



Systems Reference Library

IBM 1401 and 1460 Bibliography

This bibliography describes reference, educational, and supplemental literature available for installing, programming, and operating the IBM 1401 and 1460 Data Processing Systems. The *Tele-processing Bibliography*, Form A24-3089, lists the associated Tele-processing literature.

Part 1 of this publication lists publications by major subjects. This sequence (subject code) may be used in assembling a library.

Part 2 is a cross-index of publications by machine type number.

Part 3 contains the abstracts of the publications in form-number sequence.

Copies of most form-numbered publications can be ordered through the local IBM sales representative.

Systems Reference Library

For each major IBM data processing system, a Systems Reference Library (SRL) has been established to consolidate all basic reference literature necessary in planning, programming, installing and operating the system. An SRL Bibliography Supplement covers publications for IBM Teleprocessing equipment.

Bibliography

The bibliography lists applicable publications and related materials in subject code and machine type number sequence and provides a brief abstract of each publication. By reviewing these indexes and abstracts you may select those items of interest to your installation and keep abreast of other materials which may be useful at some future time.

File Numbers, Subject Codes

The cover page of each SRL bulletin shows the title, abstract, form number, and a file number for the document. The file number identifies the system or component discussed and the general subject area.

For publications associated with one or two Libraries, the prefix of the file number is the system type (e.g., 1401/1460-, 7080-). When the publication is included in more than two Libraries, the component type (e.g., 1311-, 7330-) is used, if applicable. In other cases "GENL" (general) is used.

The suffix of the file number is the subject code which designates a general subject area and the suggested filing sequence. Code 15, for example, is used for all publications related to physical planning specifications; code 33 appears on all publications related to IBM sort and merge programs for the system. Application program documentation appears under subject code 60.

Installation supplies such as coding forms and physical planning templates are listed under subject code 80. Other publications of general interest to a system user are listed under the headings "Supplementary Information," "Student Texts," and "Education Literature."

Fifth Edition (October 1967)

This is a major revision of, and obsoletes, A24-1495-3 and SRL Newsletter N20-1401-42. Significant changes and additions have been made throughout.

Requests for copies of this and other IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

This manual has been prepared by the IBM Systems Development Division, Product Publications, Dept. 171, P.O. Box 6, Endicott, N.Y. 13760. Address comments concerning the contents of this publication to this address.

Technical Newsletters

To keep publications current, additions and other modifications are distributed as Technical Newsletters (TNL). These are identified in the masthead with the file number and form number of the publication to which they apply. All previously issued TNL's are also listed so that you may verify receipt of all changes.

SRL Newsletter

A special SRL Newsletter is issued periodically (every four weeks if changes have occurred during that period) to update the Bibliography. All current publications are listed in subject code sequence showing form number and title of the publication as well as the form number of applicable Technical Newsletters. Obsolete publications are listed separately with new references indicated. Abstracts of new publications are also given.

The form number revision suffix is shown so that you may verify your publications as current. In some cases more than one edition of a publication is current, since a reprint incorporating previously distributed replacement pages is given a new suffix. When this occurs, all current editions and applicable Technical Newsletters are listed in the SRL Newsletter.

SRL Revision Service

A direct mail revision service is available to IBM system users to supply Technical Newsletters and major revisions of publications for a library. For details concerning subscription procedures, see your local IBM representative.

IBM Programming Systems

SRL Newsletters also show the current status of programming systems available for a system. Additional data, including ordering instructions, for these and application programs are included in the Catalog of Programs listed under subject code 20.

Part 1 — Library Subject Code Listing

This section of *Part I* lists the current IBM 1401 and 1460 marketing publications by subject code. To assist in filing, SRL publications have the subject code on the front cover as part of the file number. Most 1401 machine and programming publications are also applicable to the 1460.

Subject Code *Form Number*

1401 and 1460 System Reference Library

00

1401 and 1460 Bibliography	A24-1495
SRL Bibliography Supplement, Tele-Processing	A24-3089
1401 Systems Summary	A24-1401
1401G System Summary	A24-3165
1401H System Summary	A24-3476
1460 Systems Summary	A24-1496
1401 Configurator	A24-1491
1401 Model H Configurator	A24-3494
1401 Model G Configurator	A24-3164
1460 Systems Configurator	A24-1497

Machine System

01 Basic Reference Material

System Operation Reference Manual IBM 1401 and 1460	A24-3067
Miscellaneous Input/Output Instructions IBM 1401 and 1460	A24-3068
Tape Input/Output Instructions	A24-3069
Disk Storage Input/Output Instructions	A24-3070
1401 Data Processing System Operator's Guide	A24-3144
1401 and 1460 Instruction and Timing Summary	A24-6447
1401 Data Flow	G24-1477
Standard BCD Interchange Code	J22-6690

03 Input/Output

1011 Paper Tape Reader	A26-5754
1012 Tape Punch	A26-5776
1219 Reader Sorter, 1419 Magnetic Character Reader	A24-1499
1231 and 1232 Optical Mark Page Readers	A21-9012
1285 Optical Reader	A24-3256
1402 Card Read-Punch	A24-3072
1403 Printer	A24-3073
1403 and 1443 Printers Form Design Considerations	A24-3041
1404 Printer	A24-1446

<i>Subject Code</i>	<i>Form Number</i>
1412 Magnetic Character Reader Model 1	A24-1421
1418 Optical Character Reader, 1428 Alphameric Optical Reader	A24-1473
1418 Optical Character Reader Model 3; 1428 Alphameric Optical Reader Model 3	A24-3059
Print Quality Considerations 1418 and 1428	A24-1452
1443 Printer Models 1, 2, and N1; 1445 Printer Models 1 and N1	A24-3120
1447 Console	A24-3031
High-Speed Reader Sorter Operations Manual	C20-1607
 05 Magnetic Tape Units and Controls	
729 and 7330 Magnetic Tape Units Principles of Operation ..	A22-6589
7340 Hypertape Drive Model 2	A24-1470
 07 Disk Storage Units and Controls	
1301 Disk Storage Models 11, 12, 21, and 22	A24-3157
1301 and 1302 Disk Storage Sequential Data Organization ..	A22-6784
1311 Disk Storage Drive	A26-5991
1405 Disk Storage	A24-3085
IBM Disk Pack Handling and Operating Procedures	A26-5756
Disk Storage Concepts	F20-8161
 09 Tele-Processing Equipment	
1070 Process Communication System	A26-5989
1219 Reader Sorter Model 32; 1419 Magnetic Character Reader, Model 32 (World Trade Only)	A19-0004
 13 Special and Custom Features	
1232 and 534 Custom Features Descriptions	A21-9065
Batch Numbering Feature for 1241 and 1419 Magnetic Ink Character Recognition Readers	A24-3342
Special Features of IBM 1401 and 1460 Data Processing Systems	A24-3071
1301 Disk Storage Unit for 1401 Data Processing System RPQ 810099	L24-3186
1401 Data Processing System Paper Tape Reader Input, RPQ E95528 (1903 Model 2)	L24-1408
1401 Data Processing System Paper Tape Punch Output, RPQ E98337 (1902, Model 3)	L24-1429
Dual IBM 1403 Printer Output – RPQ E96450	L24-1465
Modified Character Sets for IBM 1403 Print Chains	L24-3102
1414 I/O Synchronizer RPQ 811225 (1401), RPQ E25693 (1440 and 1460)	L24-3294
Custom Features for IBM 1401, 1440, and 1460 Data Processing Systems	A24-3315
Mark Read Station (Slanted Mark) for 1418 and 1428	A24-3081
Endorser Special Feature for IBM Magnetic Character Readers (1412 and 1419)	A24-3036

Subject
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Form
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15 Physical Planning Specifications

1401 Installation Manual – Physical Planning	C24-1404
1460 Installation Manual – Physical Planning	A24-1493
7340 Hypertape Drive Model 2 for 1401/1410/1460 Systems–Physical Planning Specifications	C22-6674

19 Original Equipment Manufacturers' Information

729, II, IV, V, and VI Magnetic Tape Units	A22-6643
1231 Optical Mark Page Reader	A21-9020
1311 Disk Storage Drive	A26-5713
1401 Processing Unit	A24-1424
1402 Card Read-Punch	A31-1400
1403 Printer	A24-1431
1404 Printer Model 2	A24-3356
1447 Console Model 3	A24-3169
1460 Processing Unit	A24-3199
7330 Magnetic Tape Unit	A22-6619

Programming Systems

20 General Programming Material

Catalog of Programs for 1401, 1420, 1440, and 1460 Data Processing Systems	C20-1601
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21 Symbolic Assembly Systems

Symbolic Programming Systems	C24-1480
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22 Autocoder

Autocoder (on Tape) Language Specifications and Operating Procedures IBM 1401 and 1460	C24-3319
Autocoder (on Disk) Language Specifications 1401, 1440, and 1460	C24-3258
Autocoder (on Disk) Program Specifications and Operating Procedures 1401, 1440, and 1460	C24-3259
Basic Autocoder 2K Operating Procedures 1401	C24-3262
Basic Autocoder 2K for 1401: Specifications	C24-3170

24 Cobol

Cobol	F28-8053
Cobol 4K: Specifications	C24-1492
Cobol (on Disk) Specifications, 1401, 1440, and 1460	C24-3235
Cobol (on Disk) Operating Procedures 1401, 1440, and 1460	C24-3242
Cobol (on Tape) Operating Procedures, 1401	C24-3146

25 Fortran

Fortran	F28-8074
Fortran IV Language Specifications, Program Specifications, and Operating Procedures: IBM 1401, 1440, and 1460	C24-3322
Fortran Specifications and Operating Procedures: IBM 1401 ..	C24-1455

<i>Subject Code</i>	<i>Form Number</i>
28	Report Program Generator
2K Report Program Generator Specifications	C24-3209
Report Program Generator, on Disk, Specifications 1401, 1440, and 1460	C24-3261
Basic 4K Report Program Generator Specifications	C24-3166
2K Report Program Generator Operating Procedures	C24-3263
Basic 4K Operating Procedures, 1401 and 1460	C24-3267
Report Program Generator (on Disk) Operating Procedures: IBM 1401 and 1460	C24-3334
1401 Card and Tape Systems	J24-0215
Fargo	C24-1464
RAMAC® 1401 Systems: Preliminary Specifications	J24-1467
30	Input/Output Control System
1401-1419 Expanded Codeline Input/Output Control Program (World Trade Only)	A19-0009
1401 Input/Output Control System	C24-1462
Input/Output Control System for 1401-1311: Specifications ..	C24-1489
Direct Data Channel IOCS for 1401, 1440, and 1460: Specifications	C24-3025
IOCS Specifications 1460-1448: Specifications	C24-3047
Communications IOCS for 1401 and 1460 Operating Procedures	C24-3174
Input/Output Control Program Specifications 1401, 1440, and 1460 with 1285 Optical Reader	C24-3237
Communications IOCS Specifications 1401, 1440, and 1460 with 1026 and Direct Data Channel	C24-3241
Input/Output Control System (on Disk) Operating Procedures 1401 and 1460	C24-3298
On-Line Testing: IBM 1401, 1440, and 1460	C24-3341
32	Utility Programs
1401 Equipped with the 7710 Data Communication Unit	C22-6777
1401 Hypertape Utility Programs: Preliminary Specifications	C24-1439
Disk Utility Programs for 1401-1311 Specifications	C24-1484
Disk Utility Programs for 1401-1311: Operating Procedures	C24-3105
1401 Hypertape Utility Programs Operating Procedures	C24-3132
Tape Utility Programs with 120-Character Label Capability for 1401 and 1460: Specifications and Operating Procedures	C24-3156
Data Communications Utility Programs for 1009 Specifications	C24-3191
Multiple Tape Utility Program (Incorporating 120-Character Labels) Specifications and Operating Procedures: IBM 1401 and 1460	C24-3273
Programs for 1401 Card Systems Specifications	J24-0209
Utility Programs for 1401 Tape Systems: Specifications	J24-1411
1405 Disk Storage: Utility Programs	J24-1426
Multiply Utility Programs for 1401 Tape Systems: Specifications	J24-1423

1401-1009 Utility Program: Preliminary Specifications	J24-1463
1401-1012 Tape Punch Routines	J24-1485

33 Sort-Merge

Sort 6, 61, 62, 63, 64 for 1404/1460-1311:	
Specifications and Operating Procedures	C24-1420
Comparison of Sort 7 Timing: 1401 and 1460	C24-1456
Comparison of Sort 2—Version 2 Timing for 1401 and 1460	C24-3038
Merge 6 Specifications 1401 and 1460	C24-3053
Sort 3 for 1401: Preliminary Specifications	C24-3057
Sort 4 for 1401: Specifications	C24-3060
Sort 3 for 1401: Operating Procedures	C24-3077
Sort 4 for 1401: Operating Procedures	C24-3087
Sort 14 — Specifications IBM 1460	C24-3279
Sort 14 Operating Procedures	C24-3289
Sort 13 and Sort 14 Timing Program Specifications and Operating Procedures IBM 1401 and 1460	C24-3311
Sort 7 Specifications and Operating Procedures: IBM 1401 and 1460	C24-3317
Merge 7 Specifications and Operating Procedures: IBM 1401 and 1460	C24-3324
IBM 1401/1460 Timing Program for IBM System/360 Basic Programming Support Sort/Merge Program (8K Tape)	C24-3345
1401/1460 Timing Program for IBM Basic Operating System/360 Sort/Merge Program (8k Disk)	C24-3377
1401/1460 Timing Program for IBM Basic Operating System/360 Tape Sort/Merge Program (16k)	C24-3439
1401/1460 Timing Program for IBM Basic Operating System/360 Disk Sort/Merge Program (16k)	C24-3445
1401 Sort 1 Specifications	J24-1422

34 Disk Storage File Organization

Routines Specifications 1401-1405	C24-1451
Routines for 1401-1311: Operating Procedures	C24-3128
Routines Specifications 1401, 1440, and 1460 (1311 and 1301)	C24-3185

36 Supervisor Monitor

1440/1460-1070 Process Communication Monitor Specifications	C24-5859
1440/1460-1070 Process Communication Monitor Operating Procedures	C24-5986

37 Automatic Testing Program

Autotest for 1401 and 1460 with 1311: Specifications and Operating Procedures	C24-3195
Autotest for the 1401 Data Processing System	F20-0234

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48 Miscellaneous Programs

Programming for 1418 and 1428 Optical Readers	C24-1091
Standard Labeling Procedure for the 1311 Disk Storage Drive	C24-3012
IBM 1401 or 1440 Operating System Computer Assisted Instruction	C24-3253
1401/1440/1460-1026 and 1440-1448 Operating Systems Computer Assisted Instruction Author and Proctor Manual	C24-3384
1440-1448 Operating System Computer Assisted Instruction Student Manual	C24-3385
7750 Assembly Program Using the 1401	C28-6259
7740 Assembly Program Using the 1401 (1401-SP-156)	C28-8148
1401 Peripheral Integrated Processing System for Use with 7000 Series Data Processing Systems	J28-0238
7000/1400 Output Editing System	J28-6173

Installation Supplies

These aids in planning and operating an IBM 1401 system do not have subject code (80) printed on the form. These installation supplies are arranged in this section as they relate to the subject code listing in Part I.

