VisualAge Pacbase 2.5

STRUCTURED CODE REFERENCE MANUAL

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1. INTRODUCTION

1.1. THE SYSTEM FUNCTIONS

THE VisualAge Pacbase Application Development Solution

VisualAge Pacbase is an Application Development tool operating on mainframe, OS/2, UNIX or Windows NT. It has been designed to ensure the complete management of various information systems.

Consistency is ensured by all the data being stored in one Specification database and managed in a unique way by the System.

VISUALAGE PACBASE PRODUCTS

VisualAge Pacbase is a modular AD solution which is composed of two main products - Pacdesign for application design, Pacbench for application development.

Pacdesign and Pacbench are used to populate the Specifications Database and to ensure the maintenance of existing applications. Each product includes several functions.

Basic Functions

Dictionary
Structured Code
Personalized Documentation Manager (PDM-PDM+)

Generators

On-Line Systems Development
Pacbench Client/Server
Batch Systems Development
COB / Generator

Database Description

DBD
DBD-SQL

Application Revamping

Pacbench Automatic Windowing (PAW) (releases older than VisualAge Pacbase 2.0)

Pacbase Web Connection

Quality Control

Pacbench Quality Control (PQC)
Quality Control Extensibility

Table Management

Pactables

Production Turnover and Follow-up

Production Environment (PEI)
PacTransfer
Development Support Management System (DSMS)
PC function: revamped DSMS (in releases older than VisualAge Pacbase 2.0)

Additionnal services
Pac/Impact
Dictionary Extensibility
Pacbase Access Facility (PAF-PAF+)
DSMS Access Facility (DAF)
Methodology (Merise, YSM, etc.)
Sub-networks comparison utilities
Rename/move entity utility (RMEN)
Journal Statistics utility (ACTI)
RACF / TOPSECRET Security Interface
ENDEVOR
VisualAge Smalltalk-VisualAge Pacbase bridge
Team Connection-VisualAge Pacbase bridge

1.2. PURPOSE OF THE MANUAL

PURPOSE OF THE MANUAL

This manual describes the specifications of the Structured Code function which may be used independently from the complementary functions: the On-Line Systems Development (OLSD) and the Batch Systems Development (BSD) functions.

Some information concerning the OLSD and BSD functions is also related to the Structured Code function. There are instances where the descriptions are entered in this manual only in order to avoid redundancy.

PREREQUISITES

In order to understand the content of this manual, the user should have taken the PACBASE Concepts and Facilities course and have an understanding of Structured Code concepts.

Also, the user is expected to have thoroughly read the following manuals:

. The USER'S Reference Manual,

. The SPECIFICATIONS DICTIONARY Reference Manual.

1.3. PRINCIPLES OF DESCRIPTION

DESCRIPTION PRINCIPLES

In this manual, the entities and screens managed by VisualAge Pacbase are described in two parts:

. An introductory comment explaining the purpose and the general characteristics of the entity or screen,

. A detailed description of each screen, including the input fields for both on-line (screens) and batch (forms) data entry into the Database.

Since input screens and batch forms usually contain the same fields, their descriptions are often identical.

All on-line fields described in this manual are assigned an order number. These numbers are printed in bold italics on the screen examples which appear before the input field descriptions and allow for easy identification of a given field. The numbers are circled on the batch forms.

For certain descriptions, there may be slight differences between the screen and the corresponding batch form. This can be explained by the fact that batch mode is less flexible than on-line mode and often needs additional input fields for some indicators which already exist on the screen.

In addition, the user may find that the field sequence on a screen is different from the field sequence on the corresponding batch form. If that occurs, the numbers referencing the fields may not appear in ascending sequence on either the screen example or the batch form.

>>>> If you use the VisualAge Pacbase WorkStation, the graphical interface of the corresponding windows is described in the VisualAge Pacbase WorkStation Reference Manual.

1.4. GENERAL PRESENTATION

STRUCTURED CODE: GENERAL PRESENTATION

The Structured Code allows programmation teams to realize management programs. Linked with the Specifications Dictionary, it offers the following possibilities:

. Definition of PROGRAMS, using a Definition screen which contains the general characteristics of a program (program name, type, explicit keywords, etc.),

. Calling data structures already described in the Specifications Dictionary. They can be called as many times as necessary in one or several programs.

. Description of work areas, either by calling existing data structures or describing data structures specific to the program.

. Description of procedures for a given program.

. Definition of macro-structures, a macro-structure being a parameterizable set of Structured Code lines that can be called in different programs.

. Calling macro-structures in a program. The same macro-structure may be invoked several times by the same program.

ADVANTAGES OF USING THE PROCEDURAL CODE

The Procedural Code is a high-level language used by programming teams in order to develop and implement any business-oriented programs. Procedural Code, which must be used in conjunction with the Specifications Dictionary, presents the following advantages:

. Improved conciseness compared to COBOL, due to the simplification of COBOL commands and syntax;

. Hierarchical organization of procedures, which does not exist in COBOL;

. Structured programming using the following types of structures: BLOCK (BL), IF THEN (IT), ELSE (EL), DO WHILE (DW), DO UNTIL (DU), CASE OF (CO), etc.

. Improved portability due to independence from any specific hardware, and the ability to generate in a COBOL code adapted to each computer system.

CROSS-REFERENCES

Since the Structured Code function must be used in conjunction with the Specifications Dictionary, all the facilities of the Specifications Dictionary function are available.

Specifically, the user can establish cross-references between data elements, data structures and programs written with the Structured Code function.

These cross-references, which are extremely useful during program development, become a valuable tool during program maintenance since they allow the user to immediately evaluate the consequences of any changes made.

TYPES OF PROGRAMS THAT CAN BE DEVELOPED

Both batch and on-line programs can be written in Structured Code using the various features offered by parameterized macro-structures, i.e, technical procedures associated with on-line programs or database management systems.

The Structured Code function does not allow for the automatic description of screens used in on-line programs.

It does, however, provide the following:

. The generation of the COBOL source code, ready to be compiled and adapted to the operating system.

. Improved portability. Input in a single field enables the user to specify to which operating system a program should be adapted.

. Consistency between the described data and the generated COBOL code. Both originate from one common source: the Database.

. Customizing the automatically generated functions provided via the Batch or On-Line Systems Development functions.

1.5. MANAGED ENTITIES/ASSOCIATED SCREENS

MANAGED ENTITIES/ASSOCIATED SCREENS

The Structured Code function manages a single entity, the Program entity, which is defined and described on the following screens:

. Program Definition (P),

. Call of Parameterized Macro-Structures (-CP),

. Call of Data Structures (-CD),

. Beginning Insertions (-B),

. Work Areas (-W),

. Procedural Code (-P).

The Program Definition (P) screen (Batch Form '0' (zero)), is used to define the PROGRAM CODE, the PROGRAM NAME, and its general characteristics.

The Call of P.M.S. (-CP) screen (Batch Form 'M'), is used to include lines described in other programs. This is done by replacing the parameters indicated with specific values.

The Data Structures (-CD, -HCD) scree (Batch Form '1'), is used to get the description of I/O fields from the Program.

The Beginning Insertions (-B) screen (Batch Form 'D'), is used to modify the ENVIRONMENT DIVISION statements that are generated automatically as a result of Data Structure calls.

The Work Areas (-W) screen (Batch Form '7') is used to modify the WORKING-STORAGE and/or LINKAGE SECTIONs, supplementing the descriptions obtained automatically.

The Procedural Code (-P) screen (Batch Form 'P') is used to write sequences of instructions in a portable, structured, and hierarchical format.

As all entities, programs can be documented by general documentation lines and by text assignment (see the SPECIFICATIONS DICTIONARY Reference Manual).

REVERSE ENGINEERED PROGRAMS

Programs that have been "reverse engineered" include only the following:

. Work Area (-W) lines,

. Source Code (-SC) lines (COBOL source code).

It is possible to add Structured Code (-W and -P lines) and Calls of Marcro-Structures (-CP lines) to these programs, and then regenerate them. Call of Data Structures (-CD) and Beginning Insertions (-B) lines are ignored.

For complete details, please refer to the COBOL GENERATOR Reference Manual.

2. PARAMETERIZED MACRO-STRUCTURES

2.1. INTRODUCTION

INTRODUCTION

ORGANIZATION OF THE CHAPTER

The "INTRODUCTION" provides an overview of general information concerning macro-structures. The "PROGRAM DEFINITION SCREEN (P)" subchapter describes the definition of PMS's. The "CALL OF P.M.S. (-CP)" subchapter describes how to attach macros to programs, and the specification of parameter values. The "X-REF. TO PROGRAMS/SCREENS (-XP/O)" subchapter describes how to add comments (and parameter values).

THE PARAMETERIZED MACRO-STRUCTURE

The purpose of a parameterized macro-structure is to standardize sequences of procedural code, with possible variations, in order to use them:

. One or more times in one program,
. In several different programs.

DEFINITION

A parameterized macro-structure (PMS) is defined on a Program Definition (P) screen. It is a set of Beginning Insertions (-B), Work Areas (-W) and Procedural code (-P) lines which produces one or more sequences of statements which can be used in one or more programs.

A PMS is not a sub-program. A sub-program can only contain consecutive statements. A PMS can contain non-consecutive statements. It is possible, however, to call a sub-program from a PMS.

A PMS can also be defined from a program imported via the Reverse Engineering function. It would contain '-W', '-SC' (Source Code lines from the "reversed" program), and '-P' lines (if "reversed" program's PROCEDURE DIVISION has been modified). In this case, this PMS in only taken into account in "reversed" programs (TYPE AND STRUCTURE OF PROGRAM = 'S').

PRINCIPLES

When a PMS is called into a program, the request for a description of the program (DCP, DCO) and for its generation (GCP, GCO) will produce the macro-structure(s) interspersed within the program according to the key (FUNCTION/SUB-FUNCTION CODE etc.). Parameters (if any) are resolved.

As a result, PMS instructions are part of the program.

TYPES OF MACRO-STRUCTURES

Generally speaking, Parameterized Macro-Structures are used to describe functions that are common to several programs, or to several procedures of the same program.

There are six basic types of macro-structures:

. A 'general program outline type' used to give a program a standard structure which takes into account all the program development standards followed at the the user site. This type of PMS is also used to describe a body of technical (system-oriented) procedures that are linked to the use of a TP Monitor or a DBMS;

. A 'technical (system-oriented) functions type' used to standardize specific commands, such as the input/output procedures of a DBMS (Read, Modify, Suppress, etc.);

. A 'complex technical functions type' used to resolve all the complicated procedures involved in a DBMS, whether or not in an on-line environment, such as validation management, the sequential read of a file, the complete technical procedures for database update, the particular access path used in a database, etc. In general, this type is a combination of elementary technical functions that the user has to rewrite in order to minimize the task of connecting elementary PMS's to one another;

. A 'general function type' used to resolve certain procedures that are common to a set of applications, such as date validation, date transformation, or "shop" standards for on-line error message handling. The user should keep in mind that this type of PMS is independent of the computer system, the TP Monitor and the DBMS used;

. A 'specific function type' used to 'harmonize' the development of programs that make up a system. For example, to standardize the presentation of certain reports or screens by using common procedures defined in a PMS.

. A type used to create cross-references; for example, if a PMS calls a sub-program, you can automatically find out what programs use that sub-program.

DIFFERENCE BETWEEN PMS'S AND SUB-PROGRAMS

The user must often decide whether to use a sub-program or PMS to consolidate all the procedures that are common to several programs. In order to find the answer, the user must ask several questions:

. Are the common procedures consecutive?

. Is the position of these procedures defined?

. Is the number of parameters used important?

. Are these procedures executed as a general rule?

Answers to these questions will help determine which procedures should be executed in a sub-program and which should be executed in a PMS.

. If they are not consecutive ==> PMS.

. If the position is already defined ==> PMS.

. If the number of parameters is important ==> SP.

. If the procedures are not executed as a general rule ==> SP.

PARAMETERIZING A PROCEDURAL CODE (-P) SCREEN KEY

The System allows the user to parameterize the major part of the Procedural Code (-P) screen keys (FUNCTION CODE, SUB-FUNCTION CODE, and the first two characters of the LINE NUMBER). As a recommendation, before writing a macro-structure, try to structure the procedure to be written. Try to minimize the number of parameters in the key, so as to:

. Facilitate usage of the PMS,

. Obtain programs with a homogenous structure.

. Minimize the resolution time of a PMS.

As a general rule, it is not recommended to use a PMS instead of a simple line or two of Procedural Code. The latter solution may be more efficient with respect to performance at generation time and also to limit the number of necessary PMS calls.

DOCUMENTATION OF A PMS

Good documentation of a PMS is important. It gives the user the information needed to use the PMS properly: what each parameter means, which functions and/or sub-functions are used, etc.

A PMS can be documented in two different ways:

. In the same way as any program, via the General Documentation (-G) screen,

. On the PMS's X-Reference to Programs (-XP) or to On-Line screens (-XO) screen.

Note that documentation lines entered on the General Documentation screen will not appear in sub-reports of a program description (DCP, GCP; DCO, GCO) whereas the cross-reference lines will. This may be the most effective way to document the meaning of the parameters, however, since the lines will reappear each time the macro is called, brevity is advisable.

OVERRIDE OF A PMS LINE

Given the same key, Procedural Code (-P), Work Areas (-W) and Beginning Insertions (-B) lines of a Program override PMS lines. It is better to design Parameterized Macro-structures so that as few lines as possible will be overridden by the programs.

Each overridden PMS line will appear in the program description (DCP, GCP; DCO, GCO) preceded by an asterisk. This can make a program harder to read. It is preferable to include as few lines of this type as possible in a PMS.

If there is a macro-structure line key with a matching key in another macro-structure called into the same program, neither of the lines are considered for processing. These lines will be identified with an asterisk in the program description.

In cases where the identical key appears several times, the maximum number of comment lines (with an asterisk) that will appear in the program description is ten. These lines will not appear in the generated code.

CONSISTENCY OF PARAMETERS

It happens frequently that one program calls several PMS's. The user should check that the parameters are used consistently. For example, if two different PMS's are called into the same program, and both use a DATA STRUCTURE CODE as a parameter, both PMS's would ideally have that code in the same position. This has a twofold advantage of being easier for the programmer, and of presenting the same type of information in the same order in a program.

While this is not always possible, it would be wise to consider the placement of parameters in existing PMS's prior to designing a PMS.

NOTE: Any program already defined in the Database can be used as a non-parameterized macro-structure as long as its code is lower (in EBCDIC order) than the program calling it.

REMINDERS

The purpose of a parameterized macro-structure (PMS) is to standardize functions common to several programs. A called PMS is a complement to the generation possibilities of the System.

Usually, a PMS appears in a program description as if its lines had been directly entered by a programmer.

PURPOSE OF NON-EXPANDED MACRO-STRUCTURES

Non-expanded PMS's are reserved for batch programs only.

Some PMS's are called many times in several programs, and the programmer considers them as part of his/her own standard environment. In this case, there is no need to see the actual lines of these PMS's in the program description.

However, these lines are taken into account when the program is being generated.

ADVANTAGES AND DISADVANTAGES

When a PMS is called in a program, an index, called an 'Expansion Index,' is created for each PMS description line.

The system creates these indexes in order to display PMS lines in the description of the calling program.

A PMS call in a program may have the following disadvantages:

. Slow response time during update of the PMS to be expanded for all users (serialization of updates);

. Disorganization of the Index File (AN) by mass insertion of keys that are often contiguous;

. Large increase in the number of records in the Index File, thus lengthening execution time of the batch save, restore and reorganization procedures.

Using non-expanded PMS's can make impovements in these three areas provided the user does not need to view the PMS to update it on-line. Response time is thus improved because non-expanded PMS's do not create extra records in the Index File (AN).

However, using non-expanded PMS's may have the following disadvantages:

. For a non-expanded PMS which is not displayed on-line, writing and maintaining the program may be more difficult;

. For a PMS expansion which occurs during a program extraction for generation and printing, the execution time of the GPRT utility procedure is increased.

On the Call of PMS screen (-CP), non-expanded PMS's are indicated with an 'N' in the Expansion ('E') field.

2.2. THE PROGRAM ENTITY

THE PROGRAM ENTITY

The purpose of the Program entity with respect to the Structured Code function is to define Parameterized Macro-Structures.

GENERAL CHARACTERISTICS

Although the primary focus in this manual is to provide the Structured Code meaning of the Program entity screens and their fields, descriptions have been included in their entirety. This is due to the fact that the Program entity is also used to write batch programs. This means that the user may easily convert a suitable program into a macro.

NOTE: Macro-Structures do not take Call of Data Structures lines into account, but Programs do.

The Program entity contains:

. A required Definition screen (P), giving general characteristics (PROGRAM CODE, keywords, etc.),

. Documentation lines entered on the General Documentation screen or X-reference to Programs / On-line screens, to provide useful and/or necessary information,

. Several types of description lines:

- Beginning Insertions (-B) lines which enable the user to modify the IDENTIFICATION DIVISION, and the ENVIRONMENT DIVISION that is generated, up to and including the 'DATA DIVISION' and 'FILE SECTION' statements.

- Work Areas (-W) lines supplement the DATA DIVISION in the generated program,

- Procedural Code (-P) lines customize the PROCEDURE DIVISION in the generated program,

- Source Code (-SC) lines ("reversed" program only).

INPUT SPECIFICATIONS

The program classification code of a non-expanded PMS is 'N' (instead of 'M' for a regular PMS) and is entered in the PROGRAM CLASSIFICATION CODE field on the Definition screen (P) of the PMS. (This code has a documentary value in the sense that it does not affect the generated code).

The TYPE OF COBOL TO GENERATE for a macro is normally 'N' so that the variant is determined by defaulting to the variant selected by the batch or on-line program to which the macro is attached. (This also improves portability).

PROGRAM STRUCTURE

Every program is organized as a set of successive processing steps that are performed either as a loop (in batch) or in an execution (on-line). These processing steps include:

. getting the data,

. checks,

. updates,

. printings,

. returning the output.

Each one these processing steps consists of a group of homogeneous sequences of instructions called "functions."

