

**SHARE**  
REFERENCE MANUAL

*Copy 2*

**SHARE**

R E F E R E N C E M A N U A L

for the IBM

**704**

Prepared by

Joanne Edson	CS	
John Greenstadt	NY	Editor-in-Chief
Irwin Greenwald	RS	
Fletcher R. Jones	NA	
Frank V. Wagner	NA	

August, 1956

# SHARE

## REFERENCE MANUAL

### FOREWORD

The SHARE Reference Manual was prepared by the SHARE Committee on the Reference Manual, composed as follows:

John Greenstadt, Chairman	NY
Joanne Edson	CS
Irwin Greenwald	RS
Fletcher Jones	NA
Frank Wagner	NA

Preparation of the various sections was assigned as follows:

#### John Greenstadt

Table of Contents  
Distributed Programs  
Index  
Current Pages  
Binder, Reproduction, etc.

#### Joanne Edson

Synopses of SHARE Minutes (Appendix)

#### Irwin Greenwald

Programming Standards and Conventions  
Procedural Standards  
Machine Standards  
Glossary of SHARE Terms

#### Fletcher Jones

Composition of SHARE Body

#### Frank Wagner

Introduction

The SHARE Reference Manual has been prepared in loose-leaf form for easy updating and revision. From time to time, additional material will be mailed to holders of the Manual.

J. Greenstadt

# SHARE

## REFERENCE MANUAL

### FOREWORD . . 3

At the February, 1958 meeting of SHARE, the makeup of the SHARE Reference Manual Committee was changed. The committee is now composed as follows:

<u>Member</u>	<u>Assignment</u>
L. H. Amaya, CL	Chairman
A. P. Mastrogiovanni, IBM	Editor

# SHARE

## REFERENCE MANUAL

### TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>
01.01	History of the SHARE Organization
01.02	Advantages of SHARE Membership
01.03	Obligations of SHARE Membership
01.04	Scope of SHARE Activities
02.01	Officers and Officials
02.02	List of SHARE Members
02.03	Machine Configurations and Operating Character Charts
03.10	Programming Standards
03.11	Standard Flow Chart Symbols
03.20	The By-Laws of SHARE
03.21	SHARE Distribution Standards
03.30	Machine Standards
03.40	Glossary of SHARE Terms
04.01	Abstract of Distributed Programs (Guide)
04.04	704 Minimum Package
10.01	Synopses of Proceedings
11.01	Index
12.01	Current Pages
13.01	Revisions (List)

# SHARE

## REFERENCE MANUAL

### SECTION 01

#### INTRODUCTION

##### 01.01 The Origin of the SHARE Organization

Upon getting thoroughly into the problem of preparations for the IBM 704, three installations in the Los Angeles area began to have informal discussions concerning their individual plans. Having been pleasantly surprised by the successful cooperative effort for the design and coding of Pact I, a favorable climate existed for a similar joint activity in connection with program development for the 704. Accordingly, Rand, Lockheed, and North American seriously began to consider standardization. A fortunate circumstance was the seminar held by IBM in Los Angeles during the week of August 8, 1955. This brought representatives of several other western installations together, and the idea was discussed among them.

The mutual respect that the participants in these discussions had for the programming competence of the others soon brought the realization that an "isolationist" attitude no longer existed, and almost all professed themselves as quite willing to accept the ideas of others, even to the extent of obsoleting things already done within their own installations. It was unanimously agreed that a full-scale attempt should be made to bring SHARE into being. Since it seemed almost too late to do it on a nationwide basis, extreme haste was necessary and the initial meeting of SHARE was called for the week of August 22, 1955.

In spite of such short notice, almost all potential 704 installations throughout the country responded with alacrity. All expressed a desire to participate, and attendance at the first meeting was gratifyingly large. Seventeen installations - the charter members of the organization - were represented:

BA	Boeing Airplane Company
CL	Lockheed Aircraft Corporation, Burbank
CR	California Research Corporation
CW	Curtiss-Wright Corporation
GE	General Electric Company, Cincinnati
GL	Lockheed Aircraft Corporation, Marietta
GM	General Motors Research
HA	Hughes Aircraft Company

# SHARE

## REFERENCE MANUAL

PK	International Business Machines Corporation, Poughkeepsie
NY	International Business Machines Corporation, New York
ML	Lockheed Aircraft Corporation, Van Nuys
NA	North American Aviation, Inc., Los Angeles
NS	National Security Agency
RS	The Rand Corporation, Santa Monica
UA	United Aircraft Corporation
LA	University of California Los Alamos Scientific Laboratory
LC	University of California Radiation Laboratory, Livermore

One other installation, Douglas Aircraft Company - El Segundo Division, was also present at the first meeting. At that time, its 704 procurement picture was rather vague, but it subsequently became a member.

The name of the organization was selected with the naive hope that suitable words could be found which would match the initials, describe the aims of the organization, and, at the same time, be clever enough so that somebody would admit to originating them. Although many suggestions approximating this were propounded, nobody was really that smart, and so each member is free to interpret the initials in his own way. (It has been suggested that this is symbolic of one of SHARE's principles of "unity in essentials and freedom in accidentals!")

# SHARE

## REFERENCE MANUAL

### 01.02 Advantages of SHARE Membership

A member of SHARE is closely united with one of the main streams of development of computer usage in the world. A substantial percentage of the major users of high-speed digital computing equipment is represented in the SHARE membership. The knowledge of what is going on in these installations is considered by many of those members to be an indispensable requirement for efficiently exploiting the 704 and the 709. In addition to the documentary information which is received through the mail, the informal conversations at the meetings are very productive. These discussions, involving some of the most brilliant 704 and 709 programmers in the world, are frequently extremely fruitful. It has been found that critical evaluation of one another's ideas by these men usually produces a distillation of their thoughts which is superior to any individual opinions.

Member installations should be able to do considerably less programming and checkout of utility routines, mathematical routines and complete systems. Almost all the utility type routines produced by its members are expected to be distributed through SHARE. Members have had the opportunity to have a voice in the specifications of these routines and, because of the close contacts with other members, can keep as up-to-date as necessary on their progress. Even those members who have done a significant amount of utility programming have available to them a considerably more diversified library than they would otherwise. Moreover, the continual interchange of ideas among the members (representing most of the 704-709 programming talent in the world) has demonstrated that a much higher degree of computing sophistication is rapidly built up in an installation than would result if it maintained a splendid isolation.

SHARE has been able to provide IBM with well-thought-out and authoritative requests for changes to the 704, 709 and other associated equipment and believes that IBM will pay much more attention to such a united voice than to individual requests. However, SHARE members also distribute copies of their individual RPQ's through the organization. Officially, SHARE has decided not to extrapolate this activity to include the next generation of machines. However, the presence in one hotel of so much authoritative customer opinion (at SHARE meetings) is expected to be used by machine manufacturers. This is obviously an excellent spot to conduct sales research surveys with the expectation of obtaining highly meaningful information.

# SHARE

## REFERENCE MANUAL

### 01.03 Obligations of SHARE Membership

The principle obligation of a member is to have a cooperative spirit. It is expected that each member approach each discussion with an open mind, and, having respect for the competence of other members, be willing to accept the opinions of others more frequently than he insists on his own. On the other hand, majorities of members are not expected to be overbearing in their dealings with minorities. To win over dissenters to unanimity and not to vote them down is the foremost objective in every discussion. When it comes to standards, SHARE insists on adherence to them for communication purposes through SHARE channels to the extent that it refuses to distribute material not in SHARE language. Of course, decisions of SHARE can in no way be binding on any member installation so far as its internal operation is concerned. However, the great majority of SHARE members deviate internally only very slightly or not at all from the standards adopted by SHARE. New members are urged to scrutinize carefully any such deviation before deciding that it is imperative that they do so. Please note that the foregoing discussion refers to basic contradictions or radically different ways of doing things, and does not refer to minor improvements and additions which will not in the least interfere with normal communications.

#### Attendance at Meetings.

Much of the business of SHARE is transacted at periodic meetings. If it is at all possible, it is desirable that each SHARE member be represented at every meeting by at least two men, one empowered to make basic policy decisions and another thoroughly familiar with techniques, programming, and detailed operating matters.

#### Mail from the Secretary.

Much of the usefulness from SHARE can be destroyed if mail from the Secretary is not answered promptly.

- a. Proposals. As noted under "Procedures" below, certain decisions are reached by mail. When a proposal is being processed, members are under strict obligation to read the information considered in the problem carefully and quickly. If they are directly concerned or have some unique information on the subject, they have a moral obligation to communicate this to the Secretary immediately, so that all the members can be informed of it before the vote. Moreover, all members are expected to vote on every question.



# SHARE

## REFERENCE MANUAL

Because of the requirements for favorable decisions on proposals (particularly revisions to previous), a refusal of a member to vote has, frequently, the same effect as voting "No. "

- b. Information requests. Experience has shown that each installation can frequently make better decisions if it is well-informed of the situation at other installations. The SHARE Secretary will attempt to keep the members up-to-date on certain matters. Therefore, please comply immediately with his requests for information.

### Assignments.

All assignments by SHARE are purely voluntary on the part of those accepting the assignments. This is true in the case of committee assignments as well as assignments to provide utility programs. It is recognized that there may be a wide variation in wealth of manpower among members at any given time. Some may be able to do much more than others. However, once a member has accepted an assignment, he is expected to pursue it with reasonable diligence to its conclusion, and keep the membership informed through the Secretary of his progress. This is particularly important if he will be seriously delayed in completing it. The procedure for final distribution of programming assignments is described below in Section 03, 20.

### Contributions of programs which are not assignments.

All SHARE members are urged to distribute any information which they feel would be useful to other members.

### Submittal of proposals.

Every member has an obligation to evaluate continuously any activities which might involve SHARE, to analyze carefully any ideas which he may have, and to submit in proposal form those which he considers worthwhile.

### Comments on subject under consideration.

Every SHARE member has the obligation to analyze all SHARE subjects under consideration and, if a vote is in prospect, to transmit any strong opinions to the Secretary for distribution. If a subject is simply under consideration by a committee, he is urged to correspond directly with the members of the committee. If an individual member is preparing a program in which another member is interested, the latter is urged to correspond with the former presenting his opinions about the specifications.

# SHARE

## REFERENCE MANUAL

### Errors detected in material distributed.

As soon as a SHARE member detects an error in any material distributed by the SHARE Secretary or by IBM as an official SHARE distribution he has the obligation of corresponding about it directly to the originator of the material, and sending a copy of this correspondence to the Secretary. The originator then has the responsibility of taking appropriate action and distributing corrections as soon as possible, through the Secretary or IBM. These latter will not distribute the information until they hear from the originator.

# SHARE

## REFERENCE MANUAL

### 01.04 Scope of SHARE Activities

In its initial phase, during August and September, 1955, SHARE concerned itself primarily with the determination of procedures and the agreement on standards. This occupied the first two meetings.

For the next four months, from October, 1955, to February, 1956, the preparation and distribution of a minimum set of utility programs and the discussion of potential changes to the 704 were in the forefront.

At the fourth meeting, in February, 1956, decisions were reached concerning the scope of activities for the remainder of that year. The recommendations adopted by the body were:

- a. SHARE is strictly an organization of 704 users;\* any proposed activities or discussions to be undertaken by SHARE should be scrutinized closely in this light.

In particular, SHARE is not properly concerned with any computing machines other than the 704\* (together with its associated equipment). This implies that SHARE will make no recommendations with regard to the characteristics of future machines, nor will such characteristics be discussed by SHARE. (Note comments under "Advantages," paragraph 3.)

- b. No substantial slackening of SHARE activity is presently anticipated. Now that the most essential and fundamental programs and conventions are nearing completion, it is expected that the emphasis will shift to the areas of mathematics and improved operational techniques, as well as more powerful and elegant utility programs. At the subsequent meeting in 1956, consideration will be given to the assignment of responsibilities for carrying out some of these developments.
- c. Standing committees on Mathematical Techniques and on Education were established.
- d. SHARE will meet four times in 1956 (including the February meeting).

It is expected that this subject will be resurveyed at the last meeting in 1956 to chart the course of SHARE during 1957.

\*SHARE has since been expanded to include users of the 709 computing machine and its associated equipment. See section entitled "The By-Laws of SHARE."

John A. Jordan, RL  
System Development Corporation  
2500 Colorado Avenue  
Santa Monica, California

F

I

(To be appointed by Executive Board)

David J. Farber, BE  
Bell Telephone Laboratories  
Whippany, New Jersey

T

E

BD Harry Cantrell, GS  
Advanced Systems Engineering  
and Analytical Department  
General Electric Company  
Schenectady, New York

F

BD D. E. Eastwood, BE  
Mathematical Research Department  
Bell Telephone Laboratories  
Murray Hill, New Jersey

C

F

BD George H. Mealey, RS  
Computer Science Department  
The Rand Corporation  
1700 Main Street  
Santa Monica, California

F

I

EXC BD Bruce Rosenblatt, SC  
Electronic Computing Center  
Standard Oil of California  
225 Bush Street  
San Francisco, California

SU I-7700

## MANUAL

- HN James E. Rowe, DP  
Union Carbide Nuclear  
Oak Ridge Gaseous Diffusion Plant  
Oak Ridge, Tennessee
- DEMS George Ryckman  
Special Problems Department  
General Motors Research Laboratories  
General Motors Technical Center  
Warren, Michigan
- G James A. Porter, GE  
Computer Techniques Development  
General Electric Company  
Building 305  
Cincinnati 15, Ohio
- LN  
NY Wil. Strobel, CO  
Central Computer Department  
Continental Oil Company  
Bene, City Oklahoma
- W Francis V. Wagner, NA  
Engineering Computing  
North American Aviation, Inc.  
Cincinnati Airport  
Cincinnati 15, Ohio



- AF MR. JEAN SALMON  
COMMISSARIAT A L ENERGIE ATOMIQUE  
4, RUE DE MONDOVI  
PARIS 13<sup>E</sup> - FRANCE
- AL DR. WILLIAM A. MERSMAN  
AMES AERONAUTICAL LABORATORY  
NAT. ADV. COMM. FOR AERONAUTICS  
MOFFETT FIELD, CALIFORNIA  
YORKSHIRE 7-5581
- AM DR. JOHN W. WRENCH, JR.  
APPLIED MATHEMATICS LABORATORY CODE 840  
DAVID TAYLOR MODEL BASIN  
WASHINGTON 7, D.C.  
ATTENTION - MRS. F. E. HOLBERTON  
OLIVER 4-2600. EXT. 497
- AN DR. RICHARD F. KING  
APPLIED MATHEMATICS DIVISION  
ARGONNE NATIONAL LABORATORY  
BOX 299  
LEMONT, ILLINOIS  
TEL. - LEMONT 800, EXT. 2895
- AP MR. L. N. MCCLUNG  
APPLIED PHYSICS LABORATORY  
THE JOHN HOPKINS UNIVERSITY  
8621 GEORGIA AVENUE  
SILVER SPRING, MARYLAND
- AR MR. ROBERT L. CUSHMAN  
RESEARCH AND ADVANCE DEVELOPMENT DIV.  
AVCO MANUFACTURING CORPORATION  
201 LOWELL STREET  
WILMINGTON, MASSACHUSETTS  
TEL.- OLIVER 8-8911, EX. 2001

- AS MR. D. A. JACKSON  
LIQUID ROCKET PLANT  
AEROJET-GENERAL CORPORATION  
P. O. BOX 1947  
SACRAMENTO, CALIFORNIA  
TEL. YUKON 5-5111, EXT. 704
- AT DR. STEWART I. SCHLESINGER  
MANAGER, MATHEMATICAL SERVICES DEPT.  
AERONUTRONIC SYSTEMS INC.  
1234 AIRWAY  
GLENDALE, CALIFORNIA
- AV MR. A. O. DOWNING  
COMPUTING DEPT. 2923  
AVRO AIRCRAFT LIMITED  
BOX 4004, TERMINAL A  
TORONTO, ONTARIO, CANADA  
BUTLER 6 4411 EXT. 369
- BA MR. JOHN JORDAN  
ELECTRONIC SCIENCES SECTION, 15-09  
BOEING AIRPLANE COMPANY  
BOX 3707  
SEATTLE 24, WASHINGTON  
JUNIPER 5-5895, 5-5949
- BC PROFESSOR L. G. HENYAY  
COMPUTER CENTER  
ROOM 224, BLDG. T-6  
UNIVERSITY OF CALIFORNIA  
BERKELEY 4, CALIFORNIA  
TEL.- AS 3-6000, EXT. 8521
- BE DR. G. L. BALDWIN  
MATHEMATICAL RESEARCH DEPT.  
BELL TELEPHONE LABORATORIES  
MURRAY HILL LABORATORY  
MURRAY HILL, NEW JERSEY  
TEL. - CRESTVIEW 3-6000, EXT. 3584



BL MR. RAYMOND E. CARROLL  
ELECTRONIC DATA PROCESSING  
BELL AIRCRAFT CORPORATION  
POST OFFICE BOX 1  
BUFFALO 5, NEW YORK  
TEL. - NIAGARA FALLS 7851, EXT. 7196

BS MR. J. H. WEGSTEIN  
COMPUTATION LABORATORY  
NATIONAL BUREAU OF STANDARDS  
WASHINGTON 25, D. C.  
TEL. - EM 2-4040, EXT. 7501

BT MR. M. P. EPSTEIN  
BELL TELEPHONE LABORATORIES  
WHIPPANY LABORATORY  
WHIPPANY, NEW JERSEY

BW MR. WILLIAM R. BAYLESS  
DIGITAL COMPUTING UNIT  
BOEING AIRPLANE COMPANY  
WICHITA 1, KANSAS  
TEL. MU 3-8511, EXT. 3929

CA DR. PAUL E. LEWIS  
MAIL ZONE 591-30  
CONVAIR-ASTRONAUTICS  
P. O. BOX 1128  
SAN DIEGO 12, CALIFORNIA  
TEL. BROWNING 7-8900, EX. 2166

CB MR. GEORGE W. TUIE  
COMBUSTION ENGINEERING, INC.  
200 MADISON AVENUE  
NEW YORK 16, NEW YORK

- CC MRS. JOSEPHINE P. LEGAULT  
C/O MATHEMATICAL SERVICES  
BLDG. 989-1 MU811  
RCA SERVICE COMPANY  
PATRICK AFB, FLORIDA
- CE MR. WILLIAM ORCHARD HAYS  
DIRECTOR, COMPUTER SERVICES DIV.  
COUNCIL FOR ECON. AND INDUST. RSRCH.  
1200 JEFFERSON DAVIS HIGHWAY  
ARLINGTON 2, VIRGINIA  
TEL. - OT 4-6377
- CF MR. O. J. ADAIR  
DIGITAL COMPUTING LAB.  
CONVAIR DIV. OF GEN. DYNAMICS CORP.  
FORT WORTH, TEXAS  
TEL. - PE 8-7311, EXT. 7234
- CL MR. RONALD W. HOLLENBECK  
MATHEMATICAL ANALYSIS DEPARTMENT  
LOCKHEED AIRCRAFT CORPORATION  
CALIFORNIA DIVISION  
BURBANK, CALIFORNIA  
TEL. STANLEY 7-2711, EX. 3042
- CM MR. A. H. ALBERT  
APPLIED MATHEMATICS DEPARTMENT  
MISSILE OPERATIONS  
CHRYSLER CORPORATION  
P.O. BOX 2628  
DETROIT 31, MICHIGAN  
JE 9-2000, EXT. 6814
- CP MR. CHARLES W. ADAMS  
CREOLE PETROLEUM CORPORATION  
APARTADO 889  
CARACAS, VENEZUELA

- CR MR. R. F. ELDREDGE  
CORPORATE INFORMATION PROCESSING CENTER  
CHRYSLER CORPORATION  
P. O. BOX 1919  
DETROIT 31, MICHIGAN  
TULSA 3-4500, EXT. 3466
- CS MR. BEN FERBER  
DEPARTMENT 6-167  
CONVAIR DIV. OF GENERAL DYNAMICS CORP.  
PO BOX 1950  
SAN DIEGO 12, CALIFORNIA  
CYPRESS 66611, EXT 1310
- CU MR. MARSHALL B. COHEN  
COMPUTER SYSTEMS BRANCH  
CORNELL AERONAUTICAL LABORATORY, INC.  
4455 GENESEE STREET  
BUFFALO 21, NEW YORK  
TEL. - PL-7500, EXT. 714
- .CV DR. H. A. WOOD  
ENGINEERING MACHINE COMPUTATIONS GROUP  
CHANCE VOUGHT AIRCRAFT, INCORPORATED  
P. O. BOX 5907  
DALLAS 22, TEXAS  
TEL. ANDREW 2-3211, EXT. 2691
- CW MR. JOHN A. DE VRIES  
COMPUTING DEPARTMENT  
RESEARCH DIVISION  
CURTISS-WRIGHT CORPORATION  
QUEHANNA, PENNSYLVANIA  
TEL. - AMHERST 3-4711, EXT. 338
- DA MR. WALTER C. SCHLIESER  
ENGINEERING COMPUTING GROUP, B-250  
EL SEGUNDO DIVISION  
DOUGLAS AIRCRAFT CORPORATION  
EL SEGUNDO, CALIFORNIA  
TEL. - OREGON 7-6161, EXT. 1151

DC MR. CHARLES W. BACHMAN, MANAGER  
CENTRAL DATA PROCESSING  
THE DOW CHEMICAL COMPANY  
MIDLAND, MICHIGAN  
TEL. TEMPLE 2-2311, EXT. 7210

DF MR. C. E. PETTINGALL  
COMPUTING GROUP - A-850  
TESTING DIVISION  
DOUGLAS AIRCRAFT COMPANY  
3000 OCEAN PARK BOULEVARD  
SANTA MONICA, CALIFORNIA

DI DATA PROCESSING DIVISION  
DIRECTORATE OF STATISTICAL SERVICES  
HEADQUARTERS U. S. AIR FORCE  
ATTN- MR. JOSEPH B. JORDAN  
WASHINGTON 25, D. C.  
TEL. - 5-6700, EXT. 7-6284

DM DOUGLAS AIRCRAFT COMPANY  
MISSILES AND SPACE SYSTEMS  
ENGINEERING DEPARTMENT  
3000 OCEAN PARK BLVD.  
SANTA MONICA, CALIFORNIA  
ATTN. D. H. HARNED  
TEL. EXBROOK 9-9311, EXT. 2674

DS MR. JOHN LOWE  
COMPUTING ENGINEERING GROUP  
SANTA MONICA DIVISION  
DOUGLAS AIRCRAFT CORPORATION  
SANTA MONICA, CALIFORNIA  
TEL. - EXBROOK 9-9311, EXT. 4013

EB DR. A.J. VAN WOERKOM  
COMPUTING SERVICES SECTION  
ELECTRIC BOAT DIVISION OF  
GENERAL DYNAMICS CORPORATION  
GROTON, CONNECTICUT  
TEL. - NEW LONDON HILL TOP 5-4321, EXT. 1379

- EC ALFRED E. MILLER  
METHODS AND ANALYSIS SECTION  
DATA REDUCTION BRANCH FTFFDK  
AIR FORCE FLIGHT TEST CENTER  
EDWARDS AIR FORCE BASE,  
CALIFORNIA  
EDWARDS CALIF. 1101, EXT. 3-9791
- EL MR. W. R. COUCH  
SCIENTIFIC COMPUTATION LABORATORY  
INTERNATIONAL BUSINESS MACHINES CORP.  
ENDICOTT, NEW YORK  
ENDICOTT 8-2211, EXT. 564
- EO MR. KENT CURTIS  
ROOM 107, BUILDING 47  
ERNEST O. LAWRENCE RADIATION LABORATORY  
UNIVERSITY OF CALIFORNIA  
BERKELEY, CALIFORNIA
- ER MR. M. A. EFROYMSON  
ESSO RESEARCH AND ENGINEERING COMPANY  
P.O. BOX 215  
LINDEN, NEW JERSEY  
WA 5-1600, EXT. 3121
- FA MR. A. WETTER, W-657  
FEDERAL AVIATION AGENCY  
WASHINGTON 25, D. C.
- FE MR. ROBERT SIMON  
COMPUTER AND DATA REDUCTION DEPARTMENT  
FAIRCHILD ENGINE DIVISION  
FAIRCHILD ENGINE AND AIRPLANE CORP.  
COMMACK ROAD  
DEER PARK, LONG ISLAND, NEW YORK  
TEL. - DEER PARK-2-7211, EXT. 624

- GA MR. CHARLES W. LIBBY  
LYNN COMPUTATIONS OPERATION  
GENERAL ELECTRIC COMPANY  
950 WESTERN AVENUE  
BUILDING 59 RIVER WORKS  
WEST LYNN, MASSACHUSETTS  
LY 8-6000, EXT. 3737
- GC MR. GERALD D. FOGEL  
SUPERVISOR, AUTOMATIC COMPUTING GROUP  
RESEARCH DEPARTMENT  
GRUMMAN AIRCRAFT  
BETHPAGE, LONG ISLAND, NEW YORK  
WELLS 1-1500, EXT. 3864
- GD MR. HAYDEN E. WILLIAMS, MANAGER  
DATA PROCESSING OPERATIONS  
HEAVY MILITARY ELECTRONIC EQPMT. DEPT.  
GENERAL ELECTRIC COMPANY  
ELECTRONICS DIVISION  
SYRACUSE, NEW YORK  
GR 6-4411, EXT. 5324
- GE MR. FREDERICK B. BANAN  
FLIGHT PROPULSION LAB. DEPT.  
BUILDING 305  
GENERAL ELECTRIC COMPANY  
CINCINNATI 15, OHIO  
POPLAR 1-4100, EXT. 704
- GG MR. R. HABERMANN, SUPERVISOR  
DATA PROCESSING AND NUMERICAL ANALYSIS  
DEFENSE SYSTEMS DEPT.  
GENERAL ELECTRIC COMPANY  
300 SOUTH GEDDES STREET  
SYRACUSE, NEW YORK

- GH MR. H. TELLIER  
MANAGER DATA PROCESSING  
GENERAL ELECTRIC COMPANY  
HANFORD ATOMIC PRODUCTS OPERATION  
RICHLAND, WASHINGTON
- GI MR. ROBERT D. HARRISON  
SCIENTIFIC APPLICATIONS SECTION  
GENERAL ELECTRIC COMPANY  
POST OFFICE BOX 442  
TEMPE, ARIZONA  
ATTENTION- MISS MARCIA M. MOONEY  
WO 7-2071, EXT 7
- GK MR. DONALD B. MAC MILLAN  
MATHEMATICAL ANALYSIS UNIT  
KNOLLS ATOMIC POWER LABORATORY  
GENERAL ELECTRIC COMPANY  
SCHENECTADY, NEW YORK  
EXPRESS 3 6611 EXT. 602
- GL E. K. RITTER  
DEPARTMENT 72-22, MAIL ZONE 174  
LOCKHEED AIRCRAFT CORPORATION  
MARIETTA, GEORGIA  
ATLANTA JA 3-1411, EXT. 3394
- GM MR. DONALD E. HART  
SPECIAL PROBLEMS DEPARTMENT  
GENERAL MOTORS RESEARCH  
BOX 188, NORTH END STATION  
DETROIT 2, MICHIGAN  
JEFFERSON 9-5000, EXT. 4571
- GN MR. MAURICE J. AEGERTER  
MATHEMATICAL ANALYSIS UNIT  
AIRCRAFT NUCLEAR PROPULSION UNIT  
GENERAL ELECTRIC COMPANY  
CINCINNATI 15, OHIO  
TEL. VALLEY 1 7400 EXT. 608

SHARE  
REFERENCE MANUAL

- GP CORTLAND DIEHM  
MISSILE AND SPACE VEHICLES DEPT.  
GENERAL ELECTRIC COMPANY  
3198 CHESTNUT STREET  
PHILADELPHIA 4, PENNSYLVANIA  
TEL. - EVERGREEN 2-7800, EXT. 933
- GR DR. EDWARD B. WEINBERGER  
COMPUTATIONAL ANALYSIS SECTION  
GULF RESEARCH & DEVELOPMENT CO.  
P. O. DRAWER 2038  
PITTSBURGH 30, PENNSYLVANIA  
TEL. EMERSON 2-1600, EXT. 618
- GS MR. HARRY N. CANTRELL  
LARGE STEAM TURBINE-GENERATOR  
DEPARTMENT 59-244  
GENERAL ELECTRIC COMPANY  
SCHENECTADY, NEW YORK  
TEL. - FRANKLIN 42211, EXT. 3453
- HA MR. WILLIAM J. DRENICK  
HUGHES AIRCRAFT COMPANY  
FLORENCE AND TEALE STREETS  
BUILDING 6, MAIL STATION Q1072  
CULVER CITY, CALIFORNIA  
TEL. EXBROOK 1-3764, EXT. 6201 STATION 61
- HE COMMANDER, 3206TH TEST GROUP  
ATTN-PGVLDC, MR. H. L. ADAMS  
BUILDING 100  
EGLIN AFB, FLORIDA  
TELEPHONE 4225
- HK COMMANDER  
4925TH. TEST GROUP %ATOMIC%  
ATTN- SWVVD  
KIRTLAND AIR FORCE BASE, NEW MEXICO



IB MR. FRANK S. BECKMAN  
MGR. 704-709 APPLIED PROGRAMMING GROUP  
IBM CORPORATION  
425 PARK AVENUE  
10TH. FLOOR  
NEW YORK 22, N. Y.