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Code*

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Number*

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Basic Machine Reference Material (01)

Proportional Record Layout and Format Forms	X20-1702
1447 Console Status Sheet IBM 1440, 1460	X24-3100
1401, 1410, 1440, 1460 Storage Layout	X24-6438
1401 Console Sheet	X24-6587
1401 Setup Sheet	X24-6588
1401, 1440, 1460 Address Translation Card	X28-0314

Input/Output (03)

1230, 1231, 1232 Spacing Chart (Test Scoring) 5 Words per Inch	X20-8040
1230, 1231, 1232 Spacing Chart (Test Scoring) 4 Words per Inch	X20-8041
1230, 1231, 1232 Spacing Chart (Test Scoring) 3 Words per Inch	X20-8042
1230, 1231, 1232 Spacing Chart (Non-Test Scoring) 5 Words per Inch	X20-8043
1230, 1231, 1232 Spacing Chart (Non-Test Scoring) 4 Words per Inch	X20-8044
1230, 1231, 1232 Spacing Chart (Non-Test Scoring) 3 Words per Inch	X20-8045
1230, 1231, 1232 Document Marking Instructions (Reference Card)	X21-9021
1418/1428 Optical Readers Document Design and PDS Timing Chart	X24-3039
407, 408, 409, 1403, 1404, 1443, and 2203 Printer Spacing Chart (6 Lines per Inch)	X24-3115
407, 408, 409, 1403, 1404, 1443, and 2203 Printer Spacing Chart (6 Lines per Inch)	X24-6436
1011 Paper Tape Reader – Control Panel Diagram	X24-6518
407, 408, 409, 1403, 1404, 1443, and 2203 Printer Spacing Chart (8 Lines per Inch)	X24-1527
1445 Printer Spacing Chart	X24-3448

Physical Planning (15)

1460 Physical Planning Template	X24-3140
1401 Physical Planning Template	X24-6482

General Programming Material (20)

Installation and Scheduling Control Form	X20-8011
AUTOCHART Flowchart Work Sheet	X20-8021
1401, 1440, 1460 Program Chart	X24-6437
1401 Timing Estimate Sheet	X24-6562

Symbolic Assembly Systems (21)

1401 Symbolic Programming System Coding Sheet	X24-1152
7750 Assembly Program Sheet	X28-1625

Autocoder (22)

1401, 1410, and 1440 Autocoder Coding Sheet	X24-1350
1401, 1410, 1440 Library Coding Form	X24-6568

Cobol (24)

Cobol Program Sheet	X28-1464
Cobol Reference Card	X28-1520

Fortran (25)

Fortran Coding Form	X28-7327
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Report Program Generator (28)

1401 and 1410 Report Program Generator, Input Specifications	X24-1336
1401 and 1410 Report Program Generator, Data Specifications	X24-1337
1401 and 1410 Report Program Generator, Calculation Specifications	X24-1338
1401 and 1410 Report Program Generator, Format Specifications	X24-1339
1401 RPG, Program Reference Card	X24-1709
Fargo Report Specifications, Phases 4 and 1	X24-6556
Fargo Report Specifications, Phase 1	X24-6557
Fargo Report Specifications, Phase 2	X24-6558
Fargo Report Specifications, Phase 3	X24-6559
Report Program Generator: Data Specifications, 1401, 1440, 1460	X24-6591

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Sort-Merge (33)

Control Card Formats for Sort 2, Merge 2, Sort 4,
Sort 7, and Merge 7 with 1401 and 1460 X24-3245

Miscellaneous Programs (48)

Coursewriter Instruction Sheet X24-3336

1401 Autotest Autocoder Control Card and

Patch Coding Sheet X28-1585

1401 Autotest Tape and RAMAC File Generation

Data Sheet X28-1586

Decision Logic Coding Form X20-8024

Education Materials

This section lists publications and materials that are used in educational programs for the IBM 1401 and 1460. See abstract for description and availability.

<i>Subject Code</i>	<i>Form Number</i>
90	
1401 Programmer's Guide	C24-1494
From Control Panel to Stored Program	F20-0208
Bibliography of Data Processing Techniques	F20-8172
1401 Basic Programming Course Description	R20-9000
1401 Accelerated Basic Programming Course Description ...	R20-9001
1401 Course Description	R20-9010
1401 Course Description	R20-9011
1401 Fargo Course Description	R20-9012
1401 System Planning Course Description	R20-9013
1401 Advanced Training Course Description	R20-9029
1401 Autotest Course Description	R20-9030
1401 Installation Planning Course Description	R20-9031
1401 Programming System Course Description	R20-9032
1401 RPG Course Description	R20-9033
1401-1311 Course Description	R20-9034
SPS Programmed Instruction Course Description	R20-9054
1401 SPS Basic Programming, Autocoder, Course Description	R20-9055

99 **Supplementary Information**

Planning for an IBM 1401 Data Processing System	F20-0228
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Part 2 — Machine Index

This part of the *IBM 1401 and 1460 Bibliography* cross-indexes reference material on specific system components with machine type number or feature name. The *IBM 1401 Systems Summary* (A24-1401), *IBM 1401G Systems Summary* (A24-3165), *IBM 1401H Systems Summary* (A24-3476), and *IBM 1460 Systems Summary* (A24-1496), which contain summaries of machine units, are not included in this index. Consult the *IBM 1401 Configurators* (A24-1491, A24-3164, A24-3494), and *IBM 1460 Configurator* (A24-1497) for the type number of each machine unit and the name of a special feature.

<i>Machine</i>		<i>Subject Code</i>	<i>Form Number</i>
729	Magnetic Tape Unit	01	A24-3069
		05	A22-6589
		15	A24-1493
		15	C24-1404
		19	A22-6643
1011	Paper Tape Reader	01	A24-3069
		03	A26-5754
		15	C24-1404
1012	Tape Punch	01	A24-3069
		03	A26-5776
		15	C24-1404
1231 and 1232	Optical Mark Page Readers	01	A24-3068
		03	A21-9012
		13	A21-9065
1285	Optical Reader	01	A24-3068
		03	A24-3256
1301	Disk Storage Models 11, 12, 21, and 22	01	A24-3070
		07	A24-3157
		13	L24-3186
		15	A24-1493
1311	Disk Storage Drive	01	A24-3070
		07	A26-5991
		15	A24-1493
		19	A26-5713

<i>Machine</i>	<i>Subject Code</i>	<i>Form Number</i>
1401 Processing Unit	01	A24-3067
	01	A24-3144
	01	A24-6447
	01	G24-1477
	13	A24-3315
	13	L24-1408
	13	L24-1429
	13	L24-1454
	19	A24-1424
1402 Card Read-Punch	01	A24-3067
	13	A24-3071
	13	L24-1454
	15	A24-1493
	15	C24-1404
	19	A31-1400
1403 Printer	01	A24-3067
	03	A24-3041
	03	A24-3073
	13	A24-3071
	13	L24-1465
	13	L24-3102
	15	A24-1493
	15	C24-1404
	19	A24-1431
1404 Printer Model 2	01	A24-3067
	01	A24-3068
	03	A24-1446
	15	C24-1404
	19	A24-3356
1405 Disk Storage Unit Models 1 and 2	01	A24-3070
	07	A24-3085
	15	C24-1404
1406 Storage Unit Models 1, 2, and 3	01	A24-3068
	15	C24-1404
1407 Console Inquiry Station Model 1	01	A24-3068
	15	C24-1404
1412 Magnetic Character Reader Model 1	01	A24-3068
	03	A24-1421
	13	A24-3036
	15	C24-1404
1414 I/O Synchronizer	13	L24-3294

<i>Machine</i>		<i>Subject Code</i>	<i>Form Number</i>
1418	Optical Character Reader Model 1, 2, or 3	01	A24-3068
		03	A24-1452
		03	A24-1473
		03	A24-3059
		13	A24-3081
		15	C24-1404
1419	Magnetic Character Reader	01	A24-3068
		03	A24-1499
		03	C20-1607
		13	A24-3036
		13	A24-3342
		15	C24-1404
1428	Alphanumeric Optical Reader	01	A24-3068
		03	A24-1452
		03	A24-1473
		03	A24-3059
		13	A24-3081
		15	C24-1404
1441	Processing Unit Model B	01	A24-3067
		13	A24-3315
		15	A24-1493
1445	Printer Models 1 and N1	01	A24-3068
		03	A24-3120
		15	A24-1493
		15	C24-1404
1447	Console	01	A24-3067
		03	A24-3031
		13	A24-3071
		15	C24-1404
	Models 1 and 2	15	A24-1493
	Model 3 OEMI	19	A24-3169
1460	Processing Unit	01	A24-3067
		01	A24-6447
		13	A24-3315
		15	A24-1493
		19	A24-3199
1461	Input/Output Control Models 1, 2, and 3	01	A24-3067
		15	A24-1493
1462	Printer Control Unit	01	A24-3067
		03	A24-3033
		15	A24-1493

<i>Machine</i>		<i>Subject Code</i>	<i>Form Number</i>
1902	Paper Tape Punch Model 3	13	L24-1429
1903	Paper Tape Reader Model 2	13	L24-1408
7010	1401 Compatibility Feature for 7010 DPS	13	A22-6721
7330	Magnetic Tape Unit Model 1	01	A24-3069
		05	A22-6589
		15	A24-1493
		15	C24-1404
		19	A22-6619
7340	Hypertape Drive Model 2	01	A24-3069
		05	A24-1470
		15	A24-1493
		15	C22-6674
		15	C24-1404
7740	I/O Instructions for 7740 Communication Control System and 1401, 1440, 1460	01	A24-3068
7770	Audio Response Unit	01	A24-3068

This part lists the abstracts for the IBM 1401 and 1460 publications and material by form number. In addition to presenting a brief description of an item, an abstract also gives, where applicable, the type of publication and the number of pages.

A19-0004 IBM 1219 Reader-Sorter, Model 32 09
IBM 1419 Magnetic Character
Reader, Model 32
(For World Trade Use Only)

Contains detailed information about the keys, lights, switches, mechanical features, and special features of the IBM 1219 Reader Sorter, Model 32 and the IBM 1419 Magnetic Character Reader, Model 32.

On-line and off-line data-flow and operating theory are fully discussed, with step-by-step procedures for each reader operation. Programming notes and error-correction routines are also covered in detail. (In the areas of on-line operation, error-recovery, and programming notes, this manual refers to the 1401 attachment only.)

For additional information readers are referred to the following publications: *IBM 1401/1460 Miscellaneous Input/Output Instructions*, Form A24-3068; and *IBM 1419 Magnetic Character Reader with IBM 1410 System*, Form A22-0536. For information concerning the attachment of the IBM 1219/1419, Model 32 to the IBM System/360 Models 30 or 40, readers are referred to *IBM 1419, Model 32 Attached to IBM System/360 Model 30 or 40*, Form A19-0023-0. (SRL—56 pages.)

A19-0009 IBM 1401-1419 Expanded Codeline 30
Input/Output Control Program
(For World Trade Use Only)

Describes the Input/Output Control Program for the IBM 1419 Magnetic Character Reader with Expanded Codeline Feature used online with the IBM 1401 Data Processing System equipped with the Process Overlap Special Feature.

It includes machine requirements, descriptions of the IOCP routines and the user's program, and operating procedures.

This publication should be read in conjunction with

IBM 1219 Reader Sorter, Model 32, IBM 1419 Magnetic Character Reader, Model 32, Form A19-0004.

A knowledge of IBM 1401 Autocoder can be obtained from *Autocoder on Tape Specifications*, Form C24-1434.

A21-9012 IBM 1231 and 1232 Optical 03
Mark Page Readers

Describes the functions, controls, principles of operation, data flow, and programming for the IBM 1231 and 1232 Optical Mark Page Readers. Special features available are explained. Also included is a section on the IBM 534 Model 3 Card Punch. (SRL—28 pages)

A21-9020 1231 Optical Mark Page Reader 19
Original Equipment Manufacturers'
Information

Contains information that will assist non-IBM engineers who plan to attach the IBM 1231 Optical Mark Page Reader to their equipment. It includes a general description of machine functions, a reference listing of publications and engineering documents, and information concerning machine interface not readily available in other publications. (Reference Manual—12 pages)

A21-9065 IBM 1232 and 534 13
Custom Features Descriptions

Describes the effects of eight RPQ (Request for Price Quotation) features on the operations of the IBM 1232 Optical Mark Page Reader and the IBM 534 Card Punch Model 3. To use this publication effectively, the reader must be familiar with the standard operations of these two machines, as described in the SRL manual, *IBM 1231, 1232 Optical Mark Page Readers*, Form A21-9012.

The eight RPQ features described in this publication are: #842023 — Punching Sequence and Code Modification; #F13918 — 1232 Alphabetic Feature; #841-95 — 534 Alphabetic Coding Device; #F15067 — Blank Character Select; #F15704 — Units-Position Overpunching (Numeric Machines); #W18417 — Units-Position

sition Overpunching (Alphabetic Machines); #842042 — 534 Print Feature; #842024 — Printer Output Protection.