The program is structured by two supplementary principles:

. Linear linking of functions in the logical order of their execution, with each executing a functional or technological task in the program. Each function is identified by a code from 0A to 99.

. Hierarchical structuring of the processing steps in each function. A function can be broken down into sub-functions, which, in turn, can be further broken down into sub-functions, and so on.

Functions and sub-functions follow one another in the order of their codes, as determined by the EBCDIC collating sequence, with letters preceding numbers, regardless of the sorting sequence in effect for the hardware being used.

PRINCIPLES OF GENERATING A COBOL PROGRAM

Programs developed under PACBASE are generated upon request in the COBOL variant that corresponds to the hardware and the compiler for which they are intended.

The IDENTIFICATION DIVISION of the COBOL program is generated from the program definition line. This line can be modified ('-B').

The ENVIRONMENT DIVISION and the FILE SECTION are generated from Data Structure calls in the program ('-CD'). They can be completed or modified ('-B').

The other sections of the DATA DIVISION are generated from Data Structure calls. They can be completed or modified ('-W').

The PROCEDURE DIVISION is generated from Data Structure or Segment calls and from processing descriptions in Procedural code ('-P').

Macro-structure call lines are used to call all the other pre-described Procedural code lines (see the chapter "Macro-structures").

CONSTANTS OF PROGRAMS

In the WORKING-STORAGE SECTION of all programs, the System generates a PAC-CONSTANTS field in which the following are defined:

- the code of the library in which the program is defined,
- the generation session number of the program,
- the generation date of the program,
- the code of the program,
- the code of the user who requested the generation,
- the generation time of the program,
- the external name of the program,
- the code of the Database,
- the generation date with century.

These fields can be used in the program execution report. They are preceded by the literal 'WORKING', which can serve as a marker in a dump in the event of an execution problem.

DEFINITION

A Program is defined on the Program Definition (P) screen. The user enters a code, clear name and the main characteristics of the program. It is accessed by entering the following input in the CHOICE field:

```
CH: P......
```

NOTE

The access commands described are for on-line mode. The batch access commands are listed in chapter "ACCESS COMMANDS", subchapter "BATCH ACCESS COMMANDS".

```
--------------------------------------------------------------------------------
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! PROGRAM DEFINITION....... PO0001     1                                        !
!                                                                               !
! PROGRAM NAME.....................: VENDOR REPORTS   2                       !
!                                                                               !
! CODE FOR SEQUENCE OF GENERATION....: PO0001  3                                !
!                                                                               !
! TYPE OF CODE TO GENERATE...........: 0       4                                !
! COBOL NUMBERING AND ALIGNMENT OPT..:         5                                !
! CONTROL CARDS IN FRONT OF PROGRAM..: B       6                                !
! CONTROL CARDS IN BACK OF PROGRAM...: B       7                                !
! COBOL PROGRAM-ID...................: PO0001  8                                !
! MODE OF PROGRAMMING................: P       9                                !
! TYPE AND STRUCTURE OF PROGRAM......: B      10                                !
! PROGRAM CLASSIFICATION CODE........: P   PROGRAM  11                          !
! TYPE OF PRESENCE VALIDATION........:        12                                !
! SQL INDICATORS GENERATION WITH '-' :        13                                !
!                                                                               !
! EXPLICIT KEYWORDS..:  14                                                      !
!                                                                               !
! SESSION NUMBER.....: 0059        LIBRARY......: CIV    LOCK:                  !
! O: C1 CH: Ppo0001                     ACTION:                                 !
--------------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	6		PROGRAM CODE (REQUIRED) Code identifying the program in the library.
2	30		PROGRAM NAME (REQ. IN CREATION) It must be as explicit as possible since the implicit keywords are created from this name.
3	6		CODE FOR SEQUENCE OF GENERATION (Default option: PROGRAM CODE in the PACBASE library). Programs are sorted on this code in the generated program stream.
4	1		TYPE OF COBOL TO GENERATE Specifies the COBOL variant for the generated program. The default value at creation is the value of the 'GENERATED LANGUAGE' field in the Library Definition.
		N	No adaptation to a language variant. It is used to prevent program generation.
		0	Adaptation to ANSI COBOL: IBM MVS
		1	Adaptation to ANSI COBOL: IBM DOS
		2	Adaptation to COBOL : IBM 36
		3	Adaptation to COBOL : MICROFOCUS, IBM VISUAL SET
		4	Adaptation to COBOL : BULL DPS7
		5	Adaptation to ANSI COBOL: (74) BULL DPS8
		6	Adaptation to COBOL : (BCD) BULL DPS8
		7	Adaptation to COBOL : HP-3000
		8	Adaptation to ANSI COBOL: BURROUGHS (large systems) : UNISYS A Series
		9	Adaptation to ANSI COBOL: UNISYS 90/30
		A	Adaptation to COBOL : (74) PRIME
		B	Adaptation to COBOL : BURROUGHS (Medium systems) : UNISYS V Series
		C	Extraction of COBOL Source Code. (Refer to chapter "APPENDIX: PURE COBOL SOURCE CODE" in the STRUCTURED CODE Reference Manual).

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		D	Adaptation to ANSI COBOL: (74) CONTROL DATA CORP.
		E	Adaptation to ANSI COBOL: (68) CONTROL DATA CORP.
		F	Adaptation to COBOL : TANDEM
		I	Adaptation to COBOL : DEC/VAX VMS
		J	Adaptation to ANSI COBOL: PERKIN-ELMER-7-32
		K	Adaptation to ANSI COBOL: ICL 2900
		M	Adaptation to COBOL : BULL DPS6
		O	Adaptation to COBOL : AS 400
		R	Adaptation to COBOL : IBM 34
		S	Adaptation to COBOL : SFENA
		T	Adaptation to ANSI COBOL: SIEMENS
		U	Adaptation to ANSI COBOL: (74) UNISYS 1100 Series
		V	Adaptation to ANSI COBOL: UNISYS 90/60
		W	Adaptation to COBOL : DPPX IBM 8100
		X	Adaptation to ANSI COBOL: IBM MVS VS COBOL II
		Y	Adaptation to COBOL : IBM 38, AS 400
5	1		COBOL NUMBERING AND ALIGNMENT OPTION This option can be used to suppress numbering or the identification of a program or to modify the justification of the generated program lines.
		blank	Numbering, justification and identification of program in accordance with the standard COBOL line (default value).
		1	Suppression of numbering.
		2	Suppression of numbering and justification of statements (columns 8 to 71 inclusive) in column 1.
		3	Standard numbering and justification, suppression of program identification.
		4	Suppression of numbering and program identification.
		5	Suppression of numbering and of program identifica-

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			tion and justification of instructions (columns 8 to 71 inclusive) in column 1.
6	1		CONTROL CARDS IN FRONT OF PROGRAMS Enter the one-character code that identifies the job card to be inserted before the generated program. Default: Code entered on the Library Definition Screen NOTE: This value may be overridden on the relevant entities' definition screens. It may also be overridden at generation time.
7	1		CONTROL CARDS IN BACK OF PROGRAMS Enter the one-character code that identifies the job card to be inserted after the generated program. Default: Code entered on the Library Definition Screen NOTE: This value may be overridden on the relevant entities' definitions screens. It may also be overridden at generation time.
8	8		COBOL PROGRAM-ID (Default value at generation: CODE FOR SEQUENCE OF GENERATION.) This code identifies the generated program: .in the IDENTIFICATION DIVISION, .in a source module library, .in the library of executable modules. This code intervenes (totally or partially) in the job control language lines generated before or after the program.
9	1		MODE OF PROGRAMMING
		P	Default value when creating a library. Programming in Structured Code on Procedural Code '-P' lines.
		S	This value can be used for the following functions: COBOL GENERATOR function: --- (in conjunction with the Reverse Engineering function) Specific procedures composed of Source Code (-SC) and Procedural Code (-P).

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			With this value, the TYPE AND STRUCTURE OF PROGRAM field must also be 'S'. For more details on Source Code (-SC), refer to the COBOL GENERATOR Reference Manual. C LANGUAGE MANAGER function: ---------- Specific procedures composed of Source Code (-SC) lines. With this value, the TYPE AND STRUCTURE OF PROGRAM field must be 'Y'. Use the COBOL variant 0 to generate the program.
10	1		TYPE AND STRUCTURE OF PROGRAM This identifies the type of program to generate:
		B	Standard Batch program structure (default option). It provides the general structure of an iterative program: .beginning of the loop (F05), .end of run (F20), .end of the loop (F9099. GO TO F05).
		S	Suppress automatic structure generation: Structured code function: ---------- This type can be used to describe the TDS 'system generation', the IDS II 'schema', ...suppression of COBOL divisions, .the program is made up of Beginning Insertions (-B), Work Areas (-W) and Call of Data Structures (-CD) lines. COBOL Generator function: ---------- .the program is made up of '-W', -P', '-SC' and '-CP' lines.
		T	On-line program structure. Suppression of the loop, i.e: .no beginning of loop (F05), .no end of run (F20), .no end of loop (F9099. GO TO F05).

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		C	C.I.C.S. on-line program structure. Suppression of the loop, i.e: .no beginning of loop (F05), .no end of run (F20), .no end of loop (F9099. GO TO F05). Same as 'T' but also with: .generation, at the beginning of the PROCEDURE DIVISION, of the line: MOVE CSACDTA TO TCACBAR, .generation in F9099 of: DFHPC TYPE=RETURN, .no line numbering in the generated program.
		M	Parameterized macro-structure type. (For documentation purposes only). This is used for programs to be inserted into other programs. It cannot be generated alone.
		F	Program composed of Call of Data Structures (-CD) and Pure COBOL Source Code (-9) lines. This option permits the manipulation of the Pure COBOL Source Code (-9) lines that invoke the structural description of the automatically generated D.S.'s, according to the characteristics assigned to that D.S. on the Call of Data Structures (-CD) screen. For more information see chapter "APPENDIX: PURE COBOL SOURCE CODE" in the STRUCTURED CODE Reference Manual.
		D	Program composed of Call of Data Structures (-CD), Beginning Insertions (-B), Work Areas (-W) and Pure COBOL Source Code (-9) lines. This option provides the automatic generation of the IDENTIFICATION, ENVIRONMENT and DATA DIVISIONS. The PROCEDURE DIVISION is written entirely on Pure COBOL Source Code (-9) lines.
		P	Program composed of Call of Data Structures (-CD), Beginning Insertions (-B), Work Areas (-W) and Procedural Code (-P) lines. This option provides the automatic generation of the IDENTIFICATION, ENVIRONMENT and DATA DIVISIONS. The PROCEDURE DIVISION is entirely written in Structured Code.
		Y	Program written in C LANGUAGE and composed of Work Areas (-W), Source Code (-SC) and Call of P.M.S. (-CP) lines.
11	1		PROGRAM CLASSIFICATION CODE This value is used primarily for documentation purposes. The label corresponding to the selected code

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			will be displayed on reports and screens. It is also used to select the non-expansion option for macro-structures.
		A	TP System
		D	Sub-program
		G	Screen map
		M	Macro-structure
		N	Non-expanded macro-structure
		P	Program
		S	Schema
		T	On-line program (screen)
		U	Utility
		V	Sub-schema
12	1		TYPE OF PRESENCE VALIDATION In validation programs, the presence of numeric data element will be determined according to this code: For numeric fields:
		blank	Field present if not blank (default value).
		0	Field present if not zero. For alphabetic and numeric fields:
		L	Field present if not low-value.
13	1		SQL INDICATORS GENERATION WITH '-' Cross-references available for the use of SQL indicators in Structured Language.
		BLANK	SQL indicators generated in the format: VXXNNCORUB:
		-	SQL indicators generated in the format: V-XXNN-CORUB.
14	55		EXPLICIT KEYWORDS This field allows the user to enter additional (explicit) keywords. By default, keywords are generated from an occurrence's clear name (implicit keywords).

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			This field only exists on-line. In batch mode, keywords are entered on Batch Form 'G'. Keywords must be separated by at least one space. Keywords have a maximum length of 13 characters which must be alphanumeric. However, '=' and '*' are reserved for special usage, and are therefore not permitted in keywords. Keywords are not case-sensitive: upper-case and lower-case letters are equivalent. NOTE: Characters bearing an accent and special characters can be declared as equivalent to an internal value in order to facilitate occurrence search by keywords. Refer to the Operations Manual - Part II "Administrator's Guide", Chapter "Database Management Utilities", Subchapter "PARM: Update of User Parameters". A maximum of ten explicit keywords can be assigned to one entity. For more details, refer to Chapter "KEYWORDS" Subchapter "BUILDING THE THESAURUS" in the SPECIFICATIONS DICTIONARY Reference Manual.

2.3. CALL OF P.M.S. (-CP)

CALL OF P.M.S.

The Call of P.M.S. (-CP) screen is used to call a previously defined macro-structure into a program (batch or on-line), and to specify values to use for resolving parameters (if any).

PARAMETERIZING

Up to 20 parameters can be used in a P.M.S. A parameter is specified by '$n' (n=1,2,...,9,0) for the first 10 parameters; the next 10 (n=A,B,...J) have to appear on a "continuation" line with the same number as the preceding one.
Alphabetical values can not be used to parameterize the macro-structure line indicatives.
Line indicatives are: Function or Sub-Function codes or line numbers.
The user supplies the replacement values of the respective parameters in the PARAMETER VALUES field in the form of character strings (with delimiters). Each occurrence of the parameter in the original PMS is then replaced by the value entered for this particular program.

All parameter values (including delimiters) must be written on a maximum of two lines.

The number of characters used for each parameter value must correspond directly to the appropriate field length for the entity being parameterized. For example, if $1 is being used as a FUNCTION CODE, the value must be two characters.

ENTITY OCCURRENCES USED AS PARAMETERS

You can use occurrences of the Data Element, Data Structure and Segment entities as parameters.

When such an occurrence is called via a parameter, no cross-reference is created if the occurrence's code is declared as a simple character string.

This type of cross-reference is established by specifying that the parameter's value is a Data Element, Data Structure or Segment code. This is done by keying in:

/E=DELCO/ or /D=DD/ or /S=SEGT/

At the time of transformation, the parameter is replaced by DELCO, DD or SEGT and cross-references are set up.

NON-EXPANDED MACRO-STRUCTURES

An 'N' in the Expansion ('E') field indicates a non-expanded PMS.

ENTERING COMMENTS

Comment lines entered on the -CP screen are displayed only from the calling program.

The number of the line from which the display must begin can be entered after the macro-structure code.

When comments are entered on the -XP screen of the PMS, they are displayed when the PMS is called on this screen.

Entering comments on the -XP screen makes it easier to enter parameters on PMS calls.

PARAMETERIZED MACRO-STRUCTURES **2**
CALL OF P.M.S. (-CP) **3**

```
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! PROGRAM CALL OF P.M.S.............:     1 VRPREP VENDOR RATING PREPARATION    !
!                                                                               !
! 2   3       4  5   6                                                  7       !
! A   MACRO   LN C : COMMENTS OR PARAMETER VALUES                       D  E    !
!     AADA30       :                                                            !
!     AASO30       : CO/SO/                                                     !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                  :                                                            !
!                                                                               !
! O: C1 CH: -CP                                                                 !
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	6		PROGRAM CODE OR SCREEN CODE (REQUIRED) This field contains the six-character program or on-line screen code.
2	1		ACTION CODE
3	6	 AA....	MACRO-STRUCTURE CODE (REQUIRED) Do not begin with a code less than ABAAAA. These codes are used for macros supplied with the product. The macro-structure must be given a lower code than the code of the program that calls it (in EBCDIC order).
4	2	 0-99	LINE NUMBER PURE NUMERIC FIELD BLANKS EQUIVALENT TO ZERO This is used to define several documentation lines for one macro-structure or, when a macro-structure is parameterized, this can be used to call it into the same program several times.
5	1	 *	CONTINUATION The asterisk creates a continuation line
6	50		PARAMETER VALUES Call of P.M.S. (-CP): If the line contains the '/' character, the values are those of the parameters for a PMS. Otherwise, they are comments on the Macro-Structure call. X-References to Programs/Screens (-XP/-XO): On lines with CALL TYPE = 'O' or 'P': values of the parameters for a PMS. On lines with CALL TYPE = 'C': comments on the Macro-Structure. The values for the parameters must be indicated one after the other, each one ending with a delimiter. The values are entered in the sequence of the assigned parameter number. The maximum number of parameters is 20, but limited to 10 per line. The values indicated on the first line correspond to the parameters $1 to $0, and those on the second line correspond to parameters $A to $J. The parameterization of the placement of the PMS in

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			the program, such as the (sub-)function code, line number, or WSS prefix, must be specified on the first line only. In order to nullify the value of a parameter, the following technique can be used: For the first parameter, enter the delimiter in the first column of this field. For subsequent parameters, the system will understand two consecutive delimiter characters to mean ignore the next sequential parameter. For example, using '/' as the delimiter, /BB/CC/ will resolve parameters $2 and $3 with BB and CC respectively. XX//ZZ/ will resolve $1 with XX, and $3 with ZZ. To specify a blank as a parameter value, enter it between the delimiters as with any other value. In order to establish cross-references when a Data Element, a Data Structure or a Segment is used as a parameter, the value should be respectively coded: /E=DELCO/ (DELCO = Data Element code), or /D=DD/ (DD = Data Structure code), or /S=SEGT/ (SEGT = Segment code). The parameter is then replaced by the DELCO, DD or SEGT value and cross-references to the Data Element, Data Structure or Segment are established.
7	1		DELIMITER OF PARAMETERIZED VALUES This character is used to separate the different parameter values.
		/	Default value.

2.4. X-REFERENCES TO PROGRAMS/SCREENS (-XP/-XO)

X-REFERENCES TO PROGRAMS/SCREENS

The X-References to Programs (-XP) and On-Line Screens (-XO) screens are used for entering comments the user wants to appear in the sub-reports that are produced with the Generation and Print Commands 'DCP', 'GCP', 'DCO' and 'GCO' (GPRT Procedure).

These comments may be assigned by entering 'C' for the CALL TYPE, a LINE NUMBER value, and the comment desired.

It is also possible to use these lines to specify parameter values, as on the Call of P.M.S. (-CP) screen.