IE MR. ROBERT LANE  
INTERNATIONAL ELECTRIC CORPORATION  
BOX 285  
PARAMUS, NEW JERSEY

IG MR. GORDON BLACK, TECHNICAL MANAGER  
RESEARCH AND DEVELOPMENT BRANCH  
UNITED KINGDOM ATOMIC ENERGY AUTHORITY  
INDUSTRIAL GROUP HEADQUARTERS  
RISLEY  
WARRINGTON, LANCASHIRE  
ENGLAND

JM DR. KIYOO WADATI  
DIRECTOR-GENERAL  
JAPAN METEOROLOGICAL AGENCY  
OTE-MACHI, CHIYODA-KU  
TOKYO, JAPAN

JP MR. W. HOOVER  
JET PROPULSION LABORATORY  
CALIFORNIA INSTITUTE OF TECHNOLOGY  
4800 OAK GROVE DRIVE  
PASADENA 3, CALIFORNIA

LA MR. LOUIS GATT  
LOS ALAMOS SCIENTIFIC LABORATORY  
P. O. BOX 1663  
LOS ALAMOS, NEW MEXICO  
TEL. - LOS ALAMOS 7-5180

- LC DR. SIDNEY FERNBACH  
COMPUTATION DIVISION  
RADIATION LABORATORY  
UNIVERSITY OF CALIFORNIA  
LIVERMORE, CALIFORNIA  
HI 7-1100, EXT. 7204
- LF MR. THOMAS B. ANDREWS, JR.  
ANALYTICAL COMPUTING BRANCH  
LANGLEY RESEARCH CENTER  
NATIONAL AERONAUTICS AND SPACE ADMSTRN.  
LANGLEY FIELD, VIRGINIA  
TEL. PARK 2-6341, EX. 34R3
- LL MR. JAMES J. FITZGERALD  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
LINCOLN LABORATORY  
LEXINGTON 73, MASSACHUSETTS  
TEL. VOLUNTEER 2-3370, EX. 7389
- LR DR. LYNN U. ALBERS  
NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION  
LEWIS RESEARCH CENTER  
21000 BROOKPARK ROAD  
CLEVELAND 35, OHIO
- MA MRS. JUNE WATSON  
APPLIED MATH. DEPT. 666-D  
MCDONNELL AIRCRAFT CORPORATION  
P.O. BOX 516  
ST. LOUIS 3, MISSOURI  
PERSHING 1-2121, STA. 3535
- MB MR. GEORGE B. FALLON  
AUTO. COMP. SECTION  
MAIL NO. T-6032  
THE MARTIN COMPANY  
BALTIMORE 3, MARYLAND  
MURDOCK 7-3800, EXT. 8323

- MC MR. JOHN HANCOCK  
SUPERVISOR, MATH SERVICES  
MARQUARDT AIRCRAFT CO.  
P. O. BOX 2013 SOUTH ANNEX  
VAN NUYS, CALIFORNIA  
ST 5-8361, EXT. 257
- MD MR. J. E. FEELY, JR.  
THE MARTIN COMPANY  
MAIL NO A-181  
P. O. BOX 179  
DENVER 1, COLORADO  
PY 4-5211, EXT. 3354
- ME MR. ALAN R. CHANDLER  
THE MITRE CORPORATION  
P. O. BOX 208  
LEXINGTON 73, MASSACHUSETTS
- MF MR. WARREN B. KOCH  
THE MARTIN COMPANY  
MAIL NO. MP-77  
ORLANDO, FLORIDA
- MI DR. FRANK M. VERZUH  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
77 MASSACHUSETTS AVENUE  
CAMBRIDGE 39, MASSACHUSETTS  
TEL. UNIVERSITY 4-6900, EX. 637
- ML MR. L. H. AMAYA  
LOCKHEED MISSILE SYSTEMS DIVISION  
DEPT. 54-38, BLDG. 201  
3251 HANOVER STREET  
PALO ALTO, CALIFORNIA  
TEL. DAVENPORT 4-3311, EX. 415

- MP MR. J. E. HAMLIN  
COMPUTING CENTER  
DEPT. 551, BLDG. 003  
IBM MILITARY PRODUCTS DIVISION  
NEIGHBORHOOD ROAD  
KINGSTON, N.Y.  
FE 8-5000, EXT. 7374
- MS MR. LEON COOPER  
RESEARCH AND ENGR. DIV.  
MONSANTO CHEMICAL CO.  
LINDBERGH AND OLIVE STREET ROAD  
ST. LOUIS 24, MISSOURI
- MU MR. MELVIN R. STORM  
MIDWESTERN UNIV. RESEARCH ASSOC.  
2203 UNIVERSITY AVENUE  
MADISON 5, WISCONSIN  
TEL. CE 3-9757
- NA MR. OWEN R. MOCK  
INTEGRATED DATA PROCESSING, DEPT. 92  
LOS ANGELES DIVISION  
NORTH AMERICAN AVIATION, INC.  
INTERNATIONAL AIRPORT  
LOS ANGELES 45, CALIFORNIA  
ORCHARD 8-3011, EXT. 3788
- NC MR. FLETCHER R. JONES  
INTEGRATED DATA PROCESSING, DEPT 92  
COLUMBUS DIVISION  
NORTH AMERICAN AVIATION INC.  
4300 EAST FIFTH AVENUE  
COLUMBUS 16, OHIO  
BELMONT 1-1851, EXT. 1074

**SHARE  
REFERENCE MANUAL**

- NL DR. J. F. PERKINS  
GEORGIA NUCLEAR LABORATORY  
LOCKHEED AIRCRAFT CORPORATION  
MARIETTA, GEORGIA
- NO MR. ROBERT H. BRACKEN  
DATA COMPUTATION BRANCH  
CODE 3037, MICHELSON LABORATORY  
NAVAL ORDNANCE TEST STATION  
CHINA LAKE, CALIFORNIA  
INYOKERP 5-0111, EXT. 7-1631
- NP MR. E. M. PIPER  
DEPT. 3230/31  
NORTHROP AIRCRAFT INC.  
HAWTHORNE, CALIFORNIA  
OSBORNE 5-4611, EXT. 1835
- NR MR. DONALD J. BREHEIM  
D/592 INTEGRATED DATA PROCESSING  
ROCKETDYNE DIVISION  
NORTH AMERICAN AVIATION, INC.  
6633 CANOGA AVENUE  
CANOGA PARK, CALIFORNIA  
DIAMOND 7-5651 EXT. 705
- NS DIRECTOR  
NATIONAL SECURITY AGENCY  
FORT GEORGE G. MEADE, MARYLAND  
ATTN- MR. GLENN W. SHOOK, MPRO  
TEL. PARKWAY 5-4400, EX. 7625
- NT MR. HOYT L. STEVENS  
ROOM 3-250  
U. S. NAVAL ORDNANCE LABORATORY  
WHITE OAK, SILVER SPRING, MARYLAND

- NU MR. MAX GOLDSTEIN  
AEC COMPUTING FACILITY  
INSTITUTE OF MATHEMATICAL SCIENCES  
NEW YORK UNIVERSITY  
4 WASHINGTON PLACE  
NEW YORK 3, NEW YORK  
OR 7-0200
- NY MR. JOHN HAWK  
SERVICE BUREAU CORPORATION  
NEW YORK DATA PROCESSING CENTER  
635 MADISON AVENUE  
NEW YORK 22, NEW YORK  
PLAZA 1-4600, EXT. 282
- OL MR. J. R. BELFORD  
ACL COMPUTATION SERVICES  
DEPT. 510 IBM CORPORATION  
AIRBORNE COMPUTER LABORATORIES  
OWEGO, NEW YORK  
TEL. 1800, EXT. 2685
- OR MR. J. P. KELLY  
UNION CARBIDE NUCLEAR CORPORATION  
OAK RIDGE GASEOUS DIFFUSION PLANT  
OAK RIDGE, TENNESSEE  
ATTENTION - MR. E. B. CARTER  
TEL. LD 220, EXT. 8671
- OS MR. ROY F. REEVES, DIRECTOR  
NUMERICAL COMPUTATION LABORATORY  
OHIO STATE UNIVERSITY RESEARCH CENTER  
1314 KINNEAR ROAD  
COLUMBUS 10, OHIO  
HU 6-4341, EX. 214., CAMPUS EX. 87-214

- PE MR. HARVEY S. LONG  
ANALYSIS AND COMPUTATION DEPARTMENT  
IBM POUGHKEEPSIE PROD. DEV. LABORATORY  
POUGHKEEPSIE, NEW YORK
- PF MR. ANDRE ROUDIL  
EUROPEAN COMPUTING CENTER  
COMPAGNIE IBM FRANCE  
5, PLACE VENDOME  
PARIS 1, FRANCE  
TEL. OPERA 17-90
- PK MISS MAUREEN KANE  
COMPUTING CENTER, DEPT. 492  
IBM RESEARCH LABORATORY  
BOARDMAN ROAD  
POUGHKEEPSIE, NEW YORK  
TEL. - GLOBE 4-1000, EXT. 252R
- PM LLOYD A. HYNDS %CODE RO-94□  
PACIFIC MISSILE RANGE  
U.S. NAVAL MISSILE CENTER  
POINT MUGU, CALIFORNIA  
TEL. HUNTER 6-1681, EXT. 535
- PP MR. G. R. TAIT  
COMPUTER METHODS AND PROCEDURE  
COMPUTING DEPARTMENT  
PHILLIPS PETROLEUM COMPANY  
BARTLESVILLE, OKLAHOMA  
6600, EXT. 7564
- PW MR. SHELDON G. SIDRANE  
PRATT AND WHITNEY AIRCRAFT  
FLORIDA RESEARCH AND DEVELOPMENT CENTER  
MACHINE COMPUTING LABORATORY  
WEST PALM BEACH POST OFFICE  
UNITED, FLORIDA

RA MR. WILLIAM L. SULLIVAN, MANAGER  
COMPUTER TECHNIQUES  
HUNTSVILLE COMPUTER CENTER  
GENERAL ELECTRIC COMPUTER DEPARTMENT  
P. O. BOX 988  
HUNTSVILLE, ALABAMA

RC MR. DAVID B. MAYER  
SYSTEMS ENGINEERING, DIGITAL SIMULATION  
BUILDING 108-1  
DEFENSE ELECTRONICS PRODUCTS  
RADIO CORPORATION OF AMERICA  
MOORESTOWN, NEW JERSEY

RF MR. AARON FINERMAN  
SUPERVISOR, DIGITAL COMPUTING  
ENGINEERING DEPARTMENT  
REF.- P.O. NUMBER E-357518  
REPUBLIC AVIATION CORPORATION  
FARMINGDALE  
LONG ISLAND, NEW YORK  
TEL. CHAPEL 9-1100

RL MR. THOMAS B. STEEL, JR.  
SYSTEM DEVELOPMENT CORPORATION  
2500 COLORADO AVENUE  
SANTA MONICA, CALIFORNIA  
EXBROOK 3-9411, EXT. 6424

RM DR. ISADORE SILBERMAN  
RAYTHEON MANUFACTURING CO.  
MISSILE SYSTEMS DIVISION  
BEDFORD, MASSACHUSETTS

RP DR. BLAIR W. SPARKS  
C/O DATA PROCESSING PLANNING  
BLDG. 989-1 MU811  
RCA SERVICE COMPANY  
PATRICK AFB, FLORIDA



- RS MR. PAUL ARMER  
THE RAND CORPORATION  
1700 MAIN STREET  
SANTA MONICA, CALIFORNIA  
ATTENTION - MR. IRWIN GREENWALD  
EXBROOK 3-0411, EXT. 430
- RW MILLARD H. PERSTEIN, CDRC  
SPACE TECHNOLOGY LABORATORIES  
P. O. BOX 95001  
LOS ANGELES 45, CALIFORNIA  
OSBORNE 5-4677, OREGON 8-0541, EXT. 2324
- SA LT. COL. GEORGE H. MCKEE  
CHIEF, PLANS AND PROGRAM BRANCH  
CONTROL DIVISION  
DIRECTORATE OF OPERATIONS  
HEADQUARTERS, STRATEGIC AIR COMMAND  
OMAHA, NEBRASKA  
BE 2100, EXT. 25137
- SC MR. B. A. ROSENBLATT  
ELECTRONICS COMPUTING CENTER  
STANDARD OIL OF CALIFORNIA  
225 BUSH STREET  
SAN FRANCISCO, CALIFORNIA  
SU 1-7700
- SD MR. FRED G. STOCKTON  
SHELL DEVELOPMENT COMPANY  
EMERYVILLE, CALIFORNIA  
OLYMPIC 3-2100
- SE MR. SIDNEY CASHTON  
PROGRAMMING AND SIMULATION DEPARTMENT  
SYLVANIA ELECTRIC PRODUCTS, INC.  
DATA PROCESSING LABORATORY  
NEEDHAM HEIGHTS 94, MASSACHUSETTS  
TEL. HILLCREST 4-3940, EXT. 134

- SM DR. JULIUS S. ARONOFSKY  
ELECTRONIC COMPUTER CENTER  
SOCONY MOBIL OIL COMPANY, INC.  
150 EAST 42ND. STREET  
NEW YORK 17, N.Y.
- SO MR. C. M. JONES  
DATA PROCESSING DEPARTMENT  
SHELL OIL COMPANY  
50 WEST 50TH STREET  
NEW YORK 20, NEW YORK  
TEL. JUDSON 6-5000, EXT. 3388
- SP MR. C. E. GIEBLER  
MANAGER OF COMPUTER OPERATIONS  
NORTHERN STATES POWER COMPANY  
MINNEAPOLIS 2, MINNESOTA  
TEL. FEDERAL 8-7792, EX. 8450
- SQ MR. W. W. BLEDSOE  
SYSTEMS ANALYSIS DEPARTMENT, 5120  
SANDIA CORPORATION  
SANDIA BASE  
ALBUQUERQUE, NEW MEXICO
- SV MR. W. DUTTON  
SHELL OF VENEZUELA  
APARTADO 19,  
MARACAIBO, VENEZUELA  
SOUTH AMERICA
- TA MR. PAUL T. SMITH  
PROJECT MANAGER  
COMPUTING AND DATA PROCESSING PLANNING  
TEMCO AIRCRAFT CORPORATION  
P.O. BOX 6191  
DALLAS, TEXAS

- TC MR. JOHN R. PEARSON, SUPERVISOR  
PROGRAMMING AND PROCEDURES  
ENGINEERING SERVICES DIVISION  
TELECOMPUTING CORPORATION  
HOLLOMAN AFB, NEW MEXICO
- TE MR. ROBERT L. SMITH, JR.  
DATA PROCESSING CENTER  
TEXAS ENGINEERING EXP. STATION  
COLLEGE STATION, TEXAS
- TR MR. MARVIN HOWARD  
ROOM 1305, BUILDING F  
RAMO-WOOLDRIDGE DIVISION OF,  
THOMPSON RAMO WOOLDRIDGE INC.  
P. O. BOX 90534 AIRPORT STATION  
LOS ANGELES 45, CALIFORNIA
- TU MR. BOYD C. BRINTON  
THIOKOL CHEMICAL CORPORATION  
UTAH DIVISION  
BRIGHAM CITY, UTAH
- TV MR. MARTIN HOCHDORF  
SUPERVISOR, COMPUTING CENTER  
TENNESSEE VALLEY AUTHORITY  
OLD POST OFFICE BUILDING  
CHATTANOOGA, TENNESSEE  
AMHURST 5-3551, EXT. 551
- UA MR. WALTER A. RAMSHAW  
COMPUTATION LABORATORY  
RESEARCH DEPARTMENT  
UNITED AIRCRAFT CORPORATION  
400 MAIN STREET  
EAST HARTFORD 8, CONNECTICUT  
TEL. - JACKSON 84811, EXT. 8559

SHARE  
REFERENCE MANUAL

UC MR. JAMES T. SCOTT  
ASSISTANT MANAGER  
ELECTRONIC DATA PROCESSING DEPT.  
UNION CARBIDE CORPORATION  
300 MADISON AVENUE, 1ST. FLOOR  
NEW YORK 17, NEW YORK  
TEL. MU 7-8000, EX. 1392

UM MR. CECIL C. CRAIG, DIRECTOR  
STATISTICAL RESEARCH LABORATORY  
UNIVERSITY OF MICHIGAN  
106 RACKHAM BLDG.  
ANN ARBOR, MICHIGAN

UW MR. DAVID B. DEKKER, DIRECTOR  
RESEARCH COMPUTER LABORATORY  
UNIVERSITY OF WASHINGTON  
SEATTLE 5, WASHINGTON

VG MR. B. G. OLDFIELD  
VANGUARD COMPUTING CENTER  
615 PENNSYLVANIA AVENUE., N.W.  
WASHINGTON 4, D.C.  
TEL. METROPOLITAN 8-6775, EXT. 29

WB MR. HERBERT S. BRIGHT  
CENTRAL PHYSICS AND MATHEMATICS DEPT.  
WESTINGHOUSE BETTIS PLANT  
P. O. BOX 1468  
PITTSBURGH 30, PENNSYLVANIA  
HOMESTEAD 2 5000 EXT. 502

WD MR. RICHARD H. HILL  
ASSISTANT DIRECTOR  
WESTERN DATA PROCESSING CENTER  
UNIVERSITY OF CALIFORNIA  
GRADUATE SCHOOL OF BUSINESS ADMNSTN.  
LOS ANGELES 24, CALIFORNIA  
BR 2-6161, EXT. 9379

WH DR. EDWIN L. HARDER  
ANALYTICAL DEPARTMENT 4L39  
WESTINGHOUSE ELECTRIC  
EAST PITTSBURGH, PENNSYLVANIA  
ATTENTION - MR. FRANK ENGEL  
TEL. - EXPRESS 12800, EXT. 2151

WL MR. ARTHUR COHEN  
MANAGER, DATA PROCESSING  
WATSON SCIENTIFIC COMPUTING LABORATORY  
612 WEST 116TH. STREET  
NEW YORK 25, NEW YORK

WP LT. SAMUEL KAMPOS  
COMPUTATION SECTION  
JOINT NUMERICAL WEATHER PREDICTION UNIT  
WEATHER BUREAU  
U. S. DEPARTMENT OF COMMERCE  
WASHINGTON 25, D. C.  
TEL. LU 4-3000, EX. 7169

# SHARE

## REFERENCE MANUAL

### SECTION 03.10

#### SHARE Programming Standards and Conventions

##### A. Program Write-Up Format

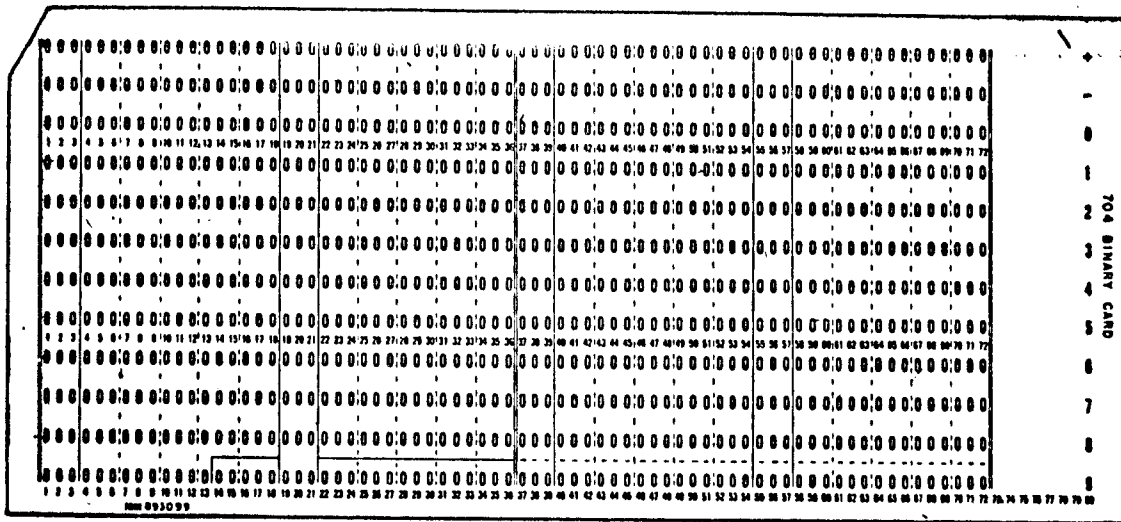
1. Identification
  - a. Deck number - Title
  - b. Author - Date
  - c. Installation
2. Purpose - Brief Statement
3. Restrictions
  - a. Components required other than "minimum 704"
  - b. Other programs required
  - c. Data (quantity, form)
  - d. Card form
  - e. Wiring diagram (for print routines using other than SHARE boards)
4. Method
  - a. Accuracy
  - b. Range
  - c. Derivation or reference
5. Usage
  - a. Calling Sequence
  - b. Space Required
  - c. Error codes (left in Accumulator or MQ)
  - d. Format received or generated if an input-output routine
6. Coding Information
  - a. Constants and their locations
  - b. Erasable input-output locations
  - c. Timing
7. Checkout
  - a. Status
  - b. Method

# SHARE REFERENCE MANUAL

## B. Card and Tape Formats

1. All cards (on-line or off-line) which contain 72 columns of information and 8 columns of identification are to be punched with the information in columns 1-72 and the identification in columns 73-80.
2. Binary Information Format

The general layout of the binary cards is shown below:



For convenience, we shall use an abbreviated designation for various parts of the card. For example, the 13th bit position of the word in the left half of the 6th row would be denoted by 6L13. (Note: The sign bit is considered as bit #0). The decrement field of the same word would be 6LD. P, T and A stand respectively for prefix, tag and address. The sign bit is denoted by S.

The 9L word is always the control word and the 9R word is always the 36 bit ACL check sum (denoted by CKS). The following list contains the various types of binary cards used.

- a) Absolute Data
- b) Relocatable Data
- c) Correction and/or Transfer
- d) Origin Table

# SHARE

## REFERENCE MANUAL

Detailed descriptions of these card types follow:

a) Absolute Data

9L1 is not punched. Bits 9L13 to 9L17 contain the word count V. 9L21 to 9L35 contain the initial location R. All other positions in 9L are ordinarily blank. 8L, 8R, 7L, 7R, ... contain the absolute data. The maximum word count is  $22_{10} = 26_8$ . If 9L2 is punched, the CKS is meant to be ignored, and no check is to be made against it. This applies also to a completely blank CKS.

b) Relocatable Data

9L1 is punched. 9L13 to 9L17 contain the word count V. 9L21 to 9L35 contain the nominal initial location R. All other positions in 9L are ordinarily blank. If 9L2 is punched, the CKS is to be ignored, as in the case of a completely blank CKS. The indicator bits are in the 8 row, starting from the left. The following one and two-bit codes are used to indicate the type of field:

0	absolute field
10	relocatable direct field
11	relocatable complemented field

"Direct" here means uncomplemented. The string of these codes starts at 8LS and proceeds continuously to the right until it terminates. 7L, 7R, 6L, 6R, ... contain the relocatable data words.