A22-6589 729, 7330, and 727 Magnetic 05
Tape Units Principles of Operation

This reference publication is a comprehensive reference manual on the use of IBM 727, 729 II, IV, V, VI, and 7330 Magnetic Tape Units. It includes principles of writing and reading coded data on magnetic tape, tape unit load and unload procedures, operating keys and lights, tape handling, organizing tape records, and reels, tape labeling and tape library records, tape error recovery procedures, and associated equipment. (SRL—44 pages)

A22-6619 7330 Magnetic Tape Unit 19
Original Equipment
Manufacturers' Information

Gives specifications for attaching a control unit to the IBM 7330 Magnetic Tape Unit. (Reference Manual—12 pages)

A22-6643 729 II, IV, V and VI Magnetic 19
Tape Units
Original Equipment
Manufacturers' Information

Includes information and specifications for use by a manufacturer of original equipment to be attached to 729 II, IV, V and VI Magnetic Tape Units. (Reference Manual—40 pages)

A22-6784 IBM 1301 and 1302 Disk Storage 07
Sequential Data Organization

Describes a way of storing and retrieving data on IBM 1301 and 1302 Disk Storage that is largely independent of the characteristics of the application. The method will enable most users to install and operate disk storage efficiently, with minimum detailed study of the data. A common set of programs and techniques can be used for all data files in disk storage. The approach allows data to be loaded in the most useful sequence, yet allows for random or sequential access to the records. As the data file is loaded, an index is created that associates data identifiers with actual track addresses and permits expansion by an easily used overflow technique. Conversion is accomplished in an orderly and efficient transition from data handling methods presently in use. (SRL—27 pages)

A24-1401 1401 Systems Summary 00

Contains brief descriptions of the machine features, components, configurations, and special features. Included is a section on programs and programming systems. (SRL—52 pages)

A24-1421 1412 Magnetic Character Reader 03
Model 1

Describes the features and functions of the IBM 1412 Magnetic Character Reader, Model 1. Explains in detail its operating principles, including document feeding, reading, and distribution, as well as control of both on-line and off-line operations. Sections on operating procedures, 1401-1412 stored program instructions, and programming notes are included.

Explains the use and operation of four special features: multiple-column-select — sort-suppress feature, auxiliary-document-counter, self-checking number verification, and electronic-accumulator and sequence-checking feature. (Reference Manual—56 pages)

A24-1424 1401 Processing Unit 19
Original Equipment
Manufacturers' Information

Provides sufficient data to satisfy the special needs of those who wish to attach their equipment to the IBM 1401 Processing Unit. It contains supplemental tie-in data not readily available in other IBM publications. Charts of cable layouts, connector receptacles, and power-plug pin assignments are included. (Reference Manual—28 pages)

A24-1431 Original Equipment Manufacturers' 19
Information — IBM 1403 Printers

This reference manual contains information that will assist non-IBM engineers to attach their equipment to the IBM 1403 Printers. It contains a general description of machine functions, a reference listing of publications and engineering documents, and information concerning machine interface not readily available in other publications. For titles and abstracts of associated publications, see the *IBM System/360 Bibliography*, Form A22-6822.

A24-1446 1404 Printer 03

Describes the features, functional characteristics and operations of the IBM 1404 Printer, including sections

on card feeding, printing, tape-control carriage operation, and the read-compare special feature. Discusses and illustrates 1404 instructions, and contains charts covering timing details. (SRL—24 pages)

A24-1452 Print Quality Considerations 03
IBM 1418 and IBM 1428

Contains a detailed description of the print quality requirements of printing to be read by the IBM 1418 Optical Character Reader and the IBM 1428 Alphameric Optical Reader, and to be used as input to an IBM 1401 or IBM 1460 Data Processing System. The use of print-quality measuring devices is fully explained with examples of the range of acceptable printing produced by the IBM 407 Accounting Machine, IBM 1403 Printer, IBM SELECTRIC® Typewriter and IBM Electric Typewriter. (SRL—41 pages)

A24-1470 7340 Hypertape Drive, Model 2 05

Describes the attachment of the 7340, Model 2, to the 1401 and 1460. Because the hypertape drive can pack two consecutive numeric characters on tape as one 8-bit character, the speed of the hypertape drive ranges from 34,000 to 68,000 characters a second. As many as four hypertape drives can be connected to a 1401 or 1460 through the IBM 7641 Hypertape Control Unit and the serial I/O adapter feature. IBM 729 and 7330 Magnetic Tape Units can be connected to the same system for off-line conversion of existing tape libraries to hypertape for large-scale system use. (SRL—20 pages)

A24-1473 1418 Optical Character Reader, 03
1428 Alphameric Optical Reader

Describes the operation of the 1418 and the 1428 as input devices to the 1401. Included are a description of character- and mark-reading capabilities, off-line sorting, document-design requirements, and examples of the range of acceptable print quality on the documents to be scanned. The use of the IBM 1418 and 1428 Document Design and PDS Timing Chart and the formulas for calculating document output and maximum character reading per document are also fully discussed as an aid in optimizing the design of documents to be read. (SRL—44 pages)

A24-1491 1401 Configurator 00

Presents a schematic representation of the units that can make up an IBM 1401 Data Processing System.

Shows the features required to attach these units and the models and special features available for each unit. (SRL—2 pages)

A24-1493 1460 Data Processing System 15
Installation Manual — Physical
Planning

Contains information needed for physical installation of a 1460 system: physical characteristics; service clearances; cable, electrical power, and environmental requirements. (SRL—12 pages)

A24-1495 1401/1460 Bibliography 00

(See front cover)

A24-1496 1460 Systems Summary 00

Contains brief descriptions of the machine features, components, configurations, and special features. Also included is a section on programming systems, and the programming publications available for the 1460 system. (SRL—24 pages)

A24-1497 1460 System Configurator 00

Presents a schematic representation of the units that can make up an IBM 1460 Data Processing System. Shows the features required to attach these units and the models and special features available for each unit. (SRL—2 pages)

A24-1499 IBM 1219 Reader Sorter 03
IBM 1419 Magnetic Character
Reader

This publication contains detailed information about the keys, lights, switches, mechanical features, and special features of the IBM 1219 Reader Sorter and IBM 1419 Magnetic Character Reader. On-line and off-line data flow and operating theory are fully discussed with step-by-step procedures for each reader operation. Programming notes and error-correction routines are also covered in detail. (SRL—64 pages)

A24-3031 1447 Console 03

Contains a detailed description of all models of the IBM 1447 Console, with sections describing the applicable keys, dials, switches, and indicator lights. It also

contains information on the console I/O printer. The required and available special features (including IBM 1050 components) are also described. (SRL—32 pages)

A24-3036 Endorser Special Feature for 13
IBM Magnetic Character Readers

Describes the features, functions, operating procedures for the endorser, special features for the IBM 1210 and 1219 Reader-Sorters and IBM 1412 and 1419 Magnetic Character Readers. Also includes endorser plate specifications. (SRL—12 pages)

A24-3041 IBM 1403 and 1443 Printers 03
Form Design Considerations

Contains information on forms design and considerations for handling forms used with the IBM 1403 and 1443 Printers. (SRL—16 pages)

A24-3059 1418 Optical Character Reader 03
Model 3; Alphameric Optical
Reader Model 3

Describes the expanded document feeding and handling capabilities of the 1418 and 1428 Model 3. Because the Model 3 is similar in appearance and operation to the Model 1, only the differences are described in this publication. These differences are document dimensions, types of paper, short-feed switch, document design, stackers, and picker-arm weight adjustment. (SRL—4 pages)

A24-3067 System Operation Reference Manual 01
IBM 1401 Data Processing System
IBM 1460 Data Processing System

This reference publication contains the introduction and basic instruction set for the IBM 1401 and IBM 1460. The operation code for each instruction is given in actual and mnemonic form, with examples of each. The formula for calculating the execution time of each instruction is also included.

In addition, this manual presents the instructions and applicable timings for the IBM 1402, 1403, 1406, and 1447.

This manual is the first of five reference manuals providing the complete instruction set for the IBM 1401 and 1460. The other four manuals are:

- Miscellaneous Input/Output Instructions (A24-3068)
- Tape Input/Output Instructions (A24-3069)
- Disk Input/Output Instructions (A24-3070)
- Special Feature Instructions (A24-3071)

To accommodate a particular system configuration, any combination of these five manuals can be placed in a single binder for the user's convenience. (SRL—74 pages)

A24-3068 Miscellaneous Input/Output 01
Instructions
IBM 1401 Data Processing System
IBM 1460 Data Processing System

This publication contains a description of the instructions used by the IBM 1401 or 1460 to operate these miscellaneous input/output units:

- IBM 1009 Data Transmission Unit
- IBM 1404 Printer
- IBM 1407 Console Inquiry Station
- IBM 1418 Optical Character Reader
- IBM 1428 Alphameric Optical Reader
- IBM 1412 Magnetic Character Reader
- IBM 1419 Magnetic Character Reader
- IBM 1448 Transmission Control Unit
- IBM 1026 Transmission Control Unit
- IBM 1231 Optical Mark Page Reader
- IBM 1285 Optical Reader
- IBM 1445 Printer
- IBM 7740 Communication Control System
- IBM 7770 Audio Response Unit Model 1

Timing information is included for each unit attached to an IBM 1401 or 1460 Data Processing System. (SRL—78 pages)

A24-3069 Tape Input/Output Instructions 01

Contains a description of the instructions used by the data processing system to operate these attached tape units: 729, 1011, 1012, 7330, and 7340. Timing information is included for each I/O device described. (SRL—30 pages)

A24-3070 Disk Storage Input/Output 01
Instructions

Contains a description of the instructions used by the data processing system to operate the disk-storage units attached to it.

The instructions for the following disk storage units are included in this publication:

- IBM 1405 Disk Storage
- IBM 1311 Disk Storage Drive
- IBM 1301 Disk Storage

Timing information is also included on each disk-storage unit. (SRL—46 pages)

A24-3071 Special Features of IBM 1401 and 1460 Data Processing Systems 13

The special features described here are available for the 1401 and/or 1460. Each feature is described and identified for the system to which it can be applied. These features offer additional flexibility in applications where special processing requirements exist. Also included are the instructions for the special features on the IBM 1402, 1403, 1447, and 1009 when these units are used with the IBM 1401 or 1460 Data Processing System. (SRL-72 pages)

A24-3072 1402 Card Read-Punch 03

Presents information about the operator controls, operating procedures, and special features for the IBM 1402 Models 1, 2, 3, 4, 5, and N1. For programming information and detailed descriptions of the operation of the 1402 with other components of a data processing system, refer to the appropriate Systems Reference Library Bibliography.

A24-3073 1403 Printer 03

Describes the various models of the 1403 and presents the functional and operating characteristics of the printer. Included are special features and timing information and paper movement. (SRL-24 pages)

A24-3081 Mark Read Station (Slanted Mark) for 1418 and 1428 13

Describes the mark read station (slanted mark) for the IBM 1418 Optical Character Reader and the IBM 1428 Alphameric Optical Reader. A detailed description of these functional specifications is included: document specifications, document format, document corner cuts, document feeding. (SRL-8 pages)

A24-3085 1405 Disk Storage

Describes the operation of the IBM 1405 Disk Storage with the IBM 1401 Data Processing System. The functional and operating characteristics of the disk storage unit are described as are the special features and timings. (SRL-8 pages)

A24-3120 IBM 1443 Printer Models 1, 2, and N1 03
IBM 1445 Printer Models 1 and N1

Describes the operation of the IBM 1443 and 1445 Printers with the IBM 1240, 1440, and System/360, Model 30, Data Processing Systems. The 1445 is also used with the IBM 1401 and 1460 Data Processing Systems.

It also discusses timing information for the printer and the tape-controlled carriage as well as their functional and operating characteristics. The speed of the printer, using various character sets, is also described. (SRL-14 pages)

A24-3144 IBM 1401 Data Processing System Operator's Guide 01

Describes the operating features and procedures for each of the units of an IBM 1401 system. Several operations that utilize two or more units of the system are also described. One section outlines recommended procedures for restarting system operation after an error condition in the 1402 or 1403.

For the operator's convenience, the logic of a 1401 system is discussed briefly. This includes addressing, phases of operation, internal checking, and coding structures. (SRL-100 pages)

A24-3157 IBM 1301 Disk Storage Models 11, 12, 21, and 22 07

Describes the operation of an IBM 1301 Disk Storage unit. It explains the uses of the keys and lights on the unit, and it includes timing information. (SRL-12 pages)

A24-3164 IBM 1401 Model G Configurator 00

Graphically presents the IBM 1401 Model G Data Processing System. Shows all the various units and special features, and specifies which special features are required for attaching a specific unit. (SRL-2 pages)

A24-3165 IBM 1401G System Summary 00

Contains brief descriptions of the machine units, special features, and the simultaneous input/output unit operations, called interleaving, on the IBM 1401 Data Processing System, Model G.

Also included are sections on programs and programming systems, and timing on individual and multiple input/output operations (with and without interleaving). (SRL—10 pages)

A24-3169 IBM 1447 Console Model 3 19
Original Equipment
Manufacturers' Information

Provides information that will assist non-IBM engineers who wish to attach the IBM 1447 Model 3 Console to their equipment. It contains a general description of machine functions, a reference listing of publications and engineering documents, and information concerning machine interface not readily available in other publications. (SRL—14 pages)

A24-3199 IBM 1460 Original Equipment 19
Manufacturers' Information

Contains information that will assist non-IBM engineers who plan to attach non-IBM equipment to the IBM 1460 Processing Unit. It includes a general description of machine functions, a reference listing of directly related publications and engineering documents, a list of recommended tools and test equipment, cable part numbers and dimensions, and information concerning machine interface not readily available in other publications. (SRL—36 pages)

A24-3256 IBM 1285 Optical Reader 03

This publication describes the functional and operating characteristics of the IBM 1285 Optical Reader. Also presented are descriptions of the instructions used to program operations on the 1285 and the input document requirements related to print quality, format, and type of paper. (SRL—15 pages)

A24-3315 Custom Features for IBM 1401, 1440, and 1460 Data Processing Systems 13

Contains brief descriptions of some of the custom features available for the IBM 1401, 1440, or 1460 Data Processing Systems. Availability of these features can be determined by requesting a price quotation from IBM. (SRL—24 pages)

A24-3342 Batch Numbering Feature for 13
IBM 1241 and 1419 Magnetic Ink
Character Recognition Readers

Describes the functions and features of the Batch Numbering special feature when used with the IBM 1241 Magnetic Ink Character Recognition Reader and the IBM 1419 Magnetic Character Reader.

The operation of the keys, lights, and switches, as well as the programming information needed to operate the feature, is covered in detail.