A line number may be entered after the code of the screen or program that will begin the display. This line number corresponds to the macro-structure call.

RECOMMENDATION

Since these lines reappear for each call of the macro, and since macros may be called many times into the same program, it is suggested that these comments be brief and contain only essential information, like the meaning of the parameters.

```
 -----------------------------------------------------------------------------
 !                 PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
 ! PROGRAM CROSS-REFERENCES                 1 AASO30 SORT INPUT PROCEDURE      !
 ! 2 3 4      5  6    7                                   >          8         !
 ! A T PG/SC  LN C  : COMMENTS OR PARAMETER VALUES                   D E       !
 !   P VRPREP       : CO/SO/                                                   !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                  :                                                          !
 !                                                                             !
 ! O: C1 CH: Paaso30XP                                                         !
 -----------------------------------------------------------------------------
```

```
 -----------------------------------------------------------------------------
 !                 PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
 ! PROGRAM CROSS-REFERENCES                1  AAPOJ1 SORT INPUT PROCEDURE      !
 ! 2 3 4      5  6   7                                            8            !
 ! A T PG/SC  LN C : COMMENTS OR PARAMETER VALUES                 D E          !
 !   O POJB01      : 020/A/                                                    !
 !   O POJB02      : 050/A/                                                    !
 !   O POJB03      : 100/A/                                                    !
 !   O POJC10      : 010/A/                                                    !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                 :                                                           !
 !                                                                             !
 ! O: C1 CH: Paapoj1XO                                                         !
 -----------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	6		MACRO-STRUCTURE CODE
		AA....	Do not begin with a code less than ABAAAA. These codes are used for macros supplied with the product.
			The macro-structure must be given a lower code than the code of the program that calls it (in EBCDIC order).
2	1		ACTION CODE
3	1		CALL TYPE
			This field contains the type of call used for each line. The values are as follows:
		C	Comments on the macro-structure.
		O	Call of the macro-structure in a screen.
		P	Call of the macro-structure in a program.
4	6		PROGRAM CODE OR SCREEN CODE
			This field contains the six-character program or on-line screen code.
5	2		LINE NUMBER
			PURE NUMERIC FIELD BLANKS EQUIVALENT TO ZERO
		0-99	This is used to define several documentation lines for one macro-structure or, when a macro-structure is parameterized, this can be used to call it into the same program several times.
6	1		CONTINUATION
		*	The asterisk creates a continuation line
7	50		PARAMETER VALUES
			Call of P.M.S. (-CP): If the line contains the '/' character, the values are those of the parameters for a PMS. Otherwise, they are comments on the Macro-Structure call.
			X-References to Programs/Screens (-XP/-XO): On lines with CALL TYPE = 'O' or 'P': values of the parameters for a PMS. On lines with CALL TYPE = 'C': comments on the Macro-Structure.
			The values for the parameters must be indicated one after the other, each one ending with a delimiter. The

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			values are entered in the sequence of the assigned parameter number. The maximum number of parameters is 20, but limited to 10 per line. The values indicated on the first line correspond to the parameters $1 to $0, and those on the second line correspond to parameters $A to $J. The parameterization of the placement of the PMS in the program, such as the (sub-)function code, line number, or WSS prefix, must be specified on the first line only. In order to nullify the value of a parameter, the following technique can be used: For the first parameter, enter the delimiter in the first column of this field. For subsequent parameters, the system will understand two consecutive delimiter characters to mean ignore the next sequential parameter. For example, using '/' as the delimiter, /BB/CC/ will resolve parameters $2 and $3 with BB and CC respectively. XX//ZZ/ will resolve $1 with XX, and $3 with ZZ. To specify a blank as a parameter value, enter it between the delimiters as with any other value. In order to establish cross-references when a Data Element, a Data Structure or a Segment is used as a parameter, the value should be respectively coded: /E=DELCO/ (DELCO = Data Element code), or /D=DD/ (DD = Data Structure code), or /S=SEGT/ (SEGT = Segment code). The parameter is then replaced by the DELCO, DD or SEGT value and cross-references to the Data Element, Data Structure or Segment are established.
8	1		DELIMITER OF PARAMETERIZED VALUES This character is used to separate the different parameter values.
		/	Default value.

3. MODIFYING THE IDENTIFICATION/ENVIRONMENT DIV. (-B)

MODIFYING THE IDENTIFICATION/ENVIRONMENT DIVISIONS

You can complete or modify the beginning of the generated program with the Beginning Insertions (-B) screen. This applies to the IDENTIFICATION DIVISION, the ENVIRONMENT DIVISION, and also the 'DATA DIVISION' and 'FILE SECTION' statements.

GENERAL CHARACTERISTICS

The use of the Beginning Insertions (-B) screen is exceptional with most hardware types.

Examples of its usage are:

. For the SELECT clause for relative access files,

. For the COPY SELECT and COPY FD clauses in a TPR TDS on a HONEYWELL H64 System.

SUPPRESSION OF GENERATED LINES

If the program includes Beginning Insertions (-B) lines containing the code of a single section or paragraph, then automatically generated lines for this section or paragraph will be suppressed.

'-B' lines are ignored in a "reversed" program.

TRANSFER OF LINES TO ANOTHER ENTITY

Lines from one entity may be copied directly to another entity. At the top of the screen, an ENTITY TYPE field with a value of 'O' or 'P', followed by the appropriate PROGRAM CODE OR SCREEN CODE, allows the user to take the lines already entered on a screen and attached to one entity, copy them, and attach them to another entity. This is not a MOVE. A duplicate set of lines is created in another entity.

EXAMPLE:

> In order to copy entity lines from screen 'SCREE1' into program 'PGM001', 'O' and 'SCREE1' should be overtyped with:
>
> 'P' and 'PGM001' respectively.

```
-------------------------------------------------------------------------------
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! PROGRAM BEGINNING INSERTIONS : P TES001 TEST FOR POJ                          !
!                                1 2                                            !
!                                                                               !
! 3 4  5  6   7                                                                 !
! A SE PA LIN INSTRUCTION TO BE INSERTED                                        !
! * 60    000 DATA DIVISION                                                     !
! * 70    000 SUB SCHEMA SECTION                                                !
! * 80    000 FILE SECTION                                                      !
! * 99 99 000 SUPPRESSED                                                        !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
! O: C1 CH: -B                                                                  !
-------------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	1		ENTITY TYPE This field is used to identify the entity to which these lines are attached:
		O	On-line Screen
		P	Program
			The user may overkey this field in order to copy lines attached to a Screen into a Program and vice-versa.
2	6		PROGRAM CODE OR SCREEN CODE This field contains the six-character program or on-line screen code.
3	1		ACTION CODE
4	2		SECTION TO GENERATE The following section codes may be used in combination with the values entered in the PARAGRAPH TO GENERATE field:
		blank	IDENTIFICATION DIVISION.
		00	CONFIGURATION SECTION.
		01	INPUT-OUTPUT SECTION. FILE CONTROL. With PARAGRAPH TO GENERATE specifying a DATA STRUCTURE CODE, the INSTRUCTION TO BE INSERTED lines will appear after the FILE CONTROL statement. With PARAGRAPH TO GENERATE = blank, the data entered in the INSTRUCTION TO BE INSERTED field will override both the INPUT-OUTPUT SECTION and the FILE CONTROL statements.
		60	Is reserved for the DATA DIVISION.
		99	Is reserved for the FILE SECTION.
		$n	In a macro-structure, the SECTION TO GENERATE can be parameterized.
		9*	With PARAGRAPH TO GENERATE = ' FF': Rewriting of FD clause for FF file.
5	2		PARAGRAPH TO GENERATE The following codes are used to identify the COBOL statements listed below. With SECTION TO GENERATE = blank:

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		05	PAF comments.
		10	PROGRAM-ID.
		20	AUTHOR.
		30	DATE-COMPILED.
		40	ENVIRONMENT DIVISION.
			With SECTION TO GENERATE = '00':
		00	SOURCE-COMPUTER.
		10	OBJECT-COMPUTER.
		20	SPECIAL-NAMES.
			With SECTION TO GENERATE = '01':
		FF	SELECT FF-FILE
		00	I-O-CONTROL. This paragraph is not automatically generated, except in certain cases; with COBOL variant 6: BULL H66 BCD.
			With SECTION TO GENERATE = '99':
		99	FILE SECTION.
		$n	In a macro-structure, the PARAGRAPH TO GENERATE can be parameterized.
		90	With SECTION TO GENERATE = '01': RECEIVE-CONTROL (TANDEM).
6	3		LINE NUMBER PARAMETERIZABLE NUMERIC FIELD
		0-999	As a recommendation, number the lines starting with 10 by intervals of 10, thus facilitating future insertions.
		$n0 to $n9	In a macro-structure, only the first two characters of the LINE NUMBER can be parameterized.
7	66		INSTRUCTION TO BE INSERTED If the INSTRUCTION TO BE INSERTED should be in Margin A of the COBOL program, begin it in the second column of this field. If it should be in Margin B, begin it in the sixth column of this field.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		Otherwise, the INSTRUCTION TO BE INSERTED will be justified in column 7 (continuation/comments) of the generated COBOL program.
	S	(or any word beginning with an 'S') The value 'S' in the first column of this field causes the suppression of the section or paragraph generated.
	$n	In a macro-structure, this field can be parameterized.

4. MODIFYING THE WORKING-STORAGE/LINKAGE SECTION

4.1. DATA STRUCTURE CALLS (-CD)

INTRODUCTION

CALL OF DATA STRUCTURES (-CD SCREEN)

The purpose of this screen is to identify all data structures used in a program, specifying their physical characteristics as well as the way these files are to be used in the program.

The CALL OF DATA STRUCTURES screen is accessed by entering '-CD' in the CHOICE field from any screen within the Program entity's network.

GENERAL CHARACTERISTICS

Each data structure may be described on as many continuation lines as needed. Certain information must be entered on the first line of the call, as opposed to being entered on a continuation line, and vice versa.

The system assigns default values to required information areas of the data structure call line. By default, a data structure will look like a sequential file with fixed-length records. The data structure description will contain all of the data structure records, with the data elements in internal format, without the optional data elements.

ORGANIZATION

Data Structures are 'organized' into three basic types:

. Standard Files,

. Database Blocks,

. Work Areas or Linkage Areas.

The descriptions of the latter category may involve specifying data structures and/or data elements.
It is preferable to define the Work or Linkage fields on the screen provided for this purpose (-W). If the program is a Macro-structure (PMS), the '-W' is generated in the calling program, not the '-CD'.

NOTE: A Data Structure call in the -W screen does not allow for the creation of continuation lines (which limits the number of segment selections to four segments, for example).

Also, utilization, control breaks, and file matching cannot be specified on -W lines.

COMPOSITE DATA STRUCTURES

It is possible at the program level to build a data structure with segments belonging to different data structures.

This is accomplished by assigning the same DATA STRUCTURE CODE IN THE PROGRAM to different data structures, and selecting the desired segments from each.

The common part will be made of the code of the Data Structure called on the first line.