Let us, for illustration, suppose that 7LD is absolute, 7LA is relocatable direct, 7RD is absolute, 7RA is relocatable and complemented, 6LD is relocatable direct, 6LA is absolute, 6RD is absolute and 6RA is relocatable complemented. Then the indicator bit pattern would be:

0 10 0 11 10 0 0 11

This may be condensed into:

010011100011

and this pattern is to be punched into the 8 row beginning with 8LS.



# SHARE

## REFERENCE MANUAL

### c) Correction and/or Transfer

#### (1) Correction

Rows 8 through 12 contain corrections which are entered in the following manner: The nominal location is punched in the LA field and the correction word itself in the right hand word of the same row. If the location is to be adjusted by an increment (i. e., the correction word is to be relocated), then the L1 bit is punched. (Note that the L1 bit always indicates relocation). If a row is completely blank, it is ignored. The indicator bits for the decrement and address fields of the correction word are punched in the L3 to L6 bit positions, using the indicator scheme outlined in section (b). The sequence of correction entries is assumed to be from the 8 row upwards. If the L20 bit (LT3) is punched, then the nominal location is assumed to be 1 more than the preceding one. Hence, it is not necessary to punch every nominal location in a consecutive block. If this punch (L20) appears in the 8 row, however, it means that the nominal location is the one actually punched in 8LA. Hence, it is possible to load absolute zero at location zero. An L2 punch causes the correction in its row to be ignored.

If 9L2 is punched, the CKS is ignored. No punches at all need appear in the 9L word, or in the 9R word, if there is to be no CKS comparison.

#### (2) Transfer

The contents of the 9LA field are taken to be the location to which control is to be transferred after all corrections have been loaded. If 9L1 is punched, then this nominal location is to be relocated in the usual manner. A 9L2 punch suppresses transfer as well as CKS checking.

### d) Origin Table

Bit 9L12 is punched. If 9L2 is punched the CKS is ignored as usual. Starting with the 8 row, the card contains a table of origins in the following format:

In each row, the nominal location which begins a region is punched in the LA field. The operating location (i. e., the final location of an instruction when it is actually to be executed) is punched in the RA field. If there is a loading

# SHARE

## REFERENCE MANUAL

location distinct from the operating location, this is punched in the RD field. If there is no loading location, then the operating location is used in place of it. The entries need not be punched in order of ascending nominal locations. If a row is completely blank, or if the L2 bit is punched in an otherwise blank row, then nominal zero will be set to absolute zero.

A general binary loader which fulfills these specifications is PKCSB3.

### 3. Column Binary Program Card

The term bit position was used to describe the above-mentioned binary card formats. Thus, the word count V was said to be contained in bit positions 9L13 to 9L17 (i. e., columns 14-18), the initial location R in bit positions 9L21 to 9L35 (i. e., columns 22-36) and the check sum in the 9R word (i. e., columns 37-72). The remaining rows contain the program.

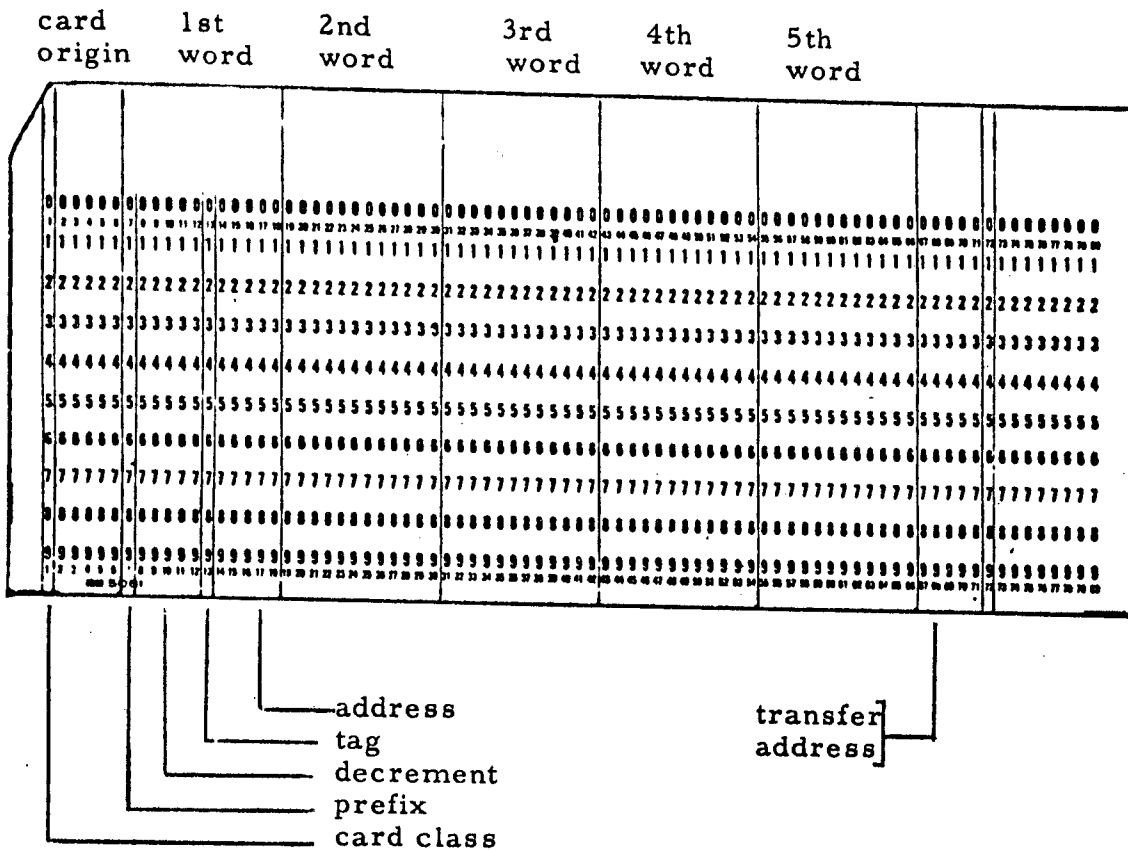
A column binary program card contains the same information, but arranged in a column sequence instead of a row sequence. For descriptive purposes, the column binary format is best represented in terms of columns and rows, not bit positions. The arrangement of information into column binary is as follows:

The 9L row of a row binary card is mapped into columns 1, 2, 3 of a column binary card with bits 1 to 12 of a word going into rows 12 to 9 of column 1, bits 13 to 24 of a word going into rows 12 to 9 of column 2, and bits 25 to 36 of a word going into rows 12 to 9 of column 3. The 9R row is mapped into columns 4, 5, 6 of the column binary card, and so on to the 12R row being mapped into columns 70, 71, 72. Hence, the word count V appears in column 2, rows 11, 0, 1 and 2; the initial location R in column 2, rows 7, 8, 9 and continued in all of column 3. The check sum appears in columns 4, 5, 6. The program appears in columns 7 through 72.



# SHARE REFERENCE MANUAL

## 5. Octal Card Format



6. Tape Format - all tape records representing 80 column cards shall be 84 characters in length and the last four characters shall be blank. Note that on the standard off-line punch, cards of more than 78 columns cannot be represented.

# SHARE

## REFERENCE MANUAL

### C. SHARE Mnemonic Operation Codes

ACL	Add and Carry Logical Word	0631
ADD	Add	0400
ADM	Add Magnitude	0401
ALS	Accumulator Left Shift	0767
ANA	And to Accumulator	-0320
ANS	And to Storage	0320
ARS	Accumulator Right Shift	0771
BST	Backspace Tape	0764
CAC	Copy Add and Carry	-0700
CAD	" " " "	-0700
CAL	Clear and Add Logical Word	-0500
CAS	Compare Accumulator with Storage	0340
CHS	Change Sign	0760,002
CLA	Clear and Add	0500
CLM	Clear Magnitude	0760,000
CLS	Clear and Subtract	0502
COM	Complement Magnitude	0760,006
CPY	Copy or Skip	0700
DCT	Divide Check Test	0760,012
DVH	Divide or Halt	0220
DVP	Divide or Proceed	0221
EFM	Enter Floating Trap Mode	-0760,002
ETM	Enter Trapping Mode	0760,007
ETT	End of Tape Test	0760,011
FAD	Floating Add	0300
FDH	Floating Divide or Halt	0240
FDP	Floating Divide or Proceed	0241
FMP	Floating Multiply	0260
FSB	Floating Subtract	0302
HPR	Halt and Proceed	0420
HTR	Halt and Transfer	0000
LBT	Low Order Bit Test	0760,001
LDA	Locate Drum Address	0460
LDQ	Load MQ	0560
LFM	Leave Floating Trap Mode	-0760,004
LGL	Logical Left	-0763
LLS	Long Left Shift	0763
LRS	Long Right Shift	0765
LTM	Leave Trapping Mode	-0760,007
LXA	Load Index from Address	0534
LXD	Load Index from Decrement	-0534
MPR	Multiply and Round	-0200
MPY	Multiply	0200
MSE	Minus Sense	-0760
NOP	No Operation	0761
ORA	Or to Accumulator	-0501
ORS	Or to Storage	-0602

# SHARE

## REFERENCE MANUAL

### SHARE Mnemonic Operation Codes (contd)

PAX	Place Address in Index	0734
PBT	P Bit Test	-0760, 001
PDX	Place Decrement in Index	-0734
PSE	Plus Sense	0760
PXD	Place Index in Decrement	-0754
RDS	Read Select	0762
REW	Rewind	0772
RND	Round	0760, 010
RQL	Rotate MQ Left	-0773
RTT	Redundancy Tape Test	-0760, 012
SBM	Subtract Magnitude	-0400
SLQ	Store Left-Half MQ	-0620
SLW	Store Logical Word	0602
SSM	Set Sign Minus	-0760, 003
SSP	Set Sign Plus	0760, 003
STA	Store Address	0621
STD	Store Decrement	0622
STO	Store	0601
STP	Store Prefix	0630
STQ	Store MQ	-0600
STZ	Store Zero	0600
SUB	Subtract	0402
SXD	Store Index in Decrement	-0634
TIX	Transfer on Index	2000
TLQ	Transfer on Low MQ	0040
TMI	Transfer on Minus	-0120
TNO	Transfer on No Overflow	-0140
TNX	Transfer on No Index	-2000
TNZ	Transfer on No Zero	-0100
TOV	Transfer on Overflow	0140
TPL	Transfer on Plus	0120
TQO	Transfer on MQ Overflow	0161
TQP	Transfer on MQ Plus	0162
TRA	Transfer	0020
TSX	Transfer and Set Index	0074
TTR	Trap Transfer	0021
TXH	Transfer on Index High	3000
TXI	Transfer with Index Incremented	1000
TXL	Transfer on Index Low or Equal	-3000
TZE	Transfer on Zero	0100
UFA	Unnormalized Floating Add	-0300
UFM	Unnormalized Floating Multiply	-0260
UFS	Unnormalized Floating Subtract	-0302
WEF	Write End of File	0770
WRS	Write Select	0766

# SHARE

## REFERENCE MANUAL

### Extended Operations List

#### READ

RCD	Read Card Reader	0762, 321
RDR	Read Drum	0762, 301-310
RPR	Read Printer	0762, 361
RTB	Read Tape - Binary	0762, 221-232
RTD	Read Tape - Decimal	0762, 201-212

#### WRITE

WDR	Write Drum	0766, 301-310
WPR	Write Printer	0766, 361
WPU	Write Punch	0766, 341
WTB	Write Tape - Binary	0766, 221-232
WTD	Write Tape - Decimal	0766, 201-212
WTS	Write Tapes - Simultaneously	0766, 321-325
WTV	Write CRT	0766, 030

#### SENSE

SLF	Sense Lights Off	0760, 140
SLN	Sense Light On	0760, 141-144
SLT	Sense Light Test	- 0760, 141-144
SPR	Sense Printer	0760, 361-372
SPT	Sense Printer Test	0760, 360
SPU	Sense Punch	0760, 341-342
SWT	Sense Switch Test	0760, 161-166

#### OTHER

CFF	Change Film Frame	0760, 030
IOD	Input-Output Delay	0766, 333

# SHARE

## REFERENCE MANUAL

### D. Standard Boards (on-line)

1. **Reader:** Any board will be considered "standard" which accepts the card format adopted by SHARE.
2. **Punch:** Any board will be considered "standard" which produces the card format adopted by SHARE. In addition, the on-line punch shall be wired such that columns two through nine may be offset gang-punched into columns 73-80.
3. **Printer:**
  - a. **Board #1**
    - (1) "72-72": Calculator exits 1-72 into type wheels 1-72 in single cycle.
    - (2) "72-120": Calculator exits 1-72 into type wheels 1-72 on first cycle of double cycle; calculator exits 1-48 into type wheels 73-120 on second cycle of double cycle.
    - (3) "72-spread 72": Calculator exits 1-12 into type wheels 1-12 and exits 13-72 into an arbitrary combination of type wheels 13-120 on a single cycle.
  - b. **Board #2**
    - (1) "72-72" with echo checking possible
    - (2) "72-120" with echo checking possible
  - c. In addition to the above modes of operation both boards will execute the following functions:
    - (1) Normal single spacing
    - (2) Double space under control of a sense instruction
    - (3) Normal overflow
    - (4) Overflow suppression under control of a sense instruction
    - (5) Programmable overflow under control of a sense instruction (unsuppressible)
    - (6) Extra space under the control of a sense instruction
    - (7) Space suppression under control of a sense instruction
    - (8) Carriage skip to channel 2 under control of a sense instruction
    - (9) A panel check under the control of a sense exit and the sense entry instruction



# SHARE

## REFERENCE MANUAL

d. Board #1 uses all 20 co-selectors and 8 of the pilot selectors. Board #2 uses all 20 co-selectors and 4 of the pilot selectors.

e. For both boards the sense exits are as follows:

<u>Sense exit</u>	<u>Function</u>
1	Skip to Channel 1
2	Skip to Channel 2
3	Extra space (after printing)
4	Double space
5	Suppress spacing
6	(Board #1 only) Sets up format control for the 72 spread-72 mode of operation
7	Panel check exit
8	Overflow suppression. This sense exit must always be impulsed on the first print cycle of the 72-120 mode of operation.
9	Sets up format control for the second print cycle of the 72-120 mode of operation. (Also suppresses spacing on this second cycle.)
10	Not used

f. Suggested wiring diagrams of the above-described Printer boards, and also of the Card Reader board for column binary operations are on the following pages.

# SHARE

## REFERENCE MANUAL

### Column Binary Wiring Diagram

The Type 714 Card Reader diagram on the following page is the standard SHARE board for column binary operations. Hubs A, B, C, D, E, F, G, H, J are available on an RPQ basis. The board incorporates look-ahead wiring features; that is, it permits a SHARE 704 program to look ahead to see if the next record is binary or BCD before reading it.

Hubs F and G are jumpered together internally and are connected to a point in the Electronic Sense and Switching Circuit. These hubs permit desired selection of a 9 punch in any column to act as the means of informing the Electronic Sense and Switching Circuit that a BCD card is being read into Row Memory and will be read onto tape during the next card cycle. For example, if a 9 punch in the nth column is to be used as the column binary control device, the nth hub of FIRST READ should be connected to Hub F and the nth hub of CHECK ENTRY connected to Hub G. SHARE standards require that column 1 be used as the column binary control device and the diagram is wired in accordance with this convention.

A 9-7 combination punch shall be the SHARE standard designation for column binary. This will avoid a mistaken interpretation of a BCD card as column binary because of an inadvertent but legitimate 9 punch in the control column.

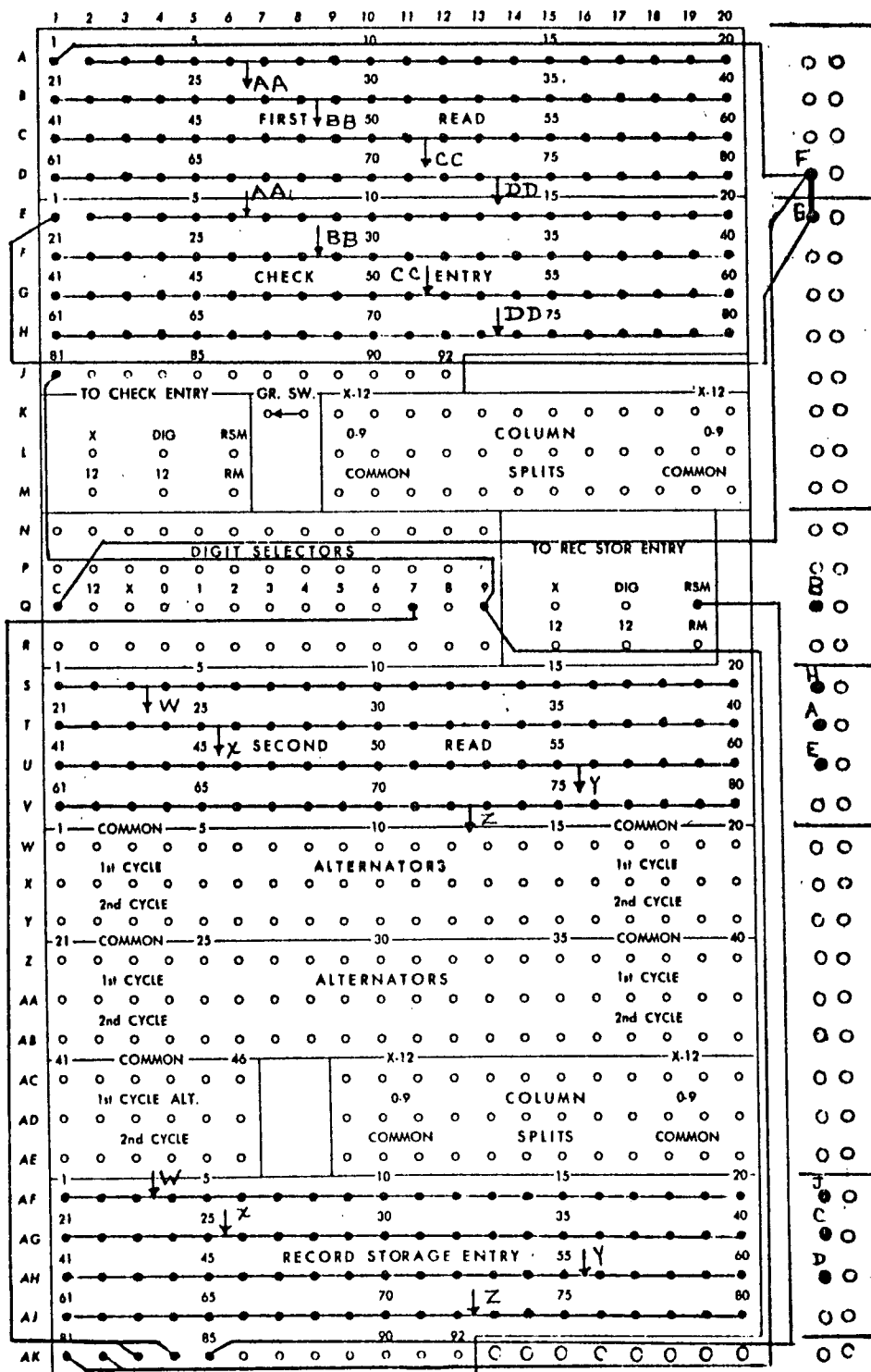
# SHARE

## REFERENCE MANUAL

### Wiring diagram for SHARE Card Reader Board for Column Binary.

**IBM**
INTERNATIONAL BUSINESS MACHINES CORPORATION
Printed in U. S. A.

CARD READER, TYPE 714, CONTROL PANEL
Form 22-6262-0

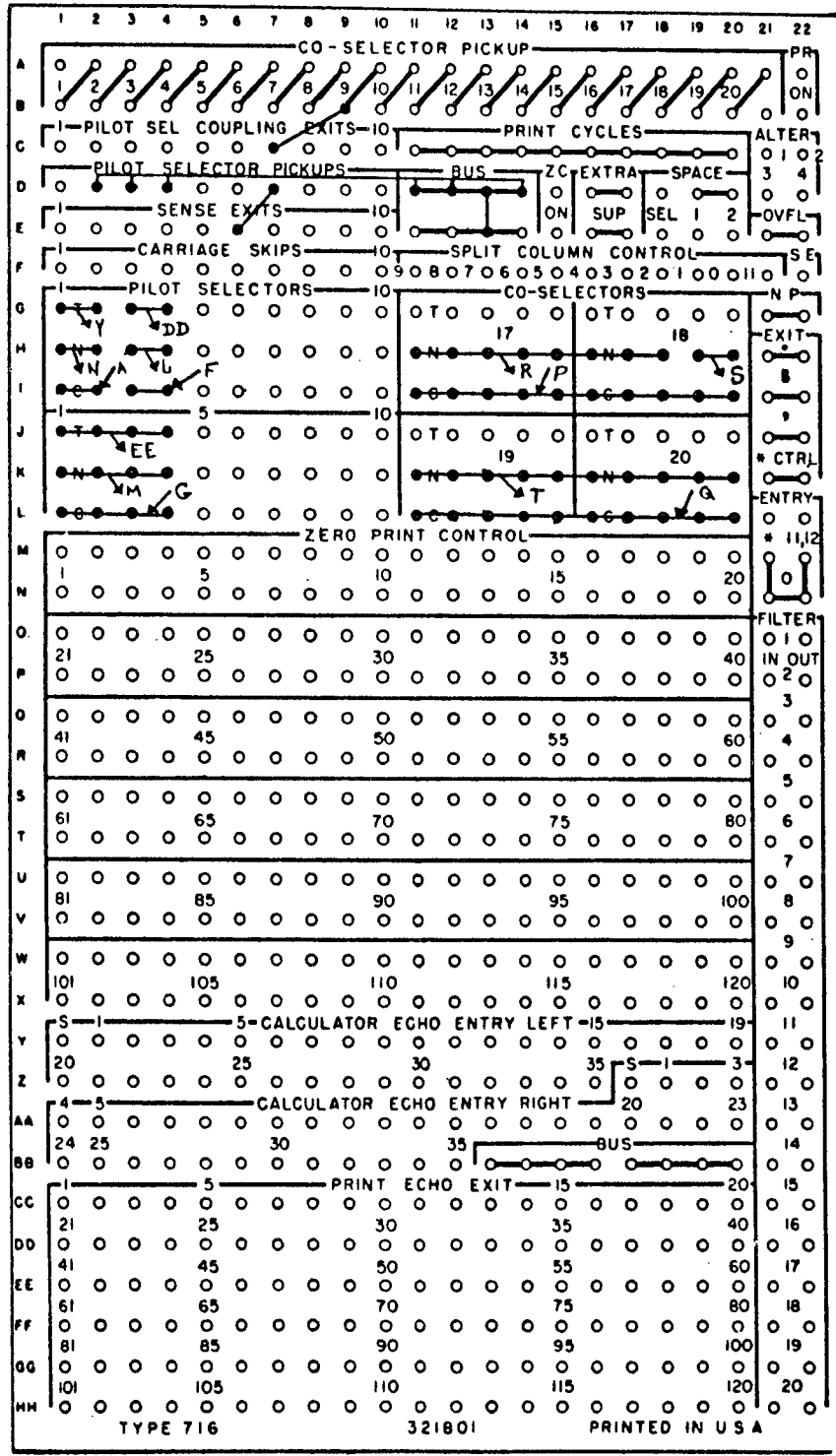


# SHARE

## REFERENCE MANUAL

Wiring diagram for SHARE Printer Board #1 (exclusive of sense impulsed selector network).

**IBM**      TYPE 716 PRINTER (LEFT HALF)      TYPE 7



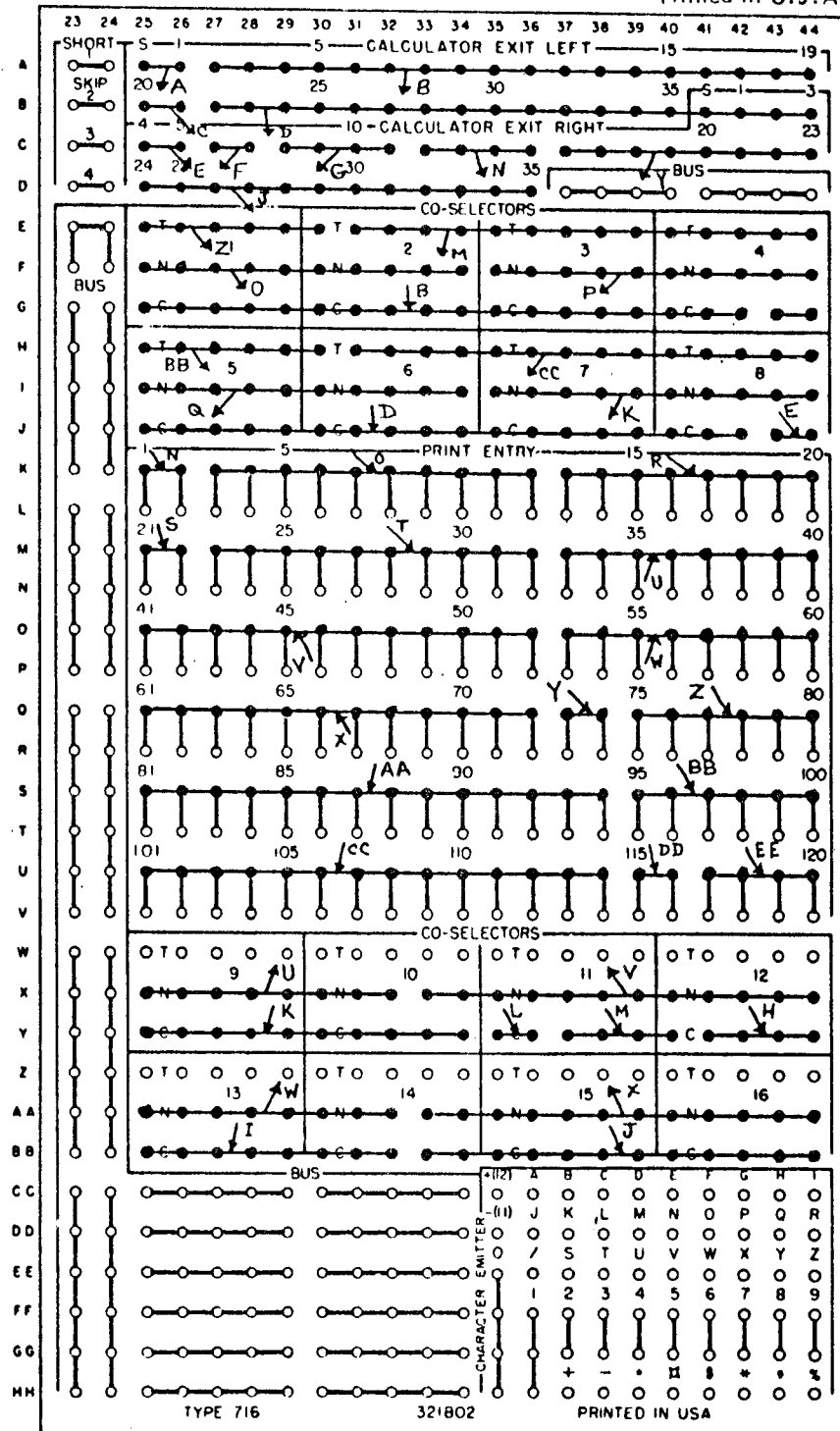
# SHARE

## REFERENCE MANUAL

Wiring diagram for SHARE Printer Board #1 (exclusive of sense impulsed selector network).