A24-3356 Original Equipment Manufacturers' 19
Information
IBM 1404 Printer Model 2

This reference manual contains information that will assist non-IBM engineers to attach their equipment to the IBM 1404 Printer Model 2. It contains a general description of machine functions, a reference listing of publications and engineering documents, and information concerning machine interface not readily available in other publications. For titles and abstracts of associated publications, see the *IBM System/360 Bibliography*, Form A22-6822. (SRL—18 pages)

A24-3476 IBM 1401H System Summary 00

Contains brief descriptions of the machine features, components, and special features. Also included is a section on programming systems available for this system. (12 pages)

A24-3494 IBM 1401 Model H Configurator 00

Presents a schematic representation of the units that make up an IBM 1401H Data Processing System. Shows the features required to attach these units and the models and special features available for each unit. (2 pages)

A24-6447 IBM 1401/1460 Instruction and 01
Timing Summary

Summarizes instructions and timings for the 1401 and 1460 systems. Listed for each instruction is: instruction name, operation code, mnemonic, operands, d-character, word marks required, address registers after operation, remarks and timings. (SRL—28 pages)

A26-5713 IBM 1311 Disk Storage Drive OEMI 19

Provides information to assist engineers in attaching the IBM 1311 Disk Storage Drive to equipment not manufactured by IBM. Included are lists of applicable publications, engineering documents, and cable interface identification for the 1311, Models 1, 2, 3, 4, and 5. (52 pages)

A26-5754 IBM 1011 Paper Tape Reader 03

Contains information that describes the operating features, components, control panel, and tape handling and loading procedures for the IBM 1011. (SRL—24 pages)

A26-5756 IBM Disk Pack Handling and Operating Procedures 07

Provides suggested operating and handling procedures for this unique new data processing device and illustrates the manufacturing processes involved in producing precision-engineered disk packs. This edition applies to disk packs that have plastic covers as opposed to the metal-covered packs. (SRL—8 pages)

A26-5776 IBM 1012 Tape Punch 03

Contains information that describes the operating features, components, tape specifications and tape loading procedures for the IBM 1012. (SRL—12 pages)

A26-5989 1070 Process Communication System 09

Describes the IBM 1070 Process Communication System, including a guide to the numerous ways in which individual units may be grouped together. The relationship between the computer programming and the operation at the process is explained by data transmission diagrams. The timing of transmission operations is considered in detail. Charts showing the coding for data and control characters in the system and the special features required for each function are also included. (52 pages)

A26-5991 IBM 1311 Disk Storage Drive 07

Describes the operating principles and features of the IBM 1311 Disk Storage Drive and the IBM 1316 Disk Pack as they are used with IBM Systems.

Included in the manual is a description of the operating keys and lights, and of disk pack operating and handling procedures.

The information in this manual supplements the information contained in the System Reference Library manuals for the following IBM Systems: IBM 1240 Bank Data Processing System; IBM 1401 and 1460 Data Processing Systems; IBM 1410 and IBM 7010 Data Processing Systems; IBM 1440 Data Processing System; IBM 1620 Data Processing System; IBM 1710 Control System; IBM 7740 Communication Control System.

Information about *addressing* disk storage, programming considerations, and special features is contained in the respective system reference manuals. (12 pages)

A31-1400 1402 Card Read-Punch Original Equipment Manufacturers' Information 19

Provides technical information for those who wish to attach the IBM 1402 Card Read-Punch to their own equipment. Voltage requirements, connector impulses and requirements are included. (Reference Manual—16 pages)

C20-1601 Catalog of Programs for IBM 1240, 1401, 1420, 1440 and 1460 Data Processing Systems 20

This Catalog contains a complete listing of all programs available for the IBM 1240, 1401, 1420, 1440 and 1460 Data Processing Systems.

Instructions for ordering magnetic tape programs are contained in the section of the Introduction entitled, "How to Order Programs."

This Catalog contains the following sections:

1. Introduction and instructions on how to use the catalogs and how to order the programs.
2. A list of corrections and revisions to announced programs (if applicable).
3. A list of new programs (if applicable).
4. A Keyword-in-Context (KWIC) Index.
5. Abstracts of all available programs.
6. A list of deletions (if applicable).

All programs listed in this Catalog should be ordered through your local IBM Branch Office.

C20-1607 High-Speed Reader-Sorter Operations Manual 03

This manual is meant primarily for operators and supervisors of high-speed reader sorters (that is, IBM

1419/1401 and IBM 1420 machine configurations). It contains: a discussion of recommended machine placements and system operating principles; a description of operating controls; operating, jam-clearing and restart procedures; cleaning and maintenance procedures; operator's tips and supervisor responsibilities; operation and maintenance of special features; a training program outline; and examples of statistical forms and run book pages. (SRL-72 pages)

**C22-6674 IBM 7340 Hypertape Drive Model 2 15
for IBM 1401 / 1460, 1410
Systems — Physical Planning
Specifications (Tentative)**

Describes specifications of size, environment, cable lengths, power consumption, and weight of Hypertape drive and control. (2 pages)

**C22-6777 Utility Programs for IBM 1401 32
Equipped with the IBM 7710
Data Communication Unit**

Describes the utility programs provided for the IBM 1401 equipped with an IBM 7710 Data Communication Unit. These utility programs are:

- 1401-7710 Tape Transmit Utility Program
- 1401-7710 Tape Receive Utility Program
- 1401-7710 Transmit-Receive Utility Program

(SRL-8 pages)

**C24-1091 Programming for the IBM 48
1418 / 1428 Optical Readers**

Describes the IBM 1401 and 1460 — 1418/1428 instructions and the factors that contribute to efficient operation of the system. Also included are: a block diagram illustrating the instructions used in a sample program, programming for a non-continuous-feed operation, and a description of a typical batch-balancing procedure at time of conversion.

The readers of this publication should be familiar with the Systems Reference Library publications, *IBM 1418 Optical Character Reader and IBM 1428 Alphameric Optical Reader*, Form A24-1473.

**C24-1404 1401 Data Processing System 15
Installation Manual — Physical
Planning**

Contains pertinent, detailed physical-planning information for the IBM 1401 Data Processing System. Di-

mensions, weights, service clearances, electrical requirements, and environmental specifications are listed separately for each unit of the system. Information on inter-unit cabling is provided in a cable-diagram and cable-requirements chart. A summary of specifications is included for ready reference.

**C24-1420 Sort Programs for 1401-1311 33
and 1460-1311, Specifications
and Operating Procedures
Generative Program Sort 6
Object Program Sort 61, 62, 63, 64**

This reference publication discusses:

Sort 6 Specifications describes the requirements for generating a sort object program.

Sort 6 Operating Procedures describes the Sort 6 program deck, preparation of the Autocoder system pack and library for generation, and the operating procedures to be followed when generating a sort object program.

Sort Object-Program Specifications describes the characteristics of object programs generated by Sort 6 and the requirements for executing the object programs. Sorts 61, 62, 63, and 64 are discussed in this section.

Sort Object-Program Operating Procedures describes the IBM-supplied generalized object decks (Sort 61, 62, 63, and 64), the insertion of user-prepared control cards in the object deck, the operating procedures to be followed when executing the object program, and the halts and messages that are associated with the sort object programs.

**C24-1439 1401 Hypertape Utility Programs: 32
Preliminary Specifications**

Contains preliminary specifications of five utility programs for a 1401 system with IBM 7341 Hypertape Drive Unit. The primary function of these programs is to enable the 1401 to perform certain peripheral functions for large-scale hypertape systems. The programs are card-to-hypertape, hypertape-to-card, hypertape-to-printer, and ½-inch tape-to-hypertape. (SRL-12 pages)

**C24-1451 Disk File Organization Routines 34
Specifications
IBM 1401-1405**

Contains the specifications of the IBM 1401-1405 disk file organization programming system based on the

chaining method. Six routines make up three general programs:

1. Chain-Loading programs
2. Chain-Addition programs
3. Chain-Maintenance programs.

Chaining is an indirect addressing method that offers an efficient, over-all solution to the problems of file organization, maintenance, and retrieval of information in an IBM 1401-1405 system.

The programming system described in this publication will operate on a 1401-1405 system with a minimum of 4,000 positions of core storage, and it uses no special features. (SRL—20 pages)

C24-1455 Fortran Specifications and Operating Procedures IBM 1401 25

This reference publication contains the language specifications necessary to code a 1401 Fortran source program and the procedures for assembling and running the object program. In addition to describing the 1401 Fortran language, the specifications section also contains descriptions of:

1. the control card
2. the phases of the compiler
3. the arithmetic and input/output routines generated by the compiler
4. the 1401 Fortran facility for linking programs or segments for continuous processing and
5. the input/output routine option provided in 1401 Fortran.

In addition to the procedures for assembling and running the object program, the operating procedures section also includes explanations of:

1. compiler output
2. compiler diagnostics
3. object-program storage allocation and
4. object-program halts.

The reader should be familiar with the *Fortran General Information Manual*, Form F20-8074, and the IBM 1401 configurations required for the assembly and the execution of the object program. (SRL—64 pages)

C24-1456 Sort 7 Timing Specifications and Operating Procedures IBM 1401 and 1460 Data Processing Systems 33

Contains the specifications and operating procedures for the Sort 7 Timing Program, Version 1. The first section discusses the machine requirements, program deck, control cards, and timing charts. The second section describes system preparation, messages, and halts.

Also included are 144 sort-timing comparison tables of the Sort 7 program run on IBM 1401 and 1460 Data Processing Systems. The parameters involved are explained.

The user should be familiar with Sort 7 Specifications and *Operating Procedures for IBM 1401 and 1460*, Form C24-3317-0.

C24-1462 1401 Input/Output Control System 30

Describes the programming required to use IOCS to control the input/output of data from card reader, card punch, printer, and tape files. Explains in detail the IOCS descriptive entries (DIOCS and DTF) and macro instructions. Defines the types of data records and labels handled by IOCS. Includes two sections especially useful to experienced programmers:

1. Summaries—listing storage area considerations, main instructions and processing-overlap.
2. Program Operation—describing IOCS library routines, labels, halts, and error indications.

Assumes a knowledge of 1401 Autocoder. (SRL—44 pages)

C24-1464 Fargo 28

Fourteen-o-one Automatic Report Generating Operation (Fargo) is a report generator that does not require expert knowledge of programming techniques. The manual describes the writing of report specifications and the preparing of *Fargo* control cards to produce the desired report. This programming system requires a card-input 1401 system having at least 4,000 positions of core storage. (SRL—50 pages)

C24-1480 IBM 1401 Symbolic Programming Systems 21

This manual provides programmers with the information necessary to code a 1401 program in SPS language and assemble a machine-language object-program. It is assumed that the programmer has a basic knowledge of 1401 machine language programming.

It describes symbolic programming principles and concepts and gives detailed specifications of the 1401 Symbolic Programming Systems, SPS-1 and SPS-2.

Operating instructions for processing the SPS source program are enumerated. The SPS processor program can assemble a machine language program on configurations of the 1401 Data Processing System equipped with a 1402 Card Read-Punch.

A sample program is included for the convenience of the beginning SPS programmer. Input and output forms, a block diagram of the program procedure, the symbolic program, and SPS output listings of the symbolic and machine-language programs are shown. (SRL—48 pages)

C24-1484 Disk-Utility Programs for 32
1401/1311: Specifications

Contains the specifications of nine disk-storage utility programs for IBM 1401-1311 systems. The programs are: Clear Disk Storage, Disk to Tape, Tape to Disk, Disk to Card, Card to Disk, Copy Disk, Print Disk, Disk Record Load, and Disk Label. (SRL—24 pages)

C24-1489 Input/Output Control System for 30
IBM 1401/1311: Specifications

Describes the programming required to use IOCS to control the input/output of data from card reader, card punch, printer, disk, and tape files. Explains in detail the IOCS descriptive entries (DIOCS and DTF) and macro instructions. Defines types of processing and types of records, and standard tape and disk labels handled by IOCS. Assumes a knowledge of IBM 1401-1311 Autocoder, disk-file organization, and standard disk labels. (SRL—52 pages)

C24-1492 Cobol 4K: Specifications 24

Describes the specifications for writing a 1401 *Cobol* program for an IBM 1401 having at least 4,000 positions of core storage. Specific examples and a sample problem demonstrate coding of *Cobol* statements. This publication assumes a basic knowledge of *Cobol* programming. (SRL—44 pages)

C24-1494 1401 Programmers' Guide 90

Discusses 1401 programming as a text book to help the student learn and apply the operations of the IBM 1401 Data Processing System. (Student Text—100 pages)

C24-3012 Standard Labeling Procedure for 48
IBM 1311 Disk Storage Drive

Describes the conventions used in labeling files on the pack for the IBM 1311. It also outlines the format specifications for standard labels. (SRL—8 pages)

C24-3025 Direct Data Channel IOCS for 30
IBM 1401, 1440, and 1460:
Specifications

Provides additional descriptive entries and macro-instructions, supplementing basic IOCS for the IBM 1401 or 1460 and the IBM 1440, that allow direct-data-channel (system-to-system) connection of 1401, 1440, and 1460 systems. Specifies machine requirements and describes user routines and error procedures. (SRL—8 pages)

C24-3038 Comparison of Sort 2-Version 2 33
Timing for 1401 and 1460

Contains 72 sort timing tables of the Sort 2-Version 2 program run on the 1401 and the 1460. This program, when used with the 1460, results in an appreciable savings in sort run time. The various parameters involved are explained in the introduction of the publication (SRL—12 pages)

C24-3047 IOCS Specifications 30
IBM 1460 with IBM 1448 (1401
and 1460 Communications IOCS —
1448-DDC)

Supplements *IOCS for IBM 1440-1448, Specifications*, Form C24-3024, with minor modifications that allow this programming system to be used with IBM 1460-1448 systems. (SRL—2 pages)

C24-3053 Merge 6 Specifications 33
IBM 1401 and 1460

Contains a description of the *IBM 1401/1460 Merge 6* program, and should be used with *Input/Output Control System (on Disk) for IBM 1401/1460: Specifications*, Form C24-1489.

This publication contains:

1. the minimum machine requirements for an IBM 1401 or IBM 1460 Data Processing System to be used for Merge 6.
2. the program capabilities,
3. a description of the control cards and the parameter cards that may be used to tailor the program to the user's specific needs,
4. a description of the phases of the program, and
5. a description of the modifications the user may make to the program. The core-storage requirements for any Merge-6 object program may be calculated from the charts in the *Appendix*.

