 ACTIVITY OF OXYGEN IN A HOT TRAPPED SODIUM COOLANT CIRCUIT.
 002 0426 AND STRUCTURES OF SOME HYDRATED URANIUM TRIOXIDES AND AMMON
 002 0426 RANATES PART A. THE UO₃ HYDRATES PART B. THE AMMONIUM DIURAN
 001 0426 SITIES OF PLUTONIUM AND HYDROGEN FOR USE IN CRITICALITY CALC

APPENDIX II.

Page From List of Report Citations

0010426

AERE-M-802 (RPT UNCLASSIFIED)
UKAEA. RESEARCH GROUP. ATOMIC ENERGY RESEARCH
ESTABLISHMENT, HARWELL, ENGLAND
ESTIMATED DENSITIES OF PLUTONIUM AND HYDROGEN FOR USE
IN CRITICALITY CALCULATIONS.
E E JACKSON AND E WAIT DECEMBER 1960 5P

0020426

AERE-R-3411 (RPT UNCLASSIFIED)
UKAEA. RESEARCH GROUP. ATOMIC ENERGY RESEARCH
THE INFRARED SPECTRA AND STRUCTURES OF SOME HYDRATED
URANIUM TRIOXIDES AND AMMONIUM DIURANATES PART A.
THE UO₃ HYDRATES PART B. THE AMMONIUM DIURANATES.
A M DEANE NOVEMBER 1960 24P
(APPROVED FOR PUBLICATION)

0030426

ARE-R-3037 (RPT UNCLASSIFIED)
UKAEA. RESEARCH GROUP. ATOMIC ENERGY RESEARCH
ESTABLISHMENT, HARWELL, BERKS, ENGLAND
A POSSIBLE GALVANIC CELL METHOD FOR MONITORING THE
ACTIVITY OF OXYGEN IN A HOT TRAPPED SODIUM COOLANT
CIRCUIT.
G W HORSLEY NOVEMBER 1959 13P

0040426

NASA-TR-R-81 (RPT UNCLASSIFIED)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LEWIS
RESEARCH CENTER, CLEVELAND, OHIO
ALIGNMENT CHARTS FOR TRANSPORT PROPERTIES VISCOSITY,
THERMAL CONDUCTIVITY, AND DIFFUSION COEFFICIENTS FOR
NONPOLAR GASES AND GAS MIXTURES AT LOW DENSITY.
R S BROKAW 1961 23P

0050426

NAA-SR-6095 (RPT UNCLASSIFIED)
ATOMICS INTERNATIONAL DIV, NORTH AMERICAN AVIATION INC,
CANOGA PARK, CALIF
VAPORIZATION OF ZIRCONIUM OXIDE.
M M NAKATA, R L MCKISSON AND B D POLLOCK APRIL 15,

APPENDIX III

Basic Flow Chart for SAPIR

Flow Chart of SAPIR Phase 1

APPENDIX V

Listing of SAPIR Phase 1

CLEAR STORAGE 1 .008015,022026,030034,041,045,053,0570731026
 CLEAR STORAGE 2 L072116,110106,1051178101/199,027A075029102780010278026/0991,0C1/001117100
 BCGTSTRAF CARD .008015,022026,056053/056029 .0240671056

PG	LN	CT	LABEL	OP	A OPERAND	B OPERAND	C	LOC	INSTRUCTION	COMMENTS	KWIC1
1	010			CTL	331						
1	020			CRG	2500						
1	030										
1	040										
1	050	7	BEGIN	SW	0001	0101		2500		, 001 101	
1	060	7		SW	0201	0400		2507		, 201 400	
1	070	7		SW	1600	1900		2514		, W00 200	
1	080	1		R				2521		1	
1	090	7		MCW	0004	0354		2522	M	004 354	
1	100	7		MCW	0347	0276		2529	M	347 276	
1	110	2		CC			1	2536	F	1	
1	120	1		W				2538	2		
1	130	4		CS	0299			2539	/	299	
1	140	2		CC			K	2543	F	K	
1	150	7		MCW	0399	0257		2545	M	399 257	
1	160	1		W				2552	2		
1	165	4		CS	0299			2553	/	299	
1	166	4		SW	0201			2557		, 201	
1	170	2		CC			L	2561	F	L	
1	180	8	START	MCW	(01	0400	R	2563	M	(U1 400 R	
1	181	5		B	TRERR		L	2571	B	P10 L	
1	182	4		CW	TIT8EG			2576	I	198	
1	184	4		CW	RECEND			2580	I	197	
1	200	5		B	ECF		K	2584	B	P78 K	
2	010	7		MCW	0354	0222		2589	M	354 222	
2	020	1		W				2596	2		
2	030	4		CS	0299			2597	/	299	
2	040	7	TESTS	MCM	0000	1 1900		2601	P	0+0 200	
2	050	4		SAR	RESET1			2608	C	189	
2	060	4		SBR	XR3			2612	H	099	
2	070	7		A	CCN10M	0100		2616	A	M95 100	
2	075	8		B	LASREC	0000	3	2623	B	Q17 0+0	
2	080	3	GO1	B	GC2	0000	1	2631	B	Q25 0+0	
2	090	3		BWZ	G03	TIT8EG	1	2639	V	Q99 198 1	
2	100	7		MCM	0000	1 0219		2647	P	0+0 219	
2	110	4		SBR	XR3			2654	H	099	
2	120	7		MCW	0337	0000	3	2658	M	337 0+0	
2	130	5	PRINT	B	PGEND		-	2665	B	A20 -	
2	140	1		W				2670	2		
2	150	4		CS	0299			2671	/	299	
2	160	3		BWZ	G0B	RECEND	1	2675	V	B63 197 1	
2	170	7	TOVAB	MCW	0189	XR1		2683	M	189 089	
3	020	4		CS	1999			2690	/	Z99	
3	030	4		SW	1900			2694		, 200	
3	032	4		CS	1999			2698	/	Z99	
3	034	4		SW	1900			2702		, 200	
3	040	4		B	TESTS			2706	B	001	
3	050	4	TRERR	SBR	BAR1 +D03			2710	H	P42	
3	060	7		MCW	CCN9	CNTR9		2714	M	190 358	

