SDC FIELD NOTE A WORKING PAPER

FN - LO - 202

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1 February 1960

(Produced under System Development Corporation subcontract No. 202 issued by International Electric Corporation in performance of contract AF-30(635)-11583)

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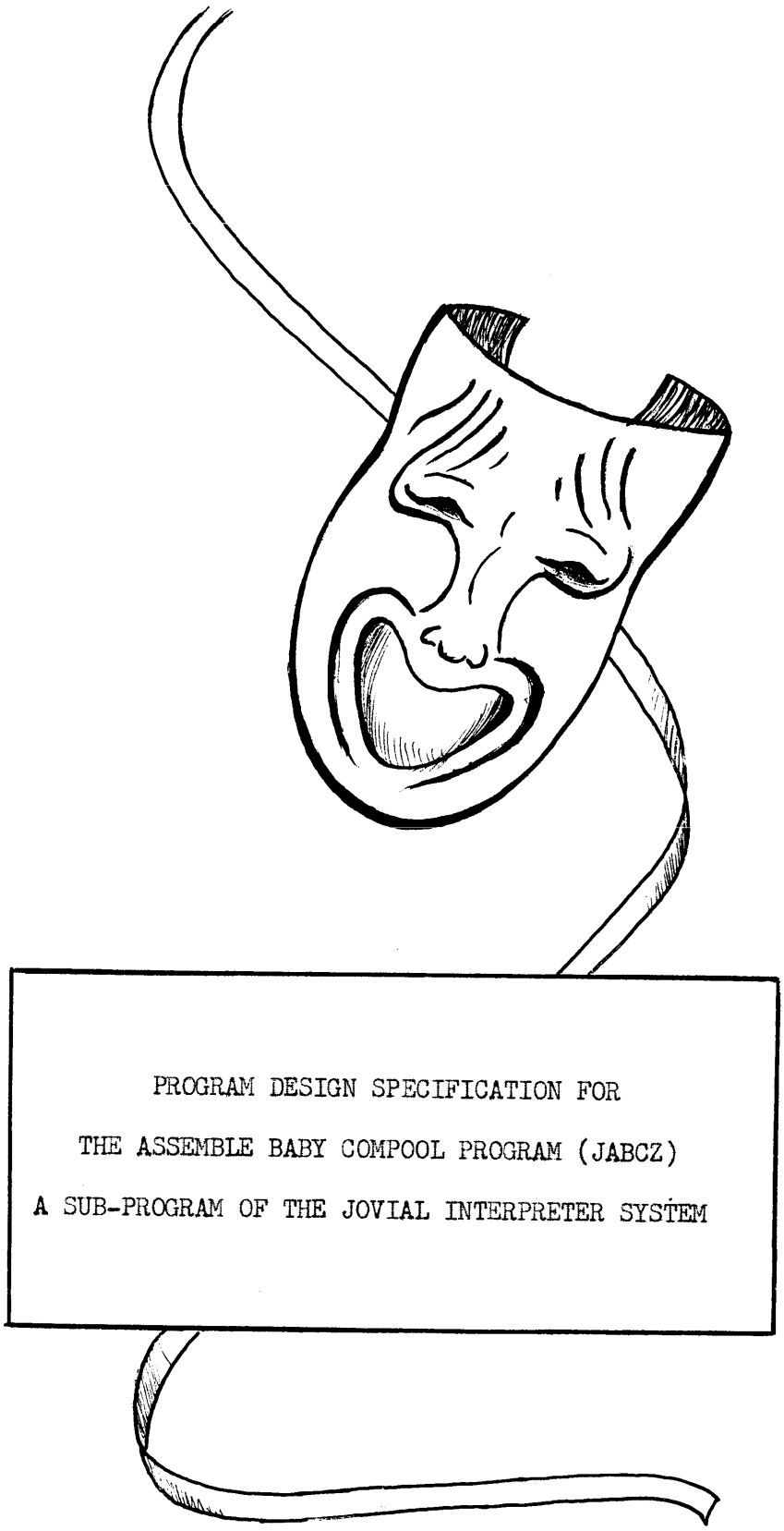

PROGRAM DESIGN SPECIFICATION FOR

THE ASSEMBLE BABY COMPOOL PROGRAM (JABCZ)

A SUB-PROGRAM OF THE JOVIAL INTERPRETER SYSTEM

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INTRODUCTION

The Assemble Baby Compool Program (JABCZ) is read into core and operated by the Test Control Program. Its function is the construction of a Baby Compool which contains definitions of data if, and only if, the data is used and/or set by the JOVIAL program under test. The Baby Compool is created in an effort to eliminate manipulation of data not required for the testing of the particular program and to provide a control medium for use by the Data Simulation and Data Processing Programs.