In order to call in a program Data Structure two or more segments which have the same two-character SEGMENT CODE or the same LAST CHARACTER OF THE REPORT CODE, but are extracted from different data structures in the library, it is necessary to change the code of one of them in the program.

```
-------------------------------------------------------------------------------
!                   PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! DATA STRUCTURES USED IN PROGRAM : 1  VRPREP VENDOR RATING PREPARATION         !
!                                                                              !
! 2 3  4    5  6      7 9 11      13  14  16   18 19     21          23  25  27!

!                      8 10 12          15  17      20     22          24  26  !
! A DP CO : DL EXTERN OARFU BLOCK T   B M U RE SE L UNIT C SELECTION F E R L PL!
!   CO    : CO PMSCO  SSFOU     0 R       D                         I     1   !
!         :    STAT.FLD: 28           ACC. KEY:  29        RECTYPEL 30         !
!   OI    : OI PMSPOF VSFID     0 R   1   C                         I     1   !
!         :    STAT.FLD:              ACC. KEY: POKEY      RECTYPEL           !
!   SO    : CO SORT   SSFTU     0 R       D                         I     1   !
!         :    STAT.FLD:              ACC. KEY:            RECTYPEL           !
!   WO    : CO WORK.  WSFOU     0 R       D                         I     1   !
!         :    STAT.FLD:              ACC. KEY:            RECTYPEL           !
!         :                                                                    !
!         :    STAT.FLD:              ACC. KEY:            RECTYPEL           !
!         :                                                                    !
!         :    STAT.FLD:              ACC. KEY:            RECTYPEL           !
!         :                                                                    !
!         :    STAT.FLD:              ACC. KEY:            RECTYPEL           !
!         :                                                                    !
!         :    STAT.FLD:              ACC. KEY:            RECTYPEL           !
!                                                                              !
! O: C1 CH: -CD                                                                !
-------------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	6		PROGRAM CODE (REQUIRED) Code identifying the program in the library.
2	1		ACTION CODE (REQUIRED)
3	2	ALPHA.	DATA STRUCTURE CODE IN THE PROGRAM (REQUIRED) This code establishes the sequence in which the data structure will be processed in the program. It must be alphabetic. It is recommended to keep the same DATA STRUCTURE CODE IN THE PROGRAM and IN THE LIBRARY when the data structure described in the library is used only once in the program.
4	2	ALPHA. blank	CONTINUATION OF D.S. DESCRIPTION First line of a data structure description. This line must contain all information defining the input-output characteristics, all technical characteristics and the description of the data structure. Two-letter code indicating a continuation line. The continuation lines are used to select the records of the different data structures in the library and to request their description in a specified position.
5	2		DATA STRUCTURE CODE This code is made up of two alphanumeric characters. This is a logical code internal to the Database and therefore independent of the names used in Database Blocks and Programs.
6	6		EXTERNAL NAME OF THE FILE (Default option: DATA STRUCTURE CODE IN THE PROGRAM.) (NOTE: In this discussion, the term 'COBOL Variant' = the value in the TYPE OF COBOL TO GENERATE field) FOR Y ORGANIZATION: This field must contain the Visualage Pacbase code of the server which accesses the Logical View. For explanations, refer to the PACBENCH C/S Reference Manual. FOR SQL ORGANIZATIONS: This field must contain the VisualAge Pacbase code of the SQL block.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			For explanations, refer to the "Structured Code" Manual, Chapter "Modifying the Procedure Division", Subchapter "Procedural Code Screen (-P)", and to the "Relational Database Description" Manual, Chapter "SQL Accesses", Subchapter "Customized SQL Accesses". FOR ALL THE OTHER ORGANIZATIONS: IBM MVS (COBOL Variant 0): DDNAME in 1 to 6 positions. IBM MVS VS2 (COBOL Variant X): DDNAME in 1 to 6 positions. IBM DOS (COBOL Variant 1), three forms: .SYSnnn Symbolic unit name. .xxxnnn Specifies at the same time the symbolic unit name and the external name of the data structure. .xxxxxx External name: The symbolic unit is generated with SYSnnn, nnn being incremented by one for each data structure starting with SYS010. DPS7 (COBOL Variant 4): .INTERNAL-FILE-NAME in 1 to 6 positons. DPS8 ASCII (COBOL Variant 5): .File code (2 characters). BURROUGHS large system (COBOL Variant 8), UNISYS A Series (COBOL Variant 8): .nnppp numeric, generate AREA nn, AREASIZE pppp. CDC (COBOL Variants D and E): Indicate output for a printer. Otherwise, external name in 1 to 6 positions. DPS8 BCD (COBOL Variant 6): 2 alphabetic characters. PRIME (COBOL Variant A): Taken into account if UNIT TYPE is D or U. BURROUGHS medium system (COBOL Variant B), UNISYS V Series (COBOL Variant B): Does not correspond to the external name, but to the space occupied on disk: .Number of areas in 2 numeric characters.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			.Number of records per area in 4 numeric characters. PERKIN-ELMER (COBOL Variant J): With ORGANIZATION 'S', indicate LUnn, varying nn from 00 to 99. HONEYWELL mini-6 (COBOL Variant M): 2 numeric or alphabetic characters. SIEMENS (COBOL Variant T): SYS000 to SYS099. IBM VS2 (COBOL Variant X): DDNAME in 1 to 6 positions. TANDEM (COBOL Variant F): external name in 1 to 6 positions. DEC/VMS (COBOL Variant I): external name in 1 to 6 positions. For an Y organization, this field corresponds to the Pacbase code of the server which contains the logical view. For more information, refer to the PACBENCH C/S Reference Manual.
			PHYSICAL CHARACTERISTICS OF FILE
7	1		ORGANIZATION
		S	Sequential (Default value).
		I	Indexed sequential (ISP for DPS8 BCD). An ISP file with a code of 'LE' will be generated in 3 work areas: LE-FILE, LE-DATA and INVKEY. LE-DATA will have the external file name as a value which must be the file code in the preceding $ DATA line. In the job control lines, the ISP lines give the physical characteristics of the file.
		V	VSAM (IBM), UFAS (Honeywell), etc. Generates the STATUS KEY IS clause and the corresponding field is declared in the STATUS FIELD: VSAM FILE INDICATOR field. The file is considered sequential if the name of the key in the record is absent; it is considered indexed if the key name is entered.
		W	File descriptions are generated in WORKING-STORAGE before the constant 'WSS-BEGIN'. A data structure thus described will be used like a work area or processed through a function of a generalized management system. (Database in particular).

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		L	Identical to 'W' except that the user may choose the description location (See CODE FOR COBOL PLACEMENT).
		X	Data structure used as a comment, not used for generation.
		G	Table description. Generates the communication area with the access module. See the PACTABLE Reference Manual.
		Y	Call of the CLAUSE COPY which corresponds to the communication area between the client and the server. For more information, refer to the CLIENT/SERVER ON-LINE SYSTEMS DEVELOPMENT Reference Manual. DATABASES --------- The values of the following codes are reserved for database descriptions when the Database Description function is not used. These values are taken into account by application programs.
		D	Reserved for the description of segments or records of the different databases, IMS (DL/1), IDS I, IDS II, (according to the TYPE OF COBOL TO GENERATE selected), in the generation of DBD, SYSGEN, schemas or application programs (according to the TYPE AND STRUCTURE OF PROGRAM selected).
		B	Reserved for the description of records for an IDMS database in the sub-schemas or application programs.
		A	Reserved for an ADABAS file description in the definition programs or usage programs of the database.
		T	Reserved for the description of 'TOTAL' files in the definition programs or the usage programs of the database.
		Q	Reserved for the description of SQL/DS, DB2/2 or DB2/6000 Databases (IBM), or ALLBASE/SQL Databases (HP3000), or DB2/2 or DB2/600 Databases (MICROFOCUS).
		2	Generation-Description of a DB2 or VAX/SQL segment. Only physical accesses are not generated. The structure of variable indicators corresponding to the columns of the DB2 or VAX/SQL table is always generated.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		C	Reserved for the description of an INTEREL RDBC, RFM database structure.
		O	Reserved for the description of an ORACLE (< V6) database structure.
		P	Reserved for the description of an ORACLE (V6 and V7) database structure.
		R	Reserved for the description of an RDMS database structure.
		3	Reserved for the description of an SQL SERVER database structure.
		4	Reserved for the description of a DB2/400 database structure.
		N	Reserved for the description of a NONSTOP SQL database structure.
		M	Reserved for the description of a DATACOM DB database structure.
		9	Reserved for the description of an INFORMIX, SYBASE, or INGRES/SQL database structure. The use of the System with the different DBMS's is documented in specific DATABASE DESCRIPTION Reference Manuals.
8	1		ACCESS MODE
		S	Sequential (default option).
		R	Random - Direct (indexed sequential organization only). Note: With random access input files, the READ is not generated automatically.
		D	Dynamic (VSAM files only - ORGANIZATION = 'V')
9	1		RECORDING MODE
		C	For P-type organizations (Oracle V6 and V7) and 9-type organizations (Sybase): Automatic generation of CONNECT AT database, DECLARE database and access SQL AT database.
		F	Fixed (default option). At generation time, the lengths of the different re-

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			cords are aligned with the length of the longest re- cord.
		V	Variable.
		U	Undefined.
		S	Spanned (Reserved for IBM MVS and DOS variants).
10	1		FILE TYPE - INPUT / OUTPUT
		I	Input file - Default option with the following values of USAGE OF DATA STRUCTURE: C, T, X, M, N and P. This value is prohibited with all other USAGEs.
		O	Output file - Default option with the following values of USAGE OF DATA STRUCTURE: D, S, R, E, I and J. This value is prohibited for all other USAGEs.
		T	Sort (on Input or Output, depending on the USAGE OF DATA STRUCTURE value).
		R	Input-Output (direct access data structures only).
		E	Output file. Generation of an OPEN EXTEND clause (only with the following values of COBOL TO GENERATE: 2, 4, 5, 6, D, E, F, G, H, I, J, K, Q, S, U, W, X, Y).
11	1		UNIT TYPE
		U	Magnetic storage with sequential access. (Default value).
		D	Magnetic memory with selective access. (Direct access device).
		R	Slow peripherals (Card punch reader, printer).
			This parameter is important when the TYPE OF COBOL TO GENERATE variant, the "ASSIGN" clause, the FD level or the WRITE statements depend on the UNIT TYPE.
12	5	NUMER.	BLOCK SIZE BLANCS ET ZEROS EQUIVALENTS
			PURE NUMERIC FIELD
			(Note: In this discussion the term 'COBOL Variant' = the value in the TYPE OF COBOL TO GENERATE field)
		0	Default value.
			The blocking factor can be zero for IBM OS (COBOL Variant 0) except for indexed data structures.
			The corresponding COBOL clause (BLOCK CONTAINS) is not

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			generated in the following cases: .sort data structure, .disk data structure (file stored on a disk) if no number is mentioned, .file with UNIT TYPE = 'R' in: .IBM DOS : (COBOL Variant 1) .PRIME : (COBOL Variant A) .fixed D.S. or with BLOCK ='0' for: .DPS8 BCD : (COBOL Variant 6) .BLOCK ='0' for : .CDC : (COBOL Variants D and E) .BURROUGHS large systems : (COBOL Variant 8) .UNISYS A Series : (COBOL Variant 8) .IBM 8100 : (COBOL Variant W) .IBM 36 : (COBOL Variant 2) .IBM 38 : (COBOL Variant Y) .AS 400 : (COBOL Variant O) This field is not used for: .ICL 2900 : (COBOL Variant K) .PERKIN-ELMER : (COBOL Variant J).
13	1		BLOCK SIZE UNIT TYPE
		R	Records (default value).
		C	Characters.
14	1		NUMBER OF CONTROL BREAKS (BATCH SYSTEMS DEVELOPMENT Function) All spaces are replaced with zeroes. For sequentially accessed, sorted files: Enter the number of elements (elementary or group) on which there is to be control break processing for the data structure.
		0	Default.
		1 to 9	1 to 9 levels, according to the number of elements to be used for control break processing. These elements are identified as the SORT KEYs for this data structure. When there is control break processing on one or more data structures, two indicators keep track of the status of the records being processed: Note: The term 'nth key data element' includes all key

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			data elements up to and including the nth level. .dd-IBn = '1': the nth key data element of the current record of data structure dd contains a new value, .dd-FBn = '1': the nth key data element of the current record of data structure dd contains the last occurrence of the present value. When these files are synchronized with others, (see FILE MATCHING LEVEL NUMBER) the control breaks are kept synchronized via two additional switches: .ITBn = '1':a new value in the nth key data element has been detected. This signals beginning processing on all synchronized d.s's. .FTBn = '1':the present value of the nth key data element is occurring for the last time. This signals end processing for the records in this iteration for all synchronized d.s's. For output files (USAGE OF DATA STRUCTURE value 'D'): A non-zero value will create a duplicate file layout to be generated in the WORKING-STORAGE area identifiable by a prefix of '1-'. Note however a preferable procedure to accomplish this is via the Work Areas (-W) Screen.
15	1		FILE MATCHING LEVEL NUMBER BLANKS REPLACED BY ZEROES. For sequentially accessed files: Used to establish the synchronization of two or more files.
		0	Default.
		1 to 9	Enter the number of elements (elementary or group) on which file matching is to be synchronized for this data structure. This number identifies the number of the key fields (identified in the SORT KEY/ field) that are involved in the synchronization. For an automatic file matching, the following conditions must be met: . The Data Structure control break level must be equal to the file matching level - 1, except for a transaction Data Structure, whose control break

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			level must be equal or superior to the file matching level. . The Data Element(s) which constitute(s) the sort keys of a Data Structure must be sorted in ascending order. . The Data Element(s) which constitute(s) the sort keys of a Data Structure must have the same length for the same level. . These Data Elements must have a display format (if they are numeric, they must be whole numbers and unsigned). Switches generated to control the file matching are: .dd-CFn: which indicates whether a file should be processed or bypassed in this iteration, ('1' = process, '0' = bypass). .dd-OCn: which indicates the status of processing on a record of a principal file (USAGE OF DATA STRUCTURE = 'P'). For sequentially accessed files: '1' = WRITE to the principal file '0' = do not WRITE. For direct access files: '1' = CREATE or REWRITE '0' = DELETE
16	1		USAGE OF DATA STRUCTURE This code defines the role of the data structure in the program and determines the generated functions.
		C	Consult: Any input file (data structure).
		D	Direct: Any output file (default).
		T	Table: A file to be fully stored in memory. The table is generated according to the number of repetitions indicated on each Segment Definition. (See OCCURRENCES OF SEGMENT IN TABLE). The maximum number of selected segments per D.S. = 50.
		X	Table: A file to be partially stored in memory. (Only elements other than FILLER are loaded). Elementary data elements other than FILLER are limited to 10 (in addition to the RECORD TYPE ELEMENT) for the '00' segment and to 29 for each specific non-00 segment.
		S	Selected: Output file extracted from another file.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			It differs from USAGE value 'D' since the generated description in the output area is not detailed. For data elements with an 'OCCURS DEPENDING ON' clause, the USAGE OF DATA STRUCTURE must be 'D'. The following values are specific to the BATCH SYSTEMS DEVELOPMENT function:
		P	Principal: Input file, likely to be updated (by a transaction file - usage value 'M' or 'N').
		R	Result: Updated principal file in sequential access mode. (When the D.S. contains an 'OCCURS DEPENDING ON' clause, the output/result D.S must be declared as 'D')
		M	Transactions to be validated: Input file to be validated which may update other file(s). The generated functions range from 30 to 76. Note: Only one 'M' or 'N' D.S. is allowed per program.
		N	Transactions not to be validated: Input file which can update other files. The generated functions are: 30, 33, 39, 70 to 76. Note: Only one 'M' or 'N' D.S. is allowed per program.
		E	Transaction file with errors detected: Output transaction file containing a field identifying records with errors. The system will generate the field(s) to track the erroneous elements, erroneous segments and user defined errors using the reserved data elements ENPR, GRPR and ERUT. (The option is selected in the RESERVED ERROR CODES IN TRANS. FILE field). Selected or not, the descriptions of these elements are generated (using the data elements DE-ERR and ER-PRR). These descriptions precede the descriptions of the elements.
		I	Direct printing (or by SYSOUT in IBM MVS). At the generation level, the lines with STRUCTURE NUMBER value of '00' will be ignored. (See Chapter "REPORTS" Subchapters "CALL OF ELEMENTS SCREEN" and "DIRECT PRINT/ APPLIC. SPOOLING RTN.")
		J	Indirect printing to be processed by a spool program. Fields required for identifying the lines, line skips, etc. are defined in report STRUCTURE NUMBER value 00.
17	2		RESULTING FILE DATA STRUCTURE CODE With USAGE OF DATA STRUCTURE value 'P', indicate the DATA STRUCTURE CODE IN THE PROGRAM of the resultant output D.S. For an output type USAGE OF DATA STRUCTURE, (value 'R' or 'D'), indicate the DATA STRUCTURE

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			CODE IN THE PROGRAM of the input principal D.S.
18	2		SOURCE OR ERROR DATA STRUCTURE CODE For a transaction file (USAGE OF DATA STRUCTURE = 'M' or 'N'), enter the DATA STRUCTURE CODE IN THE PROGRAM of the transaction file containing the error fields (USAGE OF D. S. = 'E') if one has been called. For a transaction file with the error field (USAGE OF D.S. = 'E'), enter the DATA STRUCTURE CODE IN THE PROGRAM of the corresponding transaction file (USAGE OF D.S. = 'M' or 'N'). For a selected file (USAGE OF D.S. = 'S'), enter the DATA STRUCTURE CODE IN THE PROGRAM of the input source with the corresponding data structure code of the selected file on the line where the source file is being called.
19	1		TRANSACTION CONTROL BREAK LEVEL ALL SPACES REPLACED BY ZEROS. Default option: NUMBER OF CONTROL BREAKS In a transaction file, enter the position within the SORT KEY/ of the ACTION CODE ELEMENT. For example, if the SORT KEY/ value is ABCDE and the ACTION CODE ELEMENT is 'D', enter '4' here. This element is the minor-most key of the sort key and the one used to differentiate one type of transaction from another of the same principal file. Duplicates are detected if any key elements below this one are found to match.
20	4		PHYSICAL UNIT TYPE (NOTE: The term 'COBOL Variant' = the value in the TYPE OF COBOL TO GENERATE field) Generates the following in the SELECT clause of some COBOL variants: IBM DOS (COBOL Variant 1): Enter the model type (examples: 2314, 3330, 2400). IBM 36 (COBOL Variant 2):
		DK or blank	Disk.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		PT	Printer.
			MICROFOCUS, COBOL II, IBM VISUAL SET (COBOL Variant 3)
		EXT	Generation of the EXTERNAL clause at the file FD level
		LS	Generation of the LINE SEQUENTIAL clause
		EXLS	Generation of the LINE SEQUENTIAL clause and of the EXTERNAL clause at the file FD level
			DPS7 (COBOL Variant 4):
		SSF	Option WITH SSF in the SELECT clause
		OUT	Option -SYSOUT suffix after the filename in the SELECT clause (WITH SSF is generated).
			DPS8 ASCII (COBOL Variant 5):
		PT	Printer.
		CR	Card reader.
		SSF	ORGANIZATION IS GFRC SEQUENTIAL SSF CODE SET IS IS GBCD.
		IBM	ORGANIZATION IS IBM-OS SEQUENTIAL.
		xxx	WITH xxx.
		...V	A 'V' in the 4th position generates the clause 'VALUE OF FILE-ID is 3-FF00-IDENT' (FF is the program D.S. code). The field 3-FF00-IDENT must be defined in -W by the user.
			BURROUGHS large system (COBOL Variant 8) UNISYS A Series:
		DK or blank	Disk.
		DKS	Sort Disk (with T opening).
		DKM	Merge Disk (with T opening).
		RD	Reader.
		PT	Printer.
		PO	File.
		TP	Tape.
			For the 2-character codes, a third character can specify a particular final disposition:
		..P	Purge.
		..R	Release.
		..L	Lock.
		..S	Save.
		...V	A 'V' in the 4th position generates the clause 'VALUE OF D.S. NAME IS 3-FF00-IDENT'.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		UNISYS 2200 (COBOL Variant U):
	CR	Card reader.
	CP	Card punch.
	UN	Uniservo.
	TP	Tape.
	PN	Printer with external name. If the COMPLEMENTARY PHYSICAL UNIT TAPE field contains input, the RECORDING clause is also generated.
	PT	Printer without external name.
	PF	Printer with external name and: VALUE OF PRINTER-FORMS 3-FF00-FORMS LINAGE IS 3-FF00-LINES TOP IS 3-FF00-TOP BOTTOM IS 3-FF00-BOTTOM These 4 data-names are to be declared in Work Areas (-W) lines with their appropriate values.
		DPS8 BCD (COBOL Variant 6):
	LIST	Printer.
	LINE	Card reader.
		UNISYS 90/30 (COBOL Variant 9):
	84	Disk with external name.
	PT	Printer.
	CR	Card reader.
	CP	Card punch.
	TP	Tape.
		PRIME (COBOL Variant A):
	blank	PMFS.
	T7	7 track tape.
	T9	9 track tape.
	RD	Reader.
	PR	Printer.
	PU	Puncher.
	OP	Offline printer.
	TL	Terminal.
		BURROUGHS medium system (COBOL Variant B) UNISYS V Series:
	RD	Card reader.
	DK	Fixed disk.
	DP	Removable disk.
	TP	Magnetic tape.
	PT	Printer.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		PC	Card punch.
		PP	Tape punch.
		PR	Punch tape reader.
		T7	7-track tape.
			The third character specifies a particular final disposition for the data structure:
		..P	Purge.
		..R	Release.
			PERKIN-ELMER (COBOL Variant J):
		blank	Disk.
		TP	Tape.
		PR	Printer.
		RD	Reader.
		CA	Cassette.
		PT	Paper tape.
			SIEMENS (COBOL Variant T): Examples 590, 432, etc.
			IBM SYSTEM 38 (COBOL Variant Y) or AS 400 (COBOL Variant O):
		DB	Database.
		RD	Reader.
		CP	Card Punch.
		PT	Printer.
		TP	Tape.
		DK or blank	Disk.
21	1		COMPLEMENTARY PHYSICAL UNIT TYPE
			In this discussion the term 'COBOL Variant' = the value in the TYPE OF COBOL TO GENERATE field.
			IBM DOS (COBOL Variant 1):
		R	Reader.
		P	Punch.
			IBM 3/15D (COBOL Variant 3):
		S	EBCDIC Tape.
		C	ASCII Tape.
			DPS8 ASCII (COBOL Variant 5):

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		S	EBCDIC Set code.
		C	ASCII Set code.
			CDC COBOL 68 (COBOL Variant E):
		S	Recording mode is EBCDIC.
			UNISYS 2200 (U variant):
		S	Recording followed by lock mode.
			BULL DPS7 (COBOL Variant 4) and DPS8 (COBOL Variant 6)
		O	If the value 'O' is entered in this field, the OPTIONAL option is not generated. Otherwise, the OPTIONAL option is generated by default.
			DEC VAX VMS (COBOL Variant I)
		A	File opening with option ALLOWING ALL and sequential reading with option REGARDLESS.
22	9		SORT KEY / SEG SELECT / REPORT CODES This field has three mutually exclusive uses: 1. Composition of the sort key --- This is the group of data elements making up the sort key for control break processing. They are identified by the value entered in the KEY INDICATOR FOR ACCESS OR SORT field on the Segment Call of Elements (-CE) screen. The order of sorting these key data elements may be entered here using the values assigned on the Call of Elements (-CE) screen in the desired order of major to minor - left to right. If no explicit entry is made here, elements coded with value 1 to 9 will be taken as the default. The data specifying the sort order must be entered on first line of the data structure call. (That is on the line where the CONTINUATION OF D.S. DESCRIPTION field remains blank.) Note: For transaction files, include the ACTION CODE and RECORD TYPE ELEMENTs as a part of the key. The order in which these elements are sorted will determine the sequence in which the transactions update the principal file, and the policy for duplicate record detection. 2. Selection of segments in a data structure

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE

			Rather than having all of the segments belonging to a data structure described, the user may select the ones that are needed, thus avoiding unnecessary description lines and wasted work area space. This may be significant for tables (USAGE OF DATA STRUCTURE = 'T'). This is done by entering an '*' in the first column of this field followed by a maximum of 4 SEGMENT CODEs, in addition to the common part. The segments may come from different D.S.'s, but in this case, it is better to call these segments into another segment. When the user wishes to re-create the file matching key and select records, he/she must indicate the file matching on the first Segment Call line, and the selected records on continuation lines. When segments come from different D.S. descriptions, the common part of the first D.S. called is considered to be the resulting file common part. The other D.S.'s must not have a common part. 3. Report selection for a print data structure ----------
			Enter the LAST CHARACTER OF THE REPORT CODE (max. 9). If not used, all reports specified for the data structure are printed. Generally, continuation lines are created if more than four segments or nine reports are selected. It is possible to rename a SEGMENT CODE or LAST CHARACTER OF REPORT CODE : one line per segment or report to be renamed is created. Enter the LAST CHARACTER OF REPORT CODE as known in the library, followed by the desired code for the program separated by an "=" sign. Follow the same procedure to rename the SEGMENT CODE, but precede the old segment code with an asterisk. EXAMPLE: 1=2 Rename report code 1 report code 2 *01=02 Rename segment code 01 segment code 02.
23	1		NON-PRINTING DATA STRUCTURE FORMAT This option is reserved for data structures with a USAGE OF DATA STRUCTURE other than 'I' or 'J'.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		E	Input format. (Default option with USAGE OF D.S. = 'M', 'N' or 'E').
		I	Internal format (Default with USAGE OF D.S. NOT= 'M', 'N' or 'E').
		S	Output format. Note: the Data Elements making up the Segments must not exceed 999 characters.
24	1		RESERVED ERROR CODES IN TRANS. FILE Indicates if reserved data elements (ENPR, GRPR, ERUT) contained in the data structure description are to be described.
		blank	The description is not generated.
		V	The descriptions are generated for all of these data elements.
		W	Same as 'V', but the data element ENPR represents the error vector. (Reserved for USAGE OF D.S. = 'M', 'N' or 'E'.)
		E	Only the 'ENPR' and 'GRPR' descriptions are generated.
		U	Only the 'ERUT' description is generated. In a transaction file (USAGE OF D.S.= 'M', 'N' or E'), these data elements must appear at the beginning of the description and are used to carry results of validations to the update. .ENPR: n+1 positions for values 'V' or 'E' and m+1 positions for value 'W', where: n = number of elementary data elements in the data structure description. m = greatest number of elementary elements in the file : that is, those in the common part segment plus the largest non-00 segment. The extra position is the identification error. It initializes the DE-ERR vector. .GRPR: 1 position per record + 1 for group error. It initializes the SE-ERR vector. When these elements are used in a file other than a transaction-type file, the placement and format is at the option of the user.
		1..9,0	With the PACTABLE function, it specifies the number of sub-schemas desired. (Refer to the PACTABLE

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			Reference Manual.) With an SQL utilization file, it specifies the number of the sub-schemas desired (selection of a Column in a Table).
25	1		RECORD TYPE / USE WITHIN D.S. This option is used to select the type of record description to be used in the COBOL program to allow different uses of the segment description stored in the library.
		blank	Redefined records (Default option). No VALUE clause is generated.
		1	A record set without initial values or repetitions of records. These records are presented with the segment common part followed by the different specific parts. If the data structure description appears in the COBOL FILE SECTION, the LEVEL NUMBER (COBOL) OF THE RECORD must be 2. With this value, the specific segments are described without redefines, at the COBOL 02 level. Several segment descriptions are grouped together under the same I/O area.
		2	A record set with the specific initial values of the data element of the segment as defined on the Call of Elements or Data Element Description screen. These values may also default to blank or zero depending on the format. This type of description cannot be used for a data structure having a number of repetitions in the common part definition. (Use ORGANIZATION = 'W' or 'L').
		3	A record set which incorporates the number of repetitions specified in OCCURRENCES OF SEGMENT IN TABLE on the Segment Definition Screen. No VALUE clause will be generated. If the description of the data structure appears in the COBOL FILE SECTION, the LEVEL NUMBER (COBOL) OF THE RECORD must be '2'.
		4	A record set which incorporates the number of repetitions specified in the OCCURRENCES OF SEGMENT IN TABLE on the Segment Definition Screen. The associated LEVEL NUMBER (COBOL) OF THE RECORD must be '3'. Comment specific to the OLSD function: For a description type of '4' and a COBOL 03 level,

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			the index is not generated. A COBOL 02 level is used to access the table made up of repetitions of the same record (ddssT). A COBOL 01 level is used to group the whole D.S. together - common or specific parts, whether repeated or not. A group level field that incorporates all occurrences is generated. For data structures that do not have a value specified for the OCCURRENCES OF SEGMENT IN TABLE, use ORGANIZATION = 'W' with USAGE OF D.S. = 'T'.
		6	To be used only with the GIP interface. The number of levels are the same as the one of the record type 4.
26	1		LEVEL NUMBER (COBOL) OF THE RECORD This option, used in conjunction with the RECORD TYPE /USE WITHIN D.S. field, defines the COBOL level number for the descriptions of data structures, segments and elements. In the following descriptions, the term 'D.S. Area' is meant as the area 'dd00' (possibly 1-dd00, 2-dd00).
		1	COBOL 01 level for D.S. Area and segments. (Default value). If the data structure description appears in the COBOL FILE SECTION, the segments must be redefined. If a data structure has no common part with a non-redefined description, the D.S. Area will only appear when the RECORD TYPE / USE WITHIN D.S. = blank.
		2	COBOL 01 level for D.S. Area and segments at 02 level. If the RECORD TYPE / USE WITHIN D.S. = blank, both the D.S. Area and the Segments will be described at the 02 level. (To define the 01 level, use ORGANIZATION = 'L' and Work Areas (-W) lines.)
		3	Reserved for D.S. with an ORGANIZATION = 'W' or 'L'. COBOL 02 level for the D.S. Area and segments at 03 level when associated with RECORD TYPE / USE WITHIN D.S. = 1, 2, or 3. 01 level for the D.S. Area and segments at 03 level

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			when associated with RECORD TYPE / USE WITHIN D.S.= 4. 03 level for both the D.S. Area and the segments when associated with RECORD TYPE / USE WITHIN D.S. = blank.
		4	Reserved for data structures with an 'L' ORGANIZATION and USAGE OF DATA STRUCTURE = 'D'. The 01 level is to be defined via the Work Areas Screen (-W). COBOL 02 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group appear. The D.S. Area and segment levels disappear.
		5	Reserved for data structures in ORGANIZATION 'L' or 'W' and with a USAGE OF DATA STRUCTURE = 'D'. COBOL 01 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group appear. The D.S. Area and segment levels disappear.
		6	Reserved for data structures with an 'L' ORGANIZATION and USAGE OF DATA STRUCTURE = 'D'. The 01 level is to be defined via the Work Areas Screen (-W). COBOL 02 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group disappear as well as D.S. Area and segment levels. For standard OLSD Screens only.
		7	Reserved for data structures in ORGANIZATION 'L' or 'W' and with a USAGE OF DATA STRUCTURE = 'D'. COBOL 01 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group disappear as well as D.S. Area and segment levels. For standard OLSD Screens only.
27	2		CODE FOR COBOL PLACEMENT PSEUDO-NUMERIC FIELD, blanks replaced by zeros. This field concerns only the principal description of a D.S. (ddss) and not the descriptions preceded by a prefix (1-ddss or 2-ddss).

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		This field is used to obtain a description of a D.S. in a particular area (COMMUNICATION area with DBMS's or the LINKAGE SECTION which the user must define by a Work Areas (-W) line), or at the beginning of the WORKING-STORAGE SECTION. This field is reserved for D.S.'s with an 'L','D' or 'W' ORGANIZATION, in order to place the I/O area in WORKING STORAGE. To have a data structure described in WORKING-STORAGE it is preferable to use the Work Areas (-W) lines. (Refer to the STRUCTURED CODE Reference Manual.)
	00	The description of the D.S. is inserted after all the Work Areas (-W) lines. (Default value).
	alphabet.	The description of the D.S. is inserted after all the Work Areas (-W) lines whose 5-digit line number begins with this value. The description and Work Areas (-W) lines are found at the beginning of the generated program WORKING-STORAGE SECTION. These lines appear both before data structures with ORGANIZATION = 'W' and before those whose DATA STRUCTURE CODE IN THE PROGRAM is greater than this alphabetic code. (Do not use this field with a data structure whose ORGANIZATION = 'W'.)
	alphanum.	The description of the D.S. is inserted after all the Work Areas (-W) lines whose 5-digit line number begins with this value. The Work Areas (-W) lines and the description can be found in the generated program, at the end of the WORKING-STORAGE SECTION among the user areas. Location is indicated on the first line of the D.S. call (CONTINUATION OF D.S. DESCRIPTION field = blank), and is repeated (by default) on all of its continuation lines. However, it is possible to attribute different locations to each record description of D.S. in a program. This is done by entering several call lines for this D.S., specifying a record selection and a location for each one. Therefore the data structure must have an unpacked description, whether implicit or explicit.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			WARNING: with ORACLE, you must use numeric values so that the DECLARE SECTION will be correctly generated (with data fields and indicators included in it).
28	10		STATUS FIELD - FILE INDICATOR (Note: In this discussion, the term 'COBOL Variant' = the value in the TYPE OF COBOL TO GENERATE field) Enter the DATA STRUCTURE, SEGMENT and DATA ELEMENT CODEs in the following format: ddsseeeeee (Recommendation: ss = 00). This field is used in one of three ways: For VSAM files: .The FILE STATUS IS clause is generated using 1-ddss-eeeeee (declared as a two byte field). For hardware other than DPS8 BCD and non-VSAM files: .The NOMINAL, SYMBOLIC or ACTUAL KEY depending on the COBOL Variant. The user must define the corresponding work area: 1-ddss-eeeeee. The positioning of this key as well as the read of the D.S. must be programmed by using Procedural Code (-P). For DPS8 BCD (COBOL Variant 6): .Identification of the data structure .The corresponding 'VALUE OF' clause will be generated only if it's filled in .The return-code area of the input-output operations .The corresponding 'FILE STATUS IS' clause will be generated only if it's filled in
29	6		INDEXED DATA STRUCTURE ACCESS KEY Required for indexed data structures: Enter the DATA ELEMENT CODE of the access key element.
30	6		CODE OF RECORD TYPE ELEMENT

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		Enter the code of the data element whose values define different record types of a data structure. Note: Must be in the common part (00 segment). This code can also be specified on the Segment Definition Screen for the 00 Segment in the CODE OF RECORD TYPE ELEMENT field, and is then used as a default value at generation level.

4.2. WORK AREAS SCREEN (-W)

WORK AREAS SCREEN

The Work Areas (-W) screen completes the WORKING-STORAGE SECTION, LINKAGE SECTION, and the other supplementary sections that constitute the Work Areas of the DATA DIVISION.

This screen is used to accomplish the following:

. Call in data structures that already exist in the dictionary;

. Call in data elements that already exist in the dict- ionary (with or without a segment), in the desired format;

. Declare data elements that do not exist in the dict- ionary;

. Write in Source languages other than COBOL, in free structure programs (PROGRAM TYPE = 'S');

. Name additional COBOL sections.

NOTE: This should be limited to the declaration of clauses that are not automatically generated by PACBASE, such as 'LINKAGE SECTION' in a batch program.

. Generate the indexes used in a table search (with the 'SCH' OPERATOR). This is done by associating a TABLE SIZE (OCCURS CLAUSE) value to the DATA STRUCTURE and SEGMENT CODE in the WORK AREA DESCRIPTION field.

RECOMMENDATIONS

The Data Structure (-CD) call screen defines resources that are external to the program (file, data bases, etc.). WORKING-STORAGE SECTION and LINKAGE SECTION fields are grouped together in the '-W' screen, which makes it easy to organize them.

Furthermore, it is the '-W' lines of a macro-structure that are corporated into calling programs, and not Data Structure (-CD) calls. Be sure that the macro-structure '-W' keys don't conflict with those of the calling program or of other macro-structures.

CALLING DATA STRUCTURES

Data structures are called by using 'F'-type lines. An input guide is used to enter the attributes of the data structure. (See the 'Type of line or data element format' field in the screen description.)

MODIFYING THE WORKING-STORAGE/LINKAGE SECTION 4
WORK AREAS SCREEN (-W) 2