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS	KNIC1
3	070	5	BKSP1	CU	1U1		B	2721	U	(U1 B	
3	080	8		MCW	(U1	0400	R	2726	M	(U1 400 R	
3	090	5		B	GO		L	2734	B	P43 L	
3	100	4	BAR1	E	0000			2739	B	000	
3	110	7	GO	S	CON1	CNTR9		2743	S	355 358	
3	120	8		E	PCH1	CNTR9	+	2750	B	P62 358 +	
3	130	4		E	BKSP1			2758	B	P21	
3	140	7	PCH1	MCW	0479	0180		2762	M	479 180	
3	150	1		P				2769			
3	160	4		CS	0180			2770	/	180	
3	170	4		E	NEW2			2774	B	B40	
4	110	5	EOF	CU	(U2		M	2778	U	(U2 M	
4	112	5		B	TWERR		L	2783	B	+05 L	
4	114	5		CU	(U1		U	2788	U	(U1 U	
4	120	5		CU	(U2		R	2793	U	(U2 R	
4	130	2		CC			I	2798	F	1	
4	140	7		MCW	2017	0260		2800	M	-17 260	
4	150	1		M				2807	2		
4	160	4		CS	0299			2808	/	299	
4	170	4		SW	0201			2812	,	201	
4	180	1		H				2816	.		
4	190	4	LASREC	SW	RECEND			2817	,	197	
4	200	4		B	GO1			2821	B	031	
5	010	4	G02	SW	TITBEG			2825	,	198	
5	020	7		MEM	0001	1 0222		2829	P	0+1 222	
5	030	4		SBR	XR3			2836	H	099	
5	040	7		MEM	0001	1 0000	2	2840	P	C+1 0-0	
5	050	4		SBR	XR2			2847	H	094	
5	060	7	G04	A	CCN20M	0095		2851	A	M99 095	
5	070	8		B	TITEND	0000	2	2858	B	R25 0-0	
5	080	8		B	GO5	0000	2	2866	B	G88 0-0	
5	090	7		A	CCN20	0095		2874	A	084 095	
5	100	7		LCA	0337	0000	2	2881	L	337 0-0	
5	110	7	G05	MCW	0337	0000	3	2888	M	337 0+0	
5	120	4		B	PRINT			2895	B	065	
5	130	7	G03	MEM	0000	1 0222		2899	P	0+0 222	
5	140	4		SBR	XR3			2906	H	099	
5	150	7		MEM	0000	1 0000	2	2910	P	0+0 0-0	
5	155	4		SBR	XR2			2917	H	094	
5	160	4		B	GO4			2921	B	051	
5	180	7	TITEND	A	CCN10	0095		2925	A	082 095	
5	190	7		LCA	0337	0000	2	2932	L	337 0-0	
5	200	7		A	CCN10M	0100		2939	A	M95 100	
6	010	7		MCW	0337	0000	3	2946	M	337 0+0	
6	020	4		CH	TITBEG			2953	J	198	
6	030	7		MCW	0354	1606		2957	M	354 W06	
6	040	7		LCA	0360	0000	2	2964	L	360 0-0	
6	050	8		MCW	(U2	1600		2971	M	(U2 W00 W	
6	060	5		B	TWERR		L	2979	B	+05 L	
6	080	7		LCA	0186	XR2		2984	L	186 094	
6	082	4		CS	1899			2991	/	Y99	
6	084	1		CS				2995	/		
6	086	1		CS				2996	/		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS	KWIC1
6	088	4		SW	1600			2997	, W00		
6	090	4		B	PRINT			3001	B 065		
6	100	4	TWERF	SBR	BAR2 +003			3005	M +44		
6	110	7		MCW	CON4	CNTR4		3009	M 191 357		
6	120	7		MCW	CON2	CNTR2		3016	M 361 356		
6	130	5	BKSP2	CU	IU2		B	3023	U IU2 3		
6	140	8	MTT2	MCW	IU2	1600	M	3028	M IU2 W00 M		
6	150	5		B	ERASE		L	3036	B +45 L		
6	160	4	BAR2	B	0000			3041	B 000		
6	170	7	ERASE	S	CCN1	CNTR2		3045	S 355 356		
6	180	8		B	RENT	CNTR2	+	3052	B +64 356 +		
6	190	4		B	BKSP2			3060	B +23		
6	200	7	RENT	MCW	CCN2	CNTR2		3064	M 361 356		
7	010	5		CU	IU2		B	3071	U IU2 B		
7	020	5		CU	IU2		E	3076	U IU2 E		
7	030	7		S	CON1	CNTR4		3081	S 355 357		
7	040	8		B	PCH2	CNTR4	+	3088	B A00 357 +		
7	050	4		B	MTT2			3096	B +28		
7	060	7	PCH2	MCW	1679	0180		3100	M W79 180		
7	070	1		P				3107	4		
7	080	4		CS	0180			3108	/ 180		
7	090	4		SW	0101			3112	, 101		
7	100	4		B	BAR2			3116	B +41		
7	150	1	PGENC	M				3120	2		
7	160	4		CS	0299			3121	/ 299		
7	170	4		SW	0201			3125	, 201		
7	180	7	NEWPG	MCW	0372	0229		3129	M 372 229		
7	190	2		CC			K	3136	F K		
7	200	1		M				3138	2		
8	010	4		CS	0299			3139	/ 299		
8	020	4		SW	0201			3143	, 201		
8	030	2		CC			I	3147	F 1		
8	040	7		A	CON1	NO		3149	A 355 335		
8	050	8		B	G00	0333	0	3156	B 874 333 0		
8	060	7		MCS	0335	0278		3164	Z 335 278		
8	070	7	G0F	MCW	0341	0274		3171	M 341 274		
8	080	1		M				3178	2		
8	090	4		CS	0299			3179	/ 299		
8	100	4		SW	0201			3183	, 201		
8	110	7		MCW	0399	0257		3187	M 399 257		
8	120	2		CC			K	3194	F K		
8	130	1		M				3196	2		
8	140	4		CS	0299			3197	/ 299		
8	150	4		SW	0201			3201	, 201		
8	160	2		CC			L	3205	F L		
8	170	8		BWZ	NEWREC	RECEND	1	3207	V 819 197 1		
8	180	4		B	TCVAB			3215	B 083		
8	190	7	NEWREC	LCA	0183	XR1		3219	L 183 089		
8	200	7		LCA	0184	XR2		3226	L 186 094		
9	010	7		A	CCN1	0350		3233	A 355 350		
9	020	4	NEW2	CS	1599			3240	/ V99		
9	030	1		CS				3244	/		
9	040	1		CS				3245	/		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS	KWIC1
9	050	1		CS				3246	/		
9	060	1		CS				3247	/		
9	070	1		CS				3248	/		
9	080	1		CS				3249	/		
9	090	1		CS				3250	/		
9	100	1		CS				3251	/		
9	110	1		CS				3252	/		
9	120	1		CS				3253	/		
9	130	1		CS				3254	/		
9	140	4		SW	0400			3255		400	
9	150	4		B	START			3259		B N63	
9	160	2	G08	CC			K	3263		F K	
9	170	5		B	NEWPG		-	3265		B A29 -	
9	180	4		B	NEWREC			3270		B B19	
9	190	8	G0D	B	GCE	0334	0	3274		B B93 334 0	
9	200	7		MCS	C335	0277		3282		Z 335 277	
10	010	4		B	GCF			3289		B A71	
10	020	7	GGE	MCS	C335	0276		3293		Z 335 276	
10	030	4		B	GCF			3300		B A71	
11	010	3	XR1	DCW	0089		400	0089			
11	020	3	XR2	DCW	0094		W07	0094			
11	030	3	XR3	DCW	0099		000	0099			
11	040	3	FOURCO	DCW	0183		400	0183			
11	050	3	ONE607	DCW	0186		W07	0186			
11	060	3	RESET1	DCW	0189		000	0189			
11	070	1	CON9	DCW	0190		9	0190			
11	080	1	CON4	DCW	0191		4	0191			
11	090	1	RECEND	DC	0197		R	0197			
11	100	1	TITBEG	DC	0198		8	0198			
11	120	3	NO	DCW	0335		1	0335			
11	130	2	BB	DCW	0337			0337			
11	140	4	PAGE	DCW	0341			0341			
11	150	6	PAGE1	DCW	0347		PAGE	0347			
11	160	7	REFNO	DCW	0354		0010000	0354			
11	170	1	CON1	DCW	0355		1	0355			
11	180	1	CNTR2	DCW	0356		0	0356			
11	190	1	CNTR4	DCW	0357		0	0357			
11	200	1	CNTR9	DCW	0358		0	0358			
12	010	1	DASH	DCW	0359		-	0359			
12	020	1	GMWM	DCW	0360			0360			
12	030	1	CGN2	DCW	0361		2	0361			
12	040	11	NOTE	DCW	0372		*MICROCARDS	0372			
12	050	27	HEADER	DCW	0399		UC LRL UNCLASSIFIED REPORTS	0399			
12	060	18	FINIS	DCW	2017		END OF FIRST PHASE	2017			
12	190	2	CGN20	DCW	0084		20	0084			
12	200	2	CON10	DCW	0082		10	0082			
12	210	4	CON20M	DCW	2499		1980	2499			
12	220	4	CON10M	DCW	2495		1990	2495			
13	010			END	BEGIN					/ NOO 080	