TYPE 716 PRINTER (RIGHT HALF)

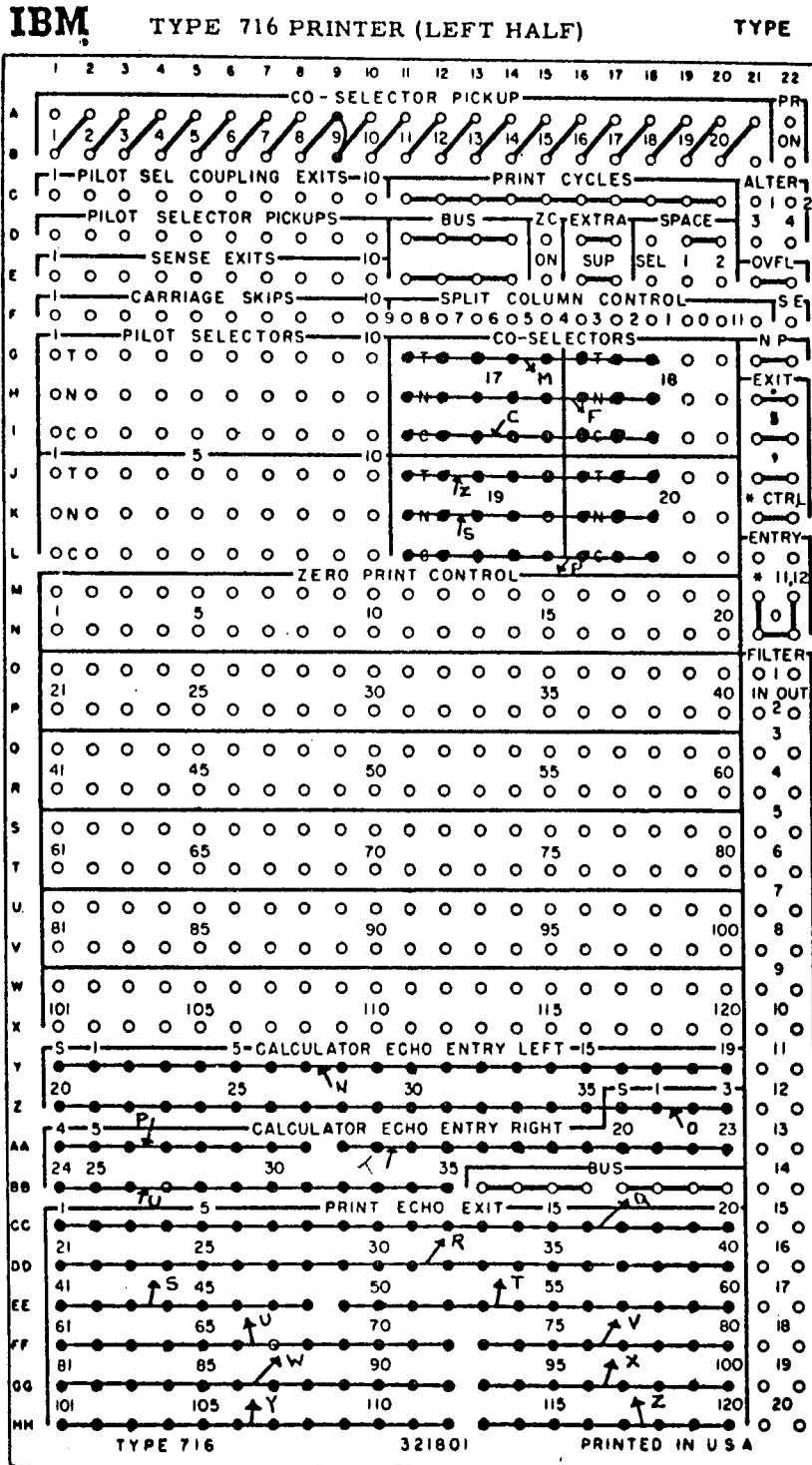
Form 24-6127-0  
Printed in U.S.A.



# SHARE

## REFERENCE MANUAL

Wiring Diagram for SHARE Printer Board #2 (exclusive of sense impulsed selector network).



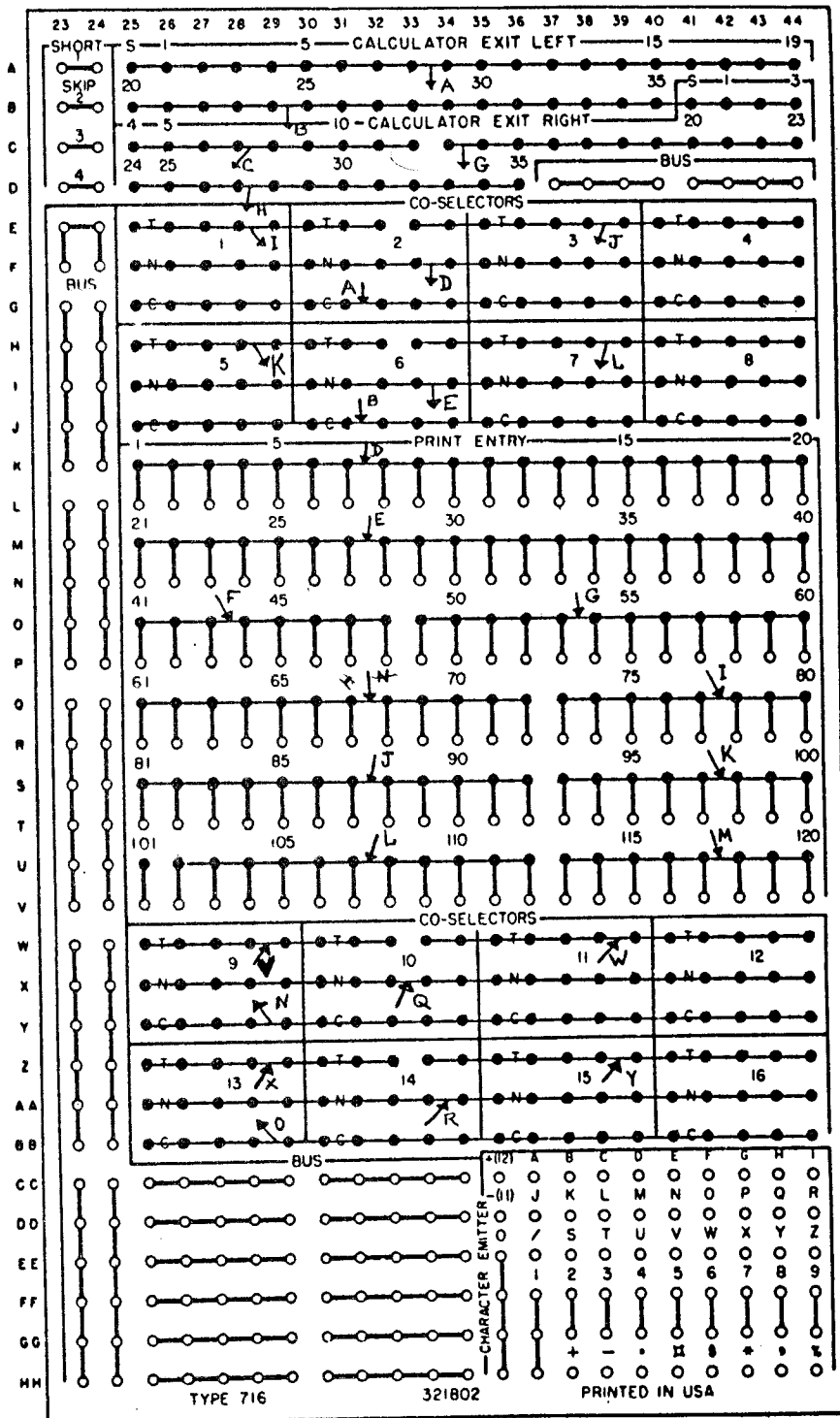
# SHARE

## REFERENCE MANUAL

Wiring Diagram for SHARE Printer Board #2 (exclusive of sense impulsed selector network).

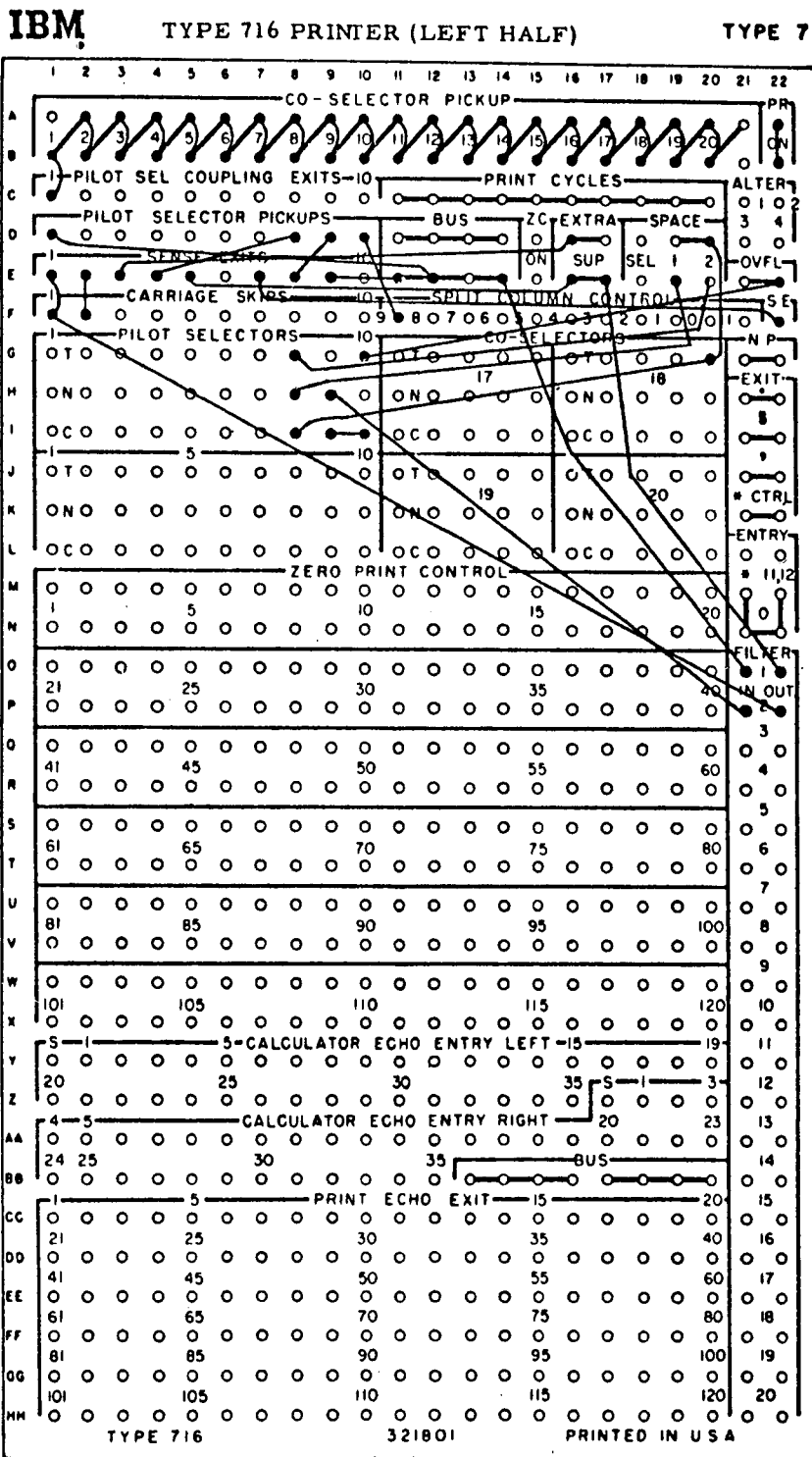
TYPE 716 PRINTER (RIGHT HALF)

Form 24-6127-0  
Printed in U.S.A.



# SHARE REFERENCE MANUAL

Selector Network for SHARE Printer Boards #1 and #2.





# SHARE

## REFERENCE MANUAL

### ALTERNATE SOLUTION TO SELECTOR AND SENSE EXIT NETWORK ON SHARE BOARD #2\*

#### A. WIRING

The first three positions of co-selectors numbers 18 and 20 are moved to pilot selectors 1, 2, and 3 (Page 03.10-14 of the SHARE Reference Manual). The sense exit and selector pick-up network is wired in accordance with the accompanying diagram (replacing page 03.10-15 of the SHARE manual).

#### B. FUNCTIONS AND USAGE

##### General Operation.

If no senses are given, the page will space one line before each line is printed. (A space means that the paper will be moved one line (1/6th inch) and does not refer to blank lines between printed lines.) Automatic overflow will cause sheet ejection to take place at the end of each page. If 72-120 mode printing is called for, this will take place on the same line as the previous 72-72 line.

There may be at least 5 milliseconds of computing between the last copy of the copy loop and the sense instructions following the copy loop. The sense instructions given before the copy loop may be given anywhere between the WPR or RPR and the first copy. The order of the sense instructions is unimportant except as they are given before or after the copy loop.

Note also that spacing before printing is suppressed on the first line of a page after an automatic sheet overflow; this is not the case if the page is restored manually or by means of the SPR1 or SPR2 instructions.

##### Sense Exit Functions.

A sense may be energized either before the copy loop or afterwards - for either read printer or write printer. The function of each according to the time at which it is given follows. Note that in general one copy is not equivalent to a full 24 or 46 copies.

**Sense Printer 1.** This is wired directly to skip to one. If given before the copy loop, the page will be ejected before the line is printed; if given after the copy loop, the line will be printed and then the sheet will be ejected. The operation of this sense is unaffected by any other senses, either before or after the copy loop.

\* There are not enough selectors free on the #1 board to allow this wiring to be adopted if all 72 print positions are moved; however, if 66 or less are moved, this wiring may be adopted for the #1 board also.

# SHARE

## REFERENCE MANUAL

- Sense Printer 2.** This is wired directly to skip to two. The operation is exactly like SPR1 except that only one-half page skip occurs, either before or after printing.
- Sense Printer 3.** This sense MUST be given AFTER the copy loop, and causes one space to be made after the line is printed, regardless of the number of spaces called for before printing the line. Note than an automatic overflow may occur after printing the line.
- Sense Printer 4.** This sense MUST be given BEFORE the copy loop, and causes two spaces to be made before printing the line. Note that if these force an automatic overflow, the page will be ejected after the line has been printed. This sense is rendered inoperative if either a SPR5 or SPR9 is also given.
- Sense Printer 5.** This sense MUST be given BEFORE the copy loop, and prevents any spacing before the line is printed. If SPR1 or SPR2 is also given before the copy loop, the page will eject before the line is printed.
- Sense Printer 6.** This sense MUST be given AFTER the copy loop, and causes two spaces to be made after the line is printed, regardless of the number of spaces called for before printing the lines. Note that an automatic overflow may occur after printing the line.
- Sense Printer 7.** This sense may be given either before or after the copy loop, and is wired directly to the printer sense entry for testing by the SPT instruction. As the timing on the return shot is variable, provision should be made to test this return shot in a loop for at least 25 milliseconds. Also note that if the printer is not on ready, the return shot will nevertheless be sensed, but the I/O interlock will not disconnect.
- Sense Printer 8.** This sense MUST be given BEFORE the copy loop, and prevents automatic overflow before the line is printed, regardless of the number of spaces being made before the line is printed. If one or more spaces are called for after printing, automatic overflow may occur after the line has been printed.

# SHARE

## REFERENCE MANUAL

**Sense Printer 9.** This sense MUST be given BEFORE the copy loop, and causes columns 1-48 of the card image to be printed from type wheels 73-120. Columns 49 through 72 are printed from type wheels 49-72. In addition, spacing is suppressed before the line is printed. If sheet ejection is called for, however, the page will be ejected before the line is printed.

**Sense Printer 10.** This sense MUST be given BEFORE the copy loop, and functions exactly as SPR9, except that spacing is not suppressed before the line is called for.



# SHARE

## REFERENCE MANUAL

### E. Subroutine Conventions

Note: These conventions are recommended. Programs which deviate from these conventions should not be withheld from SHARE on this account; all worthwhile programs should be submitted. However, the program write-up should clearly state any deviations.

1. Fixed-point and floating-point subroutines shall be separate entities.
2. Subroutines shall always be entered by a calling sequence. Index register 4 shall be used for linkage.
3. The point transferred to shall always be the first instruction in the subroutine.
4. Every effort will be made to use the following form of calling sequence:

LOC	OP	ADR	TAG	DCR
Z	TSX		4	
Z+1	R <sub>1</sub>	P <sub>1</sub>	R <sub>2</sub>	P <sub>2</sub>
Z+2	R <sub>3</sub>	P <sub>3</sub>	R <sub>4</sub>	P <sub>4</sub>
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
Z+K	ERROR RETURN			
Z+K+1	NORMAL RETURN			

The argument(s) and answer(s) will be placed in the following units of the machine, in the order indicated: (1) accumulator, (2) MQ, (3) core storage location specified in linkage. The P<sub>i</sub> in the calling sequence represent parameters, such as core storage locations or scale factors (negative scale factors should be 2's complements). The R<sub>i</sub> in the calling sequence represent any information that can be conveyed in 3 bits.

5. Stops within subroutines shall be avoided. Instead, exit shall be made to the "error return" with bits defining the reason for failure placed in the accumulator. These bit patterns and their meanings will be explained in the program write-up.

# SHARE

## REFERENCE MANUAL

6. If any information is conveyed to the master routine from the subroutine via the overflow indicators, these will be preset as needed within the subroutine.
7. Index registers and sense lights, when used by a subroutine, shall be restored to their original condition within the subroutine before exiting. The status of overflow indicators, Divide Check Light, Accumulator, and MQ are not guaranteed on exit from a subroutine. Subroutines will not normally use sense switches.

### F. Program Identification (Distributed Decks)

1. All binary program decks distributed through SHARE shall be identified in columns 73 through 80 as follows:

Cols. 73, 74    Installation code assigned to the contributing or sponsoring member installation.

Cols. 75-78    Identification of program (This information shall be different for each program distributed by the same installation).

Cols. 79, 80    Sequence number starting with 00 for self-loading decks and with 01 for other decks.

Program decks in excess of 100 or 99 cards (self-loading or otherwise) shall be divided into several decks none of which shall exceed 100 cards, and each of which shall have a unique program identification.

2. All symbolic decks distributed through SHARE shall be identified as follows:

- a. The first card shall be a special remarks (REM) card containing the following information:

Cols. 1-6    Installation code assigned to the contributing or sponsoring member installation, and the program identification.

Cols. 12-15    Card count of deck.

# SHARE

## REFERENCE MANUAL

Cols. 17-21      Month, day, and year of first issue  
(month and day are two digits, year  
is one digit).

Cols. 23-27      Month, day, and year of first  
correction.

Cols. 29-33      Second correction . . . . . etc.

A new "first card" shall be made up and submitted  
by the member installation whenever corrections  
are submitted to the SHARE Distribution Agency.

- b. All cards (including the special REM card) shall  
contain the following information:

Cols. 73-76      Identification of program

Cols. 77-80      Sequence number starting with 0001.

Program decks in excess of 9999 cards shall be  
divided into several decks none of which shall ex-  
ceed 9999 cards, and each of which shall have a  
special REM card at the beginning and a unique pro-  
gram identification.

3. The SHARE Distribution Agency will interpret columns  
1-52, 73-80 of symbolic decks, and columns 73-80 of  
binary decks.

### G. Miscellaneous Standards and Conventions

#### 1. Binary Point Representation

- a. Binary point description: The binary point will be  
described by counting from the left to the right of  
the word.
- b. Integer scaling: Integer scaling will be specified  
as  $B = 35$  rather than by  $B = \text{blank}$ .

#### 2. Symbols

- a. Erasable symbol: A "non-HEdable" symbol is  
needed in order to share erasable storage. The  
symbol "COMMON" shall serve this function.
- b. Number of characters used in a symbol: Programs  
distributed through SHARE shall use five or fewer  
characters as symbols, except when the programmer  
wishes to prevent heading (e. g. the symbol "COMMON").

# SHARE

## REFERENCE MANUAL

In addition, it is universally agreed that SHARE distributed programs will be in their most useful form if they contain only one symbol).

### 3. Tapes

- a. Tape restrictions during assembly: A SHARE program deck will not require, in order to be assembled, that other SHARE programs be available on a library tape.
- b. Library tape: At all times the standard library tape shall be Logical Tape #1.

### 4. Relocatable Binary Cards

All SHARE programs in relocatable cards will have a standard origin of 0 (zero) with COMMON storage having an origin of  $(2000)_8$ .

### 5. Sense Switches

- a. Whenever a sense switch is used for control of a program, the "sense switch down" position shall be the "unusual" case.
- b. Sense switch No. 6 will be used for trapping mode control in those programs relying upon switch setting for such control.



# SHARE

## REFERENCE MANUAL

### H. SHARE Catalog Cards

1. Each program write-up submitted by a SHARE member for SHARE distribution shall be accompanied by one or more cards comprising the catalog entry for that program. It is the responsibility of the member submitting the program to prepare these catalog cards.
2. The SHARE Distribution Agency shall accompany each distributed program write-up with a reproduced and interpreted set of the catalog cards for that program.
3. The catalog cards shall have the following formats:

Title Card:		
	<u>Columns</u>	<u>Description</u>
a.	1-2 3	Classification code Blank
b.	4-5 6	Installation code Blank
c.	7-10	Program identification
d.	11	Card serial number (must be zero on title card)
e.	12-66 67	Title Blank
f.	68 69	Status code Blank
g.	70, 72	SHARE distribution number

The second card and all subsequent cards, if any, shall be the same as the title card except for the following:

Col 11 : Numbered sequentially 1, 2, 3 ... 9  
Cols 12-72: Abstract of program

4. The various fields are used as follows:
  - a. Classification Code - Each program is assigned a classification code according to (5) below. The SHARE Distribution Agency shall assign this number upon receipt of the cards.
  - b. Installation Code - Used to identify the contributing or sponsoring member installation.

# SHARE

## REFERENCE MANUAL

- c. Program Identification - A four-column alpha-numeric designation assigned by the contributor.
  - d. Card Serial Number - Each catalog entry may consist of up to 10 cards. The card serial number merely counts from 0 to 9 for sorting purposes.
  - e. Title - Composed by contributor.
  - f. Status Code - Normally blank. May be punched with V (for void) for obsoleted programs.
  - g. SHARE Distribution Number - Punched by the SHARE Distribution Agency upon distribution, and is always the Distribution Number of the write-up.
5. Programs shall be assigned a 2-character classification code. The leftmost character is a letter indicating a primary class; the second character is a digit indicating a secondary class within the primary. The classifications shall be as follows:
- A. Programmed Arithmetic: Any of the subclasses could contain multiple precision
    - 1. Real: Multiple precision fixed and floating point arithmetic
    - 2. Complex: Complex arithmetic programs and any routines directly connected to them.
    - 3. Decimal: BCD
  - B. Elementary Functions
    - 1. Trigonometric: Includes inverse trigonometric functions
    - 2. Hyperbolic
    - 3. Exponential and Logarithmic
    - 4. Roots and Powers: Refers to roots of quantities, not polynomials
  - C. Polynomials and Special Functions
    - 1. Evaluation of Polynomials
    - 2. Roots of Polynomials
    - 3. Evaluation of Special Functions
    - 4. Simultaneous Non-linear Algebraic Equations
    - 5. Simultaneous Transcendental Equations
  - D. Operations on Functions and Solutions of Differential Equations
    - 1. Numerical Integration
    - 2. Numerical Solutions of Ordinary Differential Equations
    - 3. Numerical Solutions of Partial Differential Equations
    - 4. Numerical Differentiation

# SHARE

## REFERENCE MANUAL

- E. Interpolation and Approximations
  - 1. Table Look-up and Interpolation
  - 2. Curve Fitting
  - 3. Smoothing
- F. Operations on Matrices, Vectors and Simultaneous Linear Equations
  - 1. Matrix Operations
  - 2. Eigenvalues and Eigenvectors
  - 3. Determinants
  - 4. Simultaneous Linear Equations
- G. Statistical Analysis and Probability
  - 1. Data Reduction: Is interpreted as the calculation of the more common statistical parameters such as mean, median, standard deviation, etc.
  - 2. Correlation and Regression Analysis: Includes curve fitting which is explicitly for statistical purposes.
  - 3. Sequential Analysis
  - 4. Analysis of Variance
  - 5. Random Number Generators
- H. Operations Research and Linear Programming
- I. Input
  - 1. Binary: Presently contains binary tape and card loaders
  - 2. Octal: Card loaders only
  - 3. Decimal: Card loaders only
  - 4. BCD: Any tape input program which reads in the BCD mode
  - 9. Composite
- J. Output
  - 1. Binary: Includes binary tape or card preparation or on-line binary printing.
  - 2. Octal: Refers to on-line octal card punching and on-line octal printing but the latter only when entry is by TSX linkage and the printing represents the final result of a program. (not debugging)
  - 3. Decimal: Contains on-line decimal printing or card punching.
  - 4. BCD: All non-binary tape preparation
  - 5. Analog: CRT
  - 9. Composite

# SHARE

## REFERENCE MANUAL

- K. Internal Information Transfer: Denotes only core-to-core, drum-to-drum, and core-to-drum word movements.
1. Read Write Drum
  2. Relocation: Is for core-to-core or drum-to-drum relocation only, not input with relocation.
- L. Executive Routines
1. Assembly
  2. Compiling
  3. Automatic Operator Programs: Refers to the monitoring routines used by installations which operate in the peripheral mode.
- M. Information Processing
1. Sorting
  2. Conversion: Includes only internal conversion from one mode to another, such as internal conversion from fixed to floating, with no input-output.
  3. Collating and Merging
- N. Debugging Routines
1. Tracing, Trapping
  2. Dumps: Includes all output primarily intended for debugging purposes such as print-out (on or off-line) of drums, tape, cores, and console.
  3. Search: Searching (of tape, core, or drum) for debugging purposes is differentiated from table-lookup.
  4. Breakpoint Print
- O. Simulation Programs: Contain routines for the simulation of other machines on the 704, as well as for off-line equipment simulators.
- P. Diagnostic Programs: Are defined as those which check for malfunctions of the computer and/or its components.