```
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! WORK AREAS.........ENTITY TYPE O SA0010 *** REQUEST INPUT  ***                !
!                              1 2                                              !
! CODE FOR PLACEMENT..:  3  AB                                                  !
! 4 5   6 7                 8                                        9         !
! A LIN T LEVEL OR SECTION WORK AREA DESCRIPTION                     OCCURS     !
! * 010 *             -->  MESSAGE BEFORE PROVOKED ABEND <---                   !
! * 100   01               ABEND-MESS.                                          !
! * 120     05              FILLER       PIC X(24)   VALUE                     !
! * 130                     'TRANSACTION TERMINATION '.                        !
! * 150     05              ABEND-TRANS  PIC X(4).                             !
! * 170     05              FILLER       PIC X(11)   VALUE                     !
! * 180                     ' : FILE '.                                        !
! * 200     05              ABEND-DDNAME PIC X(8).                             !
! * 220     05              FILLER       PIC X       VALUE SPACE.              !
! * 240     05              ABEND-RMESS  PIC X(8).                             !
! * 260     05              FILLER       PIC X(23)   VALUE                     !
! * 270                    '. CALL EXTENSION 345.'.                           !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
! O: C1 CH: -W                                                                 !
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	1		ENTITY TYPE This field is used to identify the entity to which these lines are attached:
		O	On-line Screen
		P	Program
			The user may overkey this field in order to copy lines attached to a Screen into a Program and vice-versa.
2	6		PROGRAM CODE OR SCREEN CODE (REQUIRED) This field contains the six-character program or on-line screen code.
3	2		CODE FOR COBOL PLACEMENT (REQUIRED) PSEUDO-NUMERIC FIELD Valid values for this field are alphabetic characters, (blanks replaced by zeros), numeric characters, and $n for a parameterized value in a PMS. This value is used to determine the placement and the sequence in which data entered on this screen will be generated in the DATA DIVISION. These characters form the first two digits of a sequencing number, with the value in the LINE NUMBER field as the last three. For Batch programs:
		AA to ZZ 0A to 0Z	A CODE FOR COBOL PLACEMENT smaller than '00' causes the data entered on this screen to be generated at the beginning of the WORKING-STORAGE SECTION. Relatively to data structures called via the Call of Data Structures (-CD) screen, these data will be generated as follows: .before the description of data structures with ORGANIZATION = 'W' and whose DATA STRUCTURE CODE IN THE PROGRAM matches this prefix or is greater than it, .before the description of data structures with ORGANIZATION = 'L' or 'D' and whose CODE FOR COBOL PLACEMENT (on -CD screen) matches this prefix or is greater than it.
		00 to 09 1A to 19 ... 9A to 99	A CODE FOR COBOL PLACEMENT greater than '00' causes the data entered on this screen to be generated in the WORKING-STORAGE SECTION, after all data structures whose CODE FOR COBOL PLACEMENT (on -CD screen) is smaller than this prefix.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			For On-Line Programs:
		AA to 0Z	If this value is less than '00' (from 'AA' to '0Z'), the description is generated in the WORKING-STORAGE SECTION.
		00 to 99	Otherwise, it is generated in the LINKAGE SECTION.
		AA	This value is used by the system for data generated automatically.
		00	This value is used by the system for data generated automatically. Other codes may be reserved for special usage depending upon the TP monitor type chosen for generation.
		99	With LINE NUMBER = '999': This value is used by the system for the 'PROCEDURE DIVISION' statement. Therefore, you may use it to create a line with a sequencing number '99999', which will replace the generated statement.
		$n	In a Parameterized Macro-Structure, this value may be parameterized.
4	1		ACTION CODE
5	3		LINE NUMBER BLANKS REPLACED BY ZEROS
		0-999	As a recommendation, number the lines starting with 10 by intervals of 10, thus facilitating future insertions.
		$n0 to $n9	In a macro-structure, only the first two characters of the LINE NUMBER can be parameterized.
6	1		TYPE OF LINE OR DATA ELEMENT FORMAT TYPE OF LINE values: ----------
		blank	Data entered in the LEVEL AND SECTION and WORK AREA DESCRIPTION fields are to be generated as entered.
		-	Continuation character for a literal.
		*	Comment. Data entered in the LEVEL AND SECTION and WORK AREA DESCRIPTION fields contain comments to be

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		inserted into the generated program (ANSI COBOL only).
	$	This value will appear in column 7 of the generated COBOL and the other elements of the WORKING line will appear as it is.
	F	Call of a data structure. See subchapter "WORK AREAS FORMATTED LINE". When 'F' is entered, the system responds with a formatted line which is used to facilitate data entry. The fields are the same as those used on the Call of Data Structures (-CD) screen for d.s.'s with ORGANIZATION = 'W', 'L' or 'D'. .DATA STRUCTURE CODE IN THE PROGRAM. .DATA STRUCTURE CODE IN THE LIBRARY. .SEGMENT SELECTION (enter the SEGMENT CODE without an asterisk). (A segment code can only be renamed in batch). .NON-PRINTING DATA STRUCTURE FORMAT (1 to 8). .RECORD TYPE / USE WITHIN D.S. (I, E or S). .LEVEL NUMBER (COBOL) OF THE RECORD (1 to 5). .ORGANIZATION. .SUB-SCHEMA NUMBER. .LINE SEQUENCE. Type 'F' '-W' lines are processed as Data Structure call lines (-CD) only for batch. If two Type 'F' '-W' lines referring to the same d.s. (same DATA STRUCTURE CODE IN THE PROGRAM) are separated, they will nevertheless be generated one after the other. For IMS sub-monitors:
	M	Sub-monitor; enter the code of the sub-monitor in the LEVEL OR SECTION field.
	C	Call of a screen into the sub-monitor named above. Enter the SCREEN CODE of the screen belonging to the sub-monitor in the LEVEL OR SECTION field, followed by a space and a 'D' for Dynamic call or 'S' for Static. Example: C OOSCRN D Note: Enter one SCREEN CODE per 'C'-type line.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			DATA ELEMENT FORMAT values: ----------
		E	Use of the INPUT FORMAT of a data element.
		I	Use of the INTERNAL FORMAT of a data element.
		S	Use of the OUTPUT FORMAT of a data element.
			For these format types, the presence of the Data Element in the Specifications Dictionary is checked. A cross-reference is established, which prohibits the delection of the Data Element whenever the lines in which it is called have not been deleted themselves.
			If the Data Element does not exist in the Specifications Dictionary, the System sends a warning.
			When a global replacement is required (.C2), the Data Element is not checked but the cross-references will still be created.
			For these three format types, the data-name entered in the WORK AREA DESCRIPTION must therefore have the following format: W-DDSS-EEEEEE where: W = a working-storage prefix, DDSS = a given DATA STRUCTURE and SEGMENT CODE, EEEEEE = a DATA ELEMENT CODE which exists in the specifications dictionary. The corresponding format will automatically be attributed by the System.
7	17		LEVEL OR SECTION Enter a COBOL Level Number (example: 01, 05,....) or a section name (example: LINKAGE SECTION).
		$n	In a macro-structure, this value can be parameterized.
8	48		WORK AREA DESCRIPTION The user should always use data-names that conform to the standards recognized by the System. The structure of these names is 'w-ddss-eeeeee', where: w = Working-storage prefix (alpha or numeric),

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			dd = DATA STRUCTURE CODE, including the work area, ss = SEGMENT CODE, eeeeee = DATA ELEMENT CODE. If this standard is followed, the data element/program cross-references will be established automatically. Values entered in this field appear on the same line in the generated code, as the value entered in the LEVEL OR SECTION field. When used in combination with the TABLE SIZE (OCCURS CLAUSE) field, the value entered in this field must be left-justified. The prefix ('w-') may be omitted, however, two spaces must then be entered to replace them.
		$n	In a macro-structure, the WORK AREA DESCRIPTION value can be parameterized. NOTES: The period is not automatically generated after 'PICTURE', enabling the user to enter a COBOL clause (like VALUE, JUSTIFIED, etc.), which must be entered on the following line. The period must be explicitly indicated at the end of a declaration. When a data element is called into a WORKING-STORAGE or LINKAGE SECTION field, if the data element code exists in the dictionary, the data name must be entered in this field. Otherwise, the generated code must be in the following format: 03 DDSS-DELCO PICTURE X.
9	5		TABLE SIZE (OCCURS CLAUSE) PURE NUMERIC FIELD Enter the maximum number of occurrences for the table. An entry in this field causes the generation of the three indices: IddssM, IddssL and IddssR. .IddssM initialized to the value entered. .IddssL initialized to zero. This index may be used to load the table. It keeps track of the actual table size.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		.IddssR initialized to zero. This index may be used for table searches. The DATA STRUCTURE and SEGMENT CODEs are entered, prefixed with some work area prefix code in the standard PACBASE format: 'w-ddss' or 'w-ddss-eeeeee'. This value MUST be left-justified in the WORK AREAS DESCRIPTION field. The prefix may be replaced by spaces. Note: This can be done on a comment line ('*' as the TYPE OF LINE value).
	$n	In a macro-structure, this value may be parameterized. This field is not taken into account when used in a formatted line.