Flow Chart of SAPIR Phase 2

APPENDIX VII

Listing of SAPIR Phase 2

CLEAR STORAGE 1 ,008015,022026,030034,041,045,053,0570731026
 CLEAR STORAGE 2 L072116,110106,105117B101/199,027A0750291027B00102708026/0991,001/001117100
 BCOTSTRAP CARD ,008015,022029,056063/056029 ,0240671056

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LCC	INSTRUCTION	COMMENTS	KWIC2
1	010			CTL	331						
1	020			ORG	1000						
1	030				* KEY-WORD-IN-CONTEXT INDEX, 2ND PHASE, PROGRAMMED						
1	040				* BY LESTER D. TURNER, 4-12-61						
1	050	7	START	SW	0109	0117		1000		, 109 117	
1	060	7		SW	0141	0201		1007		, 141 201	
1	070	7		SW	0400	0407		1014		, 400 407	
1	080	4		SW	0751			1021		, 751	
1	090	7		MCW	ZOS	CHAR		1025	M	803 189	
1	110	7		MCW	FCS	RESET		1032	M	083 210	
1	120	4		CW	SWF			1039	J	199	
1	140	8	ROT2	MCW	(U2	0400		1043	M	(U2 400 R	
1	150	5		B	TRERR			1051	B	/30 L	
1	160	5		B	EGF			1056	B	S02 K	
1	164	7	NEW0	MCW	RESET	FHLF		1061	M	810 814	
1	165	7		A	CGN20	0811		1068	A	194 811	
1	166	7		MCW	RESET	XR1		1075	M	810 089	
1	167	7		MCW	XR1	LHLF		1082	M	089 818	
1	168	8	WDL00P	B	SETE	0000	1	1089	B	S58 0+0	
1	180	8		B	BB	0000	1	1097	B	S66 0+0	
1	190	7		MCW	XR1	RESET		1105	M	089 910	
1	200	7		A	CGN10	0090		1112	A	192 090	
2	010	7		A	CGN10	0190		1119	A	192 190	
2	020	4		B	WDLG0P			1126	B	+89	
2	030	4	TRERR	SBR	BAR1 +003			1130	H	/62	
2	040	7		MCW	CGN9	CNTR9		1134	M	196 197	
2	050	5	BKSP2	CU	(U2			1141	U	(U2 8	
2	060	8		MCW	(U2	0400		1146	M	(U2 400 R	
2	070	5		B	GC			1154	B	/63 L	
2	080	4	BAR1	B	0000			1159	B	000	
2	090	7	GO	S	CGN1	CNTR9		1163	S	195 197	
2	100	8		B	PRT	CNTR9		1170	B	/82 197 +	
2	110	4		B	BKSP2			1178	B	/41	
2	120	7	PRT	MCW	0479	0299		1182	M	479 299	
2	130	1		W				1189	2		
2	140	4		CS	0299			1190	/	299	
2	150	4		SW	0201			1194	,	201	
2	160	4		B	RCT2			1198	B	+43	
2	170	7	EOF	MCW	0844	0299		1202	M	844 299	
2	180	1		W				1209	2		
2	190	4		CS	0299			1210	/	299	
2	191	4		SW	0201			1214	,	201	
2	192	7		MCW	0876	0299		1218	M	876 299	
2	194	1		W				1225	2		
2	196	4		CS	0299			1226	/	299	
2	198	4		SW	0201			1230	,	201	
2	200	7		MCW	0896	0299		1234	M	896 299	
2	202	1		W				1241	2		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS	KWIC2
2	204	4		CS	0299			1242	/ 299		
2	206	4		SW	0201			1246	, 201		
2	208	2		CC			1	1250	F 1		
3	010	5		CU	102		U	1252	U 102 U		
3	020	1		H				1257	.		
3	030	4	SETE	SW	SWE			1258	, 198		
3	032	4		B	BLNK			1262	B T11		
3	034	7	BB	A	CON10	0090		1266	A 192 090		
3	036	8		B	UGH	0000	1	1273	B 593 0+0		
3	038	8		B	SETE	0000	1	1281	B 558 0+0		
3	040	4		B	BLNK			1289	B T11		
3	042	7	UGH	A	CON10	RESET +001		1293	A 192 811		
3	044	7		A	CON10	CHAR +001		1300	A 192 190		
3	046	4		B	BB			1307	B 566		
3	050	7	BLNK	MCW	CHAR	WRD		1311	M 189 185		
3	060	7		MCW	SS0	XR2	A	1318	M 086 094		
3	070	7		A	0190	0095		1325	A 190 095		
3	075	7		MCW	RESET	XR1		1332	M 810 089		
3	090	7	ZCNE	MCW	CC00	CC00	2	1339	M 0+0 0-0		
3	112	7		C	F15	WRD		1346	C 995 185		
3	114	5		B	KWD		U	1353	B 097 U		
3	116	7		MCW	TACCR	TBL		1358	M 998 992		
3	118	7		A	WRD	TBL		1365	A 185 992		