# SHARE

## REFERENCE MANUAL

**Q. Service Programs:** Are routines of a utilitarian nature which perform a service for the programmer such as executing the equivalent of pushing a button on the computer or accumulating a check sum.

1. Clear, Reset Programs
2. Check Sum Programs
3. Restore, Rewind, Tape Mark, Load Button Programs

**Z. All Others** Contains all routines for which no primary class has yet been selected. Routines which seem to be included by a primary class but which are not adequately described by a sub-class are assigned the applicable primary classification with a sub-class designation of zero.

6. The classifications of (5) shall be reviewed from time to time by a committee appointed from the SHARE membership. It is anticipated that new program developments will show the need for additional classifications. Any program for which no suitable secondary class exists may be assigned the secondary code 0 (zero). The committee may assign additional secondary classes as required to distribute the accumulation of "0" classed programs into applicable classes.

Similarly, where no suitable primary class exists, a program may be classed "Z". The committee may establish additional primary classes as required.

The establishment of new classification codes is reserved for the committee. Suggestions for additional classifications may be submitted to the committee by the membership.

# SHARE

## REFERENCE MANUAL

### SECTION 03.11

#### STANDARD FLOW CHART SYMBOLS

The ACM First Glossary of Programming Terminology (1954) defines "Flow Chart - a graphical representation of a sequence of operations, using symbols to represent the operations such as compute, substitute, compare, jump, copy, read, write, etc." In actual practice the flow chart consists of a series of boxes connected by lines with arrows indicating the direction of flow.

These types of boxes, shown below, are adequate for most kinds of flow charts and represent a consensus of what is actually being used by most of today's programmers. The symbols and the logic of flow charts reflect the influence of the Goldstine and von Neumann report, "Planning and Coding of Problems for an Electronic Computing Instrument", Part II, Vol. I, 1947 and Vol. II and III, 1948 and in general, what is presented here continues to be consistent with that report.

When a program is submitted to SHARE for general distribution and the submitting installation feels that a flow chart would contribute to a better understanding of that program, it is expected that the standard symbols outlined below will be used. The use of these symbols is not mandatory; however, when alternate symbols are used, their meaning should be noted either on the flow chart itself or in the complete write-up of that program.

1. Operation, Function, etc.

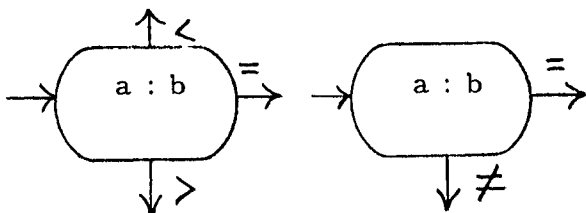


Descriptive or working block of instructions. The box may be labeled or numbered to assist in identifying the flow chart with the code. The box may contain formulas or substitution expressions. Separate boxes may be used for input or output operations with such words as IN, OUT, PRINT, WRITE, or READ in the upper left-hand corner. Each operation box should have only one entry point and one exit.

# SHARE

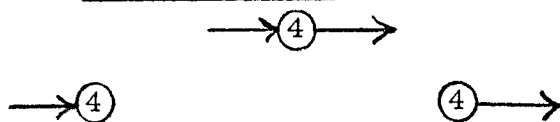
## REFERENCE MANUAL

### 2. Decision or Comparison



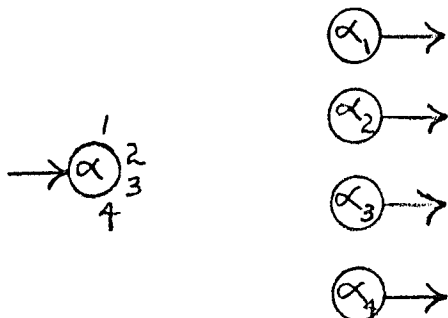
Used for conditional or branch operations. The symbol  $a : b$  represents "the relationship between"  $a$  and  $b$  specified by the 2 or 3 exits. If the box is drawn free hand without the use of a template, an oval or ellipse may be used.

### 3. Fixed Connector



Used to connect parts of a flow chart.

### 4. Variable Connector



At a point where control is predetermined to transfer to one of several possible points, a variable connector is used. The setting of variable connectors will be designated in a separate box, e. g.  $\alpha_1 \rightarrow \alpha$ ,  $\alpha \leftarrow \alpha_1$ , or  $\alpha = \alpha_1$ . The arrow when used within a box is translated "replaces" if it points to the right and "is replaced by" if it points to the left. The sign means "is set equal to" when used in this sense.

### 5. Closed Subroutine

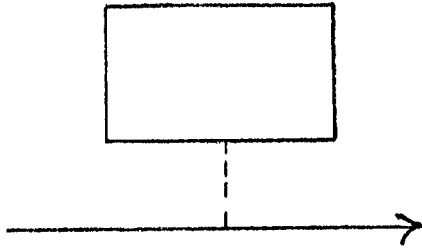


The notation in the hexagon may refer to a detailed flow chart contained elsewhere or to a standard library subroutine. Execution of the subroutine occurs at this point. Multiple exits may also be indicated.

# SHARE

## REFERENCE MANUAL


### 6. Assertion




Various blocks may be attached to the logical flow lines by dashes or dotted lines to enhance the value of the flow chart by indicating

1. That a counter or instruction is in its initialized state,
2. To describe a coding trick,
3. To make any parenthetical type remark that may serve to clarify the program.

Additional unique symbols for input, output and substitutions could be added

but special symbols are not essential. Use of the fixed connector 

for the point of initiation and  to indicate an ending seem desirable, but again special symbols are not essential. Clear designation of beginning and the ending however is necessary in any flow chart.

Note: A logical rule that should be observed when drawing detailed flow charts is: Every symbol that appears to the right of an equal sign, at the tail of an arrow, in a variable connector, in a comparison box, or in an output box should appear at some previous point in the flow chart, at the left of an equal sign, at the point of an arrow, or in an input box.



# SHARE

## REFERENCE MANUAL

### SHARE BY-LAWS Table of Contents

<u>ARTICLE</u>	<u>MANUAL PAGE</u>
I. NAME	03.20 - 01
II. OBJECT	03.20 - 01
III. MEMBERSHIP	03.20 - 02
IV. GOVERNMENT	03.20 - 03
A. Board	03.20 - 03
B. Terms of Office	03.20 - 04
V. DUTIES OF OFFICERS	03.20 - 05
A. General	03.20 - 05
B. President	03.20 - 05
C. Vice-President	03.20 - 05
D. Secretary	03.20 - 06
E. Board Members	03.20 - 07
VI. ELECTIONS	03.20 - 07
A. General	03.20 - 07
B. Time	03.20 - 07
C. Nominations	03.20 - 07
D. Election Procedure	03.20 - 08
E. Vacancies in Office	03.20 - 10
VII. COMMITTEES	03.20 - 10
A. Standing (List of)	03.20 - 10
B. Ad Hoc	03.20 - 10
C. Appointments To	03.20 - 10
D. Standing (Duties)	03.20 - 10
E. Arrangements	03.20 - 12
F. Reports	03.20 - 12
VIII. BUSINESS	03.20 - 12
A. General	03.20 - 12
B. Formal	03.20 - 12
C. Informal	03.20 - 12
D. Voting Procedure	03.20 - 12
E. Quorum for Formal Business	03.20 - 13
F. Mail	03.20 - 13
G. Reconsideration of Topics	03.20 - 14
H. Decisions of Committees	03.20 - 15
IX. MEETINGS	03.20 - 16
A. Definitions	03.20 - 16
B. Frequency and Duration	03.20 - 16
C. Attendance	03.20 - 16
D. Procedure	03.20 - 17
X. DISTRIBUTION OF INFORMATION	03.20 - 18
XI. STANDARDS	03.20 - 19
XII. AMENDMENTS	03.20 - 19

**SHARE**  
**REFERENCE MANUAL**

THE BY-LAWS OF SHARE

As Amended During The 12th Meeting

In New York, New York, ending February 20, 1959

ARTICLE I - NAME

- A. The name of this organization shall be SHARE.

ARTICLE II - OBJECT

- A. The primary object of SHARE is to advance the effectiveness of utilization of SHARE machines (The IBM 704, 709 and 7090 Electronic Data Processing Machines, and such of their successors as the membership shall from time to time determine) by promoting the free interchange of information concerning the use of such machines in the best scientific tradition. A further aim is to reduce redundant effort among machine users in the preparation of computer programs for general use.
- B. Among the means to this end, shall be:
1. The holding of meetings for the discussion of programming and operational techniques.
  2. The establishment of standards for communication of programming information.
  3. Providing for the distribution of completed programs.
  4. The formulation of recommended specifications for computer programs for general use.
  5. Providing a forum whereby all users of the same machines can make known their various applications and machine modifications. The machine manufacturers may also use this forum to disseminate current information relative to their equipment.

# SHARE

## REFERENCE MANUAL

### ARTICLE III - MEMBERSHIP

#### A. Types of Membership

##### 1. By Machine Type

- a. 704 Members - Those members who qualify for membership by having on hand or on order at least one 704.
- b. 709 Members - Those members who qualify for membership by having on hand or on order at least one 709.
- c. 7090 Members - Prior to 1 January 1960, 7090 members shall be those members who qualify for membership by having on hand, or having on order, or having a "letter of intent" to place an order for at least one 7090; on and after 1 January 1960, 7090 members shall be those members who qualify for membership by having on hand or on order at least one 7090. 7090 members qualifying on a "letter of intent" basis will be dropped from membership on 1 January 1960 unless they qualify for membership by that date by having on hand or on order at least one 7090.

##### 2. By Form of Membership

- a. Installation Member - An installation member is an organization having (or about to have) one or more of the above machines under the same administrative head who is empowered to select the machine methods to be used.
- b. Individual Member - An individual member of SHARE is an employee of an installation which is not an Installation Member of SHARE but which possesses the qualifications for membership as outlined in III-A-1. No more than one employee of such an installation may hold individual membership in SHARE at any one time.

# SHARE

## REFERENCE MANUAL

- B. Prospective members must submit a written application for membership to the Secretary, stating the machine type(s) under which they qualify for membership (III-A-1) and stating the form of membership desired (III-A-2). Prospective members qualifying under III-A-1-c must state whether their 7090 is on hand, on order, or on a "letter of intent" basis. Applicants shall become members upon a decision by the Executive Board that membership qualifications have been met.
  
- C. Loss of Membership - Any member unrepresented at two consecutive meetings of SHARE and/or who abstains from voting in three consecutive mail ballots shall be removed from membership. Two weeks' notice shall be given by the Secretary to any member about to be removed from membership. Such a member may petition the Executive Board for reinstatement. The Executive Board may reinstate the petitioner's membership if it appears that the petitioner will thereafter be active in SHARE.
  
- D. The obligations of a member of SHARE are to have a cooperative spirit in all deliberations; to evaluate continuously any activities which might involve SHARE and to propose appropriate action; to communicate to the membership opinions on matters under consideration; to read carefully and quickly all mail proposals and respond thereto promptly; to pursue with reasonable diligence to conclusion all SHARE assignments voluntarily accepted; to advise promptly the originator of distributed material, and the membership through the Secretary, of all errors detected in any SHARE material; to follow strictly SHARE standards in all communications with the members of SHARE; and to abide by the provisions of these By-Laws.
  
- E. A membership may be withdrawn at any time by authorized written notification to the Secretary. No further action is required.

### ARTICLE IV - GOVERNMENT

#### A. Executive Board

- 1. The government of SHARE shall be vested in an Executive Board of seven members: Three Executive Officers and Four Board members.

# SHARE

## REFERENCE MANUAL

2. The Executive Officers shall be the President, the Vice-President and the Secretary.
3. The Board Members shall be the immediate past President, if not re-elected to an executive office, and sufficient additional members to make a total of seven members on the Board.

### B. Terms of Office

1. Normal. Duly elected officers shall assume their duties immediately following the Anniversary Meeting as defined in IX-A-3. However, the Secretary shall not turn over to the newly elected Secretary those duties connected with issuing the Proceedings of the Anniversary Meeting. This responsibility will remain with him until it is completed.
2. Re-Election. There is no limit on the number of times a person may be re-elected to the same office or elected to another office.
3. Vacancies. Any office may become vacant in any one of the following ways.
  - a. Death.
  - b. Resignation. A letter of resignation must be received by the Secretary. It is not necessary that any action be taken by the membership to accept this resignation. It becomes effective immediately upon receipt of the letter or on the date specified in the letter of resignation, whichever one is later.
  - c. Ineligibility. When an officer ceases to satisfy the eligibility requirements as set forth in VI-C-5, he thereby immediately ceases to be an officer and shall notify the Secretary. The transfer of a person from one member installation to another shall not require his resignation from office. The office shall be held by the person and not by the member installation.

# SHARE

## REFERENCE MANUAL

- d. An office can become vacant if the Executive Board appoints the person holding it to another vacant office, as provided herein.
- e. Removal. An officer may be removed from office by the membership before his term has expired. The procedure will follow the same procedure required for reconsideration of any other previous decision of SHARE. The approval of 75 per cent of a quorum is required to remove any person from office.

### ARTICLE V - DUTIES OF OFFICERS

#### A. General

The duties of the Board Members are to do anything that they think best for the interests of SHARE unless directed otherwise by the members. These duties include, but are not restricted to, the following:

#### B. President

1. He shall be the principal executive officer of the organization.
2. He shall be an ex-officio non-voting member of all committees, except that he shall not serve on the Nominating Committee.
3. He shall appoint all committees except as otherwise provided.

#### C. Vice-President

1. He shall assist the President in any manner that the President directs. In the absence of the President, he shall have full exercise of all the rights and powers of the President. If, however, the office of President becomes permanently vacated, the office will be filled as prescribed in Article VI-E, below.
2. He shall supervise and coordinate the activities of all committees except the Nominating Committee. He shall not serve on the Nominating Committee.

# SHARE

## REFERENCE MANUAL

### D. Secretary

1. He shall be responsible for all correspondence addressed to or originating from SHARE. Exceptions to this are such matters as are handled by the SHARE Distribution Agency after mutual agreement with the Secretary.
2. He has the primary responsibility for the initial disposition of requests for membership in SHARE.
3. He has the primary responsibility for being completely familiar with all SHARE standards, By-Laws, and other decisions, policies and precedents and seeing to it that the business of SHARE is transacted in accordance with these.
4. In doubtful or ambiguous cases involving SHARE policy, where no clear standard or precedents exist, he must consult with the President before a decision is reached.
5. He shall maintain a current list of the designated Installation and Individual Members of SHARE, with indications as to the machine type(s) under which they qualify for membership (III-A-1).
6. He shall keep the minutes of the meetings and shall publish these after each meeting in a volume entitled "Proceedings of the Nth Meeting of SHARE". This shall include, as appendices, such supplementary material presented at the meeting as he may deem appropriate.
7. He shall publish, at least once a month, a serially numbered SSD (SHARE Secretary's Distribution) to all members. This will consist of all correspondence sent to him that, in his opinion, is suitable for publication. Each item will be assigned a serial number. Each SSD shall have a preface prepared by the Secretary which shall list and summarize each item contained in it and which shall provide any additional information that the Secretary wishes.

# SHARE

## REFERENCE MANUAL

### E. Board Members

The Board Members shall determine policy and interpret existing decisions of SHARE. They shall not wait until called upon for advice, but take an active interest in the government of the organization. In pursuit of this duty, they shall maintain close liaison with one another in order to monitor closely all policy matters and to act as a continual stimulus to the Executive Officers in the aggressive prosecution of their duties.

## ARTICLE VI - ELECTIONS

- A. General. Elections shall be held each year for the three executive officers and for the other members of the Executive Board.
- B. Time. Elections shall take place during the Anniversary Meeting, which is defined in Article IX-A.
- C. Nominations.
  - 1. The Executive Board shall appoint a Nominating Committee of five members and shall designate one of them as Chairman of the Nominating Committee. These appointments shall be announced on the first day of the most recent general meeting of SHARE which precedes the Anniversary Meeting by at least one month.
  - 2. On the last day of the meeting at which they were appointed, the Committee shall report in writing to the Secretary the names of those persons they place in nomination for each of the offices of President, Vice-President, Secretary, and members of the Executive Board, respectively.
  - 3. The report of the Nominating Committee shall be read to the body before adjournment of said meeting, and it shall be distributed to the members by the Secretary by mail within two weeks following final adjournment of said meeting.



# SHARE

## REFERENCE MANUAL

4. Any eligible person may be nominated, for any of the offices to be filled, by a petition signed by at least ten SHARE members. A member may not sign more than one petition submitted for any one of the Executive Offices, no more than four petitions submitted for other Board memberships. This nominating petition must be submitted in writing to the Secretary prior to the close of nominations.
5. Only an employee of an Installation Member, or an employee of an organization, an employee of which is an Individual Member is eligible for office. No person shall be nominated for office unless he has previously given assurance to those making the nomination that, if elected, he will diligently carry out the duties of that office.
6. Any candidate may withdraw his name from nomination by submitting such a request in writing to the Secretary prior to the close of nominations.
7. Nominations shall not be made in any other manner than that prescribed in the foregoing paragraphs.

### D. Election Procedure

1. On the first day of the Anniversary Meeting, as defined in IX-A-3, as the first order of business, the Secretary shall announce the names of those persons who have been nominated for each office. The Presiding Officer immediately shall announce that nominations are closed for all offices.
2. The elections shall be held as the first order of business on the last day of the Anniversary Meeting.
3. The Presiding Officer shall request volunteers to act as Tellers of the election. He shall appoint a total of three Tellers with no more than one representative from any member installation. Members having representatives in nomination are automatically disqualified from representation as Tellers of the election.

# SHARE

## REFERENCE MANUAL

4. Those nominees who are unopposed for any office shall immediately be declared elected by the Presiding Officer.
5. Election of the remaining officers shall be by ballot. The Secretary shall provide a suitable ballot bearing the name and installation codes of the nominees for each officer for which balloting is necessary. The Tellers of the election shall distribute one ballot to each Installation Member and to each Individual Member present. Each Member shall indicate his choice for each office, and shall identify his ballot with his official two-letter identification code. No vote by proxy is permitted. The Tellers shall then collect the ballots, verify the validity of each, count the votes, and announce the totals for each candidate.
6. For the Executive Offices, that candidate shall be declared elected to each office who receives a majority of the votes cast, provided that the number of valid ballots received shall be at least one-third of the number of members of SHARE.
7. If no candidate for a given Executive Office receives the necessary majority of the votes cast, the names of those candidates receiving the two highest number of votes for each office shall remain in nomination, and a succeeding ballot shall be had to select between them according to the procedure of paragraphs 5 and 6 above.
8. The procedure for electing the members of the Executive Board shall be as follows. Each member may vote for as many candidates as there are vacancies to be filled. Those candidates, equal in number to the number of vacancies to be filled, receiving the highest number of votes shall be declared elected to the Board. In case of ties, a runoff between the tied candidates shall be held in the same manner outlined above in this same paragraph.

# SHARE

## REFERENCE MANUAL

### E. Vacancies in Office

When an Office becomes vacant, the Executive Board shall immediately appoint a person to fill out the unexpired term. They shall use such procedures for this as they deem advisable under the circumstances, including the holding of a special election, following the procedures of these By-Laws.

## ARTICLE VII- COMMITTEES

### A. The Standing Committees shall be the following:

Data Processing  
Mathematics  
Utility  
Distribution  
Manual  
SHAREmanship  
Government

### B. The President shall establish and may dissolve such Ad Hoc Committees as he sees fit, or as he is directed by the SHARE body, or as are specified herein.

### C. The chairman and voting members of each committee, shall be appointed by the President of SHARE with the advice and approval of the Executive Board. Each committee shall have a minimum of five voting members. A committee chairman, except for the chairman of the Nominating Committee, may appoint additional members of his committee, to participate in all deliberations of the committee except for final voting on SHARE standards. A committee chairman and/or voting member may be relieved of his appointment by the President of SHARE with the advice and consent of the Executive Board. Committee chairmen and members shall serve until the conclusion of the Anniversary Meeting following their appointment. They may be reappointed.

### D. The Standing Committees shall assist the officers in implementing the objects of SHARE in their respective areas of specialization as they may be directed by the Executive Board or by action of the membership of SHARE. These duties shall include the following:

# SHARE

## REFERENCE MANUAL

1. The Data Processing, Mathematics and Utility Committees shall, within their respective areas:
  - a. Evaluate existing programs, survey their usage, and define a minimum package.
  - b. At specified intervals, gather and disseminate information concerning programs in preparation, coordinate this activity, and stimulate the cooperation of SHARE members.
  - c. Suggest areas needing attention and make assignments to implement their suggestions.
2. The Distribution Committee shall be responsible for the methods, procedures and standards used in distributing information to the members of SHARE. It shall also design, implement and maintain the system of cataloging SHARE programs. It may delegate certain of its functions to the SHARE Distribution Agency as it sees fit, but shall retain responsibility for all of its functions.
3. The Manual Committee shall maintain the SHARE manual.
4. The SHAREmanship Committee shall:
  - a. Be an authoritative source of information on all matters which all members should know, e. g. , SHARE, programming, typical organizational structure of installations, machine room layout, etc.
  - b. Hold a general information seminar immediately prior to or immediately succeeding each SHARE meeting.
5. The Government Committee shall study proposals for changes and additions to procedure for governing SHARE and make such recommendations as appropriate to the members of SHARE. The Secretary of SHARE shall be a member ex-officio.

# SHARE

## REFERENCE MANUAL

- E. At each meeting, the President shall appoint an Ad Hoc Committee on Arrangements for the next meeting. The Secretary of SHARE shall be an ex-officio member of this Committee.
- F. Each Committee and Sub-Committee appointed by the Committee Chairman shall keep a record of its activities and shall submit in writing a report to the members of SHARE at each meeting of SHARE.

### ARTICLE VIII - BUSINESS

- A. **General.** Any business of SHARE may be conducted at any session of any SHARE meeting in accordance with ARTICLE IX below and/or by mail.
- B. **Formal Business.** Formal business is transacted by mail or at meetings following the introduction of a formal proposal or motion by a member. It is within the authority of the Presiding Officer, at meetings, to determine when he shall entertain such formal motions.
- C. **Informal Business.** Informal business is conducted by the Executive Officers, the Executive Board and by committees acting in accordance with Section VIII-H, and is subject to review and monitoring by the members as they deem necessary.
- D. **Voting Procedure for Formal Business.** Delegates may vote as individuals when the Presiding Officer so indicates. On all formal votes, however, the Presiding Officer will indicate that members are to vote as such; in such cases, each member shall have only one vote which cannot be split. Before any formal vote, the Presiding Officer shall designate which one of the following conditions exists:
  - 1. That it is a matter concerning only a particular SHARE machine or machines and that only those members qualifying for the appropriate type of membership may vote.
  - 2. That it is a matter concerning all SHARE machines or concerning SHARE in general and that all members may vote.
  - 3. That it is a special situation and the rules of IX-D-3 apply.

# SHARE

## REFERENCE MANUAL

### E. Quorum for Formal Business.

1. At least one third of the Members eligible to vote on the matter at hand, according to the breakdown under VIII-D-1, 2 and 3, must be present in person and voting at a meeting to constitute a quorum in order to transact SHARE business. For conducting business by mail, at least one third of the Members eligible to vote on the matter at hand, according to the breakdown under VIII-D-1, 2 and 3, must vote on the proposal at hand in order to constitute a quorum. Abstentions shall not be counted as voting in determining the existence of a quorum. Unless otherwise specified herein, a simple majority of those voting is necessary to pass any motion.
2. No proxies are permitted, either for purposes of obtaining a quorum or for making formal decisions.

### F. Processing Proposals by Mail

The business of SHARE may be transacted by mail as follows:

1. The proposal is sent to the Secretary.
2. The Secretary immediately sends a copy of the proposal to the membership.
3. Interested members explore the ramifications of the proposal and mail their comments on it to the Secretary immediately. Opposition comments may contain a statement that a defined counterproposal will be submitted if the proposal is rejected.
4. The Secretary shall designate who may vote on the proposal at hand according to the breakdown under Section VIII-D. Within thirty days of mailing the original proposal he shall mail copies of the proposal and the comments to all those members of SHARE eligible to vote on the matter, together with a ballot to be marked "Yes" or "No". Counterproposals do not appear on the ballot. The ballots are marked and returned to the Secretary. Members shall vote as such on all mail ballots; there shall not be the equivalent of delegates voting as individuals as may occur at meetings.