The data source for this construction is a subset of the tables produced by the First Pass of the Interpreter Program. This subset contains the Variable Definition Table, the Intermediate Language Table, and the Status Switch Table. The data definitions are taken from the unsorted Variable Definition Table. The Interpreter First Pass supplements the Variable Definition Table with a defining source, which may be either the Master Compool or the program under test. If both define the variable, then the program definition overrides the Master Compool. The Intermediate Language Table is interrogated to determine the set-used status of each variable. This status is included in the Baby Compool definition. Finally, the Intermediate Language Table and Status Switch Tables are examined, and all referenced statuses of status-type items are retained in the Baby Compool.

Item, table and parameter definitions in the Baby Compool are intermixed and arranged alphabetically by tag. The newly-constructed Baby Compool is stored on buffer tape C1 for future use by the Data Processing Program. It is also retained in core storage for immediate use by the Data Simulation Program which operates next. The communication register "COMREG" is set with the number of words and the core address of the Baby Compool.

ENVIRONMENT

The following environment is used to produce the Baby Compool (see Output Section, below). Items not used by JABCZ are not considered as part of the environment.

Tables (Set by Interpreter - First Pass)

1. VAT -- Variable Definition Table - four-word entries

VTAG Left-justified Hollerith-coded tag

VTYPE Type of variable

Ø = undefined
1 = item
2 = table
3 = parameter item

VCODE Coding of variable:

Ø = Status (ST)
1 = Floating Point (FP)
2 = Fixed Integer (FI)
3 = Six-bit Hollerith (BH)
5 = Mixed Fraction (MX)

VLENT Number of blocks in table or,
relative position in STAT table of first status value for this item (VCODE = ST)

VFIX Ø = fixed length table
1 = variable length table

VNENT Number of words in each block of the table (maximum if VFIX = variable) or,
Relative position of VAT entry for table containing this item. The relative position of the first data word is zero.

VPRO Number of the procedure for which this variable is defined. (Procedure number = Ø if defined for whole program.)

VPAR Binary value of parameter item

VSIGN Signed/unsigned indicator if item VCODE = FI, MX or FP

Ø = unsigned
1 = signed

VDEF Definition source:

1 = program-defined
2 = Master Compool-defined
3 = Master Compool definition overriden by program definition

VRIGHT Number of bits to the right of binary point if VCODE = MX

VNUM Number of bits including sign if VCODE = FI, MX or FP
Number of bits if VCODE = BH (multiple of six)
Number of statuses if VCODE = ST

VLOC Absolute address of table control word
Absolute address of item with zero subscript

VUSE A set-used item added to this table by JABCZ for its own convenience.

1 = item set by JOVIAL program under test
2 = item used by JOVIAL program under test
3 = item set and used by JOVIAL program

2. SWT - Switch Table - two-word entries

SWST Status in Hollerith; left-justified

3. STAT - Status Table - one-word entries. Items VNENT and VNUM for status-coded items refer to this table.

SVALUE Status value of status item (6-bit Hollerith left-justified).

4. ILT - Intermediate Language Table - five-word entries

OPERI Operator showing function of entry

LCLAS Class of left term

LRELS Number of statuses in switch table (SWT) (OPERI = 47).

LRELV Relative location of initial entry for this switch in switch table (SWT) (OPERI = 47)

Absolute location of VAT entry describing the left term variable.

RRELV Absolute location of VAT entry describing the right term variable

RCLAS Class of right term

RFORM Form of right term

5. SORTT Sorting Table

Each non-procedure entry in the Variable Definition Table (VAT) is represented as an absolute address in the SORTT Table.