3	120	7		A	WRD	TBL		1372	A 185 992		
3	122	7		A	WRD	TBL		1379	A 185 992		
3	124	7		A	WRD	TBL		1386	A 185 992		
3	126	7		A	WRD	TBL		1393	A 185 992		
3	128	7		A	WRD	TBL		1400	A 185 992		
3	130	7		MCW	TBL	MCD1 +003		1407	M 992 017		
3	135	7	MCD1	MCW	0000	XR3		1414	M 000 099		
3	140	7		A	CCN3	TBL		1421	A 182 992		
3	145	7		MCW	TBL	LOOP +003		1428	M 992 038		
3	150	7	LGCP	C	0000	XR3		1435	C 000 099		
3	155	5		B	KWD		S	1442	B 097 S		
3	160	7		C	0000	C000	3	1447	C 0-0 0+0		
3	165	5		B	TESE		S	1454	B 070 S		
3	170	7		A	CHAR	XR3		1459	A 189 099		
3	175	4		B	LGCP			1466	B 035		
4	010	6	TESE	BWZ	ENDS	SWE	1	1470	V W81 198 1		
4	012	4	NEXT	CS	0799			1478	/ 799		
4	020	4		SW	0751			1482	, 751		
4	030	7		MCW	ZGS	CHAR		1486	M 803 189		
4	040	4		B	NEW0			1493	B +61		
4	050	7	KWD	A	CON35	LHLF		1497	A 806 818		
4	060	7		MCW	LHLF	XR3		1504	M 818 099		
4	070	7		MCW	0000	0176	3	1511	M 0+0 176		
4	080	4		SBR	XR2			1518	H 094		
4	082	7		C	XR2	CON140		1522	C 094 399		
4	084	5		B	CK		S	1529	B V42 S		
4	086	7		MCW	0000	0176	3	1534	M 0+0 176		
4	088	1		MCW				1541	M		
4	090	8	CK	BWZ	AH	SWF	1	1542	V V58 199 1		
4	092	4		SW	SWF			1550	, 199		
4	094	4		B	CH			1554	B V72		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS	KWIC2
4	096	7	AM	MCW	FHLF	XR3		1558	M	814 099	
4	098	7		MCW	0000	0139		1565	M	0+0 139	
4	100	7	OM	MCW	0406	0115		1572	M	406 115	
4	110	1		P				1579			
4	120	8		BWZ	ST4	SWC	1	1580	V	W30 186 1	
4	130	7		A	CCN1	PCNT		1588	A	195 899	
4	140	8		B	GOES	PCNT -002	9	1595	B	W51 897 9	
4	150	8	NP1	BWZ	ENDS	SWE	1	1603	V	W81 198 1	
4	155	4		CS	0180			1611	/	180	
4	160	7		SW	0109	0117		1615	,	109 117	
4	170	4		SW	0141			1622	,	141	
4	190	4		B	NEXT			1626	B	U78	
5	080	7	ST4	A	CCN1	PCNT		1630	A	195 899	
5	090	8		B	NP2	0897	9	1637	E	W66 897 9	
5	100	2		SS			4	1645	K	4	
5	110	4		B	NP1			1647	B	W03	
5	130	4	GOES	SW	SWC			1651	,	186	
5	135	7		MCW	ZCS	PCNT		1655	M	803 899	
5	140	4		B	ST4			1662	B	W30	
5	150	4	NP2	CW	SWC			1666	I	186	
5	160	7		MCW	ZCS	PCNT		1670	M	803 899	
5	170	4		B	NP1			1677	E	W03	
5	180	4	ENDS	CW	SWE			1681	I	198	
5	182	4		CS	0799			1685	/	799	
5	184	1		CS				1689	/		
5	186	1		CS				1690	/		
5	188	1		CS				1691	/		
5	190	4		CS	0J8C			1692	/	180	
5	192	4		B	START			1696	B	*00	
6	010	3	F05	DCW	0083		405	0083			
6	020	3	S50	DCW	0086		750	0086			
6	030	3	XR1	DCW	0089		407	0089			
6	040	3	XR2	DCW	0094		750	0094			
6	050	3	XR3	DCW	0099		000	0099			
6	060	3	WRD	DCW	0185		000	0185			
6	070	3	CHAR	DCW	0189		000	0189			
6	080	2	CON10	DCW	0192		10	0192			
6	090	2	CON20	DCW	0194		20	0194			
6	100	1	CGN1	DCW	0195		1	0195			
6	105	1	CGN3	DCW	0182		3	0182			
6	110	1	CON9	DCW	0196		9	0196			
6	120	1	CNTR9	DCW	0197		0	0197			
6	130	1	SWE	DC	0198		E	0198			
6	140	1	SWF	DC	0199		F	0199			
6	150	3	ZCS	DCW	0803		000	0803			
6	160	3	CGN35	DCW	0806		035	0806			
6	170	3	RESET	DCW	0810		000	0810			
6	180	3	FHLF	DCW	0814		000	0814			
6	190	3	LHLF	DCW	0818		000	0818			
6	200	25		DCW	0844			0844			
7	010	32		DCW	0876			0876			
7	020	20		DCW	0896			0896			
7	030	3	PCNT	DCW	0899		000	0899			
7	035	1	SWC	DC	0186		C	0186			