# SHARE

## REFERENCE MANUAL

5. On such a mail ballot it will require at least 75 percent of a quorum of those eligible to vote to approve the proposal. The proposal is defeated if less than 50 percent of a quorum of those eligible vote for it. If 50 percent or more, but less than 75 percent (of a quorum of those eligible), vote for it, action is suspended until the next meeting, when it shall be automatically brought up for vote under old business.
6. Two weeks after the date of distribution of the ballots the vote closes, and notices of results are sent to the members by the Secretary.
7. Any proposed amendment to the By-Laws submitted for mail ballot shall be reviewed by the Executive Board of SHARE prior to submission to the membership. The Executive Board shall submit its comments on the merits of such proposals to the membership along with the subsequent mail ballot.

### G. Reconsideration of Topics

1. When the topic is handled by mail, no preliminary voting is required in order to reopen the subject for consideration.
2. When advance notice by mail is given that the topic will be treated at a meeting, the approval of more than 50 percent of the quorum is required in order to reopen the subject for consideration.
3. When the topic is brought up at a meeting without advance mail notice, 75 percent of the quorum must approve reopening the subject for reconsideration.
4. A motion to change any previous decision of SHARE requires the approval of 75 percent of the quorum in order to be put into effect.

# SHARE

## REFERENCE MANUAL

### H. Decisions by Committees

1. Except for revisions to the By-Laws and election of officers, any committee of SHARE (appointed as in Section VII-A, B and C) may establish, revise or repeal SHARE standards as defined in ARTICLE XI. These standards shall become effective without a formal vote by the SHARE body in accordance with the following procedure.
2. Only the voting members of the committee can participate in its final vote on SHARE standards. To constitute a quorum, one-third or more, but a minimum of three, voting members of the committee must vote on each decision.
3. Committee decisions establishing SHARE standards shall be given to the Executive Board for review. At this point the Board may veto the decision. If so, the committee or any member of SHARE is privileged to introduce it as a proposal for formal business.
4. The Board may tentatively decide to ratify the decision. If so, it is immediately distributed to the members by the Secretary, via SSD or otherwise.
5. Those members who object to the proposed standard must communicate their objections directly to the Executive Board (a copy to each Board member), signed by the SHARE addressee who objects. Thirty days after the mailing of the new standard, the Board will consider any objections that it has received and ratify or veto the standard. If objections are received from one-tenth or more of the membership eligible to vote on the subject, the board shall automatically submit the proposal for a vote to the entire membership eligible to vote.
6. The Secretary will immediately (via SSD or otherwise) publish the final decision of the Board together with any objections received and the Board's reason for its decision.



# SHARE

## REFERENCE MANUAL

7. Standards become effective upon such publication by the Secretary, and shall be included in the appropriate SHARE Manual as soon thereafter as possible.

### ARTICLE IX - MEETINGS

#### A. Definitions

1. A meeting is the assemblage, which has been announced at least one month in advance in a notice by mail to all members, of the delegates for a number of Sessions during which they may adjourn briefly or overnight, until a time specified for reconvening.
2. A Session is any continuous gathering of the delegates during a meeting, e. g. , "morning general sessions", "committee sessions", "informal sessions for new members", etc.
3. The Anniversary Meeting is the first meeting of SHARE which convenes on or after August 1st each year.

#### B. Frequency and Duration

The members shall from time to time determine the schedule for future meetings. However, there shall be at least one meeting a year, the Anniversary Meeting. Normally, a meeting will last three days. In emergencies, the Executive Board may change the scheduled dates of a meeting or call another meeting. Every effort to give at least one month's advance notice by mail to all members shall be made by the Executive Board.

#### C. Attendance

1. If it is at all possible, it is desirable that each Installation Member of SHARE be represented at each meeting by at least two men, one empowered to make basic policy decisions and another thoroughly familiar with techniques, programming, and detailed operating matters.
2. Individual Members and/or the latter's appointed delegates and the employees of Installation Members may attend meetings of SHARE. They may participate in all discussions and may be appointed to all committees.

# SHARE

## REFERENCE MANUAL

3. Non-members may be invited to attend SHARE meetings by a member of the Executive Board of SHARE.

### D. Procedure

1. Parliamentary procedure shall be governed by Robert's Rules of Order except when otherwise specified by these By-Laws. It is within the authority of the Presiding Officer of the session to determine, as circumstances warrant, whether to conduct the session as an informal discussion of proposals or whether to require that strict parliamentary procedure be followed. The general policy shall be to avoid the complexities of parliamentarianism until such time as the issues have been clarified to the point where a definitive motion can be clearly debated as a choice between a few alternatives.
2. Members are obliged to be completely informed concerning business to be transacted in order to avoid unnecessary delays while negligent individuals are brought up to date. For the same reason, members who intend to submit proposals for consideration have the serious obligation of sending to the Secretary for distribution to the members, information concerning their proposals at least one month in advance of the meeting. Members who neglect to study carefully such information should disqualify themselves from commenting on it at the meeting.
3. **Special Procedure.** At a meeting, when a main motion is on the floor concerning a particular SHARE machine or machines, and after the Presiding Officer has designated that only those members concerned may vote, the following special procedure shall apply:
  - a. Any member shall have the right (1) to move postponement of consideration of the main motion to a definite later time or (2) to move a recess for a fixed length of time during which those members entitled to vote on the main motion shall be permitted to conduct any business concerning only that type of member. Such a motion, for postponement or recess must be seconded but may not be discussed, amended or reconsidered; it shall take precedence over any motion, substantive or procedural. Any member is entitled to vote and a majority of those present

# SHARE

## REFERENCE MANUAL

is required for approval.

- b. Motions to close or limit discussion on the main motion in any other way may be made, seconded, discussed or voted upon only by those members designated by the Presiding Officer to be entitled to vote on the main motion.

### ARTICLE X - DISTRIBUTION OF INFORMATION

#### A. Distribution Channels

1. There shall be two official channels for distributing information to the members, the Secretary and the SHARE Distribution Agency. Their addresses shall be listed in the Manual along with the list of members. They shall agree between themselves as to the material which each will distribute. In general, the Secretary will distribute only correspondence to the members and the SHARE Distribution Agency will distribute bulky material such as program write-ups, listings, and cards.

#### B. SHARE Policy Concerning Distribution to Non-Members

1. SHARE wishes the information contributed by its members for distribution through the SHARE Distribution Agency to be made as accessible as is practicable to anyone in the computing field who has a legitimate interest in the information. To this effect, the membership confers on the SHARE Distribution Agency the right to distribute to non-members any of the material that the members contribute for formal SHARE distribution.

#### C. Distribution Standards

SHARE shall determine Distribution Standards. They shall be set forth in the SHARE Manual.

#### D. Character of Material Distributed

Any material submitted for distribution through any SHARE channels is assumed to be non-proprietary and non-classified in nature. The recipient, therefore, is under no obligation to

# SHARE

## REFERENCE MANUAL

refrain from reproducing or redistributing it to any one that he chooses. It is permissible, however, that each distribution carry a disclaimer clause. In the case of program material, this disclaimer is mandatory and shall be affixed by the SHARE Distribution Agency.

### ARTICLE XI - STANDARDS

#### A. General

SHARE shall from time to time establish such standards as it deems necessary in the furtherance of its objectives. These must be followed, for communication purposes, to the extent that SHARE refuses to distribute material not conforming to SHARE standards.

#### B. Type of Standards

SHARE shall establish standards which shall be published in the Manual. Areas of standardization shall be as follows:

1. Programming Standards, Manual, section 03. 10.  
These are all required for communication purposes.
2. Procedural Standards, Manual, section 03. 20. These are required whenever a member wishes to transact any business or distribute any information through SHARE.
3. Machine Standards, Manual, section 03. 30.
4. Glossary, Manual, section 03. 40.

### ARTICLE XII - AMENDMENTS

- A. Amendments to these By-Laws may be made by three-quarters of a quorum.

# SHARE

## REFERENCE MANUAL

### SECTION 03.21

#### SHARE DISTRIBUTION STANDARDS

##### A. GENERAL

This section outlines in greater detail the standards for distribution by the SHARE Distribution Agency and by the SHARE Secretary.

##### B. DISTRIBUTION BY SHARE DISTRIBUTION AGENCY

###### 1. Procedures

###### (a) SHARE Member List

A list is kept of all SHARE Member Installations. New members are added to this list on notification from the Secretary of SHARE that an installation has become a member. It is not within the authority of the SHARE Distribution Agency to decide who shall be a member of SHARE.

- (b) Each SHARE member receives by prompt distribution a one or two page write-up which conforms to the SHARE programming standards and conventions. This material is reproduced on vellum paper for easy ozalid or blueprint duplication.

A deck of abstract cards in standard form is distributed with the initial printed material for each program. In addition, the SHARE Distribution Agency will send to each member installation four SHARE order cards per program, by means of which the following material, if available, can be ordered.

Punched In  
Columns 34-35

- |       |  |    |
|-------|--|----|
| (i)   | Full program description consisting mainly of appendices to the write-up | PA |
| (ii)  | Program Listing  | LS |
| (iii) | Symbolic Cards   | SY |
| (iv)  | Binary Cards   | BI |

# SHARE

## REFERENCE MANUAL

For each of the four types of material desired, a separate order card with the classification code of the requesting installation punched in columns 31 and 32 (bordered in red on the actual card) must be sent to the SHARE Distribution Agency. The requested material will be forwarded as soon as possible (usually within 48 hours).

The format for the order card is as follows:

<u>Card Columns</u>	<u>Description</u>
1-2	Abstract classification
4-5	Code of installation submitting the program
7-10	Program identification
12-19	Date complete program received at SHARE Distribution Agency
21-24	SHARE Distribution Number
31-32	Classification code of requesting installation
34-35	Type of material requested
37-40	Card or Page count
42-49	Date order card received by SHARE Distribution Agency
51-58	Date material sent out by SHARE Distribution Agency
60-80	Miscellaneous remarks

The diagram shows a grid representing the order card. The columns are labeled as follows: CL., IDENT., DATE OF DIST., DIST. NO., NO OF CARDS, RETURNED, and SENT. The rows are numbered from 00 to 99. The grid is filled with a repeating pattern of digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) in a grid format. On the right side, there is a vertical label 'SHARE ORDER CARD'. On the left side, there are two vertical labels: '1778643' and '1778642'.

# SHARE

## REFERENCE MANUAL

### (c) Non-Member SHARE Distribution List

A list is also kept of individuals who are interested in obtaining 704 programs and who have asked to receive whatever routines become available. (The routines consist almost entirely of SHARE programs.) These individuals receive, by a somewhat delayed distribution ozalid copies of abstracted write-ups of all SHARE programs. Non-SHARE personnel do not, however, receive cards.

### (d) Updating of New Members

#### Updating of Paper

1. Printed information of all SHARE 704 programs will be sent to all new members via paper and/or 35mm microfilm.
2. Reports of the proceedings of past SHARE meetings, to the extent that they are available, will be forwarded to each new member.

#### Updating of Cards

A complete set of SHARE Order Cards corresponding to all previously distributed program decks will be sent to each member by means of which he may order any program deck previously distributed.

### 2. Procedure for Submittal of Items for SHARE Distribution

IMPORTANT: These standards must be adhered to when submitting programs and/or documentation to the SHARE Distribution Agency. The SHARE Distribution Agency will return to the contributing installation all programs not in accordance with these standards.

All items should be submitted to the following:

Mr. Donald C. Cashman  
Applied Programming Department  
International Business Machines Corporation  
590 Madison Avenue  
New York 22, New York

# SHARE

## REFERENCE MANUAL

### (a) Program Write-ups

Write-ups should conform in content and form to the SHARE programming standards and conventions. They should be on white bond paper, and should be as clear and as black as possible. The Xerox process is used to reproduce write-ups, and it is essential to have a sharp, black first copy, if the best results are to be obtained on duplicates. Inadequate originals will produce illegible copies.

The SHARE standards for program write-up format are specified on page 03.10 - 01 of this manual. They are repeated here for the convenience which derives from having all information on a subject obtainable in one section of a source text.

#### Program Write-up Format

##### i. Identification

- a. Deck Number - Title
- b. Author - Date
- c. Installation

##### ii. Purpose - Brief Statement

##### iii. Restrictions

- a. Components required other than "minimum 704"
- b. Other programs required
- c. Data (quantity, form)
- d. Card form
- e. Wiring diagram (for print routines using other than SHARE boards)

##### iv. Method

- a. Accuracy
- b. Range
- c. Derivation or reference

##### v. Usage

- a. Calling Sequence
- b. Space Required



# SHARE

## REFERENCE MANUAL

- c. Error Codes (left in Accumulator or MQ)
- d. Format received or generated if an input-output routine

### vi. Coding Information

- a. Constants and their locations
- b. Erasable input-output locations
- c. Timing

### vii. Checkout

- a. Status
- b. Method

## (b) Program Listings

When listings are made on a line printer, care should be taken that a fairly fresh, black ribbon is being used. It is very common to have a well-reproduced write-up and a badly reproduced listing.

## (c) Covering Letter

A letter should accompany each item for distribution, explaining what is in the package.

## (d) Wiring Diagrams

These should be drawn clearly in black on a standard panel form. It is a great help if care is taken to keep diagrams neat, since they always become less clear in reproduction.

## (e) Symbolic Cards

Cards should be well-packed, and should be interpreted when feasible. This will simplify any card-handling involved in the reproduction. A set of cards bearing the abstract of the program, and with SHARE standard identification punching should accompany each program deck. See section 03.10 for card format.

## (f) Binary Cards

In the event that binary cards are chosen to bear the program, the identification should be punched and

# SHARE

## REFERENCE MANUAL

interpreted on each card.

- (g) The address for the SHARE Distribution Agency will be carried on the list of members of SHARE in section 02. Latest information on this, however, is usually distributed somewhat earlier by the SHARE Secretary.

### C. DISTRIBUTION BY SHARE SECRETARY

#### 1. Procedures

- (a) All material which is not of a bulky nature is distributed by the SHARE Secretary. These are issued in batches at approximately one-month intervals. Each item carries a serial number affixed by the SHARE Secretary with alphabetical prefixes as follows:

- I - Information requested by SHARE Secretary  
(R. S. V. P. immediately)
- C - SHARE Correspondence
- P - Performance Statistics on machine
- M - Machine configuration summaries
- O - Operating character of installation
- B - Mail ballots
- A - Address list

- (b) Not everything which is sent to the Secretary is distributed. He makes the decision as to whether it is of sufficient interest to the members to warrant adding to the large quantity of mail which is distributed. If you feel that he might misinterpret your wishes in this matter, note in the letter that you request its distribution.
- (c) Items with the prefix "I" must be answered immediately. The Secretary's job is difficult enough, but it becomes intolerable when the members ignore these requests for information.

#### 2. Format

- (a) All such correspondence must be identified by installation. Please submit only good black type on white bond. If at all possible, the original of any typing should be sent.

# SHARE

## REFERENCE MANUAL

### D. DISCLAIMER CLAUSE

1. The SHARE Distribution Agency stamps with a Disclaimer Clause at least one page (usually the first) on each item submitted for distribution. The SHARE Secretary does not affix any such notation. If a member wishes to affix this Disclaimer Clause himself to any material sent to the Secretary or to the SHARE Distribution Agency, he is free to do so as follows:

#### DISCLAIMER

Although each program has been tested by its contributor, no warranty, express or implied, is made by the contributor, SHARE, or IBM as to the accuracy and functioning of the program and related program material and no responsibility is assumed by the contributor, SHARE, or IBM in connection therewith.

### E. ERRORS

1. Errors detected in material submitted.

As soon as a SHARE member detects an error in any material distributed by the SHARE Secretary or the SHARE Distribution Agency, he has the obligation of corresponding about it directly to the originator of the material and of sending a copy of this correspondence to the Secretary. The originator then has the responsibility of taking appropriate action and distributing corrections as soon as possible via the Secretary and/or the Distribution Agency as appropriate. These latter will not distribute anything until they hear from the originator.

2. The Secretary, however, will note in his monthly letter to the members, "suspense items" consisting of letters concerning errors which he is holding because they have not as yet been answered by the originator. Members should scrutinize carefully this list of suspense items as soon as they receive their monthly letter from the Secretary. They should set up a mechanism within their own organization to insure that responsible persons are aware that immediate action must be taken on these.

# SHARE

## REFERENCE MANUAL

### F. SUBMITTAL OF INFORMATION FROM NON-MEMBERS

1. It is recognized that organizations or persons on the non-member distribution list may wish to repay in some way for receiving this information. They may do so by submitting material for distribution. However, this must be done under the sponsorship of some member of SHARE. The installations of the Service Bureau Corporation are recommended as appropriate sponsors.
2. The installation code of the sponsoring SHARE member will be a part of the program identification. The sponsoring installation will actually submit the program for distribution. On the program write-up, the author's actual organization will follow his name.
3. It is clear that sponsors must take the responsibility of screening such material for its merit and adherence to SHARE standards.

### G. RPQ INFORMATION

1. It is recognized that better use can be made of a computing machine if changes requested by other installations are known. Then each user may judge whether the new feature has applications in his installation.
2. Each SHARE member shall consider it a part of his obligation to survey any RPQ submitted by his installation and shall, upon finding that the release of information on this RPQ is not in violation of proprietary or government classified standards, submit to the Secretary, for distribution in SHARE, a description of this RPQ.

# SHARE

## REFERENCE MANUAL

### SECTION 03.4

#### GLOSSARY OF SHARE TERMS

**Note:** SHARE recommends the use of the latest IRE Standard for definitions of hardware, and the latest ACM Glossary for definitions of programming terms. Where these are inadequate, the following glossary should be used:

**Breakpoint.** A location in a routine which the computer may, under any type of control (a manually set switch, a signal set into the code, etc.) be stopped or made to produce information for a check of progress. This is a type of trapping.

**Breakpoint Printing.** Information printed out at a breakpoint.

**Calling Sequence.** The group of instructions within a routine which include the following:

1. **Link Out:** The instruction or instructions which transfer control to a subroutine and supply the necessary information for it to set up an exit (or return) to the appropriate place and to obtain:
2. **Parameters:** Words following the link out which may be data, locations of data, scale factors, special codes, etc.
3. **Error Return:** The location to which a subroutine exits if it has not succeeded in its function.
4. **Normal Return:** The location to which a subroutine exits if it has succeeded in its function.

**Characteristic.** An exponent which has had added to it a constant integer such that the result is not negative.

**Check.**

1. See A.C.M. Glossary.
2. An automatic indication arising from the failure of the computer to verify a test built into the hardware (e.g. on the 704; divide check, tape check, copy check, etc.).

**Cut Address.** (Used in conjunction with assembly routines)  
The address at which deletions are to be started; the address before which insertions are to be made.

# SHARE

## REFERENCE MANUAL

Debugging Routine. A routine used to locate a mistake in coding.

Decrement.

1. A modifying quantity by which a variable is decreased.
2. A specific part of the 704 instruction word.

Diagnostic Routine. A routine used to locate a malfunction in the computer.

Dump (verb).

1. See A.C.M. Glossary.
2. To copy the contents of all or a large part of one type of storage into another or onto an output mechanism, usually for the purpose of providing a rerun point. When used in this sense, a tape dump or a card dump is a dump onto tape or cards.

Post Mortem Dump (noun). The output of a post mortem. When used in this sense, a "PM core dump" or a "PM tape dump" is a dump from core storage or tape onto the output medium.

Effective Address. The address used for execution of an instruction when this differs from the instruction in storage because of the use of an index register.

End of File Mark.

1. For tape (727) a single character record associated with a file to indicate or signal the end of the file.
2. Any indicator to signal the end of a file.

Extract. See A.C.M. Glossary.

File.

1. See A.C.M. Glossary.
2. A sequential set of records.

File Gap. An interval of space or time associated with a file to indicate or signal the end of the file.

Floating Point Representation. A notation in which a number  $x$  is represented by a pair of numbers  $y$  and  $z$  (and an integer  $N$

# SHARE

## REFERENCE MANUAL

inserted is usually called a breakpoint.

Underflow. (Floating point only). When the characteristic is less than its minimum allowable value.

### Proposed Additions to SHARE Glossary

Indicator: Functionally, any device which conveys information from within an internally programmed computer to the console of the computer. This device may be set automatically by the computer as the result of certain conditions (e.g. parity check, failure on tape reading) or from the routine being executed.

Switch: Functionally, any manually set device which conveys information from the console of a computer to the routine stored within the computer.

### Toggle.

1. A storage device having a capacity of one binary digit.
2. Functionally, any device which conveys information from within an externally programmed computer to the routine being executed. This device may be set automatically by the computer or from the routine being executed.
3. Loosely, an indicator.

# SHARE

## REFERENCE MANUAL

### SECTION 04. 01

#### Abstracts of Distributed Programs

The following pages contain abstracts of SHARE Programs which have been distributed. The list is ordered by type.

1. The various fields in the list are used as follows:
  - a. Classification Code - Each program is assigned a classification code according to (2) below. The SHARE Distribution Agency shall assign this number upon receipt of the cards.
  - b. Installation Code - Used to identify the contributing or sponsoring member installation.
  - c. Program Identification - A four-column alpha-numeric designation assigned by the contributor.
  - d. Card Serial Number - Each catalog entry may consist of up to 10 cards. The card serial number merely counts from 0 to 9 for sorting purposes.
  - e. Title - Composed by contributor.
  - f. Status Code - Normally blank. May be punched with V (for void) for obsoleted programs.
  - g. SHARE Distribution Number - Punched by the SHARE Distribution Agency upon distribution, and is always the Distribution Number of the write-up.
2. Programs shall be assigned a 2-character classification code. The leftmost character is a letter indicating a primary class; the second character is a digit indicating a secondary class within the primary. The classifications shall be as follows:
  - A. Programmed Arithmetic: Any of the subclasses could contain multiple precision
    1. Real: Multiple precision fixed and floating point arithmetic
    2. Complex: Complex arithmetic programs and any routines directly connected to them.
    3. Decimal: BCD



# SHARE

## REFERENCE MANUAL

- B. Elementary Functions
  - 1. Trigonometric: Includes inverse trigonometric functions
  - 2. Hyperbolic
  - 3. Exponential and Logarithmic
  - 4. Roots and Powers: Refers to roots of quantities, not polynomials
- C. Polynomials and Special Functions
  - 1. Evaluation of Polynomials
  - 2. Roots of Polynomials
  - 3. Evaluation of Special Functions
  - 4. Simultaneous Non-linear Algebraic Equations
  - 5. Simultaneous Transcendental Equations
- D. Operations on Functions and Solutions of Differential Equations
  - 1. Numerical Integration
  - 2. Numerical Solutions of Ordinary Differential Equations
  - 3. Numerical Solutions of Partial Differential Equations
  - 4. Numerical Differentiation
- E. Interpolation and Approximations
  - 1. Table Look-up and Interpolation
  - 2. Curve Fitting
  - 3. Smoothing
- F. Operations on Matrices, Vectors and Simultaneous Linear Equations
  - 1. Matrix Operations
  - 2. Eigenvalues and Eigenvectors
  - 3. Determinants
  - 4. Simultaneous Linear Equations
- G. Statistical Analysis and Probability
  - 1. Data Reduction: Is interpreted as the calculation of the more common statistical parameters such as mean, median, standard deviation, etc.
  - 2. Correlation and Regression Analysis: Includes curve fitting which is explicitly for statistical purposes
  - 3. Sequential Analysis
  - 4. Analysis of Variance
  - 5. Random Number Generators
- H. Operations Research and Linear Programming

# SHARE

## REFERENCE MANUAL

- I. Input
1. Binary: Presently contains binary tape and card loaders
  2. Octal: Card loaders only
  3. Decimal: Card loaders only
  4. BCD: Any tape input program which reads in the BCD mode
  9. Composite
- J. Output
1. Binary: Includes binary tape or card preparation or on-line binary printing.
  2. Octal: Refers to on-line octal card punching and on-line octal printing but the latter only when entry is by TSX linkage and the printing represents the final result of a program. (not debugging)
  3. Decimal: Contains on-line decimal printing or card punching.
  4. BCD: All non-binary tape preparation
  5. Analog: CRT
  9. Composite
- K. Internal Information Transfer:
- Denotes only core-to-core, drum-to-drum, and core-to-drum word movements.
1. Read Write Drum
  2. Relocation: Is for core-to-core or drum-to-drum relocation only, not input with relocation.
- L. Executive Routines
1. Assembly
  2. Compiling
  3. Automatic Operator Programs: Refers to the monitoring routines used by installations which operate in the peripheral mode.
- M. Information Processing
1. Sorting
  2. Conversion: Includes only internal conversion from one mode to another, such as internal conversion from fixed to floating, with no input-output.

# SHARE

## REFERENCE MANUAL

3. Collating and Merging
- N. Debugging Routines
1. Tracing, Trapping
  2. Dumps: Includes all output primarily intended for debugging purposes such as print-out (on or off-line) of drums, tape, cores, and console.
  3. Search: Searching (of tape, core, or drum) for debugging purposes is differentiated from table-lookup.
  4. Breakpoint Print
- O. Simulation Programs: Contain routines for the simulation of other machines on the 704, as well as for off-line equipment simulators.
- P. Diagnostic Programs: Are defined as those which check for malfunctions of the computer and/or its components.
- Q. Service Programs: Are routines of a utilitarian nature which perform a service for the programmer such as executing the equivalent of pushing a button on the computer or accumulating a check sum.
1. Clear Reset Programs
  2. Check Sum Programs
  3. Restore, Rewind, Tape Mark, Load Button Programs
- Z. All Others Contains all routines for which no primary class has yet been selected. Routines which seem to be included by a primary class but which are not adequately described by a sub-class are assigned the applicable primary classification with a sub-class designation of zero.