4.3. WORK AREAS FORMATTED LINE

WORK AREAS FORMATTED LINE

When a data structure that was previously defined is to be used as a work file, the user may call this data structure into the WORKING-STORAGE (or LINKAGE) SECTION by requesting a Formatted Line. This is done by entering 'F' in the TYPE OF LINE field (a LINE NUMBER value is also required). The system will respond with a line containing screen labels for input fields.

INPUT FIELDS

Only the fields that pertain to the formatted line will be described in this subchapter. The fields that pertain to the Work Areas (-W) screen as a whole are described in the previous subchapter.

The formatted line fields for the most part are a subset of the fields that appear on the Call of Data Structures (-CD) screen, and are used in a similar fashion. The exceptions to this rule are:

. The SEGMENT SELECTION field is used to select segments within a data structure to be described. On the Call of Data Structures screen, the user would need to enter an asterisk prior to the SEGMENT CODE. On the Work Areas screen, no asterisk is to be entered. For on-line programs, the common part segment (00) must be explicitly entered. With batch programs, it is implicitly selected (if it exists).

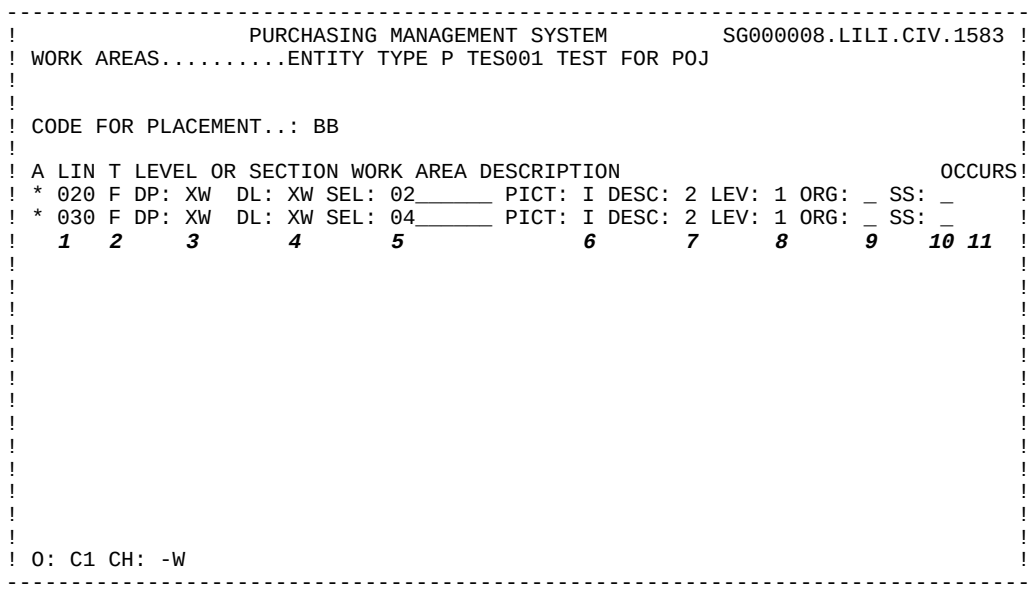
. The SUB-SCHEMA NUMBER field is used with the PACTABLE function, and is used to specify which sub-schema is to be described.

. The LINE SEQUENCE field does not have a screen label. Its physical location on this line is the column directly to the right of the SUB-SCHEMA NUMBER field. This field is used only for upward compatibility, if needed.

GENERAL INFORMATION

Segments generated as a result of data entered on the formatted line are named according to the following standard: ddss.
Data elements are named: ddss-eeeeee.

MODIFYING THE WORKING-STORAGE/LINKAGE SECTION 4
WORK AREAS FORMATTED LINE 3



NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	3		LINE NUMBER BLANKS REPLACED BY ZEROS
		0-999	As a recommendation, number the lines starting with 10 by intervals of 10, thus facilitating future insertions.
		$n0 to $n9	In a macro-structure, only the first two characters of the LINE NUMBER can be parameterized.
2	1		TYPE OF LINE
		F	When 'F' is entered, the system responds with a formatted line which is used to facilitate data entry. The fields here, for the most part, are the same as those on the Call of Data Structures (-CD) screen for data structures with ORGANIZATION = 'W', 'L' or 'D'. .DATA STRUCTURE CODE IN THE PROGRAM. .DATA STRUCTURE CODE IN THE LIBRARY. .SEGMENT SELECTION. .NON-PRINTING DATA STRUCTURE FORMAT. .RECORD TYPE / USE WITHIN D.S. .LEVEL NUMBER (COBOL) OF THE RECORD. .ORGANIZATION. .SUB-SCHEMA NUMBER. .LINE SEQUENCE. (Note: This field has no label on the screen). Type 'F' '-W' lines are processed as Data Structure call lines (-CD). If two Type 'F' '-W' lines referring to the same d.s. (same DATA STRUCTURE CODE IN THE PROGRAM) are separated, they will nevertheless be generated one after the other.
3	2		DATA STRUCTURE CODE IN THE PROGRAM This code establishes the sequence in which the data structure will be processed in the program. It must be alphabetic. It is recommended to keep the same DATA STRUCTURE CODE IN THE PROGRAM and IN THE LIBRARY when the data structure described in the library is used only once in the

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			program.
4	2		DATA STRUCTURE CODE This code is made up of two alphanumeric characters. This is a logical code internal to the Database and therefore independent of the names used in Database Blocks and Programs.
5	8		SEGMENT SELECTION Rather than describing all of the segments belonging to a data structure, the user may select the ones that are needed, thus avoiding unnecessary description lines and wasted work area space. Enter the SEGMENT CODE (up to four are allowed) for the segments to be described. Do not enter spaces between these codes.
6	1		NON-PRINTING DATA STRUCTURE FORMAT This option is reserved for data structures with a USAGE OF DATA STRUCTURE other than 'I' or 'J'.
		E	Input format. (Default option with USAGE OF D.S. = 'M', 'N' or 'E').
		I	Internal format (Default with USAGE OF D.S. NOT= 'M', 'N' or 'E').
		S	Output format. Note: the Data Elements making up the Segments must not exceed 999 characters.
7	1		RECORD TYPE / USE WITHIN D.S. This option is used to select the type of record description to be used in the COBOL program to allow different uses of the segment description stored in the library.
		blank	Redefined records (Default option). No VALUE clause is generated.
		1	A record set without initial values or repetitions of records. These records are presented with the segment common part followed by the different specific parts. If the data structure description appears in the COBOL FILE SECTION, the LEVEL NUMBER (COBOL) OF THE RECORD must be 2. With this value, the specific segments are described without redefines, at the COBOL 02 level. Several segment descriptions are grouped together under the same I/O area.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		2	A record set with the specific initial values of the data element of the segment as defined on the Call of Elements or Data Element Description screen. These values may also default to blank or zero depending on the format. This type of description cannot be used for a data structure having a number of repetitions in the common part definition. (Use ORGANIZATION = 'W' or 'L').
		3	A record set which incorporates the number of repetitions specified in OCCURRENCES OF SEGMENT IN TABLE on the Segment Definition Screen. No VALUE clause will be generated. If the description of the data structure appears in the COBOL FILE SECTION, the LEVEL NUMBER (COBOL) OF THE RECORD must be '2'.
		4	A record set which incorporates the number of repetitions specified in the OCCURRENCES OF SEGMENT IN TABLE on the Segment Definition Screen. The associated LEVEL NUMBER (COBOL) OF THE RECORD must be '3'. Comment specific to the OLSD function: For a description type of '4' and a COBOL 03 level, the index is not generated. A COBOL 02 level is used to access the table made up of repetitions of the same record (ddssT). A COBOL 01 level is used to group the whole D.S. together - common or specific parts, whether repeated or not. A group level field that incorporates all occurrences is generated. For data structures that do not have a value specified for the OCCURRENCES OF SEGMENT IN TABLE, use ORGANIZATION = 'W' with USAGE OF D.S. = 'T'.
		6	To be used only with the GIP interface. The number of levels are the same as the one of the record type 4.
8	1		LEVEL NUMBER (COBOL) OF THE RECORD This option, used in conjunction with the RECORD TYPE /USE WITHIN D.S. field, defines the COBOL level number for the descriptions of data structures, segments and

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		elements. In the following descriptions, the term 'D.S. Area' is meant as the area 'dd00' (possibly 1-dd00, 2-dd00).
	1	COBOL 01 level for D.S. Area and segments. (Default value). If the data structure description appears in the COBOL FILE SECTION, the segments must be redefined. If a data structure has no common part with a non-redefined description, the D.S. Area will only appear when the RECORD TYPE / USE WITHIN D.S. = blank.
	2	COBOL 01 level for D.S. Area and segments at 02 level. If the RECORD TYPE / USE WITHIN D.S. = blank, both the D.S. Area and the Segments will be described at the 02 level. (To define the 01 level, use ORGANIZATION = 'L' and Work Areas (-W) lines.)
	3	Reserved for D.S. with an ORGANIZATION = 'W' or 'L'. COBOL 02 level for the D.S. Area and segments at 03 level when associated with RECORD TYPE / USE WITHIN D.S. = 1, 2, or 3. 01 level for the D.S. Area and segments at 03 level when associated with RECORD TYPE / USE WITHIN D.S.= 4. 03 level for both the D.S. Area and the segments when associated with RECORD TYPE / USE WITHIN D.S. = blank.
	4	Reserved for data structures with an 'L' ORGANIZATION and USAGE OF DATA STRUCTURE = 'D'. The 01 level is to be defined via the Work Areas Screen (-W). COBOL 02 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group appear. The D.S. Area and segment levels disappear.
	5	Reserved for data structures in ORGANIZATION 'L' or 'W' and with a USAGE OF DATA STRUCTURE = 'D'. COBOL 01 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group appear. The D.S. Area and segment levels disappear.
	6	Reserved for data structures with an 'L' ORGANIZATION

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			and USAGE OF DATA STRUCTURE = 'D'. The 01 level is to be defined via the Work Areas Screen (-W). COBOL 02 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group disappear as well as D.S. Area and segment levels. For standard OLSD Screens only.
		7	Reserved for data structures in ORGANIZATION 'L' or 'W' and with a USAGE OF DATA STRUCTURE = 'D'. COBOL 01 level for group data elements or elementary elements that are not part of a group. Elementary elements that are part of a group disappear as well as D.S. Area and segment levels. For standard OLSD Screens only.
9	1		ORGANIZATION
		G	Table description. (PACTABLE). Causes the communication area with the access module to be generated. See the PACTABLE Reference Manual.
		D	Reserved for the description of segments or records of the different databases, IMS (DL/1), IDS I, IDS II, (according to the TYPE OF COBOL TO GENERATE selected), in the generation of DBD, SYSGEN, schemas or application programs (according to the TYPE AND STRUCTURE OF PROGRAM selected).
		blank	Defaults to ORGANIZATION of 'L' or 'W' depending on the value of the CODE FOR COBOL PLACEMENT.
10	1		SUB-SCHEMA NUMBER
		0 to 9	Indicates the sub-schema to be selected. (The value '0' corresponds to sub-schema 10.)
11	1		LINE SEQUENCE
		*	This value is used to generate segments from Formatted Work Areas lines according to a generation method which should NOT be used currently. The purpose of this specification is to facilitate the maintenance of programs generated with this method, i.e., before the April 1985 sub-release of PACBASE 7.1. This field has no screen label. The field is directly to the right of the SUB-SCHEMA NUMBER field.

5. MODIFYING THE PROCEDURE DIVISION

5.1. INTRODUCTION

INTRODUCTION

ORGANIZATION OF THE CHAPTER

This chapter contains a discussion of the concepts of Procedural code, as well as the Preview Facility. Since the Procedures Generated (-PG) screen is closely related to the Procedural Code (-P) screen, these two will be documented in the same subchapter. The Titles Only (-TO) screen is mentioned in the "TITLES AND CONDITIONS SCREEN (-TC)" Subchapter.

MODIFICATION OF THE PROCEDURE DIVISION

This Chapter discusses modifications to the PROCEDURE DIVISION of a program through the use of Procedural Code (-P) lines attached directly to a batch or on-line program. The user can also use the PACBASE Preview Facility, which includes the Procedures Generated (-PG) screen, the Titles and Conditions (-TC) screen and the Titles Only (-TO) screen.

. The Procedures Generated (-PG) screen allows the user to write specific procedures and, at the same time, view the titles of automatically generated procedures.

. The Titles and Conditions (-TC) screen allows the user to view the general structure (titles and conditions of all procedures) of a batch or on-line program.

. The Titles Only (-TO) screen lets the user view the hierarchical organization of program functions.

TRANSFER OF PROCEDURAL CODE (-P) LINES TO ANOTHER ENTITY

Procedural Code (-P) lines may be copied directly to another entity. Please see paragraph TRANSFER OF LINES TO ANOTHER ENTITY in Chapter "MODIFYING THE ENVIRONMENT DIVISION".

5.2. PROCEDURAL CODE SCREEN (-P)

PROCEDURAL CODE SCREEN

The Procedural Code (-P) screen is used to write all program procedures.

These program procedures are structured into functions and sub-functions, with each function or sub-function identified as a condition or structure type. They are hierarchically set up by level. Program procedures are described using operators followed by operands.

LEVEL OF SUB-FUNCTIONS

Functions are always an 05 level. Sub-functions have a 10 level by default. However, they can be an 06 level to a 98 level.

Within a given function, a 15-level sub-function is part of the 06- to 14-level sub-functions which precede it. In other words, a sub-function of a logically lower level will have a level number that is greater (ex: a 15-level sub-function is logically dependent on, or inferior to, a 14-level sub-function).

In this way, a sub-function dependent on another sub-function (i.e., a 15-level sub-function included in a 14-level sub-function), is only executed under the conditions of execution of the logically higher level sub-function (14-level in this case).

ELEMENTARY PROCEDURES

An elementary procedure is a series of condition lines.

The '99' level is reserved for elementary procedures in a sub-function. It is used to write a condition without changing the sub-function code. This condition applies until the next occurrence of a '99' level or until the end of the sub-function.

A '99' level procedure is limited to 75 lines. A sub-function can contain a maximum of 98 '99' levels.

A sub-function with no title line (N in the OPERATOR field) is assumed to be an elementary procedure and automatically assigned a '99' level.

CONDITION TYPE OR S.F. STRUCTURE

A function can be only an 'IT' (IF THEN) type if its execution depends on a condition. Otherwise, it must be a 'BL' (BLOCK) type. This is indicated in the CONDITION TYPE OR S.F. STRUCTURE field on the first line of the procedure.

If the CONDITION TYPE OR S.F. STRUCTURE is not indicated, the default assumed for any one of these options is selected according to what has been entered in the CONDITION FOR EXECUTION field. If an execution condition is entered, the System defaults to the 'IF THEN' structure; if an execution condition is not entered, it defaults to the 'BLOCK' structure.

For the sub-functions and the elementary procedures, the default options are the same. However, the user can also indicate more complex types of structures.

IF THEN ('IT') & ELSE ('EL')

The sub-function type 'IT' (IF THEN) can be followed by an 'EL' (ELSE) type sub-function of the same level.

The 'ELSE' sub-function will be executed if the 'IF THEN' sub-function condition has not been met. The 'ELSE' must directly follow the 'IF THEN' sub-function.

CASE OF ('CO')

The name of the variable which conditions the different procedures following the 'CASE OF' must be included in the 'CASE OF' statement.

The 'CASE OF' structure is followed by sub-functions of the 'IT' type (IF THEN) at the next logically lower level. The variable value corresponding to the condition for execution of the sub-function is specified each time.

The 'IF THEN' ('IT') sub-functions that depend on a 'CASE OF' sub-function must all be on the same level. They can be broken down into logically lower level sub-functions.