GREETINGS FROM LES TURNER
 PHASE 2 IS COMPLETE-YOU DID WELL
 NOW, ON WITH THE SORT

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION	COMMENTS	KWIC2
7	040	2		DCW	1804		WE	1804			
7	050	2		DCW	1806		OF	1806			
7	060	2		DCW	1808		ME	1808			
7	070	2		DCW	1810		BE	1810			
7	080	2		DCW	1812		HE	1812			
7	090	2		DCW	1814		IF	1814			
7	100	2		DCW	1816		II	1816			
7	110	2		DCW	1818		UP	1818			
7	120	2		DCW	1820		TO	1820			
7	130	2		DCW	1822		SO	1822			
7	140	2		DCW	1824		NO	1824			
7	150	2		DCW	1826		OR	1826			
7	160	2		DCW	1828		ON	1828			
7	170	2		DCW	1830		AN	1830			
7	180	2		DCW	1832		DO	1832			
7	190	2		DCW	1834		IN	1834			
7	200	2		DCW	1836		US	1836			
8	010	2		DCW	1838		MY	1838			
8	020	2		DCW	1840		AS	1840			
8	030	2		DCW	1842		AT	1842			
8	040	2		DCW	1844		BY	1844			
8	050	2		DCW	1846		IS	1846			
8	060	2		DCW	1848		IT	1848			
8	070	1		DCW	1850		*	1850			
8	080	3		DCW	1853		THE	1853			
8	090	3		DCW	1856		SEE	1856			
8	100	3		DCW	1859		ONE	1859			
8	110	3		DCW	1862		OFF	1862			
8	120	3		DCW	1865		AND	1865			
8	130	3		DCW	1868		ARE	1868			
8	140	3		DCW	1871		DID	1871			
8	150	3		DCW	1874		DUE	1874			
8	160	3		DCW	1877		HAD	1877			
8	170	3		DCW	1880		III	1880			
8	180	3		DCW	1883		WHO	1883			
8	190	3		DCW	1886		TWO	1886			
8	200	3		DCW	1889		PER	1889			
9	010	3		DCW	1892		OWN	1892			
9	020	3		DCW	1895		CUR	1895			
9	030	3		DCW	1898		AGO	1898			
9	040	3		DCW	1901		ALL	1901			
9	050	3		DCW	1904		CAN	1904			
9	060	3		DCW	1907		FAR	1907			
9	070	3		DCW	1910		FOR	1910			
9	080	3		DCW	1913		HER	1913			
9	090	3		DCW	1916		HIM	1916			
9	100	3		DCW	1919		YET	1919			
9	110	3		DCW	1922		WHY	1922			
9	120	3		DCW	1925		WAY	1925			
9	130	3		DCW	1928		WAS	1928			
9	140	3		DCW	1931		NOW	1931			
9	150	3		DCW	1934		NOT	1934			
9	160	3		DCW	1937		NEW	1937			
9	170	3		DCW	1940		CUT	1940			