Five Merge-6 object-program timing charts are also included. The parameters used in compiling these charts are explained. (SRL—26 pages)

C24-3057 Sort 3 for IBM 1401: Preliminary 33
Specifications

Contains a description of the Sort-3 program for the IBM 1401 Data Processing System with IBM 1405 Disk Storage. Sort 3 is a generalized program which can be modified by control-card information supplied by the user. The program utilizes the 1405 to sort records written either on magnetic tape or in disk storage. The records are sorted and then written on magnetic tape or in disk storage. (SRL—8 pages)

C24-3060 Sort 4 for IBM 1401: 33
Specifications

Contains a description of the Sort-4 generalized tape-sorting program. Sort 4 is designed to operate on the IBM 1401 Data Processing System with the processing overlap special feature. (SRL—12 pages)

C24-3077 Sort 3 for IBM 1401: 33
Operating Procedures

Contains the operating procedures for the Sort-3 program. Use this publication with the SRL publication *Sort 3 for the IBM 1401: Specifications*, Form C24-3057. Sort 3 is a generalized sorting program designed for use on the 1401 that has an IBM 1405 Disk Storage. The program sorts a file written on magnetic tape or in disk storage into either ascending or descending sequence. The file is sorted according to control data, which can be 193 characters long and can be contained in as many as 10 fields. It is then written in sequence either on magnetic tape or in disk storage. (SRL—24 pages)

C24-3087 Sort 4 for IBM 1401: 33
Operating Procedures

Contains the operating procedures to be used with *Sort 4 for the IBM 1401: Preliminary Specifications*, Form C24-3060. Sort 4 is a generalized program that utilizes the processing-overlap special feature, and is designed for use on the 1401 with a minimum of four IBM 729 II, 729 IV, 729 V, or 7330 Magnetic Tape Units. The program sorts a file written on magnetic tape into either ascending or descending sequence. The file is

sorted according to control data, which can be 999 characters long and can be contained in as many as ten fields, and is then written in sequence on magnetic tape. (SRL—28 pages)

C24-3105 Disk-Utility Programs for IBM 32
1401-1311: Operating Procedures

Contains the procedures to follow to operate these disk-utility programs for the 1401-1311: Clear Disk Storage, Disk to Tape, Tape to Disk, Disk to Card, Card to Disk, Copy Disk, Print Disk, Disk Record Load, and Disk Label. The reader should be familiar with the SRL publication, *Disk-Utility Programs for IBM 1401-1311: Specifications*, Form C24-1484. (SRL—32 pages)

C24-3128 Disk-File Organization Routines 34
for IBM 1401-1311:
Operating Procedures

Contains procedures to be followed to generate and run the IBM 1401-1311 Disk-File Organization Routines. The reader should be familiar with the SRL publication *Disk-File Organization Routines for IBM 1401-1311: Specifications*, Form C24-1483. (SRL—40 pages)

C24-3132 IBM 1401 Hypertape Utility 32
Programs: Operating Procedures

Contains the operating procedures of five utility programs for use on IBM 1401 systems equipped with the IBM 7340 Hypertape Drive, Model 2. The primary function of these programs is to enable the 1401 to perform certain peripheral functions for large-scale hypertape systems. The operating procedures in this publication are:

- Card-to-Hypertape program
- Hypertape-to-Card program
- Hypertape-to-Printer program
- Hypertape-to-½-Inch Tape program
- ½-Inch-Tape-to-Hypertape program

This publication is divided into two sections: the first section describes the minimum machine requirements and the special optional cards that are common to all five programs; the second section describes the detailed operating procedures for each of the five programs in the order listed above.

It is assumed that the user has reference to the following two publications:

IBM 1401 Hypertape Utility Programs: Specifications, Form C24-1439.

IBM 7340 Hypertape Drive, Model 2, Form A24-1470. (SRL—38 pages)

C24-3146 Cobol (on Tape) Operating 24
Procedures
IBM 1401

Describes the operating procedures used to assemble a machine-language program from a source program written in 1401 *Cobol* language. It also describes the operating procedures for producing and modifying the *Cobol* tapes, the phases that make up the *Cobol* processor program, and lists diagnostic and error messages in detail. (SRL—31 pages)

C24-3156 Tape Utility Programs with 120- 32
Character Label Capability for
IBM 1401 and 1460: Specifications
and Operating Procedures

Contains the specifications and operating procedures of IBM 1401 or 1460 Data Processing Systems. The programs are:

- Card-to-Tape
- Tape-to-Card
- Tape-to-Printer.

These programs perform a function similar to that performed by three antecedent programs described in the publication: *Utility Programs for IBM 1401 Tape Systems: Specifications*, Form J24-1411. These three new programs differ from the former in the following ways:

- The capability of processing the IBM standard 120-character tape labels, using procedures similar to those available from IOCS.
- A simplified exception procedure.
- Selective processing of tape files identified by tape header labels.
- An end-of-job option providing:
 1. no rewind
 2. rewind
 3. rewind and unload.

(SRL—28 pages)

C24-3166 Basic 4K Report Program 28
Generator Specifications
IBM 1401 and 1460

The IBM 1401 and 1460 Basic 4K Report Program Generator, with *load-and-go* capability, produces programs

that write reports of variable format. This publication explains the writing of report specifications and the preparation of source decks, to produce object programs.

The language used for the report specifications is problem-oriented rather than machine-oriented. Therefore, little knowledge of machine-language coding is required. (SRL—36 pages)

C24-3170 Basic Autocoder 2K for IBM 1401: 22
Specifications

Contains language specifications for the IBM 1401 Basic Autocoder 2K system. Also included are machine requirements; explanations of the source program, processor program, and the coding sheet; and information requirements necessary to write a Basic Autocoder 2K statement. The coding sheet used with this Basic Autocoder is the Autocoder Coding Sheet (Form X24-1350).

Descriptions of Basic Autocoder 2K statements are presented in a special format that describes the operation which the statement performs, shows how the statement is written by the programmer, states the action of the processor program during processing of the symbolic program, describes the effect (if any) of the statement on the object program, and shows an example that uses the statement.

The user may find the SRL publication *Basic Autocoder 2K Operating Procedures*, Form C24-3262 helpful in planning and organizing his program.

C24-3174 Communications IOCS for 30
IBM 1401 and 1460:
Operating Procedures

Provides IOCS (Input/Output Control System) operating procedures for IBM 1401 systems that can include the IBM 729, 1311, 1402, 1403, 7330, and direct data-channel feature, and for IBM 1460 systems that can include these same I/O facilities plus the IBM 1448. It supplements *Autocoder (on IBM 1311) for IBM 1401 and 1460: Operating Procedures*, Form C24-3109. Specifications for the IOCS programming systems included in these operating procedures are available in these publications:

Input/Output Control System (on Disk) for IBM 1401 and 1460: Specifications, Form C24-1489
IOCS for IBM 1460-1448: Specifications, Form C24-3047

Direct Data Channel IOCS for IBM 1401, 1440, and 1460: Specifications, Form C24-3025

These operating procedures should be used only for 1401 systems that include the direct data-channel feature and for 1460 systems that include either the IBM 1448 or the direct data-channel feature. When only IBM 729, 1311, 1402, 1403, and 7330 input/output files are to be handled, use *Input/Output Control System (on IBM 1311) for IBM 1401 and 1460: Operating Procedures*, Form C24-3088. (SRL—8 pages)

C24-3185 Disk File Organization Routines 34
Specifications
IBM 1401, 1440, 1460
(1311 and 1301)

Contains the specifications of four separate but similar packages of disk-file organization routines. The four packages and the system configurations on which they are used are:

- IBM 1401-1311 Disk-File Organization Routines
(Used also on IBM 1460-1311)
- IBM 1440-1311 Disk-File Organization Routines
- IBM 1440-1301 Disk-File Organization Routines
- IBM 1460-1301 Disk-File Organization Routines

The following subjects are discussed in this publication:

- An introductory section on general considerations of disk-file organization.
 - Descriptions of each of the 13 individual object programs.
 - Allowable sizes and formats of input-output files.
 - Program exits and labels useful to user subroutines.
 - The parameter cards used to generate the object programs and the RDLIN cards used for area definition at object time.
 - Suggested retrieval routines (block diagrams).
 - A complete example of a random file and the programs generated to load and maintain it.
- (SRL—60 pages)

C24-3191 Data Communications Utility 32
Programs for IBM 1009:
Specifications

Contains specifications for *Data Communications Utility Programs for IBM 1009*, which consists of seven utility programs for use on IBM 1401-1009, IBM 1440-

1009, and IBM 1460-1009 systems. The individual programs are:

- Tape Transmit
- Tape Receive
- Disk Transmit
- Disk Receive
- Card Transmit
- Card Receive
- Print Receive

The user should be familiar with the following publications: *IOCS (on Disk) for IBM 1401 and 1460: Specifications*, Form C24-1489, and *IBM 1009 Data Transmission Unit*, Form A24-1039. (SRL—17 pages)

C24-3195 Autotest for IBM 4101 and 1460 37
with IBM 1311: Specifications and
Operating Procedures

Describes the specifications and operating procedures for the *IBM 1401-1311 Autotest 8K and the 1401-1311 Autotest 16K* programs. Included are sections that define the control cards required, specify the arrangement of cards in the test deck, specify the autopatch card format and autopatching procedures, and describe the operating procedures for testing 1401-1311 Autocoder object programs. (SRL—40 pages)

C24-3209 2K Report Program Generator 28
Specifications
IBM 1401

The IBM 1401 2K Report Program Generator produces programs that write reports of variable format. This publication explains the writing of report specifications and the preparation of source decks to produce object programs.

The language used for the report specifications is problem-oriented rather than machine-oriented. Therefore, little knowledge of machine-language coding is required. (SRL—24 pages)

C24-3235 Cobol (on Disk) Specifications 24
IBM 1401, 1440, and 1460

This reference publication is intended for programmers who have a basic knowledge of *Cobol* programming. It includes the additional specifications necessary to write a *Cobol* program for the IBM 1401, 1440, and 1460 Data Processing Systems with disk storage.

Specific examples show how many *Cobol* statements are coded. A general explanation of these statements is also given. A sample problem shows entries for all divisions. (SRL—41 pages)

C24-3237 Input/Output Control Program 30
Specifications
IBM 1401, 1440, and 1460 with
IBM 1285 Optical Reader

Describes the Input/Output Control Program (IOCP) for IBM 1401, 1440, and 1460 with the IBM 1285 Optical Reader. Included is:

1. a description of the functions of the program
2. the user's requirements in coding routines that use the program
3. information set up by IOCP for use in processing.

The reader should be familiar with the publication, *IBM 1285 Optical Reader*, Form A24-3256, and appropriate Autocoder and Basic Autocoder publications associated with 1401 and 1460. (SRL-6 pages)

C24-3241 Communications IOCS 30
Specifications
IBM 1401, 1440 and 1460 with
IBM 1026 and Direct Data Channel

Provides specifications for IBM 1026 Transmission Control Unit operations in programs assembled with either of two processor programs: *1401 and 1460 Communications IOCS (1026-DDC)*, or *1440 Communications IOCS (1026-DDC)*. It includes additional descriptive entries and macro instructions, supplementing basic 1401, 1460 and 1440 IOCS, that allow any of these three systems to be used with the 1026 and:

1. IBM 1030, 1050, and 1060 remote terminals connected by local customer-provided communication lines or leased common-carrier lines.
2. IBM 1050 Data Communications System connected by common-carrier lines with automatic-answering facilities.
3. IBM 1032 Digital Time Unit.

The minimum machine requirements are specified. User routines are described. A section on programming considerations is included. (SRL-30 pages)

C24-3242 Cobol (on Disk) Operating 24
Procedures
IBM 1401, 1440, and 1460

Contains the operating procedures for building the *Cobol* system using IBM 1311 Disk Storage, modifying the *Cobol* system, and assembling a machine-language object program from a source program written in the *Cobol* language. A description of the phases that make up the *Cobol* system, a list of halts and messages, and a sample program are included. (SRL-44 pages)

C24-3253 IBM 1401 or 1440 Operating 48
System
Computer Assisted Instruction

This reference publication describes the IBM Coursewriter program for the IBM 1401 or 1440 Data Processing System. Included is a general description of Coursewriter as an aid in writing and presenting instruction courses through the IBM 1050 Data Communications System. The flexibility of Coursewriter makes it the ideal program for the school, industry, or military institution experimenting with advanced teaching techniques. Used experimentally, it can be evaluated by the educator himself for its proper place in the education picture.

For titles and abstracts of associated publications, see the *IBM 1440 Bibliography*, Form A24-3005, and the *IBM Tele-processing Bibliography*, Form A24-3089 (SRL-28 pages)

C24-3258 Autocoder (on Disk) Language 22
Specifications
IBM 1401, 1440, and 1460

Describes the disk Autocoder programming system for IBM 1401, 1440, and 1460. The first section contains the specifications of the symbolic language of Autocoder (mnemonics, labels, address types), a description of declarative, imperative, and assembler control operations, and the rules for writing the source program. The second section describes macro operations and macro instructions. Reference charts that list all valid Autocoder mnemonics also are included. (SRL-56 pages)

C24-3259 Autocoder (on Disk) Program 22
Specifications and Operating
Procedures
IBM 1401, 1440, and 1460

Contains the program specifications and operating procedures for the Autocoder (on disk) programming system.

The specifications describe the two programs, System Control and Autocoder Assembler, that make up the Autocoder system. Logical files defined and used by the system, control cards, and results of processing operations are also included.

The operating procedures are divided into two sections. The first section describes assembling and executing object programs, changing logical-file assignments, maintaining an Autocoder library, and revising

an object program. The second section describes building and updating an Autocoder system.

A summary of control card formats, phase descriptions, and a listing of a sample program make up the appendix of this publication. (SRL—65 pages)

C24-3261 Report Program Generator, 28
on Disk, Specifications
IBM 1401, 1440, and 1460

This reference publication contains specifications for IBM 1401/1460 report program generator, on disk, and IBM 1440 report program generator, on disk. The publication explains the writing of report specifications and the preparation of control cards, to produce object programs.

Examples and sample programs illustrate the applications of the report program generator language. (SRL—116 pages)

C24-3262 Basic Autocoder 2K 22
Operating Procedures
IBM 1401

These operating procedures supplement the *Basic Autocoder 2K for IBM 1401: Specifications*, Form C24-3170. They include procedures to be followed by the operator when assembling and executing a Basic Autocoder 2K program on an IBM 1401 Data Processing System. This publication also includes a general description of the assembly process, instructions for running the object program, and instructions for patching. (SRL—16 pages)

C24-3263 2K Report Program Generator 28
Operating Procedures
IBM 1401

Contains operating procedures for 2K Report Program Generator, IBM 1401, and should be used in conjunction with the Systems Reference Library publication, *2K Report Program Generator Specifications, IBM 1401*, Form C24-3209. It contains these main sections: program deck description, the control card, operating instructions for generating as well as for running an object program, the edit listing, and halts and messages. (SRL—10 pages)

C24-3267 Basic 4K Report Program 28
Generator Operating Procedures
IBM 1401 and 1460

Contains operating procedures for IBM 1401 and 1460 Basic 4K RPG, and should be used with the SRL publication *Basic 4K Report Program Generator Specifications for IBM 1401 and 1460* (Form C24-3166).