Communication Registers

BILT The address portion only is used. It is set by Interpreter First Pass (JALLZ) and contains the address of the Intermediate Language Table.

BSWT Address of the Status Switch Table (see BILT, above)

BSTAT Address of the Status Table (see BILT, above)

BVAT Address of the Variable Definition Table (see BILT, above)

MATTBL+2 Address portion is set by Interpreter First Pass (JALLZ) and contains the future address of the VAT Table as it occurs in the environment of the Interpreter Second Pass (JOLLZ).

MATTBL+3 Future address of the Status Switch Table (see MATTBL+2, above).

INPUT

There are no dynamic inputs to the Assemble Baby Compool Program. It is assembled from existing tables (see Environment Section).

FUNCTIONS

1. Transfer, in alphabetical order, the data definitions of all non-procedure variables in the Variable Definition Table (VAT) to DTAB Table of the Baby Compool.

2. Use the Intermediate Language Table (ILT) and the Status Switch Table to obtain all statuses of status-type items referred to by the JOVIAL Program.

3. Store these statuses in STAB Table of the Baby Compool and supply the number and location of statuses for each appropriate status item entry in DTAB Table.

4. Interrogate the Intermediate Language Table to determine the set-used status of each variable.

5. Set "COMREG" with the number of words and current location of the Baby Compool.

6. Store the Baby Compool, Tables DTAB and STAB, on tape C1 for future use by the Data Processing Program. No end-of-file is written.

7. Make no legality checks.

8. Communication registers are used to obtain current and future addresses of Tables VAT, ILT, SWT and STAT. These addresses are used to compute the conversion factor which is added to those absolute addresses in the Intermediate Language Table which reference either the VAT or SWT Tables.

9. Sort the addresses in SORTT Table indirectly on the corresponding variable tags in the VAT Table.

OUTPUT

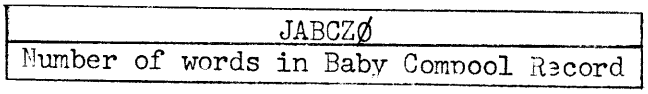
Core

Two tables are left in core as output of the Assemble Baby Compool Program. They are subsequently used by JSTRZ, the Data Simulation Program. These two tables, DTAB and STAB make up the Baby Compool. The DTAB Table contains a control word and a series of three-word entries. Each entry contains the definition of a table, item, or parameter tag which is used by the JOVIAL Program during testing. These entries are arranged alphabetically according to the symbolic tags (see diagram 1). The status-coded items represent the single case where the three-word entry is not large enough to contain the complete definition. The complete definition includes a list of all possible statuses assigned to the item; e.g., the item MAUTO (make of auto) could take on any one of the following statuses: FORD, DODGE, CHEV, DESOTO, PLY. It is clear that the number of statuses and status items may vary greatly. This necessitates a Variable Length Table with variable length entries. This table is known as STAB, the Status Table. Each entry in the table contains all the statuses, one per register, for a particular item. The entry's location and length are given in the two items ADDSTA and NSTATI, which are part of the definition of the corresponding item (see Diagram 2).

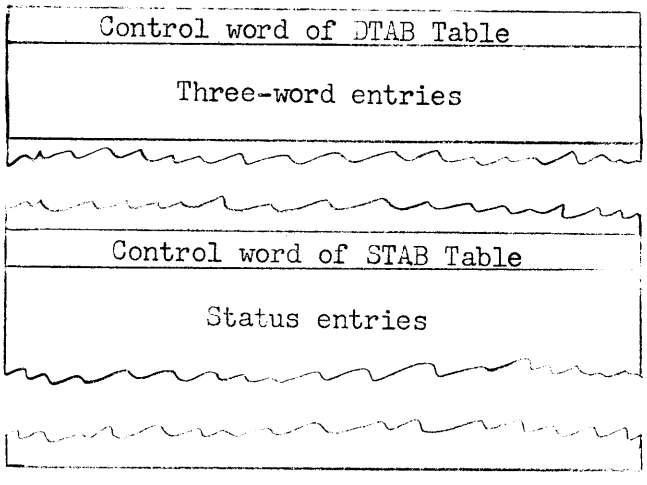
Tape

The two Baby Compool Tables are also stored on buffer tape for future use by the Data Processing Program, JDSYZ. The two tables are written as one record and are preceded by a two-word Ident record. The two records are not terminated by an end-of-file record.