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION COMMENTS	KWIC2
9	180	3		DCW	1943		MAY	1943		
9	190	3		DCW	1946		LOW	1946		
9	200	3		DCW	1949		ANY	1949		
10	010	3		DCW	1952		BUT	1952		
10	020	3		DCW	1955		FEW	1955		
10	030	3		DCW	1958		GET	1958		
10	040	3		DCW	1961		HAS	1961		
10	050	3		DCW	1964		HIS	1964		
10	060	3		DCW	1967		HOW	1967		
10	070	3		DCW	1970		ITS	1970		
10	080	1		DCW	1973		*	1973		
10	090	4		DCW	1977		WITH	1977		
10	090	4		DCW	1977		WITH	1977		
10	100	4		DCW	1981		WERE	1981		
10	110	4		DCW	1985		USED	1985		
10	120	4		DCW	1989		TAKE	1989		
10	130	4		DCW	1993		SUCH	1993		
10	140	4		DCW	1997		SOME	1997		
10	150	4		DCW	2001		SAME	2001		
10	160	4		DCW	2005		SAID	2005		
10	170	4		DCW	2009		NOTE	2009		
10	180	4		DCW	2013		NONE	2013		
10	190	4		DCW	2017		NEED	2017		
10	200	4		DCW	2021		ONCE	2021		
11	010	4		DCW	2025		MUCH	2025		
11	020	4		DCW	2029		MORE	2029		
11	030	4		DCW	2033		MAKE	2033		
11	040	4		DCW	2037		MADE	2037		
11	050	4		DCW	2041		LONG	2041		
11	060	4		DCW	2045		LIKE	2045		
11	070	4		DCW	2049		ABLE	2049		
11	080	4		DCW	2053		BOTH	2053		
11	090	4		DCW	2057		CAME	2057		
11	100	4		DCW	2061		COME	2061		
11	110	4		DCW	2065		DATA	2065		
11	120	4		DCW	2069		EACH	2069		
11	130	4		DCW	2073		GAVE	2073		
11	140	4		DCW	2077		GIVE	2077		
11	150	4		DCW	2081		HAVE	2081		
11	160	4		DCW	2085		HERE	2085		
11	170	4		DCW	2089		HIGH	2089		
11	180	4		DCW	2093		WILL	2093		
11	190	4		DCW	2097		WHOM	2097		
11	200	4		DCW	2101		WHEN	2101		
12	010	4		DCW	2105		WELL	2105		
12	020	4		DCW	2109		UPON	2109		
12	030	4		DCW	2113		TOOK	2113		
12	040	4		DCW	2117		THEN	2117		
12	050	4		DCW	2121		THEN	2121		
12	060	4		DCW	2125		THAN	2125		
12	070	4		DCW	2129		SEEN	2129		
12	080	4		DCW	2133		SEEM	2133		
12	090	4		DCW	2137		OVER	2137		
12	100	4		DCW	2141		ALSO	2141		

PG	LN	CT	LABEL	OP	A OPERAND	B OPERAND	C	LOC	INSTRUCTION COMMENTS	KWIC2
12	110	4		DCW	2145			BACK	2145	
12	120	4		DCW	2145			BEEN	2145	
12	130	4		DCW	2153			DOWN	2153	
12	140	4		DCW	2157			EVEN	2157	
12	150	4		DCW	2161			FROM	2161	
12	160	4		DCW	2165			INTO	2165	
12	170	4		DCW	2169			WHAT	2169	
12	180	4		DCW	2173			WENT	2173	
12	190	4		DCW	2177			WAYS	2177	
12	200	4		DCW	2181			VERY	2181	
13	010	4		DCW	2185			THUS	2185	
13	020	4		DCW	2189			THIS	2189	
13	030	4		DCW	2193			THEY	2193	
13	040	4		DCW	2197			THAT	2197	
13	050	4		DCW	2201			SLOW	2201	
13	060	4		DCW	2205			SHOW	2205	
13	070	4		DCW	2209			NEXT	2209	
13	080	4		DCW	2213			MUST	2213	
13	090	4		DCW	2217			ONLY	2217	
13	100	4		DCW	2221			MOST	2221	
13	110	4		DCW	2225			MANY	2225	
13	120	4		DCW	2229			LEFT	2229	
13	130	4		DCW	2233			LAST	2233	
13	140	4		DCW	2237			JUST	2237	
13	150	4		DCW	2241			AWAY	2241	
13	160	4		DCW	2245			BEST	2245	
13	170	4		DCW	2249			CENT	2249	
13	180	4		DCW	2253			DOES	2253	
13	190	4		DCW	2257			EASY	2257	
13	200	4		DCW	2261			GCES	2261	
14	010	5		DCW	2265			*	2265	
14	020	5		DCW	2270			WOULD	2270	
14	030	5		DCW	2275			WHOSE	2275	
14	040	5		DCW	2280			WHOLE	2280	
14	050	5		DCW	2285			WHILE	2285	
14	060	5		DCW	2290			WHICH	2290	
14	070	5		DCW	2295			WHERE	2295	
14	080	5		DCW	2300			THREE	2300	
14	090	5		DCW	2305			THOSE	2305	
14	100	5		DCW	2310			THIRD	2310	
14	110	5		DCW	2315			THESE	2315	
14	120	5		DCW	2320			THERE	2320	
14	130	5		DCW	2325			SINCE	2325	
14	140	5		DCW	2330			LARGE	2330	
14	150	5		DCW	2335			ABOVE	2335	
14	160	5		DCW	2340			ALONG	2340	
14	170	5		DCW	2345			AMONG	2345	
14	180	5		DCW	2350			ARISE	2350	
14	190	5		DCW	2355			QUITE	2355	
14	200	5		DCW	2360			BEING	2360	
15	010	5		DCW	2365			COULD	2365	
15	020	5		DCW	2370			FOUND	2370	
15	030	5		DCW	2375			GOING	2375	
15	040	5		DCW	2380			UNTIL	2380	