It contains these main sections: a description of the Basic 4K RPG deck, the control card, the input deck, operating instructions for generating as well as for running an object program, the edit listing, and halts and messages. (SRL—12 pages)

C24-3273 Multiple Tape Utility Program 32
(Incorporating 120-Character Labels)
Specifications and Operating
Procedures
IBM 1401 and 1460

This publication contains the program specifications and operating procedures for the *IBM 1401/1460 Multiple Tape Utility Program with 120-Character Label Capability*. Included in the specifications is a description of the program, the operations it performs, the user's file requirements (card and tape), and necessary program-control information.

Tape labels are discussed throughout the specifications. A special section for tape labels is also included.

The operating procedures contain a description of the program deck, the procedures for running the program, and the program halts. (SRL—15 pages)

C24-3279 Sort 14 Specifications, IBM 1460 33

This reference publication, which contains a description of the IBM 1460 Sort 14 program, should be used in conjunction with *Input/Output Control System (on Disk) for IBM 1401/1460: Specifications*, Form C24-1489.

This publication contains the following information: 1. Minimum machine requirements for an IBM 1460 Data Processing System to be used for Sort 14. 2. Program capabilities. 3. A description of the control cards and RDLIN cards that are required to define the users specific sort program. 4. A description of the phases of the program. 5. The formulas needed to determine the size of program-required areas of disk storage. 6. A description of the facilities provided for inserting user-written routines into the program. (SRL—30 pages)

C24-3289 Sort Operating Procedures 33
IBM 1460

This reference publication contains the following information:

1. The minimum machine requirements for an IBM 1460 Data Processing System to be used for Sort 14.
2. A description of the program decks.
3. A description of the procedure to follow when modifying the program decks.
4. The instructions for running a Sort 14 program.
5. The programmed halts and messages that can occur while the program is being run.

(SRL—23 pages)

C24-3298 Input/Output Control System 30
(on Disk) Operating Procedures
IBM 1401 and 1460

Describes the operating procedures for the IBM 1401 and 1460 IOCS (on disk) program, designed for a 1401 system that includes an IBM 1311 Disk Storage Drive, or a 1460 system that includes an IBM 1301 or 1311 Disk Storage Drive. Use this publication in conjunction with the Systems Reference Library publication *Input/Output Control System (on Disk) for IBM 1401 and 1460: Specifications*, Form C24-1489.

Three main sections are included in this publication: combining IOCS routines with the IBM 1401, 1440 and 1460 Autocoder system; assembling an object program; and running an object program. Because IOCS is actually a set of Autocoder library routines, this publication covers only those functions that are unique to IOCS. The reader should be familiar with the operating procedures described in the Systems Reference Library publication *Autocoder (on Disk) Program Specifications and Operating Procedures: IBM 1401, 1440, and 1460*, Form C24-3259. (SRL—10 pages)

C24-3311 Sort 13 and Sort 14 Timing 33
Program
Specifications and Operating
Procedures
IBM 1401 and 1460

This reference publication contains the specifications and operating procedures for the Sort 13 and Sort 14 Timing Program. An IBM 1401 or 1460 Data Processing System, with the required machine configuration, can be used to produce Sort 13 timing estimates for disk files to be sorted on any IBM 1440 Data Processing System, and Sort 14 timing estimates for disk files to be sorted on any IBM 1460 Data Processing System.

The first section of this publication contains machine requirements, a description of the program deck, timing considerations, and program information requirements. The second section describes system preparation, messages, and halts.

The user should be familiar with the following publications:

Sort 13 Specifications, IBM 1440 (C24-3278)

Sort 13 Operating Procedures, IBM 1440 (C24-3288)

Sort 14 Specifications, IBM 1460 (C24-3279)

Sort 14 Operating Procedures, IBM 1460 (C24-3289)

For a list of associated publications and their abstracts, see the *IBM 1440 Bibliography*, Form A24-3005. (SRL—24 pages)

C24-3317 Sort 7 33
Specifications and Operating
Procedures
IBM 1401 and 1460

This reference publication contains the specifications and operating procedures for the Sort 7 program. The *Specifications* section describes the sorting technique, the tape-loadable and user-program features of the program, file requirements and control cards.

The *Operating Procedures* section contains the instruction for transferring Sort 7 to tape and for executing the Sort 7 program. A description of the Sort 7 program deck, system preparation, and a list of halts and messages are also included.

Schematics of Type A and Type B standard tape labels are given in the *Appendix* to this publication. (SRL—56 pages)

C24-3319 Autocoder (on Tape) Language 22
Specifications and Operating
Procedures
IBM 1401 and 1460

This reference publication contains the language specifications and operating procedures for the Autocoder (on Tape) programming system. The IBM 1401 Autocoder processor program produces machine-language object programs for IBM 1401 and IBM 1460 from source programs written in the symbolic language of Autocoder.

The language specifications are divided into two sections. The first section contains the specifications of the symbolic language (mnemonics, labels, address types, and control operations) and the rules for writing the source program. The second section describes macro operations and macro instructions.

The operating instructions supplement the language specifications section of this publication. Described are the procedures to be performed by the operator when assembling an Autocoder program on an IBM 1401 or 1460 tape system. The phases of the Autocoder processor are explained and system halts and restarts are given. (SRL—60 pages)

**C24-3322 Fortran IV Language Specifications, 25
Program Specifications, and
Operating Procedures
IBM 1401, 1440, and 1460**

This reference publication contains the language specifications, program specifications, and operating procedures for the Fortran IV Programming System.

The language specifications describe the Fortran IV language that is processed by the Fortran system. The language closely resembles the language of mathematics, and includes various types of arithmetic, control, input/output, and specification statements.

The program specifications describe the two programs, *System Control* and *Fortran Processor*, that make up the Fortran system. Logical files defined and used by the system, control cards, and results of processing operations are also included.

The operating procedures are divided into two parts. The first part describes compiling and executing object programs, changing logical-file assignments, and maintaining a Fortran library of subprograms. The second part describes building and updating a Fortran system.

A summary of processor jobs, control-card formats, phase descriptions, and a listing of a sample program make up the appendix of this publication. Also included in the appendix is a description of the procedures to be followed in building a system that contains both Fortran and Autocoder.

For a list of other publications and abstracts, see *the IBM 1440 Bibliography*, Form A24-3005. (SRL—90 pages)

**C24-3324 Merge 7 Specifications and 33
Operating Procedures
IBM 1401 and 1460**

This reference publication contains the specifications and operating procedures for the Merge 7 program. The *Specifications* section describes the merging technique, file requirements, exits for user programming, and control cards.

The *Operating Procedures* section includes a description of the Merge 7 program deck, deck and system preparation, error options, and a list of halts and messages.

Schematics of Type A and Type B standard tape labels are given in the *Appendix*. (SRL—25 pages)

**C24-3334 Report Program Generator (on Disk) 28
Operating Procedures
IBM 1401 and 1460**

This reference publication, which contains operating procedures for IBM 1401 and 1460 Report Program Generator (on Disk), should be used in conjunction with these SRL publications:

Report Program Generator (on Disk) Specifications, IBM 1401, 1440, and 1460, Form C24-3261.

Autocoder (on Disk) Program Specifications and Operating Procedures, IBM 1401, 1440, and 1460, Form C24-3259.

Input/Output Control System (on Disk) Operating Procedures, IBM 1401 and 1460, Form C24-3298.

Input/Output Control System (on Disk) for IBM 1401 and 1460: Specifications, Form C24-1489.

This publication contains a description of the RPG program deck, system file preparation, input deck for the RPG run, Autocoder control cards, operating instructions for generating and executing an object program, the edit listing, and halts and messages. (SRL—30 pages)

**C24-3341 On-Line Testing 30
IBM 1401, 1440, and 1460**

This publication presents on-line testing procedures for a communication-oriented IBM 1401, 1440, or 1460 Data Processing System with a remote IBM 1050 Data Communications System and/or IBM 1030 Data Collection System. Use of these procedures reduces the inconvenience caused by malfunctions external to the data processing system and the IBM 1026 or 1448 Transmission Control Unit.

The IOCS options for on-line testing are discussed, and a typical user's diagnostic routine is described. Also, suggestions are given for: (1) operator testing procedures at the remote terminal, (2) content of a diagnostic test message, and (3) types of off-line performance reports.

The reader should be familiar with the following SRL publications, depending on the system he has installed.

IBM 1050 Data Communications System, Form A24-3020

IBM 1030 Data Collection System, Form A24-3018.

For a data processing system with an IBM 1448:
IBM 1448 Transmission Control Unit, Form A24-3010

IOCS Specifications, IBM 1460 with IBM 1448 (1401/1460 Communications IOCS – 1448/DDC), Form C24-3047

IOCS Specifications, IBM 1440 with IBM 1448 (1440 Communications IOCS – 1448/DDC), Form C24-3024.

For a data processing system with an IBM 1026:
IBM 1026 Transmission Control Unit, Form A24-3244

Communications IOCS Specifications, IBM 1401, 1440, and 1460 with IBM 1026 and Direct Data Channel, Form C24-3241.

(SRL–15 pages)

**C24-3345 IBM 1401/1460 Timing Programs 33
for IBM System/360 Basic
Programming Support
Sort/Merge Programs (8K Tape)**

This publication contains the specifications and operating procedures for the IBM 1401 and 1460 timing programs used to estimate the amount of time required to sort records with an IBM System/360 Basic Programming Support 1-channel or 2-channel Sort/Merge Program (8K Tape).

The following information is included in this publication:

1. Minimum machine requirements for estimating times with these programs.
2. A description of the user-prepared information cards required to define the proposed sort operation.
3. The procedure to follow for executing the timing programs.

The user of this publication should be familiar with *IBM System/360 Basic Programming Support Sort/Merge Programs (8K Tape)*, Form C24-3320. For a list of associated 1401/1460 publications, see the *IBM 1401/1460 Bibliography*, Form A24-1495. For a list of associated System/360 publications, see the *IBM System/360 Bibliography*, Form A22-6822.

**C24-3377 IBM 1401/1460 Timing Program 33
for IBM Basic Operating System/360
Sort/Merge Program (8K Disk)**

Contains the specifications and operating procedures for the IBM 1401 and 1460 timing program used to estimate the amount of time required to sort records with the IBM Basic Operating System/360 8K Disk Sort/Merge program.

The following information is included in this publication: 1. Minimum machine requirements for estimating times with this program; 2. A description of the user-prepared information cards required to define the proposed sort operation; 3. The procedure to follow for executing the timing program.

The user of this publication should be familiar with *IBM Basic Operating System/360 Sort/Merge Program (8K Disk)*, C24-3321. For a list of associated System/360 publications, see *IBM System/360 Bibliography*, A22-6822.

**C24-3384 IBM 1401/1440/1460-1026 and 48
1440-1448 Operating Systems
Computer Assisted Instruction
Author and Proctor Manual**

Describes the IBM Computer Assisted Instruction program (CAI) for the IBM 1401/1440/1460-1026 and 1440-1448 Data Processing Systems. It describes: 1. The capabilities of the CAI program; 2. The minimum machine requirements for CAI; 3. The operating procedures and related information for the proctor to prepare the systems for CAI; 4. The operating instructions and information for the author and proctor to enter material into the computing system via the IBM 1052 Printer-Keyboard.

For the titles and abstracts of other associated publications, see the *IBM 1440 Bibliography*, Form A24-3005, and the *IBM Tele-processing Bibliography*, Form A24-3089.

**C24-3385 IBM 1440-1448 Operating System 48
Computer Assisted Instruction
Student Manual**

Describes the IBM 1052 Printer-Keyboard as used with the Computer Assisted Instruction Program (CAI). The publication: 1. Contains the information necessary for the student to use the printer-keyboard to receive course material from the computer, 2. Describes the standard features, operation, and cautions the student must exercise while using the printer-keyboard.

**C24-3439 IBM 1401/1460 Timing Program for 33
IBM Basic Operating System/360
Tape Sort/Merge Program (16K)**

Contains the specifications and operating procedures for the IBM 1401 and 1460 timing programs used to estimate the amount of time required to sort records with the IBM Basic Operating System/360 Tape Sort/Merge Program (16K).

The following information is included in this publication: 1. Minimum machine requirements for estimating times with these programs. 2. A description of the user-prepared information cards required to define the proposed sort operation. 3. The procedure to follow for executing the timing programs.

The user of this publication should be familiar with *IBM Basic Operating System/360 Tape Sort/Merge Program (16K)*, Form C24-3438. For a list of associated System/360 publications, see the *IBM System/360 Bibliography*, Form A22-6822.

**C24-3445 IBM 1401/1460 Timing Program for 33
IBM Basic Operating System/360
Disk Sort/Merge Program (16K)**

Contains the specifications and operating procedures for the IBM 1401 and 1460 timing program used to estimate the amount of time required to sort records with the IBM Basic Operating System/360 Disk/Sort/Merge program (16K).

The following information is included in this publication: 1. The minimum machine requirements for estimating times with this program. 2. A description of the user-prepared information cards required to define the proposed sort operation. 3. The procedure to follow for executing the timing program.

The user of this publication should be familiar with *IBM Basic Operating System/360 Specifications Sort/Merge Program (16K Disk)*, C24-3444. For a list of associated System/360 publications, see *IBM System/360 Bibliography*, A22-6822.

**C26-5859 1440/1460-1070 Process 36
Communication Monitor
Specifications**

Provides the specifications for the IBM 1440/1460-1070 Process Communication Monitor (PCM). The Monitor, designed to operate in conjunction with user's programs written in 1440 or 1460 Autocoder language, consists of a monitor routine, several processing sub-routines, and an error locating routine.

Included in this publication are the macro-instructions and calling sequences used to gain access to the PCM system, descriptions of the PCM routines, core storage requirements, error procedures, and a section on programming considerations.

**C26-5986 IBM 1440/1460-1070 Process 36
Communication Monitor
Operating Procedures**

Contains the operating procedures for the 1440/1460-1070 Process Communication Monitor. Detailed descriptions cover the library, pre-assembly, assembly, and loading procedures, as well as the diagnostic messages related to the object program.