# SHARE

## REFERENCE MANUAL

3. The classifications of (2) shall be reviewed from time to time by a committee appointed from the SHARE membership. It is anticipated that new program developments will show the need for additional classifications. Any program for which no suitable secondary class exists may be assigned the secondary code 0 (zero). The committee may assign additional secondary classes as required to distribute the accumulation of "0" classed programs into applicable classes.

Similarly, where no suitable primary class exists, a program may be classed "Z". The committee may establish additional primary classes as required.

The establishment of new classification codes is reserved for the committee. Suggestions for additional classifications may be submitted to the committee by the membership.

# SHARE

## REFERENCE MANUAL

### SECTION 04.04

#### 704 Minimum Package

#### B Elementary Functions

B1	GE SIN2	Sine-Cosine (Floating)	033
B1	NA 33.1	Arctangent (Floating)	051
B3	LA S816	Exponential (Floating)	069
B3	LA S820	Natural Logarithm (Floating)	069
B4	UA SQR4	Square Root (Floating)	004

#### C Polynomials and Special Functions

C2	CL AEQ2	Roots of a Polynomial	223
----	---------	-----------------------	-----

#### D Operations on Functions and Solutions of Differential Equations

D1	CL INT3	Evaluation of Integrals (Equal Interval)	116
D1	CL INT4	Evaluation of Integrals (Unequal Interval)	116
D1	GL GAUS	Evaluation of Integrals (Gauss Quadrature)	237
D2	GM DEQ1	Solution of Differential Equations (Requires "fix" for underflow)	063

#### E Interpolation and Approximations

E1	WK LIN1	Lagrangian Interpolation	197
E1	NO INTP	Nth Order Interpolation (Divided Differences)	265

#### F Operation on Matrices, Vectors and Simultaneous Linear Equations

F1	CL "Package"	Matrix Operations (Used with Abstraction)	085
F1	PK CIMX	Matrix Inversion, Complex	122
F1	UA INV1	Matrix Inversion, Real	058
F2	NY CRV1	Eigenvalues and Eigenvectors	148
F2	NY CRV3	Real Symmetric Matrix	218

# SHARE

## REFERENCE MANUAL

F4	CL LSQ2	Least Squares Solution of Simultaneous Equations	116
F4	CL LSQ3		116
F4	LA S885	Solution of General Matrix Equation AX-B	141
I Input			
I1	GL BUL2	One Card Absolute Binary Upper Loader	044
I1	PK CSB3	Relocating Binary Loader, Lower and Upper	208
I1	RL 0058	One Card Absolute Binary Lower Loader	106
I1	UA CSB1	Absolute Binary Loader	066
I3	RS 0046	Floating Point and Fixed Point Decimal Input	040
I4	UA CSH2	Read BCD Tape or On-Line Card Reader	073
I9	UA DBC1	Decimal, Octal, BCD Loader	073
J Output			
J1	NA 003.1	Absolute Binary Card Punch	051
J3	RL 0023	Normalized Floating Point Print	021
J4	NA 109.0	Write a Single BCD Character on CRT	150
J4	NA 110.0	Write BCD Characters Stored in N 704 Words on CRT	150
J5	CL PLT1	Point Plot on Off-Line Printer	131
J5	NA 111.0	Plot a Point Given by a Set of Coordinates in Floating Point	150
J9	UA BDC1	Generalized Print Program	072
J9	GM GPR	General Print Program	070

# SHARE

## REFERENCE MANUAL

### K Internal Information Transfer

K1	UA RWD1	Read-Write Drum	054
K2	RL 0044	Tape Copy	106

### L Executive Routines

LO	PK DSMB	Binary Card Disassembly Program	158
L1	UA SAPI	SHARE Assembler	036
L1	CL REL	Relativize Symbolic Deck	116

### N Debugging Routines

N1	NY FTR1	High-Speed Flow Trace	147
N1	UA SPO2	Flow Trace	026
N2	NY DS1	Octal Memory Print Out Program	286
N2	UA SPM1	Trap Decimal Memory Print	113
N2	RS 0071	Punch Console	067

### O Simulation Programs

O1	UA CTH1	Off-Line Card Reader Simulator	024
O1	UA TCH1	Off-Line Punch Simulator	071
O1	UA TPH1	Off-Line Printer Simulator	071

### Q Service Programs

Q0	RL 0079	Tape Compare	106
Q1	UA ZCS <del>L</del>	Set Core Storage to Zero	119
Q1	UA ZDR1	Clear N Drums	065

# SHARE

## REFERENCE MANUAL

Q2	RL	0059	Binary Check Sum Corrector	106	?
Q2	UA	PCS1	Punch Drum Check Sum Verifier	065	
Q2	UA	VCS1	Verify Drum Check Sum	065	
Q3	RS	0075	Adjust Tape	091	
Q3	UA	OTM4	Tape Rewind Control	097	





# SHARE

## REFERENCE MANUAL

f. Papers Presented

Cross Bar Switching Manual of operation for 704 using CAGE	United Aircraft General Electric, Evendale
704 Regional Symbolic Assembly Program	Los Alamos
704 Matrix Routine 704 Simulator on the 701	Lockheed, Burbank Rand, Santa Monica

2. SECOND MEETING      September 12-13, 1955      Philadelphia, Pa.

a. Attendance - Sixteen member organizations and IBM Applied Science Division were represented. The number of members of SHARE was increased to twenty-one.

b. SHARE Standards Adopted

- 1) On the basis of new information, it was agreed to use the United Aircraft Assembly Program as the framework of the SHARE Assembler, instead of the IBM NYAPI as previously adopted.
- 2) The calling sequence form adopted at the first meeting should be a suggested form only and should not restrict the programmer.
- 3) Erasable storage symbol chosen -- COMMON
- 4) A SHARE program deck will not require that certain subroutines be available within the tape library for assembly.
- 5) Integer scaling will be specified as  $B=35$ , or a special data card form may be used.
- 6) Additions were made to the binary card form.

c. New Operations - A report from IBM was made concerning the additional operations requested at the first meeting.

1) Shortly to be added to list of standard operations

2-6) - Presently being engineered

# SHARE

## REFERENCE MANUAL

- 7) Requires an RPQ from each installation
- 8) Impossible

IBM reported that half-word logic will be available at \$500.00 per month.

d. Committees

A report was submitted by the Glossary Sub-committee.

- e. Papers including subroutines for elementary functions, data handling and diagnostics were presented by Lockheed, United Aircraft, North American, Los Alamos, Rand, California Research, IBM and General Electric.

3. THIRD MEETING      November 10-11, 1955      Boston, Mass.

- a. Attendance - Twenty-two members of SHARE and IBM Applied Science Division were represented.

b. SHARE Organization

- 1) Member is defined as an installation which has on hand or on order at least one 704. \*
- 2) Quorum shall consist of at least two-thirds of members. Majority of quorum is necessary to pass any motion. †
- 3) Established percent of quorum is necessary to reconsider a previous decision and to overrule it.

c. SHARE Standards Adopted

- 1) Octal card form presented in the second proceedings will be the SHARE standard.
- 2) Material which is not in SHARE language will not be distributed by SHARE.
- 3) The standard library tape shall be Tape No. 1.
- 4) Procedures were established to transact SHARE business by mail.

\* SHARE has since been expanded to include users of the 709 computer. See section entitled "The By-Laws of SHARE".  
† Has since been changed; see "The By-Laws of SHARE".

# SHARE

## REFERENCE MANUAL

- 5) All distributed decks which carry sequence numbers must use the following convention: Sequence numbers in self-loading decks shall start with zero; all others shall start with one.
  - 6) Programs distributed through SHARE will use five or fewer characters as symbols, except when programmer wishes to prevent heading, as in erasable storage.
- d. Request to IBM - SHARE requested IBM to use unused bits in the decrement field in a definite order.
- e. Committees and Assignments
- 1) Committees were appointed to study the following:
    - a) Bibliography and index of SHARE distributed material.
    - b) Future 704 changes
    - c) Machine time charges
    - d) Periquip changes
    - e) Periquip reader wiring
    - f) Printer board standard
    - g) RPQ procedures
  - 2) Various installations were charged with submitting mail proposals concerning:
    - a) Standing committee on mathematical analysis
    - b) New operations      Sense Copy Check  
                                 Index Register ADD  
                                 instead of OR  
                                 Load Index with own  
                                 address  
                                 Load Index with com-  
                                 plement of own address.
    - c) Trapping mode console switch
- f. Papers presented included descriptions of new routines, usage of peripheral equipment and compilers.

# SHARE

## REFERENCE MANUAL

4. FOURTH MEETING February 6 and 10, 1956 San Francisco, California

- a. Attendance - Twenty-seven member installations and IBM Applied Science Division were represented.
- b. SHARE Organization
  - 1) Don Shell resigned as vice-chairman.
  - 2) Walter Ramshaw was elected new vice-chairman.
  - 3) Standards were adopted for election of officers.
  - 4) Non-members shall attend SHARE meetings by invitation only.
  - 5) Statements were adopted describing the following:
    - a. Obligations and advantages of SHARE membership
    - b. Scope of SHARE activities for balance of 1956.
- c. SHARE Standards Adopted
  - 1) Card Form - binary, decimal, octal, chinese binary

Identification	Col	73-80
Information	Col	1-72
  - 2) On-line Board Wiring

On-line Reader	72-72 to accept adopted card form
On-line Punch	Col 2-9 offset gang punched identification columns
  - 3) Printer Board Wiring Diagrams
  - 4) Tape record representing 80 column card should be 84 characters in length, the last 4 being blank.

# SHARE

## REFERENCE MANUAL

- 5) Sense switch conventions
    - a. When a sense switch is used for control, the "down" position shall be the "unusual" case.
    - b. Sense switch No. 6 shall be used for trapping mode control.
  - 6) A method for the exchange of statistical information concerning machine time charges was adopted.
- d. Reports from IBM
- 1) It was restated that bits in decrement field of Type B instructions should not be used. These will be used by IBM in future machine changes and there is no order of probability of use.
  - 2) Key punch code plates will be available which will print SHARE characters.
  - 3) Notification of 704 changes will be distributed to SHARE in addition to appearing in 704 Information Bulletin.

e. RPQ Procedures

Certain legal ramifications render undesirable any joint action by SHARE in requesting machine changes. Future RPQ's originating in SHARE shall be submitted by each member, noting that the request is sponsored by SHARE.

It was urged that a member submit for SHARE distribution information on any RPQ submitted to IBM, if this is not in violation of proprietary or security standards.

Members were requested to submit an RPQ concerning a change to the automatic carriage control on the 717 printer.

# SHARE

## REFERENCE MANUAL

An RPQ agreed upon by mail ballot concerning changes to the peripheral equipment was described.

f. Committees - The following committees were formed:

- 1) Education of Computer Personnel
- 2) Mathematical Methods

g. Papers presented

- 1) Programs written by Lockheed
- 2) SHARE Assembler Listing

# SHARE

## REFERENCE MANUAL

5. FIFTH MEETING                      May 9-11, 1956                      Chicago, Illinois

a. Attendance - Thirty-seven member installations were represented.

b. Format of Meeting

- 1) First Day - Panels on 704 experience, debugging, machine layout and CRT usage.
- 2) Second Day - 3 schedules of sub-committee meetings
- 3) Third Day - Reports from IBM concerning time clock, sequencing device on on-line punch, Chinese Binary, black box, 32 K word core, Fortran  
  
Report on PACT 1A compiler  
  
Reports from sub-committees

c. SHARE Standards Adopted

- 1) Change on SHARE standard 716 panel such that sense exit No. 1 be wired directly to skip to channel No. 1
- 2) Programs submitted after May 14, 1956 will include catalog entry cards. Format of cards and outline of classification approved.  
(IBM Poughkeepsie will prepare catalog cards for prior programs.)
- 3) Chinese Binary Card Format - (Binary Cards to be distributed will remain in row-wise format.)
- 4) Absolute binary card decks will be distributed only for programs to be used from operator's console.
- 5) "CAC" or "CAD" is mnemonic code for Copy, Add and Carry Logical word instruction.

d. Recommendations to IBM

- 1) Overflow -- Underflow
  - a) No automatic stop on floating overflow and/or floating underflow feature is to be provided.



# SHARE

## REFERENCE MANUAL

- b) Execution of floating operations which do not overflow or underflow is not to take more time than at present.
  - c) Whenever a floating OF or UF occurs in AC and/or MQ the location of the instruction following the offending instruction is to be stored at location 0000 and control is to be transferred to some cell (not 0000 or 0001) in low end of memory.
- 2) IBM urged to study extensively magnetic tape life and reliability.
- e. Committees and Assignments
- 1) Permanent Committee to prepare and maintain SHARE Reference Manual
  - 2) Logical Data Processing Committee
  - 3) Education Committee to prepare outline of course for training computer personnel
  - 4) New Programs Committee
  - 5) Instruction Mnemonics Committee
  - 6) Permanent Catalog Committee to review methods to maintain SHARE catalog
  - 7) Committee to originate and distribute Monthly Check List to strengthen communication
  - 8) Committee to Collect Programming Statistics
- f. Appendix
- 1) Machine Configuration Chart
  - 2) Typical 704 layouts
  - 3) Diagram of 32K work core frame
  - 4) Report of Education Committee to ACM Council

# SHARE

## REFERENCE MANUAL

- b) Execution of floating operations which do not overflow or underflow is not to take more time than at present.
  - c) Whenever a floating OF or UF occurs in AC and/or MQ the location of the instruction following the offending instruction is to be stored at location 0000 and control is to be transferred to some cell (not 0000 or 0001) in low end of memory.
- 2) IBM urged to study extensively magnetic tape life and reliability.
- e. Committees and Assignments
- 1) Permanent Committee to prepare and maintain SHARE Reference Manual
  - 2) Logical Data Processing Committee
  - 3) Education Committee to prepare outline of course for training computer personnel
  - 4) New Programs Committee
  - 5) Instruction Mnemonics Committee
  - 6) Permanent Catalog Committee to review methods to maintain SHARE catalog
  - 7) Committee to originate and distribute Monthly Check List to strengthen communication
  - 8) Committee to Collect Programming Statistics
- f. Appendix
- 1) Machine Configuration Chart
  - 2) Typical 704 layouts
  - 3) Diagram of 32K work core frame
  - 4) Report of Education Committee to ACM Council

# SHARE

## REFERENCE MANUAL

### 6. SIXTH MEETING

August 22-24, 1956

Denver,  
Colorado

- a. Attendance - Fifty-two member installations were represented.
- b. SHARE Organization
- 1) Question of legal status of SHARE referred to committee for investigation.
  - 2) The Executive Board shall be composed of seven members, which number shall include the officers of SHARE, any officers of the year immediately passed who are not re-elected to office, and a number of members chosen by nomination and election, sufficient to complete the seven-member body. It shall act as an advisory body to the executive officer of SHARE
  - 3) Executive Board elected for 1956-1957:  

Chairman:	Frank Engel (WH)
Vice-Chairman:	Randall Porter (BA)
Secretary:	Joanne Edson (CS)
Other Members of Executive Board:	Paul Armer (RS) Fletcher Jones (NA) Walter Ramshaw (UA) Jack Strong (NA)
- c. SHARE Standards Adopted
- 1) Identification of program decks for SHARE distribution:  

First card will be a REM card containing program title and installation code.

Symbolic decimal program deck:

Columns 73-76	Program identification
Columns 77-80	Sequence number

Binary card identification not changed. (See First Meeting, O. c. 9). Recommended that new identification be used for second 100 cards.
- d. Reports from IBM
- 1) Chinese binary is ready for field testing.
  - 2) Internal clock now available by RPQ.

# SHARE

## REFERENCE MANUAL

- 3) Sequencing device for the on-line punch will be available soon by RPQ.
  - 4) 704's are being changed in the field to permit checking of the longitudinal redundancy bits. A 30-cycle delay is needed.
  - 5) 704's will be changed in the field to give program detectable external indication of physical end-of-tape.
  - 6) The Copy instruction which is presently used will not be available on the 738 (Model III).
  - 7) The 32000-word core will be changed in size.
  - 8) Report on status of FORTRAN.
- e. Recommendations to IBM
- 1) SHARE requests IBM to make no changes which affect existing 704 operations other than those already requested by SHARE.
  - 2) SHARE urges IBM to distribute the 704 Information Bulletin monthly.
  - 3) SHARE urges IBM to revise the Add and Carry Logical Word instruction in the manner as requested by SHARE, such that the Q bit is not cleared on execution.
- f. Committees and Assignments
- 1) Mnemonics Committee dissolved. Its function can more efficiently be performed by IBM.
  - 2) New committee formed to investigate diagnostic system for the prevention of machine stops.
  - 3) Legality and Individual Membership Committee
  - 4) Committee to prepare Schedule of Meetings.
- g. Other topics discussed
- 1) Idle time and its relationship to efficient operation.
  - 2) Tape reliability
  - 3) Aptitude testing
  - 4) Debugging

# SHARE

## REFERENCE MANUAL

- 5) 704 layout
- 6) Critique of SHARE'S first year

### h. Appendices

- 1) Attendance
- 2) Index of UA Library Programs
- 3) Mathematical Routine Questionnaire
- 4) Programmer Training Committee Questionnaire Results. Syllabus of Proposed Training Program
- 5) Diagram of 32000 Word Core Frame
- 6) An example of FORTRAN coding
- 7) Graphical representation of relationship between 704 waiting time and work load.
- 8) Preliminary report on General Electric tape reliability test.
- 9) Description of Midwestern Universities Research Association (MU)
- 10) Index

7. SEVENTH MEETING                      December 13-14, 1956                      New York,  
New York

- a. Attendance - Sixty-eight member installations were represented.
- b. SHARE organization
  - 1) Recommendation by Executive Board concerning government of SHARE was adopted.
  - 2) A formal committee-subcommittee structure was approved.
- c. SHARE Standards Adopted
  - 1) Standard format for abstract cards for programs in preparation or revised.

# SHARE

## REFERENCE MANUAL

### d. Reports from IBM

- 1) Storage life and reliability of magnetic tape.
- 2) Description of 774 Tape Data Selector.
- 3) Overflow-underflow change requested by SHARE being worked on.
- 4) Chinese binary being field tested at North American.
- 5) Add and Carry Logical Instruction now available.
- 6) Store Zero instruction will now be maintained.
- 7) End of Tape Test instruction being put on all machines.
- 8) Reports on FORTRAN: Subroutine structure, distribution system, experience to date, future aspects, debugging, and input-output.

### e. Recommendations to IBM

- 1) The use of mnemonic code SLT on the improved 704 is deplored, as it conflicts with a SHARE extended operation code.

### f. Committees and Assignments

- 1) Education Committee reorganized as "Public Relations in the Computing Field" Committee.
- 2) 704 Model 3 System Committee founded to study the establishment of a uniform system as well as a uniform language in the next machines.

### g. Other Topics Discussed

- 1) Indoctrination session for new members held prior to general meeting.
- 2) Proposal concerning legal counsel for SHARE.
- 3) Panel discussion of operator programs employing tape-to-tape operation, new debugging techniques, and snapshot dumping.

# SHARE

## REFERENCE MANUAL

### h. Appendices

- 1) Attendance
- 2) Report of the Education Committee
- 3) Chart of SHARE Committee Structure.
- 4) Committee Chairmen and Members
- 5) Report on status of SHARE Assembly Program
- 6) Panel discussion.
- 7) SHARE Monthly Checklist Questionnaire.
- 8) Chart of SHARE Machine Configurations.
- 9) Chart of Operating Characteristics.

### 8. EIGHTH MEETING

April 24-26, 1957

Dallas,  
Texas

- a. Attendance - Sixty-seven member installations were represented
- b. SHARE Organization
  - 1) New By-Laws adopted.
  - 2) Slate of officers nominated for 1957 - 1958.
- c. SHARE Standards Adopted
  - 1) Method of distributing program decks on request.
  - 2) System of program revision.
- d. Reports from IBM
  - 1) 727/792 tape unit compatibility on 704 and 709.
  - 2) 150/500/1000 line printers and tape unit compatibility
  - 3) 704/709 RAMAC
  - 4) COMTRAN
  - 5) Programmable trap interval timer.

# SHARE

## REFERENCE MANUAL

e. Preparation for 709

- 1) Minimum 709 defined.
- 2) Objectives of system listed.

f. Other Topics discussed

- 1) Floating Point Trap (Floating underflow-overflow) - informal survey of installations ordering.
- 2) Decided not to add mean error-free time to machine performance statistics.
- 3) Report on SHARE Assembly Program.
- 4) Panel on direct input devices.
- 5) Panel on improvement of program material for SHARE distribution.
- 6) Panel on program checkout techniques.
- 7) Panel on programming tricks and conventions.
- 8) Panel on administration of computer facilities.
- 9) Operational reports on FORTRAN and PACT 1A.
- 10) Panel on unexpected arithmetic difficulties due to machine characteristics.
- 11) Panel on flow charting techniques.
- 12) Panel on techniques for handling completed program library.

g. Appendices

- 1) Attendance
- 2) By-Laws
- 3) Standing and Ad Hoc Committees
- 4) Transfer of Responsibility for SHARE Distribution
- 5) Machine configuration and Operating Characteristic Charts.



# SHARE

## REFERENCE MANUAL

- 6) Supplementary Input-Output Functions for 704
- 7) FORTRAN Status Report
- 8) Report on SHARE Assembler
- 9) Results of Program Usage Questionnaire
- 10) Report of Committee on SHARE Distribution
- 11) Report of Committee on Public Relations in the Computer Field
- 12) Report of SHARE Reference Manual Committee
- 13) Report of Programmer Training Committee
- 14) Report of Mathematics Subcommittee
- 15) Guide for the preparation of program critiques
- 16) Report of Utility Programs Subcommittee
- 17) Report of 709 System Committee

9. NINTH MEETING                      October 1-3, 1957                      San Diego, California

a. Attendance - Seventy-six member installations were represented.

b. SHARE Organization

1) Executive Board elected for 1957 - 1958 :

Chairman:	F. V. Wagner (NA)
Vice-Chairman:	B. Ferber (CS)
Secretary:	H. S. Bright (WB)
Executive Board:	L. H. Amaya (CL)
	P. Armer (RS)
	W. A. Ramshaw (UA)

(Ex-officio seventh member of Executive Board is the outgoing Chairman, F. Engel)

2) Quorum reduced to one-half of membership.

# SHARE

## REFERENCE MANUAL

- 3) Amendment simplifying election procedure adopted. (New elections for all offices simultaneous; one election for board members regardless of number of nominees).
- 4) By-Laws rearranged to put all paragraphs on attendance together.
- 5) Future meetings will be scheduled in such a way as not to be contiguous with related major technical meetings. Each meeting will be three days in length, Monday - Wednesday or Wednesday - Friday. Two meetings will be held a year.

c. SHARE Standard Adopted

- 1) Standards for column binary agreed on:

Combination 9-7 punch in column 1 shall designate column binary card.

Card images on tape shall agree exactly with standard row binary except for bits 9 and 11 in the first word corresponding to the 9 - 7 control punch in the card.

The SHARE standard 714 board shall be wired to permit the program to look ahead to see if the next record is column binary or BCD.

d. Reports from IBM

- 1) Organization of Applied Programming Department of IBM.
- 2) 704 and 709 Publications
- 3) New library programs.
- 4) FORTRAN II plans.
- 5) COMTRAN, proposed IBM common language translator.
- 6) Special engineering applications and special hardware requests.

# SHARE

## REFERENCE MANUAL

e. Committee and Assignments

- 1) Ad Hoc committee formed to consider distribution of informal material within SHARE.
- 2) Ad Hoc committee on type wheel standards recommended 8 - 4 character change. Mail ballot will be taken.

f. Preparation for 709

- 1) Discussion of reasons for various choices of machine configurations.
- 2) Discussion of interchangeable sets of type wheels.
- 3) Panel discussion of 709 system.
- 4) Ad Hoc committee formed to study elimination of Q bit from 709.

g. Other Topics Discussed

- 1) Proposed FORTRAN Source Language Translator.
- 2) Survey of non-engineering applications of the 704.
- 3) Panel discussion on output generators.
- 4) Panel discussion on curve plotting techniques.
- 5) CORBIE automatic operator system.
- 6) Panel on experience with 32000-word core storage.
- 7) Panel on FORTRAN experience
- 8) Panel on Universal Computer Language.

h. Appendices

- 1) Summary of decisions
- 2) Attendance
- 3) SHARE committees
- 4) IBM reports
- 5) Non-Engineering 704 usage

# SHARE

## REFERENCE MANUAL

- 6) Progress report on 709 Supervisory Control
- 7) SHARE members 704 and 709 Configurations.
- 8) Report of Mathematics Committee, including report of Scope Subcommittee.
- 9) Report of Utility Programs Subcommittee.
- 10) Report of the SHARE Reference Manual Committee.
- 11) Report of the Committee on Column Binary
- 12) Report of Committee on 709 Type Wheel Standards.
- 13) Report of Committee for Scheduling of Future SHARE Meeting.
- 14) Notes on Panel Discussion on Administration.
- 15) Notes from Meeting on Universal Computer Language.
- 16) Proposed FORTRAN Source Language Translator.
- 17) Summary of Answers to 704 Clock Questionnaire.