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LCC	INSTRUCTION COMMENTS	KWIC2
15	050	5		DCW	2385		UNDER	2385		
15	060	5		DCW	2390		THEIR	2390		
15	070	5		DCW	2395		TAKEN	2395		
15	080	5		DCW	2400		STILL	2400		
15	090	5		DCW	2405		SMALL	2405		
15	100	5		DCW	2410		SHOWN	2410		
15	110	5		DCW	2415		OTHER	2415		
15	120	5		DCW	2420		OFTEN	2420		
15	130	5		DCW	2425		LATER	2425		
15	140	5		DCW	2430		AFTER	2430		
15	150	5		DCW	2435		AGAIN	2435		
15	160	5		DCW	2440		CHAIN	2440		
15	170	5		DCW	2445		GIVEN	2445		
15	180	5		DCW	2450		TIMES	2450		
15	190	5		DCW	2455		STUDY	2455		
15	200	5		DCW	2460		SHOWS	2460		
16	010	5		DCW	2465		SEEMS	2465		
16	020	5		DCW	2470		RULES	2470		
16	030	5		DCW	2475		RIGHT	2475		
16	040	5		DCW	2480		NEEDS	2480		
16	050	5		DCW	2485		MIGHT	2485		
16	060	5		DCW	2490		MEANS	2490		
16	070	5		DCW	2495		MAKES	2495		
16	080	5		DCW	2500		LEAST	2500		
16	090	5		DCW	2505		ABOUT	2505		
16	100	5		DCW	2510		BELOW	2510		
16	110	5		DCW	2515		EARLY	2515		
16	120	5		DCW	2520		EVERY	2520		
16	130	5		DCW	2525		FIRST	2525		
16	140	5		DCW	2530		GIANT	2530		
16	150	5		DCW	2535		GIVES	2535		
16	160	5		DCW	2540		GREAT	2540		
16	170	1		DCW	2545		*	2545		
16	180	6		DCW	2551		TOWARD	2551		
16	190	6		DCW	2557		TAKING	2557		
16	200	6		DCW	2563		SHOULD	2563		
17	010	6		DCW	2569		SECOND	2569		
17	020	6		DCW	2575		SEARCH	2575		
17	030	6		DCW	2581		NEEDED	2581		
17	040	6		DCW	2587		METHOD	2587		
17	050	6		DCW	2593		LITTLE	2593		
17	060	6		DCW	2599		AROUND	2599		
17	070	6		DCW	2605		BECAME	2605		
17	080	6		DCW	2611		BECOME	2611		
17	090	6		DCW	2617		BEFORE	2617		
17	100	6		DCW	2623		CALLED	2623		
17	110	6		DCW	2629		DOUBLE	2629		
17	120	6		DCW	2635		DURING	2635		
17	130	6		DCW	2641		ENOUGH	2641		
17	140	6		DCW	2647		FORMED	2647		
17	150	6		DCW	2653		INDEED	2653		
17	160	6		DCW	2659		ITSELF	2659		
17	170	6		DCW	2665		SYSTEM	2665		
17	180	6		DCW	2671		REMAIN	2671		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION COMMENTS	KWIC2
17	190	6		DCW	2677		RATHER	2677		
17	200	6		DCW	2683		APPEAR	2683		
18	010	6		DCW	2689		BETTER	2689		
18	020	6		DCW	2695		CENTER	2695		
18	030	6		DCW	2701		EITHER	2701		
18	040	6		DCW	2707		HAPPEN	2707		
18	050	6		DCW	2713		HIGHER	2713		
18	060	6		DCW	2719		THINGS	2719		
18	070	6		DCW	2725		THEORY	2725		
18	080	6		DCW	2731		SERVES	2731		
18	090	6		DCW	2737		REVIEW	2737		
18	100	6		DCW	2743		REPORT	2743		
18	110	6		DCW	2749		REALLY	2749		
18	120	6		DCW	2755		NEARLY	2755		
18	130	6		DCW	2761		NARROW	2761		
18	140	6		DCW	2767		PARTLY	2767		
18	150	6		DCW	2773		OTHERS	2773		
18	160	6		DCW	2779		MOMENT	2779		
18	170	6		DCW	2785		MERELY	2785		
18	180	6		DCW	2791		LIKELY	2791		
18	190	6		DCW	2797		ACROSS	2797		
18	200	6		DCW	2803		ALLOWS	2803		
19	010	6		DCW	2809		ALMOST	2809		
19	020	6		DCW	2815		CANNOT	2815		
19	030	6		DCW	2821		EASILY	2821		
19	040	6		DCW	2827		EFFECT	2827		
19	050	6		DCW	2833		IMPACT	2833		
19	060	1		DCW	2839			2839		
19	070	7		DCW	2846		THROUGH	2846		
19	080	7		DCW	2853		BECAUSE	2853		
19	090	7		DCW	2860		EXAMPLE	2860		
19	100	7		DCW	2867		HIMSELF	2867		
19	110	7		DCW	2874		INCLUDE	2874		
19	120	7		DCW	2881		INDUCED	2881		
19	130	7		DCW	2888		INSTEAD	2888		
19	140	7		DCW	2895		SPECIAL	2895		
19	150	7		DCW	2902		SEVERAL	2902		
19	160	7		DCW	2909		SECTION	2909		
19	170	7		DCW	2916		PROBLEM	2916		
19	180	7		DCW	2923		ANGULAR	2923		
19	190	7		DCW	2930		ANOTHER	2930		
19	200	7		DCW	2937		BETWEEN	2937		
20	010	7		DCW	2944		CERTAIN	2944		
20	020	7		DCW	2951		CONTROL	2951		
20	030	7		DCW	2958		EARLIER	2958		
20	040	7		DCW	2965		FURTHER	2965		
20	050	7		DCW	2972		GENERAL	2972		
20	060	7		DCW	2979		GREATER	2979		
20	070	7		DCW	2986		HOWEVER	2986		
20	080	7		DCW	2993		WITHOUT	2993		
20	090	7		DCW	3000		VARIOUS	3000		
20	100	7		DCW	3007		USUALLY	3007		
20	110	7		DCW	3014		THOUGHT	3014		
20	120	7		DCW	3021		SYSTEMS	3021		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LCC	INSTRUCTION COMMENTS	KWIC2
20	130	7		DCW	3028		STUDIES	3028		
20	140	7		DCW	3035		RESULTS	3035		
20	150	7		DCW	3042		READILY	3042		
20	160	7		DCW	3049		PRESENT	3049		
20	170	7		DCW	3056		PERHAPS	3056		
20	180	7		DCW	3063		LARGELY	3063		
20	190	7		DCW	3070		AGAINST	3070		
20	200	7		DCW	3077		ALREADY	3077		
21	010	7		DCW	3084		BESIDES	3084		
21	020	7		DCW	3091		BROUGHT	3091		
21	030	7		DCW	3098		CENTERS	3098		
21	040	7		DCW	3105		CHANGES	3105		
21	050	7		DCW	3112		CLEARLY	3112		
21	060	7		DCW	3119		EFFECTS	3119		
21	070	7		DCW	3126		FINALLY	3126		
21	080	1		DCW	3133		*	3133		
21	090	8		DCW	3141		THEMSELF	3141		
21	100	8		DCW	3149		SOMETIME	3149		
21	110	8		DCW	3157		RESEARCH	3157		
21	120	8		DCW	3165		PRODUCED	3165		
21	130	8		DCW	3173		POSSIBLE	3173		
21	140	8		DCW	3181		POSITIVE	3181		
21	150	8		DCW	3189		LIFETIME	3189		
21	160	8		DCW	3197		ALTHOUGH	3197		
21	170	8		DCW	3205		APPROACH	3205		
21	180	8		DCW	3213		COMPLETE	3213		
21	190	8		DCW	3221		EVIDENCE	3221		
21	200	8		DCW	3229		TOGETHER	3229		
22	010	8		DCW	3237		SOLUTION	3237		
22	020	8		DCW	3245		MOREOVER	3245		
22	030	8		DCW	3253		BEHAVIOR	3253		
22	040	8		DCW	3261		SECTIONS	3261		
22	050	8		DCW	3269		PROBLEMS	3269		
22	060	8		DCW	3277		APPARENT	3277		
22	070	8		DCW	3285		ELEMENTS	3285		
22	080	1		DCW	3293		*	3293		
22	090	9		DCW	3302		THEREFORE	3302		
22	100	9		DCW	3311		SOMETHING	3311		
22	110	9		DCW	3320		DEPENDING	3320		
22	120	9		DCW	3329		FOLLOWING	3329		
22	130	9		DCW	3338		INFLUENCE	3338		
22	140	9		DCW	3347		PRINCIPAL	3347		
22	150	9		DCW	3356		PRECISION	3356		
22	160	9		DCW	3365		POTENTIAL	3365		
22	170	9		DCW	3374		PROCESSES	3374		
22	180	9		DCW	3383		GENERALLY	3383		
22	190	1		DCW	3392		*	3392		
22	200	10		DCW	3402		ASSOCIATED	3402		
23	010	10		DCW	3412		PRODUCTION	3412		
23	020	10		DCW	3422		EVALUATION	3422		
23	030	10		DCW	3432		VARIATIONS	3432		
23	040	10		DCW	3442		POTENTIALS	3442		
23	050	10		DCW	3452		CONDITIONS	3452		
23	060	10		DCW	3462		ESPECIALLY	3462		