**C28-6259 Reference Manual IBM 7750 48
Assembly Program Using the
IBM 1401**

Contains a description of the IBM 7750 Assembly Program and has been written to facilitate the preparing programs for the IBM 7750 Programmed Transmission Control. The assembly medium is the IBM 1401. That is, the Assembly Program runs on the 1401 and produces output suitable for loading into the IBM 7750 through the IBM 1410 or 7000 Series Data Processing Systems.

**C28-8148 IBM 7740 Assembly Program 48
Using IBM 1401**

Describes a symbolic programming language developed by IBM to facilitate the writing of stored programs for the IBM 7740 Communication Control System. Source programs written in this language are assembled by means of the 7740 Assembly Program on the IBM 1401 (or the IBM 1410 in 1401 mode). The resulting object programs, if written in IBM 1311 disk storage, can be loaded directly into a 7740; if on cards or magnetic tape, they can be loaded by means of an IBM data processing system connected to the 7740.

Appendices to the publication include a description of the assembly program output, a list of operation codes, and an operator's guide. (SRL—28 pages)

**F20-0208 From Control Panel to Stored 90
Program**

Aids in the transition from wired control-panel machines to the 1401. Introduces stored-programming concepts and prepares the reader for a detailed course on the 1401. Consists of three sections:

1. concepts and terms associated with stored programming and the 1401
2. a brief machine description of the 1401
3. how the 1401 accomplishes wired control-panel functions—reading, arithmetic functions, selection, printing, punching, and emitting.

(General Information Manual—52 pages)

F20-0228 Planning for an IBM 1401 99
Data Processing System

Assists management in planning for a 1401. Main topics are: the planning phase, the systems study, system design, documentation testing, conversion, operating the installation, physical installation planning, the data processing library, magnetic tape and disk storage. Planning and operating forms illustrate the text. (General Information Manual—24 pages)

F20-0234 Autotest for the IBM 1401 37
Data Processing System

Describes the specifications, features, forms and diagrams required, and operating instructions for using program autotest. This is an advanced testing program for the IBM 1401 to aid in testing Autocoder, SPS, and Fargo programs. Autotest provides the ability to stack programs and to produce automatically, without operator intervention, the necessary documents to evaluate the tested programs. (General Information Manual—56 pages)

F28-8053 Cobol 24

The Common Business Oriented Language (*Cobol*) for programming computers was developed by a committee of the Conference On Data Systems Languages (*Codasyl*) as a cooperative effort of computer users in industry, the Department of Defense and other Federal Government agencies, and computer manufacturers. This manual describes the language specified by *Codasyl* as *Cobol-1961*; that is, the *Cobol* specifications prescribed in the official government manual for 1961.

The *Cobol* language consists of English nouns, verbs, and arithmetic and logical expressions describing business problems. The *Cobol* processor for a given system translates *Cobol* programs into actual machine coding. (General Information Manual—172 pages)

F28-8074 Fortran 25

Fortran is an automatic coding system developed to express problems in a symbolic source language similar to the language of mathematics. This manual describes *Fortran* and prepares the reader to use its facilities. (General Information Manual—104 pages)

F20-8172 Bibliography of Data 90
Processing Techniques

This bibliography and associated classification system provides a means to identify selected IBM publications which, either wholly or in part, document data processing *techniques* information. The listing of any given publication in this bibliography, however, does not preclude its appearance in other reference bibliographies such as the Systems Reference Library.

Part I of this bibliography lists publications by form number within major subject classification. Part II contains abstracts of the publications in form-number sequence only. (Data Processing Techniques—14 pages)

G24-1477 1401 Data Flow 01

Describes each internal 1401 operation, plus card input-output and printer operations, to assist operators, programmers, and systems engineers in understanding 1401 operations. Presents each operation in the form of a data-flow diagram. Shows graphically the path data takes during an operation, along with a written explanation of the steps involved. (Bulletin—64 pages)

J22-6690 Standard BCD Interchange Code 01

Describes the standard BCD interchange code. Discusses the IBM card code, IBM BCD magnetic tape code, correspondence between codes and printed symbols, correspondence between codes and machine controls, collating sequence of code elements, and two subsets of alternate graphics. (Bulletin—4 pages)

J24-0209 Programs for IBM 1401 Card 32
Systems: Specifications

Describes five IBM 1401 utility programs, five frequently used subroutines, and four program error-detection aid routines for use in program testing on 1401 systems using card input and card or printed output. Each program is easily adapted to the user's program. Flexibility of the programs provides using either 100 or 132 positions of printing where applicable, and for adapting the programs to 1401 systems with 1400, 2000, or 4000 positions of core storage. (SRL—36 pages)

J24-0215 Report Program Generator for 28
IBM 1401 Card and Tape Systems

Presents a description of writing the report specifications and preparing a source deck for the report program generator.

The report program generator (RPG) produces programs for writing reports of variable format. When using this program, the user need only supply a set of specifications for the report. Because the language for the specifications is problem-oriented rather than machine-oriented, little knowledge of machine-language coding is required. Specifications of the desired report, after being punched into cards, are used as input to the RPG. The generator then produces a program to write the desired report, using the input data from the user's card or magnetic tape file. The report programs that are generated can include such features as: various classes of headings and totals, input data selection, report format control, arithmetic operations including multiplication and division, half-adjusting and position adjusting, and user's subroutines. The output of report programs generated can be printed, punched in cards, or written on magnetic tape. (Bulletin—76 pages)

J24-1411 Utility Programs for IBM 1401 32
Tape Systems: Specifications

Describes three utility programs that facilitate translating data: card-to-tape, tape-to-card, and tape-to-printer. These programs enable 1401 tape systems to perform operations now done off-line by 700 and 7000 series auxiliary equipment. Minimum machine requirements are the 1401 Model C3 and the high-low-equal compare feature. To process binary tape records or column-binary cards requires also the column binary feature. (Bulletin—36 pages)

J24-1422 1401 Sort 1 Specifications 33

Presents specifications for Sort 1, a generalized sorting program for use on an IBM 1401 Data Processing System equipped with a minimum of four IBM 729 II, 729 IV, or 7330 Magnetic Tape Units. The program can modify itself according to information punched in a control card and thus perform a variety of sorting applications. This bulletin also provides information for preparing control cards and estimating the timing of sorting applications. (Bulletin—12 pages)

J24-1426 1405 Disk Storage: Utility Programs 32

Contains detailed specifications for six utility programs for the IBM 1405 Disk Storage unit. The programs are: clear disk storage, disk-to-tape, tape-to-disk, disk-to-card, card-to-disk, and disk-to-printer. (Bulletin—12 pages)

J24-1428 Multiple Utility Programs for 32
IBM 1401 Tape Systems:
Specifications

Presents the multiple utility program for IBM 1401 tape systems, which performs concurrently three off-line utility operations: card-to-tape, tape-to-card, and tape-to-printer. This program can accommodate, within limitations, magnetic tapes and card decks prepared on any IBM system.

The program requires an IBM 1401 Model C3 tape system, and the high-low-equal compare and advanced programming special features. To process binary tape-records or column-binary cards requires also the column binary feature. (SRL—4 pages)

J24-1463 1401-1009 Utility Program: 32
Preliminary Specifications

Presents preliminary specifications of a utility program for operating a 1401-1009 system with a minimum of programming effort. Describes the functional characteristics and the operational control of the program. Gives the minimum machine requirements of one transmission terminal using the program, and lists the various configurations of equipment with which this terminal can communicate.

This 1401 program provides transmit and receive control of the IBM 1009 Data Transmission Unit by six manually-controlled sense switches on the 1401. A 1401-1009 system under control of this program can perform card-to-card, card-to-tape, tape-to-card and tape-to-tape transmissions with various 1401-1009 configurations, or an IBM 7701 Terminal Unit. (Bulletin—8 pages)

J24-1467 Report Program Generator for 28
IBM RAMAC 1401 Systems:
Preliminary Specifications

Explains the writing of report specifications, defines the disk input file, describes the preparation of the control card, and gives the minimum system requirements for generating and for executing the object programs.

The report program generator for IBM RAMAC 1401 systems produces object programs that write reports of variable format. The data files to be processed must be contained in the IBM 1405 Disk Storage unit. Because the language used for the report specifications is problem-oriented rather than machine-oriented, little knowledge of machine-language coding is required. (Bulletin—16 pages)

J24-1485 1401-1012 Tape Punch Routines 32

Describes the program routines for punching 5- and 8-track tape on the IBM 1012 Tape Punch. Includes sections on general operation, tape checking and corrections, end-of-reel processing, diagnostic halts, and operating procedures. The routines, as written, are to be incorporated into an Autocoder system library. Two main instructions cause the 1401 Autocoder to generate the necessary instructions. (Bulletin—4 pages)

J28-0238 1401 Peripheral Integrated 48
Processing System for Use with 7000
Series Data Processing Systems

Describes the IBM 1401 peripheral integrated processing system. This system includes among its supervised peripheral programs the D-programs of the 7000 and 1400 output editing system. (Bulletin—28 pages)

J28-6173 7000 and 1400 Output Editing 48
System

Describes the 7000 and 1400 output editing system whereby the output of a large-scale computer (IBM 7000 series) program may be edited and printed or punched on the IBM 1401. Gives detailed information on the I-language, and the 1401 D-program. (Bulletin—64 pages)

L24-1408 IBM 1401 Data Processing System 13
— Paper Tape Reader Input,
RPQ E95528

Describes the operation of the IBM 1903 Model 2 Paper Tape Reader when used with 1401 Models B, C, and D.

Control panel hubs, signal lights, control switches, and 1401 instructions are fully described. Appendices cover paper-tape definitions, paper-tape specifications, and preparation for strip, reel, and center-roll feeding. (Bulletin—24 pages)

L24-1429 IBM 1401 Data Processing System 13
Paper Tape Punch Output,
RPQ E98337

Describes the operating features of the IBM 1902 Model 3 Paper Tape Punch when used with the IBM 1401 Data Processing System. Included are code charts for translating IBM 1401 BCD code to 5-track telegraphic code, description of operation keys and

lights, 1401 operation code, and branch-on-error routine. Appendices cover paper-tape definitions, reel feeding, and paper-tape splicing. (Bulletin—16 pages)

L24-1465 Dual IBM 1403 Printer Output, 13
RPQ E96450

Describes the method of operating a second IBM 1403 Printer on an IBM 1401 Data Processing System. Also included are the operation of the additional instruction and switch, specifications for the additional print-storage assembly area, and physical planning considerations. (Bulletin—2 pages)

L24-3102 Modified Character Sets for the 13
IBM 1403 Print Chains and
Print Trains

Contains a complete explanation of four modified-character-set IBM 1403 print chains or trains, available on an RPQ (Request for Price Quotation) basis for the IBM 1403 Printer Models 1, 2, and 3. The physical characteristics, BCD codes, card codes, IBM 1401 and 1460 programming considerations, printing speed, and synonym codes are fully discussed for these four print chains: 60-character set (optional format), 80-character set (set format), 80-character set (optional format), and 120-character set (optional format).

This publication also covers the ordering procedures for the four print chains or trains and the prerequisite RPG items.

For a list of related publications and abstracts, see the IBM Bibliography for the associated Data Processing System. (16 pages)

L24-3186 IBM 1301 Disk Storage Unit for 13
IBM 1401 Data Processing System,
RPQ 810099

Presents the functional characteristics, operating characteristics, and related timing considerations of the IBM 1301 Disk Storage attachment (RPQ 810099) for the IBM 1401 Data Processing System. A basic knowledge of the 1401 system is assumed. (Bulletin—22 pages)

L24-3294 **IBM 1414 Input/Output Synchronizer** **13**
RPQ 811225 (1401),
RPQ E25693 (1440/1460)

Describes the attachment of an IBM 1414 Input/Output Synchronizer Models 3, 4, 5, or 8 to an IBM 1401, 1440, or 1460 Data Processing System. The instructions used by the processing system to control the data transmission between the system and the 1414 are described. Presents physical planning information. (SRL—13 pages)

R20-9000 **1401 Basic Programming Course Description** **90**

R20-9001 **1401 Accelerated Basic Programming Course Description** **90**

R20-9010 **1401 Course Description** **90**

R20-9011 **1401 Course Description** **90**

R20-9012 **1401 Fargo Course Description** **90**

R20-9013 **1401 System Planning Course Description** **90**

R20-9029 **1401 Advanced Training Course Description** **90**

R20-9030 **1401 Autotest Course Description** **90**

R20-9031 **1401 Installation Planning Course Description** **90**

R20-9032 **1401 Programming System Course Description** **90**

R20-9033 **1401 RPG Course Description** **90**

R20-9034 **1401-1311 Course Description** **90**

R20-9054 **IBM SPS Programmed Instruction Course Description** **90**

R20-9055 **IBM 1401 DPS Basic Programming, Autocoder, Course Description** **90**

NOTE: Each course description booklet describes the course, its objectives and length, the intended audience, the prerequisites, and the course code. It lists all materials required by the instructor and by the student. Abstracts are included for educational materials created specifically for the course. Also, abstract references are provided for the other materials.

X20-1702 **Proportional Record Layout and Format Forms** **80**

The front side of this sheet consists of the Proportional Record Layout Form. It is suitable for card, tape, and disk records. Positional markings are 00-99 and 01-100.

The back side of the sheet is the Record Format Form. This form permits record layouts to be prepared without the space limitations of positional markings. Space is also provided for reference data.

X20-8011 **Installation and Scheduling Control Form** **80**

This form is a chart for entering scheduled and completion dates for each phase of programming and testing. The reverse side contains a weekly progress chart. (25 sheets per pad—16½" x 11")

X20-8021 **AUTOCHART FLOWCHART Work Sheet** **80**

This work sheet is used for rough layout of flowcharts prior to coding in the IBM AUTOCHART language. (25 sheets per pad—16½" x 11")

X20-8024 **Decision Logic Coding Form** **80**

This Form is a design logic coding aid for users of the IBM 1401 Design Logic Translator Program.