Format of Ident Record



Format of Baby Compool Record



Communication Register

The length and location of the Baby Compool Tables are stored in the decrement and address portions of the communication register, COMREG. Only the starting location of the DTAB Table is entered in COMREG since the two Baby Compool Tables follow one another.

Diagram 1 - DTAB Table Format

Control word contains:

NENT: number of entries in DTAB Table
NWDS: number of words in DTAB Table including the control word

NENT		NWDS	
COMTAG (Table)			
TAG TAB SET VAR TYP TYP USE DEF	WDSTRY	NENTRY	
		ABSADD	
COMTAG (Item)			
TAG SIG SET VAR TYP NED USE DEF	ITCODE	PNTPOS ADDSTA	NBITS NSTATI
TABREF		ABSADD	
COMTAG (Value)			
TAG SIG SET VAR TYP NED USE DEF	ITCODE	PNTPOS	NBITS
VALUE			

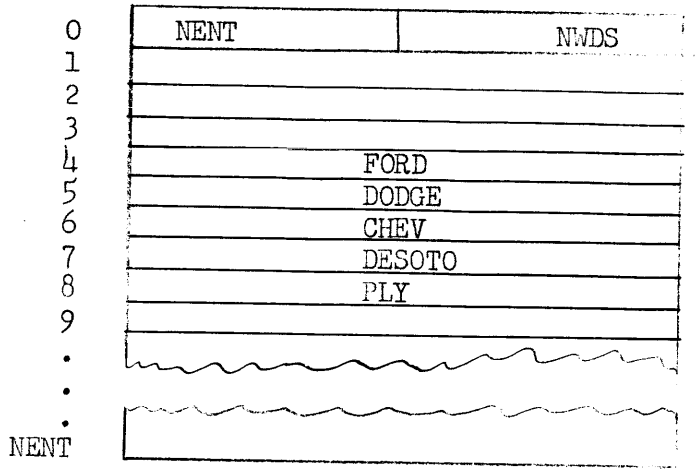
CORRESPONDING VAT TABLE

TAG	TAG	BITS	DEFINITION
COMTAG	VTAG	Ø-35	Hollerith tag left-justified.
TAGTYP	VTYPE	Ø,1	Ø = Item; 1 = Table; 2 = Value.
TABTYP	VFIX	2	Ø = Fixed length; 1 = Variable length.
SIGNED	VSIGN	2	Ø = Unsigned item; 1 = Signed item.
SETUSE	VUSE	3,4	Ø = Null; 1 = Set; 2 = Used; 3 = Both.
VARDEF	VDEF	5,6	1 = Variable defined by the program. 2 = Variable defined by the Master Compool 3 = Master Compool definition overriden by program.
WDSTRY	VLENT	7-17	Number of blocks in this table.
NENTRY	VNENT	18-35	Number of words per block.
ABSADD	VLOC	18-35	Absolute address of table control word, or absolute address of table block containing this item.
PNTPOS	VRIGHT	18-29	Mixed fractions. The number of bits to the right of the binary point.
ADDSTA	VLENT	18-29	Relative address in STAB Table of the block of registers containing the legal statuses used by this program.
NBITS	VNUM	3Ø-35	Number of bits in item including the sign bit.
NSTATI	VNUM	3Ø-35	Number of statuses for status-coded items.
ITCODE	VCODE	14-17	The item coding: Ø=ST; 1=FP; 2=FI; 3=BH; 5=MX.
VALUE	VPAR	Ø-35	The constant described by this value entry.
TABREF	VNENT	Ø-17	Relative position of DTAB Entry for table containing this item. The control word is relative position zero.