# SHARE

## REFERENCE MANUAL

### SECTION 11.01

#### INDEX

Absolute Card Format	03.10-02
Abstracts of Distributed Programs	03.10-28-29
Format	03.10-28-29
Guide to Abstracts	04.01-01-05
Procedure for Submittal	03.10-29-32
Advantages, of SHARE Membership	03.10-28-29
Advisory Board	01.02-01
Amendments to By-Laws	02.01-01
Anniversary Meeting	03.20-19
Assignments	03.20-16
Obligation towards	01.03-02
Attendance, At Meetings	01.03-02
Individual Member	03.20-16
Installation Member	03.20-16
Non-Member	03.20-17
Lack of, Loss of Membership	03.20-03
Binary (See Card Formats)	
Binary Point Representation	03.20-26
Business	03.20-12-16
By-Laws of SHARE	03.20-01-19
Calling Sequence Conventions	03.10-24-25
Card Formats	03.10-02-07
Absolute	03.10-02-03
Column Binary	03.10-05
Correction and/or Transfer	03.10-04
Octal	03.10-07
Origin Table	03.10-04-05
Relocatable	03.10-03
Symbolic	03.10-06

# SHARE

## REFERENCE MANUAL

Card Reader Wiring Diagram (with Comment)	03.10-13-14
Catalog Cards	03.10-28-29
Charter Members of SHARE	01.01-01-02
Check Sum	03.10-02
Chinese Binary	03.10-05
Classification of Programs	03.10-29-32
Review of Classification Programs	03.10-32
Column Binary	03.10-05
Committees, Standing	03.20-10
Data Processing	03.20-11
Mathematics	03.20-11
Utility	03.20-11
Distribution	03.20-11
Manual	03.20-11
SHAREmanship	03.20-11
Government	03.20-11
Committees, Ad Hoc	
Arrangements Committee	03.20-12
Procedure for Establishment	03.20-10
Contents, Table of	00.00-01
Contents, Table of (For By-Laws)	03.20-00
Contributions	01.03-02
Non-Assigned Programs	01.03-02
Correction and/or Transfer Card	03.10-04
Distribution of Information	03.20-18-19
Channels	03.20-18
Character of Material	03.20-18-19
Standards	03.20-18
Distribution Agency, Address of	02.01-02
Elections	03.20-07-10
Nominations	03.20-07-08
Procedure	03.20-08-09
Time	03.20-07
Errors Detected in Distributed Material	01.03-03
	03.21-06

# SHARE

## REFERENCE MANUAL

Executive Board	03. 20-03-05
Composition	03. 20-03-04
Terms of Office	03. 20-04-05
Flow Charting, Standard Symbols of	03. 11-01-03
Glossary of SHARE Terms	03. 40-01-06
Proposed Additions	03. 40-06
Government of SHARE (See Committees)	03. 20-03-05
History of SHARE	01. 01-01
Identification of Programs	03. 10-25-26
Indicator Bit Logic	03. 10-03
Indoctrination of New Members (See SHAREmanship Committee)	
Initial Meeting of SHARE	01. 01-01
Introduction (to Manual)	01. 01-01
Joint RPQ's	01. 02-01
Level of Activity	01. 04-01
Library Tape Number	03. 10-27
Library Tape Restrictions during Assembly	03. 10-27
List of Members (See entire Section 02.02)	
Loaders	03. 10-05
Machine Change Requests	01. 02-01
Machine Standards	03. 30-01-02
Mail from Secretary	01. 03-01-02
Information Requests	03. 21-04-05
Obligations Towards	01. 03-01
Proposals	01. 03-02
Manual, SHARE Reference (See Committees)	01. 03-01
	03. 20-11

# SHARE

## REFERENCE MANUAL

Material for Distribution	03. 20-18-19
(see also entire Section 03. 21)	
Meetings	03. 20-16-18
Anniversary	03. 20-16
Attendance at	03. 20-16-17
Definition of	01. 03-01
Frequency and Duration	03. 20-16
Procedure	03. 20-16
Session	03. 20-17-18
Membership	03. 20-16
Advantages of	03. 20-02-03
Applications for	01. 02-01
Loss of	03. 20-03
Obligations of	03. 20-03
Types of	03. 20-02
Membership, List of (see entire Section 02)	
Officers	02. 01-01
IBM SHARE Staff	02. 01-02
Other (see entire Section 02. 02)	
Minimum Machine	03. 30-01-02
Minimum Package	04. 04-01-04
Miscellaneous Programming Standards	03. 10-26-27
Mnemonic Operation Codes	03. 10-08-10
New Members, Indoctrination of (SHAREmanship)	03. 20-11
Nominating Committee for Officers	03. 20-07-08
(see also Committees)	
Non-Members	
(see Attendance at Meetings)	03. 20-17
Distribution List	03. 21-03
Distribution, of SHARE Material to	03. 20-18
Submittal of Information by	03. 21-06
Obligations of Membership	01. 03-01
Assignments	01. 03-02
Towards Mail	01. 03-01
Octal Card Format (See Card Format)	
Officers of SHARE	03. 20-03
Duties of	03. 20-05-07
List of	02. 01-01
Terms of	03. 20-04-05
Re-election of	03. 20-04
Vacancies of	03. 20-04



# SHARE

## REFERENCE MANUAL

Operation Codes	03. 10-08-10
Origin, of SHARE Organization	01. 01-01-02
Origin Table	03. 10-04-05
Periodic Meetings	01. 02-01
Printer Board Wiring Diagrams	03. 10-12
Alternate Solution of Board No. 2 (with Comment)	03. 10-20-23
Board No. 1	03. 10-15-16
Board No. 2	03. 10-17-18
Selector Network for Board No. 1 and Board No. 2	03. 10-19
Programming Coordination (SHAREmanship)	03. 20-11
Program Identification	03. 10-25-26
Programming Standards (entire Section 03. 10)	
Proposals	01. 03-02
Mail	01. 03-01
Submittal of	01. 03-02
Purpose of SHARE Organization	03. 20-01
Quorum	03. 20-13
Reconsideration of Topics	03. 20-14
Re-election	03. 20-04
Relocatable (See Card Format)	
Relocatable Programs, Origins of	03. 10-27
	03. 10-03
Representation of Installations at Meetings	01. 03-01
RPQ's, SHARE Standard (see also 03. 20-07)	03. 30-01
List of RPQ's	03. 30-01
Method of Submittal	03. 30-01
Scaling Integer	03. 10-26
Scope of SHARE	01. 04-01
History	01. 04-01
Restriction to 704 (see footnote)	01. 04-01
Sense Lights in Subroutines	03. 10-25
Sense Switch Conventions	03. 10-27
Session of Meeting	03. 20-16
SHARE, Choice of Name	01. 01-02
SHAREmanship (See Committees)	
SHARE Standard RPQ	03. 30-01

# SHARE

## REFERENCE MANUAL

Standard Boards (Wiring Diagrams)	
Descriptions	03. 10-11-13
Column Binary	03. 10-14
Printer Board No. 1	03. 10-15-16
Printer Board No. 2	03. 10-17-18
Selector Network for Boards #1 and #2	03. 10-19
Alternate Solution to Board #2	03. 10-20-23
Standards, of SHARE (see also entire Section 03. 10)	03. 20-19
Standing Committees (See Committees)	
Stops in Subroutines	03. 10-24
Subjects under Consideration	01. 03-02
Comments on by Mail	01. 03-02
Subroutine Conventions	03. 10-24-25
Symbolic Instruction Card	03. 10-06
Symbols, Conventions of	03. 10-26-27
Synopses of SHARE Proceedings (1st - 9th Meetings)	10. 01-01-20
Tape Format	03. 10-07
Terms of Office	03. 20-04-05
Vacancies	03. 20-04-05
Death	03. 20-04
Ineligibility	03. 20-04
Removal	03. 20-05
Replacement Procedure	03. 20-10
Resignation	03. 20-04
Voluntary Nature of SHARE	01. 03-01
Voting Procedure	03. 20-08-10
Withdrawal of SHARE Membership	03. 20-03
Wiring Diagrams (See Standard Boards)	
Write-up Format	03. 10-01 03. 21-04-05

# SHARE

## REFERENCE MANUAL

### CURRENT PAGES

I	8/15/56
II	8/15/56
III	3/25/57
IV	5/15/58
00.00 - 01	4/15/59
01.01 - 01	10/15/58
01.01 - 02	10/15/58
01.02 - 01	10/15/58
01.03 - 01	10/15/58
01.03 - 02	10/15/58
01.03 - 03	10/15/58
01.04 - 01	10/15/58
02.01 - 01	10/15/58
02.01 - 02	4/15/59
02.02 - 01	4/15/59
02.02 - 02	4/15/59
02.02 - 03	4/15/59
02.02 - 04	4/15/59
02.02 - 05	4/15/59
02.02 - 06	4/15/59
02.02 - 07	4/15/59
02.02 - 08	4/15/59
02.02 - 09	4/15/59
02.02 - 10	4/15/59
02.02 - 11	4/15/59
02.02 - 12	4/15/59
02.02 - 13	4/15/59
02.02 - 14	4/15/59
02.02 - 15	4/15/59
02.02 - 16	4/15/59
02.02 - 17	4/15/59
02.02 - 18	4/15/59
02.02 - 19	4/15/59
02.02 - 20	4/15/59
02.02 - 21	4/15/59
02.02 - 22	4/15/59
02.02 - 23	4/15/59
02.02 - 24	4/15/59

**SHARE**  
**REFERENCE MANUAL**

03. 10 - 01	5/15/58
03. 10 - 02	5/15/58
03. 10 - 03	5/15/58
03. 10 - 04	5/15/58
03. 10 - 05	5/15/58
03. 10 - 06	5/15/58
03. 10 - 07	5/15/58
03. 10 - 08	5/15/58
03. 10 - 09	5/15/58
03. 10 - 10	5/15/58
03. 10 - 11	5/15/58
03. 10 - 12	5/15/58
03. 10 - 13	5/15/58
03. 10 - 14	5/15/58
03. 10 - 15	5/15/58
03. 10 - 16	5/15/58
03. 10 - 17	5/15/58
03. 10 - 18	5/15/58
03. 10 - 19	5/15/58
03. 10 - 20	5/15/58
03. 10 - 21	5/15/58
03. 10 - 22	5/15/58
03. 10 - 23	5/15/58
03. 10 - 24	5/15/58
03. 10 - 25	5/15/58
03. 10 - 26	5/15/58
03. 10 - 27	5/15/58
03. 10 - 28	5/15/58
03. 10 - 29	5/15/58
03. 10 - 30	5/15/58
03. 10 - 31	5/15/58
03. 10 - 32	5/15/58
03. 11 - 01	4/15/59
03. 11 - 02	4/15/59
03. 11 - 03	4/15/59
03. 20 - 00	4/15/59
03. 20 - 01	4/15/59
03. 20 - 02	4/15/59
03. 20 - 03	4/15/59
03. 20 - 04	4/15/59
03. 20 - 05	4/15/59
03. 20 - 06	4/15/59
03. 20 - 07	4/15/59
03. 20 - 08	4/15/59
03. 20 - 09	4/15/59
03. 20 - 10	4/15/59

# SHARE

## REFERENCE MANUAL

03. 20 - 11	4/15/59
03. 20 - 12	4/15/59
03. 20 - 13	4/15/59
03. 20 - 14	4/15/59
03. 20 - 15	4/15/59
03. 20 - 16	4/15/59
03. 20 - 17	4/15/59
03. 20 - 18	4/15/59
03. 20 - 19	4/15/59
03. 21 - 01	3/15/59
03. 21 - 02	3/15/59
03. 21 - 03	3/15/59
03. 21 - 04	3/15/59
03. 21 - 05	3/15/59
03. 21 - 06	3/15/59
03. 21 - 07	3/15/59
03. 21 - 08	3/15/59
03. 30 - 01	5/15/58
03. 30 - 02	5/15/58
03. 4 - 01	
03. 4 - 02	
03. 4 - 03	
03. 4 - 04	
03. 4 - 05	
03. 4 - 06	
04. 01 - 01	10/15/58
04. 01 - 02	10/15/58
04. 01 - 03	10/15/58
04. 01 - 04	10/15/58
04. 01 - 05	10/15/58
04. 04 - 01	10/15/58
04. 04 - 02	10/15/58
04. 04 - 03	10/15/58
04. 04 - 04	10/15/58
10. 01 - 01	10/15/58
10. 01 - 02	10/15/58
10. 01 - 03	10/15/58
10. 01 - 04	10/15/58
10. 01 - 05	10/15/58
10. 01 - 06	10/15/58
10. 01 - 07	10/15/58
10. 01 - 08	10/15/58
10. 01 - 09	10/15/58
10. 01 - 10	10/15/58

**SHARE**  
**REFERENCE MANUAL**

10.01 - 11	10/15/58
10.01 - 12	10/15/58
10.01 - 13	10/15/58
10.01 - 14	10/15/58
10.01 - 15	10/15/58
10.01 - 16	10/15/58
10.01 - 17	10/15/58
10.01 - 18	10/15/58
10.01 - 19	10/15/58
10.01 - 20	10/15/58

11.01 - 01	4/15/59
11.01 - 02	4/15/59
11.01 - 03	4/15/59
11.01 - 04	4/15/59
11.01 - 05	4/15/59
11.01 - 06	4/15/59
11.01 - 07	4/15/59

12.01 - 01	4/15/59
12.01 - 02	4/15/59
12.01 - 03	4/15/59
12.01 - 04	4/15/59

13.01 - 31	10/15/58
13.01 - 32	10/15/58
13.01 - 33	10/15/58
13.01 - 34	10/15/58
13.01 - 35	10/15/58
13.01 - 36	10/15/58
13.01 - 37	3/15/59
13.01 - 38	4/15/59

# SHARE

## REFERENCE MANUAL

REVISION 9

TO BE REMOVED

00.00 - 01	10/15/58
01.01 - 01	
01.01 - 02	
01.03 - 01	
01.03 - 02	
01.03 - 03	
01.04 - 01	
02.01 - 01	
02.01 - 02	
03.10 - 05	5/15/58
03.20 - 01	5/15/58
03.20 - 02	5/15/58
03.20 - 03	5/15/58
03.20 - 04	5/15/58
03.20 - 05	5/15/58
03.20 - 06	5/15/58
03.20 - 07	5/15/58
03.20 - 08	5/15/58
03.20 - 09	5/15/58
03.20 - 10	5/15/58
03.20 - 11	5/15/58
03.20 - 12	5/15/58
03.20 - 13	5/15/58
03.20 - 14	5/15/58
03.20 - 15	5/15/58
03.20 - 16	5/15/58
04.01 - 01	
04.01 - 02	
04.02 - 01	5/15/58
04.02 - 02	5/15/58
04.02 - 03	5/15/58
04.02 - 04	5/15/58
04.02 - 05	5/15/58
04.02 - 06	5/15/58
04.02 - 07	5/15/58
04.02 - 08	5/15/58
04.02 - 09	5/15/58
04.02 - 10	5/15/58
04.02 - 11	5/15/58
04.02 - 12	5/15/58
04.02 - 13	5/15/58
04.02 - 14	5/15/58
04.02 - 15	5/15/58

13.01 - 31

10/15/58

# SHARE

## REFERENCE MANUAL

04.02 - 16	5/15/58
04.02 - 17	5/15/58
04.02 - 18	5/15/58
04.02 - 19	5/15/58
04.02 - 20	5/15/58
04.02 - 21	5/15/58
04.02 - 22	5/15/58
04.02 - 23	5/15/58
04.02 - 24	5/15/58
04.02 - 25	5/15/58
04.02 - 26	5/15/58
04.02 - 27	5/15/58
04.02 - 28	5/15/58
04.02 - 29	5/15/58
04.02 - 30	5/15/58
04.02 - 31	5/15/58
04.02 - 32	5/15/58
04.02 - 33	5/15/58
04.02 - 34	5/15/58
04.02 - 35	5/15/58
04.02 - 36	5/15/58
04.02 - 37	5/15/58
04.02 - 38	5/15/58
04.02 - 39	5/15/58
04.02 - 40	5/15/58
04.02 - 41	5/15/58
04.02 - 42	5/15/58
04.02 - 43	5/15/58
04.02 - 44	5/15/58
04.02 - 45	5/15/58
04.02 - 46	5/15/58
04.02 - 47	5/15/58
04.02 - 48	5/15/58
04.02 - 49	5/15/58
04.02 - 50	5/15/58
04.02 - 51	5/15/58
04.02 - 52	5/15/58
04.02 - 53	5/15/58
04.02 - 54	5/15/58
04.02 - 55	5/15/58
04.02 - 56	5/15/58
04.02 - 57	5/15/58
04.02 - 58	5/15/58
04.02 - 59	5/15/58
04.02 - 60	5/15/58
04.02 - 61	5/15/58



**SHARE**  
**REFERENCE MANUAL**

04.02 - 62	5/15/58
04.02 - 63	5/15/58
04.02 - 64	5/15/58
04.02 - 65	5/15/58
04.02 - 66	5/15/58
04.02 - 67	5/15/58
04.02 - 68	5/15/58
04.02 - 69	5/15/58
04.02 - 70	5/15/58
04.02 - 71	5/15/58
04.02 - 72	5/15/58
04.02 - 73	5/15/58
04.02 - 74	5/15/58
04.02 - 75	5/15/58
04.02 - 76	5/15/58
04.02 - 77	5/15/58
04.02 - 78	5/15/58
04.02 - 79	5/15/58
04.02 - 80	5/15/58
04.02 - 81	5/15/58
04.02 - 82	5/15/58
04.02 - 83	5/15/58
04.02 - 84	5/15/58
04.02 - 85	5/15/58
04.02 - 86	5/15/58
04.02 - 87	5/15/58
04.02 - 88	5/15/58
04.02 - 89	5/15/58
04.02 - 90	5/15/58
04.02 - 91	5/15/58
04.02 - 92	5/15/58
04.02 - 93	5/15/58
04.02 - 94	5/15/58
04.02 - 95	5/15/58
04.02 - 96	5/15/58
04.02 - 97	5/15/58
04.02 - 98	5/15/58
04.02 - 99	5/15/58
04.02 - 100	5/15/58
04.02 - 101	5/15/58
04.02 - 102	5/15/58
04.02 - 103	5/15/58
04.02 - 104	5/15/58
04.02 - 105	5/15/58
04.02 - 106	5/15/58
04.02 - 107	5/15/58

**SHARE  
REFERENCE MANUAL**

04.02 - 108	5/15/58
04.02 - 109	5/15/58
04.02 - 110	5/15/58
04.02 - 111	5/15/58
04.02 - 112	5/15/58
04.02 - 113	5/15/58
04.02 - 114	5/15/58
04.02 - 115	5/15/58
04.02 - 116	5/15/58
04.02 - 117	5/15/58
04.02 - 118	5/15/58
04.02 - 119	5/15/58
04.02 - 120	5/15/58
04.02 - 121	5/15/58
04.02 - 122	5/15/58
04.02 - 123	5/15/58
04.02 - 124	5/15/58
04.02 - 125	5/15/58
04.02 - 126	5/15/58
04.02 - 127	5/15/58
04.04 - 01	5/15/58
04.04 - 02	5/15/58
04.04 - 03	5/15/58
04.04 - 04	5/15/58
12.01 - 01	5/15/58
12.01 - 02	5/15/58
12.01 - 03	5/15/58
12.01 - 04	5/15/58
12.01 - 05	5/15/58
12.01 - 06	5/15/58
12.01 - 07	5/15/58

**SHARE**  
**REFERENCE MANUAL**

REVISION 9

TO BE ADDED

00.00 - 01	10/15/58
01.01 - 01	10/15/58
01.01 - 02	10/15/58
01.02 - 01	10/15/58
01.03 - 01	10/15/58
01.03 - 02	10/15/58
01.03 - 03	10/15/58
01.04 - 01	10/15/58
02.01 - 01	10/15/58
02.01 - 02	10/15/58
03.10 - 05	10/15/58
03.20 - 01	10/15/58
03.20 - 02	10/15/58
03.20 - 03	10/15/58
03.20 - 04	10/15/58
03.20 - 05	10/15/58
03.20 - 06	10/15/58
03.20 - 07	10/15/58
03.20 - 08	10/15/58
03.20 - 09	10/15/58
03.20 - 10	10/15/58
03.20 - 11	10/15/58
03.20 - 12	10/15/58
03.20 - 13	10/15/58
03.20 - 14	10/15/58
03.20 - 15	10/15/58
03.20 - 16	10/15/58
03.20 - 17	10/15/58
04.01 - 01	10/15/58
04.01 - 02	10/15/58
04.01 - 03	10/15/58
04.01 - 04	10/15/58
04.01 - 05	10/15/58
04.04 - 01	10/15/58
04.04 - 02	10/15/58
04.04 - 03	10/15/58
04.04 - 04	10/15/58
10.01 - 01	10/15/58
10.01 - 02	10/15/58
10.01 - 03	10/15/58
10.01 - 04	10/15/58
10.01 - 05	10/15/58
10.01 - 06	10/15/58

# SHARE

## REFERENCE MANUAL

10.01 - 07	10/15/58
10.01 - 08	10/15/58
10.01 - 09	10/15/58
10.01 - 10	10/15/58
10.01 - 11	10/15/58
10.01 - 12	10/15/58
10.01 - 13	10/15/58
10.01 - 14	10/15/58
10.01 - 15	10/15/58
10.01 - 16	10/15/58
10.01 - 17	10/15/58
10.01 - 18	10/15/58
10.01 - 19	10/15/58
10.01 - 20	10/15/58
12.01 - 01	10/15/58
12.01 - 02	10/15/58
12.01 - 03	10/15/58
12.01 - 04	10/15/58
13.01 - 31	10/15/58
13.01 - 32	10/15/58
13.01 - 33	10/15/58
13.01 - 34	10/15/58
13.01 - 35	10/15/58
13.01 - 36	10/15/58

# SHARE

## REFERENCE MANUAL

REVISION 10

### TO BE REMOVED

03.21 - 01	5/15/58
03.21 - 02	5/15/58
03.21 - 03	5/15/58
03.21 - 04	5/15/58
03.21 - 05	5/15/58
03.21 - 06	5/15/58
03.21 - 07	5/15/58
12.01 - 02	10/15/58
12.01 - 03	10/15/58

### TO BE ADDED

03.21 - 01	3/15/59
03.21 - 02	3/15/59
03.21 - 03	3/15/59
03.21 - 04	3/15/59
03.21 - 05	3/15/59
03.21 - 06	3/15/59
03.21 - 07	3/15/59
03.21 - 08	3/15/59
12.01 - 02	3/15/59
12.01 - 03	3/15/59
13.01 - 37	3/15/59

**SHARE**  
**REFERENCE MANUAL**

REVISION 11

TO BE REMOVED

00.00 - 01	10/15/58
02.02 - 01	10/15/58
02.02 - 02	10/15/58
02.02 - 03	10/15/58
02.02 - 04	10/15/58
02.02 - 05	10/15/58
02.02 - 06	10/15/58
02.02 - 07	10/15/58
02.02 - 08	10/15/58
02.02 - 09	10/15/58
02.02 - 10	10/15/58
02.02 - 11	10/15/58
02.02 - 12	10/15/58
02.02 - 13	10/15/58
02.02 - 14	10/15/58
02.02 - 15	10/15/58
02.02 - 16	10/15/58
02.02 - 17	10/15/58
02.02 - 18	10/15/58
02.02 - 19	10/15/58
02.02 - 20	10/15/58
03.20 - 01	10/15/58
03.20 - 02	10/15/58
03.20 - 03	10/15/58
03.20 - 04	10/15/58
03.20 - 05	10/15/58
03.20 - 06	10/15/58
03.20 - 07	10/15/58
03.20 - 08	10/15/58
03.20 - 09	10/15/58
03.20 - 10	10/15/58
03.20 - 11	10/15/58
03.20 - 12	10/15/58
03.20 - 13	10/15/58
03.20 - 14	10/15/58
03.20 - 15	10/15/58
03.20 - 16	10/15/58
03.20 - 17	10/15/58

**SHARE**  
**REFERENCE MANUAL**

11.01 - 01	10/15/58
11.01 - 02	10/15/58
11.01 - 03	10/15/58
11.01 - 04	10/15/58
11.01 - 05	10/15/58
11.01 - 06	10/15/58
11.01 - 07	10/15/58

12.01 - 01	10/15/58
12.01 - 02	3/15/59
12.01 - 03	3/15/59
12.01 - 04	10/15/58

TO BE ADDED

00.00 - 01	4/15/59
------------	---------

02.01 - 02	4/15/59
02.02 - 01	4/15/59
02.02 - 02	4/15/59
02.02 - 03	4/15/59
02.02 - 04	4/15/59
02.02 - 05	4/15/59
02.02 - 06	4/15/59
02.02 - 07	4/15/59
02.02 - 08	4/15/59
02.02 - 09	4/15/59
02.02 - 10	4/15/59
02.02 - 11	4/15/59
02.02 - 12	4/15/59
02.02 - 13	4/15/59
02.02 - 14	4/15/59
02.02 - 15	4/15/59
02.02 - 16	4/15/59
02.02 - 17	4/15/59
02.02 - 18	4/15/59
02.02 - 19	4/15/59
02.02 - 20	4/15/59
02.02 - 21	4/15/59
02.02 - 22	4/15/59
02.02 - 23	4/15/59
02.02 - 24	4/15/59

03.11 - 01	4/15/59
03.11 - 02	4/15/59
03.11 - 03	4/15/59

13.01 - 39	4/15/59
------------	---------

# SHARE

## REFERENCE MANUAL

03. 20 - 00	4/15/59
03. 20 - 01	4/15/59
03. 20 - 02	4/15/59
03. 20 - 03	4/15/59
03. 20 - 04	4/15/59
03. 20 - 05	4/15/59
03. 20 - 06	4/15/59
03. 20 - 07	4/15/59
03. 20 - 08	4/15/59
03. 20 - 09	4/15/59
03. 20 - 10	4/15/59
03. 20 - 11	4/15/59
03. 20 - 12	4/15/59
03. 20 - 13	4/15/59
03. 20 - 14	4/15/59
03. 20 - 15	4/15/59
03. 20 - 16	4/15/59
03. 20 - 17	4/15/59
03. 20 - 18	4/15/59
03. 20 - 19	4/15/59
11. 01 - 01	4/15/59
11. 01 - 02	4/15/59
11. 01 - 03	4/15/59
11. 01 - 04	4/15/59
11. 01 - 05	4/15/59
11. 01 - 06	4/15/59
12. 01 - 01	4/15/59
12. 01 - 02	4/15/59
12. 01 - 03	4/15/59
12. 01 - 04	4/15/59
13. 01 - 38	4/15/59
13. 01 - 39	4/15/59
13. 01 - 40	4/15/59