X20-8040 **1230, 1231, 1232 Spacing Chart** **80**
(Test Scoring) 5 Words per Inch

Used to lay out test scoring forms using 5 words per inch for the 1230, 1231, and 1232. (25 to a pad—12" x 17")

X20-8041 **1230, 1231, 1232 Spacing Chart** **80**
(Test Scoring) 4 Words per Inch

Used to lay out test scoring forms using 4 words per inch for the 1230, 1231, and 1232. (25 to a pad—12" x 17")

X20-8042 **1230, 1231, 1232 Spacing Chart** **80**
(Test Scoring) 3 Words per Inch

Used to lay out test scoring forms using 3 words per inch for the 1230, 1231, and 1232. (25 to a pad—12" x 17")

X20-8043 **1230, 1231, 1232 Spacing Chart** **80**
(Non-Test Scoring) 5 Words per Inch

Used to lay out non test scoring forms using 5 words per inch for the 1230, 1231, and 1232. (25 to a pad—12" x 17")

X20-8044 **1230, 1231, 1232 Spacing Chart** **80**
(Non-Test Scoring) 4 Words per Inch

Used to lay out non test scoring forms using 4 words per inch for the 1230, 1231, and 1232. (25 to a pad—12" x 17")

X20-8045 **1230, 1231, 1232 Spacing Chart** **80**
(Non-Test Scoring) 3 Words per Inch

Used to lay out non test scoring forms using 3 words per inch for the 1230, 1231, and 1232. (25 to a pad—12" x 17")

X21-9021 **Reference Card** **80**
IBM 1230, 1231, 1232
Document Marking Instructions

This reference card provides, in simple illustrated form, the basic information needed to produce a properly marked document. Marks read from the documents by IBM optical mark readers can be: (1) transmitted to a data processing system, (2) scored, as for

student test, or (3) punched into cards for later processing. It is, therefore, very important that the documents are marked correctly and with care. (Card—7¼" x 3¾")

X24-1152 **1401 Symbolic Programming** **80**
System Coding Sheet

This coding form aids in programming the IBM 1401 using the symbolic programming system. Provides space for all information relevant to the coding and subsequent assembly of the object program. Prenumbered lines sequence each entry. Fields are numbered and ruled to facilitate both programming and card punching. (The cards corresponding to this form can be ordered under Electrotype No. C55369.) (25 sheets per pad—11" x 8½")

X24-1336 **1401 and 1410 Report Program** **80**
Generator, Input Specifications

This is one of four Report Program Generator (RPG) specifications forms. The four forms apply for card, IBM 1405 Disk Storage, and magnetic-tape applications of RPG for both the IBM 1401 and the 1410. On this form (input specifications), the user describes his input file from which the report is to be prepared. (The input-specifications cards corresponding to this form can be ordered under Electrotype No. N12836.) (25 sheets per pad—11" x 8½")

X24-1337 **1401 and 1410 Report Program** **80**
Generator, Data Specifications

This is one of four Report Program Generator (RPG) specifications forms. The four forms apply for card, IBM 1405 Disk Storage, and magnetic-tape applications of RPG for both the IBM 1401 and the 1410. On this form, the user describes the data fields that appear in the output and those used in processing. (The data-specifications cards corresponding to this form can be ordered under Electrotype No. N12837.) (25 sheets per pad—11" x 8½")

X24-1338 **1401 and 1410 Report Program** **80**
Generator, Calculation Specifications

This is one of four Report Program Generator (RPG) specifications forms. The four forms apply for card, IBM 1405 Disk Storage, and magnetic-tape applications of RPG for both the IBM 1401 and the 1410. The user can specify on this form calculations that are more

extensive than those that can be defined on the data specifications sheet. Some examples are comparison, multiplication, and division, as well as subsequent computations using the results from data specifications and prior entries on the calculation sheet. (The calculation-specifications card corresponding to this form can be ordered under Electrotpe No. N12835.) (25 sheets per pad—11" x 8½")

X24-1339 1401 and 1410 Report Program 80
Generator, Format Specifications

This is one of four Report Program Generator (RPG) specification forms. The four forms apply for card, IBM 1405 Disk Storage, and magnetic-tape applications of RPG for both the IBM 1401 and the 1410. On this form the user describes the lines and the fields constituting the output. (The format-specification cards corresponding to this form can be ordered under Electrotpe No. N12834.) (25 sheets per pad—11" x 8½")

X24-1350 1401, 1410, and 1440 Autocoder 80
Coding Sheet

This coding sheet is designed for use in programming the IBM 1401 using 1401 Autocoder, the IBM 1410 using 1410 Autocoder or Basic Autocoder, and the IBM 1440 using 1440 Autocoder. The columns and lines of the sheet are numbered to facilitate both programming and card punching. (Autocoder source-input cards corresponding to this form can be ordered under Electrotpe No. A36199. Autocoder condensed-output cards can be ordered under Electrotpe No. C59503.) (50 sheets per pad—11" x 8½")

X24-1527 407, 408, 409, 1403, 1404 80
1443 and 2203 Printer Spacing
Chart (8 Lines per Inch)

This spacing chart, scaled in non-photographic blue, provides 132 printing positions at 10 characters per inch, for carriage spacing of 8 lines per inch. Rulings indicate the print span for 100, 120, and 132 printing positions. A matching, reduced carriage-control tape facilitates planning tape punching. Space is available to indicate the print storage layout of four line formats. (25 sheets per pad—16½" x 11")

X24-1709 1401 RPG Program Reference Card 80

This reference card presents the report specification parameters and the control card to assist users of the IBM 1401 Report Program Generator (1401 RPG) in preparing the input, data, calculation, and format report specifications (Forms X24-1336 to X24-1339, inclusive). The entries acceptable to 1401 RPG, as well as a brief explanation of them, are included, together with the 1401 RPG control-card contents and format. (Card—15¼" x 8½")

X24-3039 1418 and 1428 Optical Readers 80
Document Design and
PDS Timing Chart

This chart is an aid for designing documents to be read by the 1418 or 1428 optical reader.

The full-size drawing of the transport path shows exact location of read stations and photo document sensors. Moving a document across this chart simulates actual operation. (25 sheets per pad—22" x 11")

X24-3100 1447 Console Status Sheet 80
IBM 1440, 1460

This sheet is a representation of the IBM 1447 Console. It can be used as an aid in preparing the 1440 or 1460 system for operation or used when testing programs to mark down the status of console lights, registers, and switches. (1 sheet—8½" x 11")

X24-3115 407, 408, 409, 1403, 1404, 1443, 80
and 2203 Printer Spacing Chart
(6 Lines per Inch)

This spacing chart, which is the same as X24-6436 but scaled in photographic green, provides 132 printing positions at 10 characters per inch, for carriage spacing of 6 lines per inch. Rulings indicate the print span for 100, 120, and 132 printing positions. A carriage-control tape facilitates planning for tape punching. Space is available to indicate the print-storage layout of four line formats. (25 sheets per pad—16½" x 11")

X24-3140 IBM 1460 Physical Planning 80
Template

This template provides a ¼" = 1 foot scale drawing of units for the 1460 system and is to be used for the floor planning of an installation. (Plastic sheet—8½" x 11")

X24-3245 Control Card Formats for Sort 2, Merge 2, Sort 4, Sort 7, and Merge 7 with 1401/1460 80

This form is designed to assist the user in preparing control cards and documentation for 1401 and 1460 tape-sorting and tape-merging programs. For each of the five control-card formats, a brief description of the information to be specified is provided. To the left of each description are column numbers and spaces in which to write the information to be punched. (25 sheets per pad—17½" x 11")

X24-3336 Coursewriter Instruction Sheet 80

This sheet is designed for use with the IBM 1401 or 1440 Operating System Computer Assisted Instruction. This sheet guides the author in writing a course in the Coursewriter format for subsequent keying into the IBM 1052 Printer-Keyboard. The sheet provides space for course name, author name and number, the labels, operation codes, and text material. (25 sheets per pad—8½" x 11")

X24-3448 IBM 1445 Printer Spacing Chart 80

IBM 1445 Printer Spacing Chart is scaled in non-photographic blue and provides 113 printing positions at 8 characters per inch for carriage spacing of 6 lines per inch. Vertical rulings are shown for each inch, or every 8 characters apart, to assist in printing layout. A carriage-control tape facilitates planning for tape punching. Space is available on the top of the form to indicate miscellaneous print line formats.

X24-6436 407, 408, 409, 1403, 1404, 1443, and 2203 Printer Spacing Chart (6 Lines per Inch) 80

This chart is scaled in non-photographic blue and provides 144 printing positions at 10 characters per inch for carriage spacing of 6 lines per inch. Rulings indicate the print span for 100, 120, 132, and 144 printing positions. A carriage-control tape facilitates planning for tape punching. Space is available to indicate the print-storage layout of four line formats. (25 per pad—17½" x 11")

X24-6437 1401, 1440, and 1460 Program Chart 80

This form is a program planning chart with columns provided for step number, instruction address, machine instruction, remarks and effective number of characters in instruction and data. (25 sheets per pad—8½" x 11")

X24-6438 1401, 1410, 1440, and 1460 Storage Layout 80

This sheet provides storage positions for assigning data, symbolic notations, and word marks. The chart is arranged in ten rows of 100 positions each, with space provided in the upper left corner of each row to enter the hundred's address.

The reverse side contains a pre-numbered schematic for allocating 2000 positions of storage. Pre-assigned standard input-output storage areas are indicated by light shading. Pre-assigned output print area for the expanded-print feature, and the read-in area for the IBM 1404 read-compare feature are indicated by dark shading. (25 sheets per pad—16½" x 11")

X24-6482 1401 Physical Planning Template 80

Contains equipment templates printed on acetate sheets (scale: ¼" = 1' for planning machine-room layouts). The components to be cut out are: 1401 Model A; 1401 Models B, C, D, E, and F; 1402; 1403; 1405; 1406; 1407; 1412; 1418; 1419; 1428; 1009; 1011; 729; 7330; and compressor. (3 sheets—8½" x 11")

X24-6518 1011 Paper Tape Reader — Control Panel Diagram 80

This sheet contains a control-panel diagram for 5-track tape on the front, and for 8-track tape on the back. (25 sheets per pad—8½" x 11")

X24-6556 Fargo Report Specifications, Phases 4 and 1 80

This is one of four forms used with *Fargo*. The programmer uses this form to record report specifications to be punched in report and field-headings control cards (phase 4) and in master report and control-break control cards (phase 1). (25 sheets per pad—11" x 8½")

X24-6557	Fargo Report Specifications, Phase 1	80	X24-6588	Operating Instruction Sheet IBM 1401, 1440, and 1460	80
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This is one of four forms used with *Fargo*. The programmer uses this form to record report specifications to be punched in constants control cards (phase 1). (25 sheets per pad—11" x 8½")

This form can be used as a guide for preparing the system for a program run. The form has areas for indicating: input and output files from card, disk or tape, switch settings, program halts, and forms to be used with the punch and printer. (25 sheets per pad—8½" x 11")

X24-6558	Fargo Report Specifications, Phase 2	80
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This is one of four forms used with *Fargo*. The programmer uses this form to record report specifications to be punched in total control cards (phase 2). (25 sheets per pad—11" x 8½")

X24-6591	Report Program Generator: Data Specifications IBM 1401, 1440, 1460	80
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This is one of four forms provided for use in connection with the Report Program Generator for the IBM 1440. The forms of this set are numbered X24-6590 through X24-6593. (25 sheets per pad—11" x 8½", one side)

X24-6559	Fargo Report Specifications, Phase 3	80
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This is one of four forms used with *Fargo*. The programmer uses this form to record report specifications to be punched in detail control cards (phase 3). (25 sheets per pad—11" x 8½")

X24-6562	1401 Timing Estimate Sheet	80
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This form facilitates job timing, and can show timing justifications for 1401 sales proposals. (25 sheets per pad—11" x 8½")

X28-0314	1401, 1440, 1460 Address Translation Card	80
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This card aids the programmer with a chart for translating machine-coded core-storage addresses into numeric addresses and vice versa. It also has a position guide for reading printout and a character code chart for reading registers during testing operations. (Card—7¾" x 3¼")

X24-6568	1401, 1410, 1440 Library Coding Form	80
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This form is used in coding library routines for the IBM 1401, 1410, and 1440 Autocoder macro-instructions. Space is provided for information that must be included in the library entries. Fields are numbered and ruled to facilitate coding and card punching. (25 sheets per pad—11" x 8½")

X28-1464	Cobol Program Sheet	80
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This sheet aids the programmer in writing the entries of a *Cobol* source program. The sheet is designed according to the principles governing the *Cobol* reference format (see *Cobol* General Information Manual, Form F28-8053). The form provides for recording the entries for the four divisions of a *Cobol* program: identification, environments, data, and procedure. (*Cobol* source-program cards corresponding to this form can be ordered under Electrotype No. C61897.) (25 sheets per pad—11" x 8½")

X24-6587	1401 Console Sheet	80
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This sheet is a representation of the IBM 1401 Processing Unit console. The form can aid in preparing the 1401 system for operation or for indicating the status of console lights, registers, and switches when program testing. (25 sheets per pad—8½" x 11")

X28-1520 Cobol Reference Card 80

This card provides a convenient reference to material frequently used by the *Cobol* programmer. Included are a *Cobol* word list, basic *Cobol* formats, and the following tables:

- Special characters used in *Cobol*
 - Arithmetic expressions—sequence of symbols
 - Conditional expressions—sequence of symbols
 - Arithmetic operators
 - Relational operators
 - Data-items pictorial characters.
- (6-sided folded card—7 $\frac{3}{8}$ " x 3 $\frac{1}{4}$ ")

**X28-1585 1401 Autotest Tape and 80
RAMAC File Generation Data Sheet**

**X28-1585 1401 Autotest Tape and 80
RAMAC File Generation Data Sheet**

This is one of three forms used with the 1401 autotest program. This form facilitates coding and card punching of file-generation control and data cards for tape and RAMAC files. (25 sheets per pad—13 $\frac{1}{2}$ " x 9 $\frac{1}{2}$ ")

X28-1625 7750 Assembly Program Sheet 80

This coding form is used to write specifications for the 7750 Assembly Program, which is run on the IBM 1401. (25 per pad—8 $\frac{1}{2}$ " x 11"

This is one of three forms used with the 1401 autotest program. This form facilitates Autocoder coding and card punching of Autocoder program control, tape control and patch cards. (Patch cards corresponding to this form can be ordered under Electrotpe No. L18557; and program and tape-control cards, under Electrotpe No. L18558.) (25 sheets per pad—13 $\frac{1}{2}$ " x 9 $\frac{1}{2}$ ")

X28-7327 Fortran Coding Form 80

This form is used when programming in the *Fortran* language. Columns and lines are ruled and numbered to facilitate both programming and card punching. (Cards corresponding to this form can be ordered under Electrotpe No. 888157.) (50 sheets per pad—11" x 8 $\frac{1}{2}$ ")



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