Diagram 2 - STAB Table Format

Control word contains:

NENT: number of statuses
NWDS: number of words including control word



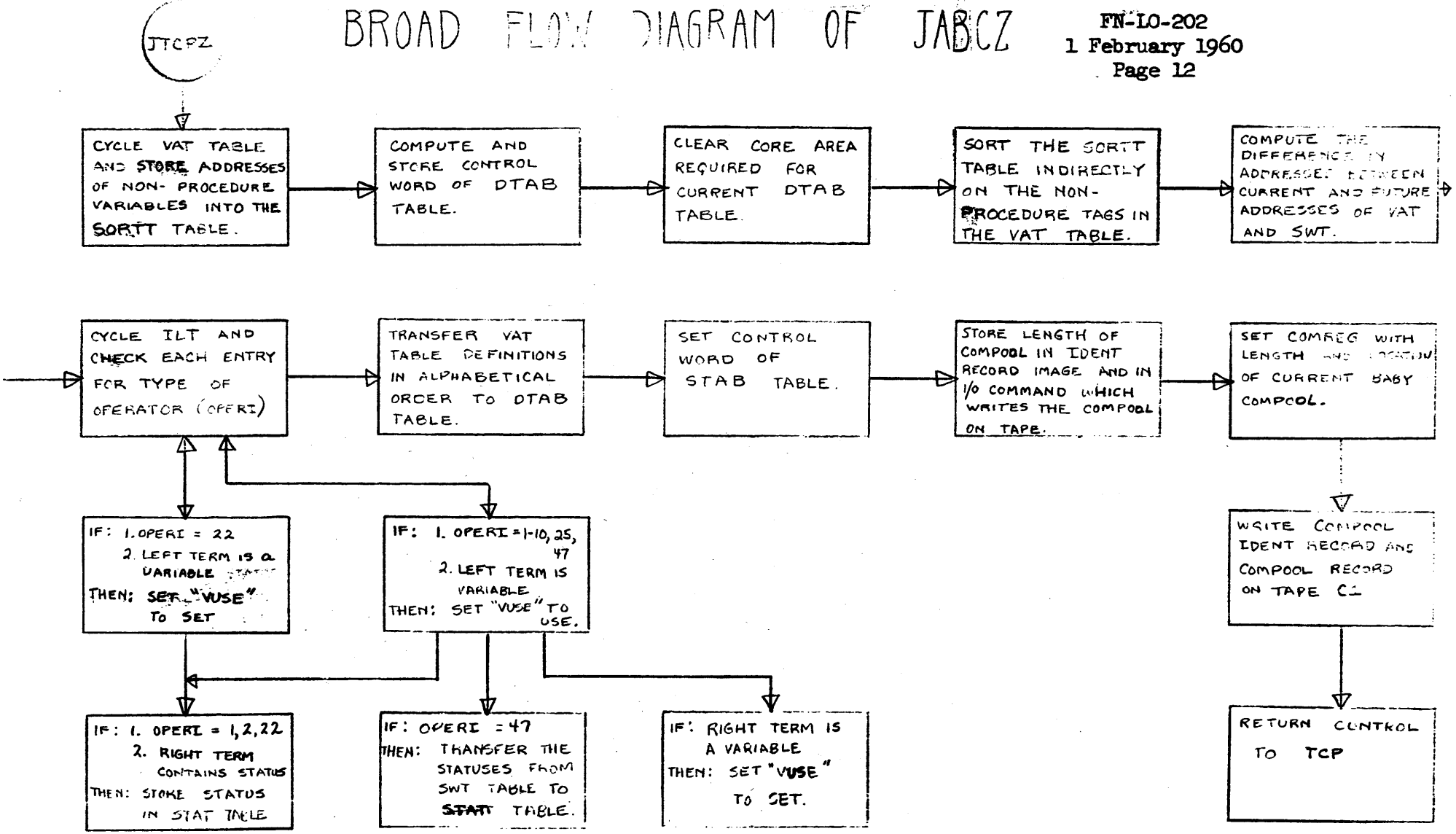
Statuses are Hollerith-coded and left-justified. Each status may contain a maximum of six alphanumeric characters.

From the above illustration it follows that for status item MAUTO we have:

ADDSTA = 4

NSTATI = 5

BROAD FLOW DIAGRAM OF JABCZ



A listing of the program symbolic deck will be issued as the first supplement to this document (FN-LO-202, S-1).

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