PG	LIN	CT	LABEL	CP	A OPERAND	B OPERAND	D	LCC	INSTRUCTION COMMENTS	KWIC2
23	070	10		DCW	3472		EVENTUALLY	3472		
23	080	10		DCW	3482		EXPERIMENT	3482		
23	090	1		DCW	3492		*	3492		
23	100	11		DCW	3503		VARIATIONAL	3503		
23	110	11		DCW	3514		DEVELOPMENT	3514		
23	120	11		DCW	3525		DISCREPANCY	3525		
23	130	1		DCW	3536		*	3536		
23	140	12		DCW	3548		EXPERIMENTAL	3548		
23	150	1		DCW	3560		*	3560		
23	160	13		DCW	3573		REEXAMINATION	3573		
23	170	13		DCW	3596		DEMONSTRATION	3596		
23	180	13		DCW	3609		DETERMINATION	3609		
23	190	13		DCW	3612		INVESTIGATION	3612		
23	200	1		DCW	3625		*	3625		
24	010	14		DCW	3639		CHARACTERISTIC	3639		
24	020	14		DCW	3653		INTERPRETATION	3653		
24	030	14		DCW	3667		CONFIGURATIONS	3667		
24	040	1		DCW	3681		*	3681		
24	050	15		DCW	3696		CHARACTERISTICS	3696		
24	060	1		DCW	3711		*	3711		
24	070	1		DCW	3712		A	3712		
24	080	1		DCW	3713		I	3713		
24	090	1		DCW	3714		*	3714		
26	010	3		DCW	C902		G12	0902		
26	020	3		DCW	C905		G14	0905		
26	030	3		DCW	C908		Y04	0908		
26	040	3		DCW	C911		Y50	0911		
26	050	3		DCW	C914		Y53	0914		
26	060	3		DCW	C917		Z73	0917		
26	070	3		DCW	C920		Z77	0920		
26	080	3		DCW	C923		K65	0923		
26	090	3		DCW	C926		K70	0926		
26	100	3		DCW	C929		N45	0929		
26	110	3		DCW	C932		N51	0932		
26	120	3		DCW	C935		C39	0935		
26	130	3		DCW	C938		Q46	0938		
26	140	3		DCW	C941		A33	0941		
26	150	3		DCW	C944		A41	0944		
26	160	3		DCW	C947		B93	0947		
26	170	3		DCW	C950		C02	0950		
26	180	3		DCW	C953		C92	0953		
26	190	3		DCW	C956		C02	0956		
26	200	3		DCW	C959		C92	0959		
27	010	3		DCW	C962		E03	0962		
27	020	3		DCW	C965		E36	0965		
27	030	3		DCW	C968		E48	0968		
27	040	3		DCW	C971		E60	0971		
27	050	3		DCW	C974		E73	0974		
27	060	3		DCW	C977		F25	0977		
27	070	3		DCW	C980		F39	0980		
27	080	3		DCW	C983		F81	0983		
27	090	3		DCW	C986		F96	0986		
27	100	3		DCW	C989		G11	0989		
27	110	3	TBL	DCW	C992		000	0992		

PG	LIN	CT	LABEL	OP	A OPERAND	B OPERAND	D	LOC	INSTRUCTION COMMENTS	KWIC2
27	120	3	F15	DCW	0995		015	0995		
27	130	3	TADDR	DCW	0998		896	0998		
27	140	3	CON140	DCW	0399		140	0399		
27	150	3	INCR	DCW	0393		000	0393		
27	160	3	CONST	DCW	0396		0+0	0396		
27	170	3	LOC	DCW	0390		000	0390		
30	010			END	START				/ #00 080	

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