The last sub-function which depends on the 'CASE OF' sub-function can be a 'BLOCK' ('BL') type sub-function (non-conditioned). This last sub-function must be on the same level as the 'IF THEN' sub-functions. It will be executed when none of the 'IF THEN' conditions have been met.

If the last sub-function is not a 'BLOCK' type and none of the 'IF THEN' conditions are met within the 'CO' structure type, processing continues with the first sub-function at a higher logical level than the 'IT' sub-functions.

EXAMPLE:

```
15     CO  ddss-eeeeee
  16   IT  value1
  16   IT  value2
  16   IT  value3
  16   BL
```

LOOPS

There are three types of 'LOOP' structures: DO WHILE ('DW'), DO UNTIL ('DU') and DO ('DO').

A 'DW' ('DO WHILE') sub-function is only executed 'while' the indicated condition is true.

A 'DU' ('DO UNTIL') sub-function is executed at least once and 'until' the indicated condition is met.

A 'DO' ('DO') sub-function is executed as many times as indicated in the condition.

The user must be careful to correctly specify the conditions to be met in the first two types of sub-functions in order to avoid an infinite loop.

'WARNING' TYPE ERROR MESSAGE

When a 'WARNING' type error message is displayed, the character 'W' appears in the ACTION CODE field. The user can ignore the message by pressing Enter again.

CONDITION FOR EXECUTION

The construction of the lines of the Procedural Code (-P) screen separates the CONDITION FOR EXECUTION of a procedure from the procedure itself. That is, the left part of the screen (the OPERAND FIELD) is used for the statement and the right part for the CONDITION FOR EXECUTION, if any.

Writing a CONDITION FOR EXECUTION of a function or sub-function begins on the first line of that function or sub-function and continues onto as many lines as necessary, up to a limit of 24 lines (23 lines in case of 'Do Until').

These lines may or may not include processing statements.

However, they will be executed under the global conditions set.

Note on DATE PROCESSING OPERATORS of the On-Line Systems Development function:

> When the condition is entered on several lines, the continuation lines may not contain operands. The operands must be entered before the condition continuation.

In order to facilitate the writing of a condition, the CONDITION TYPE OR S.F. STRUCTURE field must be used to indicate the 'AN' (AND) and/or 'OR' (OR) relationships within these conditions.

Parentheses, if needed, must be indicated.

PROCEDURES - OPERATORS AND OPERANDS

Procedures written in Procedural Code are written with OPERATORS followed by OPERANDS.

This makes programs easy to read by isolating the 'verbs' from the manipulated data.

OPERATORS are translated into COBOL and take into account the information provided for the different files and the features of each compiler.

An OPERATOR is indicated only once, even if the OPERANDS continue onto several lines. The one exception to this rule is the '*' (comments) OPERATOR, which must be repeated on each comment line.

TRANSFER 'GO-TO' TYPE BRANCHING

The structure of a program must remain linear. Skipping from one function to another can only be done in sequence.
Branching from one function or sub-function to a preceding function or sub-function breaks the linear flow and is not permitted.

Thus, the only legitimate TRANSFER 'GO TO' TYPE branch is one which branches to the end of the current (sub-)function.

Specific OPERATORS are used for all of the TRANSFER 'GO TO' TYPE branches.

Some OPERATORS and types of functions can be used only with the On-Line Systems Development function (see the OPERATORS field).

NON-STANDARD OPERATORS

The user may specify a paragraph label and a PERFORM instruction for a user-defined function F80. This is done by using the 'Yaa' and 'Xaa' OPERATORs (the 'aa' to be replaced by the user). When this occurs, the system will display a warning message at the bottom of the screen to inform the user that this is a non-standard operator. The letter 'W' will appear in the ACTION CODE field. If the user presses the ENTER key, the system will accept the operator.

FIELD ALIGNMENT

In a release prior to PACBASE 7.0, the OPERANDS and CONDITION FOR EXECUTION fields were larger and not completely displayed on-line. This no longer applies to the current release (see the JUSTIFICATION OF OPERANDS and the JUSTIFICATION OF CONDITION FIELD fields).

ON-LINE PREVIEW OF THE PROCEDURES

The user can preview a program, via the Procedures Generated (-PG) screen, to see how Procedural Code is integrated with automatically generated functions.

USE OF THE PROCEDURES GENERATED (-PG) SCREEN

The Procedures Generated (-PG) screen allows the user to write specific procedures and visualize simultaneously the titles of generated procedures.

The Procedures Generated (-PG) screen is accessed by entering the following in the CHOICE field:

CH: PppppppPG

Specific procedures written on the Procedures Generated (-PG) screen are described according to the same rules which apply to the Procedural Code (-P) screen.

```
--------------------------------------------------------------------------------
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! PROCEDURAL CODE       P PO0001 VENDOR REPORTS               FUNCTION: 02    !
!                       1 2                                          3     !
!                                                                            !
! 6 7  8   9   10                               11 12 13                     !
! A SF LIN OPE OPERANDS        4                 LVTY CONDITION   5           !
!   AA     N   GET CURRENT DATE                  10BL                         !
!   AA  10 ADT DATOR                                                         !
! - -- --- --- -------------------------------- ---- -------------------------!
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
! *** END ***                                                                !
! O: C1 CH: -P                                                               !
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! PROCEDURAL CODE       P BBINIT GENERAL PROCESSING           FUNCTION: 02    !
!                         2                                          3     !
!                                                                            !
! 6 7  8   9   10                               11 12 13                     !
! A SF LIN OPE OPERANDS                          LVTY CONDITION               !
!   BB     N   MONITOR INITIALIZATION           10BL                         !
!   BB 100 M   PROGE        K-S$1-PROGE                                      !
! - -- --- --- -------------------------------- ---- -------------------------!
!   CC     N   DISPLAY FIRST RUN                10IT ICF       =   ZERO      !
! - -- --- --- -------------------------------- ---- -------------------------!
!   DD     N   ACQUIRING DATE OF THE DAY        10BL                         !
!   DD 100 AD8                                                               !
! - -- --- --- -------------------------------- ---- -------------------------!
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
!                                                                            !
! THIS SCREEN DISPLAYS GENERATED FUNCTIONS                                   !
! O: C1 CH: -PG                                                              !
--------------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	1		ENTITY TYPE This field is used to identify the entity to which these lines are attached:
		O	On-line Screen
		P	Program
			The user may overkey this field in order to copy lines attached to a Screen into a Program and vice-versa.
2	6		PROGRAM CODE OR SCREEN CODE This field contains the six-character program or on-line screen code.
3	2		FUNCTION CODE (REQUIRED)
		AA to 99	This code determines the placement of the Procedural Code lines in the sequence of functions. This is particularly important when used with the On-Line Systems Development and Batch Systems Development functions in which automatic functions have pre-determined codes.
		$n	In a macro-structure, the FUNCTION CODE can be parameterized.
4	1		JUSTIFICATION OF OPERANDS This field has been maintained for a prior release of PACBASE. For users with release 7.0 or later, this field is not used. Used to left-justify the operands. In other words, to display on the screen the right-hand part of the operands.
		blank	Left-justification of the operands field.
		n	(Any value other than blank): Right-justification of the operands field. This option prohibits all updates.
5	1		JUSTIFICATION OF CONDITION FIELD This field has been maintained for a prior release of PACBASE. For users with release 7.0 or later, this field is not used. Used to left-justify the condition. In other words, to display on the screen the right-hand part of the CONDITION FOR EXECUTION.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		blank	Left-justification of the condition field.
		n	(Any value other than blank): Right-justification of the condition field. This option prohibits all updates.
6	1		ACTION CODE
7	2		SUB-FUNCTION CODE Made up of numeric or alphabetic characters. This code determines the placement of the Procedural Code within the function.
		$n	In a macro-structure, the SUB-FUNCTION CODE can be parameterized.
8	3		LINE NUMBER PARAMETERIZABLE NUMERIC FIELD
		0-999	As a recommendation, number the lines starting with 10 by intervals of 10, thus facilitating future insertions.
		$n0 to $n9	In a macro-structure, only the first two characters of the LINE NUMBER can be parameterized.
			PROCEDURE Procedures are written in the format of an operator followed by corresponding operands. Operands may be continued onto several lines. When this occurs, the OPERATOR is entered once only: on the first line. Normally, PACBASE manages the punctuation. This is done according to the hierarchical relationship between the functions and sub-functions. The user can customize the punctuation as needed.
		$n	In a parameterized Macro-Structure, the OPERATOR can be parameterized.
9	3		OPERATORS STANDARD PROCESSING OPERATORS ----------
		N	Title of function or sub-function (required). The title is to be entered on the first line of a function or sub-function, on a single line. Depending on whether or not an entry is made in the CONDITION FOR EXECUTION field, and whether it is a function or a sub-function, the system can assign the default values for LEVEL NUMBER and CONDITION TYPE OR S.F. STRUCTURE.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		(These may be modified in the normal way by the user.)
	*	Comment line. This operator must be repeated for each line of comments. The generation of the period which normally precedes a '99' level is inhibited when the prior line is a comment line. To generate the period, insert a '99b1' on the first line of the comment. The commands in upper case are COBOL commands. The operands work just as they do in COBOL.
	M	MOVE .The first operand is the source of the MOVE; subsequent operands are the targets.
	MA	MOVE ALL .The first operand is the source, followed by the target operands.
	P	PERFORM .Branch to the function or sub-function indicated as the first operand, and return to sequence after executing the (sub-)function 'EXIT'. .If a second operand is entered, return to the sequence following the paragraph indicated. (Example: PERFORM F23BB THRU F24CC-FN.)
	C	COMPUTE .Calculation. The result field must be entered as the first operand, followed by an equal sign ('='). The fields to be computed must be separated by the necessary arithmetic operators and necessary parentheses.
	A	ADD .Addition of the first operand to the following operand(s).
	S	SUBTRACT .The first operand is subtracted from the second.
	MP	MULTIPLY .Multiplication of the first operand by the second.
	DV	DIVIDE .Division of the second operand by the first.
	MES	Display constants or parameters defined in operands.
	ACC	ACCEPT .Accept and transfer parameters or constants in the

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		field defined in the operands.
	CAL	CALL .Call of the program or sub-program defined in the operands. The USING clause must be explicitly written out if it is to be used.
		Branch type operators:
	GT	GO TO .Branch to the end of the (sub-)function to which the statement belongs. The level of the (sub-)function must be indicated by two numeric characters in the OPERAND field. If the (sub)-function type is 'IT' and if it used with an 'EL' type of (sub)-function at the same level, the GT operator, used at this level, branches to the beginning of the 'EL' (sub)-function.
	GFT	Go to the end of the iteration. When this command is entered from a sub-function with a hierarchically inferior LEVEL NUMBER, the branch is to the end of the processing loop for the sub-function with the controlling level number. .On-Line Programs: Branch to the end of the category processing. .Batch Programs: Branch to the end-of-run function (F20) and set the end-of-file processing switches.
	GDI	Go to the beginning of the iteration. When this command is entered from a sub-function with a hierarchically inferior LEVEL NUMBER, the branch is to the top of the processing loop for the sub-function with the controlling level number. .On-Line Programs: Branch to the next occurrence of the current category or to the next category. .Batch Programs: Branch to the top of the iteration loop (F05).
	GB	GO TO Ffusf-900 .This operator branches to the paragraph that immediately precedes the 'EXIT' for the (sub-)function whose LEVEL NUMBER is entered in the OPERAND field. This causes a return to the top of the loop of the (hierarchically) next higher level. If the (sub)-function type is 'IT' and if it used with an 'EL' type of (sub)-function at the same level, the GB operator, used at this level, branches

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		to the end of the 'EL' (sub)-function. For all branch type operators, the generated instruction is always followed by a period ('.').
	EXA	Generates the COBOL 'EXAMINE' command from the field entered as the Operand, possibly followed by complementary clauses (TALLYING, etc.); refer to the COBOL syntax.
	INS	Generates the COBOL 'INSPECT' command from the field entered as the Operand, possibly followed by complementary clauses (TALLYING, etc.); refer to the COBOL syntax.
	COB	Pure COBOL: justified at the B margin of the generated program.
	COA	Pure COBOL: justified at the A margin of the generated program.
	U07	Pure COBOL: justified on column 7 of the generated program.
	SUP	Suppresses the generation of the automatic function or sub-function with the same code as the line with this operator. Note: In the case of the Batch Module, enter the SUP value on the first line of the sub-function in order to delete it.
	SCH	Search. Table Search in the table indicated as the first operand, for the search argument indicated as the second operand. The search assumes a sorted file and starts at the beginning of the table. The code of this table must include the work area prefix, if it exists (EX : 1-ddss, or 1-ddss-eeeeee if the table's data element code differs from the code of the search argument). The search argument must be coded according to the System's standards. This operator must be used in an elementary structure whose CONDITION TYPE OR S.F. STRUCTURE = 'BL'. (This may be implicit). The search is done using the standard indexes (IddssM, IddssR and IddssL). If no match is found, IddssR will be greater than IddssL. (See TABLE SIZE (OCCURS CLAUSE) on the Work Areas (-W) screen).
	SCB	Search in sorted table. As opposed to the 'SCH' operator, the search stops as soon as the table argument is greater than the search argument.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		NOTE: For further details on specific operators, see the OLSD and BATCH LANGUAGE Reference Manuals.
		COBOLII PROCESSING OPERATORS
	CON	Generates the COBOL 'CONTINUE' command (no Operand)
	EVA	Generates the COBOL 'EVALUATE' command of the condition the Operand expresses
	EVT	Generates the COBOL 'EVALUATE TRUE' command (generally, there is no Operand)
	EVF	Generates the COBOL 'EVALUATE FALSE' command (generally, there is no Operand)
	EEV	Generates the COBOL 'END-EVALUATE' command (no Operand)
	EIF	Generates the COBOL 'END-IF' command (no Operand)
	EPE	Generates the COBOL 'END-PERFORM' command (no Operand)
	ESE	Generates the COBOL 'END-SEARCH' command (no Operand)
	INI	Generates the COBOL 'INITIALIZE' command from the field entered as the Operand
	SEA	Generates the COBOL 'SEARCH' command from the field entered as the Operand
	GOB	Generates the COBOL 'GO-BACK' command from the field entered as the Operand
	STR	Generates the COBOL 'STRING' command before the parameters entered in the Operand field
	UNS	Generates the COBOL 'UNSTRING' command before the parameters entered in the Operand field
		OLSD FUNCTION OPERATORS OPERATORS FOR END-OF-PROCESSING: ----------
	GF	Branch to the end of the automatic sub-function. Used only in functions F20, F25, F35 and F60.
	GFR	Reception End Processing (branch to 'END-OF-RECEPTION' paragraph).
	GFA	End of display processing (branch to 'END-OF-DISPLAY' paragraph).

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
	GDB	Return to the beginning of current iteration. NOTE: With the 'GF', 'GFR' and 'GFA' OPERATORS, the generated instruction is always followed by a period ('.'). This means that no 'EL' (ELSE type of conditioning should be used on a following line, as the generated COBOL would then be erroneous. OPERATORS FOR SCREEN TRANSFER: ----------
	OTP	Immediate call of the screen (external name indicated as the OPERAND). The transfer occurs without delay - processing of the loop may not have completed.
	OSC	Call of the screen (code) indicated as the OPERAND.
	OSD	Call of the screen (code) indicated as the OPERAND (deferred to the end of reception processing). OPERATORS FOR ACCESSING SEGMENTS: ----------
	XR	Read of the segment indicated in the OPERAND.
	XP	Read of the first record by Dynamic Access. Whatever the system, this OPERATOR always brings up a record. The segment code is indicated in the OPERAND.
	XRN	Sequential Read of the segment indicated in the OPERAND (Dynamic Access).
	XRU	Read for update of the segment indicated in the OPERAND.
	XW	Write of the segment indicated in the OPERAND.
	XRW	Rewrite of the segment indicated in the OPERAND.
	XD	Deletion of the segment indicated in the OPERAND.
	XUN	Unlocking of the segment indicated in the OPERAND (except for DL1). By using these operators, the corresponding access function can be generated. When the indicated segment is a table or an SQL view, make sure the segment is defined in the screen with either a reception or a display use. The XP and XRN operators are reserved for segments defined in a repetitive category with a display use.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		OPERATORS FOR ERROR POSITIONING: ----------
	ERU	Error positioning on the screen. In the OPERAND field, enter in positions: . 1 to 4: error code (managed by the user) . 5: blank . 6: DATA ELEMENT CODE (optional) of the erroneous data element. The error message corresponding to the error code is specified on the General Documentation (-G) screen of the Dialogue. This message will be displayed on the error message line (ERMSG), and if the DATA ELEMENT CODE has been entered, the cursor will be positioned on the data element, and error attributes will apply. This OPERATOR cannot be used on a repetitive data element.
	ERR	'Manual' data element error. In the OPERAND field, enter in positions: . 1: error code (alphanumeric character except for '0' or '1', which are reserved for the coding of documentary messages) . 2: blank . 3: code (six positions) of the variable data element with which the error code is associated. The cursor is positioned and the data element takes on the attributes defined for the data elements in error. In the case of a repetitive data element, its code is indicated, followed by the sequence number of the data element occurrence. The use of error messages with the On-Line Systems Development function is detailed in the corresponding Reference Manual.
		NON-STANDARD OPERATORS: ----------
	Yaa	Generates a COBOL paragraph label for Function F80. Followed by a segment code (ddss) in the OPERAND

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		field, will generate a 'F80-ddss-aa' COBOL paragraph label.
	Xaa	With 'Yaa', will generate a PERFORM of paragraph 'F80-ddss-aa'.
		BATCH PROCESSING OPERATORS These operators cannot be used with the OLSD function. The OPE, CLO, R, RN, W and RW commands ensure the opening, closing, read, write and rewrite of files with sequential or indexed-sequential organizations. The statements generated are adapted to the specifications indicated on the Call of Data Structures (-CD) screen, for d.s's entered on the first 23 lines, and to the appropriate COBOL variant, as selected. Thus, a same 'READ' operator can generate: a READ AT END, a READ INVALID KEY, a CALL GETSEQ or GETRAN, or a RETURN AT END. With the exception of the OPEN and CLOSE of a file, these operators will call for the intervention of the 'IK' variable which will take on a value other than zero if there is an abnormal execution of the generated instruction (End of File, Error on Key, etc.). The user must determine the action to take, according to the value of the 'IK' variable. With the following Operators, enter the DATA STRUCTURE CODE IN THE PROGRAM (2 characters) as the only OPERAND. The OPERAND must be on the same line as the OPERATOR. If it is on a continuation line ('blank' in OPERATOR field), it will be generated in the 'INVALID KEY' clause.
	OPE	OPEN
	CLO	CLOSE
	R	READ
	RN	READ NEXT
	DEL	DELETE
		With the following operators, enter the SEGMENT CODE as the Operand. Other options may follow, such as FROM or AFTER.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
	W	WRITE
	RW	REWRITE
	SRT	SORT. The operands are the parameters following the the SORT command.
	STA	START For START, the D.S. CODE IN THE PROGRAM is entered, followed by the setting of the key: EXAMPLE: STA FF NOT < FF00-START generates: MOVE 0 TO IK START FF-FILE KEY IS NOT < FF00-START INVALID KEY MOVE 1 TO IK.
	E	User defined Error Message. The OPERAND field is coded as follows: Column 1: A User Error Code character. Note: Avoid values '0 to 5' inclusive, as they have predefined meanings. Recommendation: Use '6' since this is the value used in the product standard macros. Column 2 to 4: Enter a unique identifying number for this message. Column 5: Gravity of the error Column 6: Begin your error message. Note: The message may be continued in the CONDITION FOR EXECUTION field.
		DATE AND TIME PROCESSING OPERATORS DATE PROCESSING OPERATORS
	ADT	Call of the System Date. The date obtained will have the format YYMMDD in the 'DATOR' constant and in the Data Element indicated in the OPERAND field. For IBM hardware: An inversion option may be used to indicate the position of the day and month in the system date according to the value entered in the SYSTEM DATE FORMAT INDICATOR field on the Library Defenition screen.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			Note: in COBOL II and COBOL 85, if the year is less than '61', the century is automatically set to '20'.
		ADC	System date with century: CCYYMMDD (CC = century). Note: in COBOL II and COBOL 85, if the year is less than '61', the century is automatically set to '20'.
			Date formatting.
		AD	A date may be formatted in different ways. When the condition is entered on several lines, the operands must be entered before the condition continuation lines (either on lines without operand or on comment lines). The OPERANDS are 'XY DELCO1 DELCO2', where X and Y are each replaced by the value of one of the following codes: +----------+ ! CODE ! GENERATED FORMAT ! !----------! ! I ! 'Internal': YYMMDD ! !----------! ! D ! 'Display': MMDDYY or DDMMYY ! ! ! according to the value entered in the DATE ! ! ! FORMAT IN GENERATED PROGRAMS field on the ! ! ! Library Definition screen. ! !----------! ! E ! 'Extended': MM/DD/YY or DD/MM/YY ! ! ! according to the value entered in the DATE ! ! ! FORMAT IN GENERATED PROGRAMS field on the ! ! ! Library Definition screen. ! !----------! ! S ! 'Internal': CCYYMMDD ! !----------! ! C ! 'Display': DDMMCCYY or ! ! ! MMDDCCYY ! ! ! according to the value entered in the DATE ! ! ! FORMAT IN GENERATED PROGRAMS field on the ! ! ! Library Definition screen. ! !----------! ! M ! 'Extended': DD/MM/CCYY ! ! ! according to the value entered in the DATE ! ! ! FORMAT IN GENERATED PROGRAMS field on the ! ! ! Library Definition screen. ! +----------+ ! G ! 'Extended': CCYY/MM/DD ! +----------+ EXAMPLE --------

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		In order to change an 'I'-formatted date into a 'D'-formatted date, 'AD' should be entered in the OPERATOR field and 'ID DELCO1 DELCO2' in the OPERAND field: DELCO1 is the data element containing a YY/MM/DD date format (it is possible to use the DATOR constant) and DELCO2 is the data element containing the changed date format: DD/MM/YY or MM/DD/YY. A SF LIN OPE OPERAND LVTY CONDITION BB 100 AD ID DELCO1 DELCO2 BATCH FUNCTION: the date processing function is generated in F9520. You may change this by coding, in an 'O'-type line of the Program's -G, the DATPRO=ffss parameter, where ffss is the specified function-sub-function code.
	AD0	Century positioned from DAT-CTY field initialized to '19' and it can be modified by the user.
	AD1	Century set to '19' if System year is less than the value in DAT-CTYT field (Default='61'),'20' otherwise
	AD2	Century set to '20' if System year is less than the value in DAT-CTYT field (Default='61'), '19' otherwise DATE PROCESSING OPERATORS (OLSD) ----------
	AD6	Equivalent to ADT + ADI (See below). Transforms the system date into a 6-character date format of MMDDYY or DDMMYY depending on the value in the DATE FORMAT IN GENERATED PROGRAMS field on the Library Definition screen. The transformed date is moved into the data element indicated in the OPERAND field.
	AD8	Transforms the system date into an 8-character date with slashes, MM/DD/YY or DD/MM/YY depending on the value in the DATE FORMAT IN GENERATED PROGRAMS field on the Library Definition screen. The transformed date is moved into the data element indicated in the OPERAND field. DATE PROCESSING OPERATORS (BATCH) ----------
	ADI	Date inversion. The first two characters are replaced by the last two characters and vice-versa.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		Both OPERANDS must have a length of 6 characters. The second OPERAND is optional. If absent, the modified date will be moved back into the first OPERAND.
	ADS	Reversal of date with century. Both OPERANDS must have a length of 8 characters. The second OPERAND is optional. If absent, the modified date will be moved back into the first OPERAND.
	ADE	Insertion of slashes in a date. The first OPERAND must be the field which contains the original six-character date, and the second must contain an eight-character field which will receive the reformatted date.
	ADM	Insertion of slashes in a date with century.
		TIME PROCESSING OPERATORS ----------
	TIM	Hour display in 'HHMMSS' format from the EIBTIME field in CICS; from the TIME field with other hardware. EXAMPLE: A SF LIN OPE OPERAND LVTY CONDITION BB 100 TIM DELCO1
	TIF	'HHMMSS' format changed into 'HH:MM:SS'. EXAMPLE: A SF LIN OPE OPERAND LVTY CONDITION BB 100 TIF DELCO1 DELCO2
		COMMUNICATION OPERATORS NOTE: Non operational with the OLSD Function. These OPERATORS ensure the liaison between a COBOL program and the 'Communication Units' in use:
	ENA	ENABLE Connecting the Unit.
	DSB	DISABLE Disconnecting the Unit.
	RE	RECEIVE Receiving a Message.
	SD	SEND Sending a Message.
		DBMS OPERATORS IDS1 OPERATORS

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE

		(Cannot be used with the On-Line S. D. function.)
	I.. T..	The IDS1 OPERATORS are coded with an 'I' or 'T' as the first character, followed by the two-character codes defined below:
	MV	MOVE
	MC	MOVE CURRENT
	MD	MODIFY
	DE	DELETE
	R	RETRIEVE
	SE	SET
	ST	STORE
	I	IF_____GOTO_____(paragraph name)
	IE	IF ERROR GOTO_____(paragraph name)
	HE	HEAD
	CL	CLOSE
	OU	OPEN UPDATE
	OR	OPEN RETRIEVAL
		The parameters or options for these instructions are to be indicated in the OPERANDS field.
		'ENTER IDS' will be generated for all OPERATORS beginning with the letter 'I'. A period ('.') is generated at the end of a series of IDS OPERATORS, or in front of an OPERATOR beginning with 'I'.
		Certain IDS OPERATORS can be used in TDS (value 'T' in the TYPE AND PROGRAM STRUCTURE field on the Program Definition (-P) screen). In this case, 'ENTER TDS' is generated instead of 'ENTER IDS'.
		CODASYL OPERATORS ----------
	B..	The Codasyl OPERATORS are coded with a 'B' as the first character, followed by the two-character codes defined below:

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
	RY	READY
	FH	FINISH
	FD	FIND
	G	GET
	ER	ERASE
	DT	DISCONNECT_____FROM_____
	CT	CONNECT_____TO_____
	MD	MODIFY
	ST	STORE
		TP MONITOR OPERATORS These OPERATORS cannot be used for the screen processing descriptions with the On-Line Systems Development function. CICS MACRO LEVEL OPERATORS --- (Cannot be used with the On-line S. D. function.)
	D..	These OPERATORS are coded with a 'D' as the first character, followed by the specific two-character code of the CICS Macro.
	XX	DFHXX TYPE =
	BM	DFHBMS TYPE = All OPERATORS must be left justified. The continuation character in column 72 of the generated program and the justification of the continuation lines is automatically managed by the System. CICS COMMAND LEVEL OPERATORS --- EXEC CICS operands END-EXEC. TDS OPERATORS ON HONEYWELL H66 BCD --- (Cannot be used with the On-line S.D. function.)
	I..	The TDS OPERATORS are coded with an 'I' or 'T' as the

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
	T..	first character, followed by the two-character codes defined below:
	MV	MOVE
	MC	MOVE CURRENT
	MD	MODIFY
	DE	DELETE
	R	RETRIEVE
	SE	SET
	ST	STORE
	I	IF_____GOTO_____(paragraph name)
	IE	IF ERROR GOTO_____(paragraph name)
	SD	SEND
	SB	SENDB
	RE	RECEIVE
	T	TERMINATE-TPR
	TL	TERMINATE-TPR and LOAD
		The parameters or options for these instructions are to be indicated in the OPERAND field. 'ENTER TDS' is generated for all OPERATORS beginning with the letter 'I'. A period ('.') is generated at the end of a series of TDS OPERATORS, or in front of an OPERATOR beginning with 'I'.
		Some of these OPERATORS can be used in IDS (a value other than 'T' in the TYPE AND PROGRAM STRUCTURE field on the Program Definition (-P) screen). In this case, 'ENTER IDS' is generated in place of 'ENTER TDS'.
		PAF OPERATOR
	EXP	This OPERATOR is used to activate a VA Pac Database access request via the PAF (PACBASE Access Facility) facility. It generates PAF or DAF modules.
		EXEC PAF (...request...) END-EXEC.
		For more detailed information, refer to the PAF or DSMS Access Facility Reference Manual.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		SQL OPERATORS SQL operators are documented in the "Relational Database Description" Reference Manual, Chapter "SQL Accesses".
	SCC	CONNECT order or its equivalent.
	SDC	DISCONNECT order or its equivalent.
	SCO	COMMIT order.
	SRO	ROLLBACK order.
	SWH	WHENEVER order.
		The SQL operators should be used with the following syntax: - SCC cccccc d - SDC cccccc d r - SCO cccccc d - SRO cccccc d - SWH instruction cccccc: VA Pac code of the block (6 caracters long). d: value 2 if distributed base (ex: Oracle sybase). r: value R to select DISCONNECT order with ROLLBACK order. Rules: - d and r indicators can be reversed. - Each order can be completed on continuation lines (with no operator). You can specify, for example, the FORCE option in a COMMIT order for ORACLE. Generation: - On the Segment Calls (-CS or -CD), if you enter an SQL organization (ORGANIZATION field) and so a Block code (EXTERNAL NAME field), this organization has priority on the Block type indicated on the Block Definition. - If the block is indicated in the Segment Calls as being distributed, the orders linked to this block will be generated "distributed". - Unrecognized SQL orders are ignored. The END-EXEC is automatically generated and, with the batch generator, it is is always followed by a period.
	SQL	The generated SQL order is standard and can be modified in the -G of the segment.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			The customization of SQL accesses is documented in the "Relational Database Description" Manual, Chapter "SQL Accesses", Subchapter "Customized SQL Accesses". In order to take these modifications into account, the Program -CD must contain a Block code in the EXTERNAL NAME field and an organization in the ORGANIZATION FIELD. The SQL operator should be used with the following syntax: OPE I OPERANDS SQL I FFSS FLSS SO PO (1s format) SQL I FFSS SO PO (2nd format) FFSS : file-segment code in the program FLSS : file-segment code in the library SO : type of the standard order (two characters) or specific order described in S FLSS G. PO : particular order identifier in S FLSS G. The 1st format should be used if the code of the program is different from the one of the library. The particular order code is optional, it modifies the description resulting of the standard order. The implemented SQL organizations are the following: C (Interel) M (Datacom) N (Nonstop) O and P (Oracle) Q (SQL-DS ALLbase) 2 (DB2) 3 (SQL SERVER) 4 (DB2/400) 9 (Informix Ingres and SYBASE) H (General SQL organization) For a number of these organizations, the reference of the block type is required (H and 9 for exemple). Restrictions: - the RDMS orders' syntax is not implemented (R organization) - The prefixing rule is not applied. The table name is not modified, the dot is removed if there is one. Limit: - in the case of program-macro and macro-macro lines with same indicators, the generated lines from S FFSS G cannot be deleted. Relationnal operator: ----------
		EXQ	EXEC SQL operands END-EXEC.
10	32		OPERANDS

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			This field contains the OPERANDS required by the preceding OPERATOR to complete the procedural instruction. The first OPERAND must be placed on the same line as the OPERATOR. When an OPERATOR calls for several OPERANDS, they must be indicated one after the other in a continuous sequence, separated by at least one blank. The Qualification of Names using 'OF' is acceptable if the 'OF' of the first OPERAND is on the same line as the OPERATOR. When the first OPERAND is an alphanumeric literal that does not completely fit on one line, the continuation of the literal can be indicated between quotes on the following line. The System ensures continuity for the literal at the generation level.
			STRUCTURE The structure of a function or sub-function is defined by a LEVEL NUMBER and a CONDITION TYPE OR S.F. STRUCTURE, with which a condition, variable or a value can be associated, if necessary. Structures with levels other than 99 must be defined on the first line of a (sub-)function, while conditioning can continue onto several lines. Default values for level and type are taken from the title line of the (sub-)function. Functions are the highest level (05) structures.
11	2		LEVEL NUMBER PARAMETERIZABLE NUMERIC FIELD The LEVEL NUMBER is indicated only on the first line of a structure. The CONDITION FOR EXECUTION of a structure at a given level applies to all the logically lower level structures which follow the initial structure, until the next logically higher level structure is encountered.
		05	This level is always assigned to functions. It is also the default level of the first line of a function structure.
		10	This is the default level of the first line of a

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			sub-function structure.
		06 to 98	Possible levels for a sub-function.
		99	Defines an elementary procedure in a function or sub-function. (Maximum number of '99' levels in a sub-function = 98).
		$n	In a macro-structure the LEVEL NUMBER can be parameterized.
			NOTE: Inserting comments on '99' level and 'IT' type processing lines suppresses the generation of a period at the end of the sentence. On the other hand, you can add comments on '99' level and 'BL' type lines.
12	2		CONDITION TYPE OR S.F. STRUCTURE
			On the first line of a function or sub-function, the CONDITION TYPE OR S.F. STRUCTURE value indicates the 'structure type' processing to be executed.
			In a macro-structure the CONDITION TYPE OR S.F. STRUCTURE cannot be parameterized.
			A (sub-)function constitutes a block of processing or structure. It's also possible to define, within a (sub-)function, elementary structures characterized by a '99' level.
		BL	'Block' type structure.
			Default value for all non-conditioned structures.
		IT	'IF THEN' type structure.
			Default value for all conditioned structures. Executed if the condition is satisfied.
		EL	'ELSE' type structure.
			Prohibited at the function level.
			Executed if the preceding structure at the same level (which must be an 'IF THEN') was not executed. An 'ELSE' structure cannot have its own condition.
		CO	'CASE OF' type structure.
			Prohibited at the '05' function level and at the '99' level.
			A 'CO' structure is used for procedures that are exclusive of each other, and that are executed depen-

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		ding on the possible values of a variable. In a 'CASE OF' structure only the name of the variable is defined (in the condition field and on a single line). The possible values of this variable are specified in the structures at the next lower, non-elementary, hierarchical level. In a Dialog screen, nesting of 'CASE OF' loops is not authorized within another 'CASE OF' loop.
	DW	'DO WHILE' structure. Prohibited at the '05' function level and at the '99' level. This structure is executed repeatedly, as long as its condition is satisfied.
	DU	'DO UNTIL' structure. Prohibited at the '05' function level and at the '99' level. This structure is executed repeatedly until its condition is satisfied. Thus, it is executed at least one time. For the 'DW' and 'DU' type structures, the user must set up the condition status (incrementation of an index, for example).
	DO	'DO' structure ('loop' structure). Cannot be used at an '05' function level or the '99' level. The 'DO' structure is executed in a repetitive way depending upon the conditioning of three variables: the first variable being the iteration number where the processing should start; the second one, the iteration number where the processing should stop, the third being the incrementing interval. All three variables may be either numbers or data elements. The increment variable is optional and its default value is '1'. (If indicated, its value must be positive.) Both iteration variables must be entered on the first line of the sub-function, separated by a space. The parameters must be entered in the following order: starting limit (positive), ending limit and increment interval.

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		DO calls for 3 parameters, of which the first 2 are required. All 3 must appear on the first line. The System automatically generates an index: JfusfR, 'fu' standing for the FUNCTION CODE, and 'sf' standing for the SUB-FUNCTION CODE.
	OR	Continuation of the condition associated with the preceding lines by a logical 'OR'.
	AN	Continuation of the condition associated with the preceding lines by a logical 'AND'. NOTE: The parentheses which group the terms of a condition must be indicated in the text of the condition. In a macro-structure the type of structure or condi-
	WH	You can use COBOL commands after an EVA or SEA command. Each of these commands indicates one processing to be performed according to the fulfilled condition. In the example below, processing1 will be performed when condition1 is fulfilled. EVA condition ---processing1--- 99WH ---condition1--- ---processing2--- 99WH ---condition2--- ---processing1--- 99WH ---condition2--- ---processing3--- 99WH ---condition3--- ON-LINE SYSTEMS DEVELOPMENT --- The following values, in the CONDITION TYPE OR S.F. STRUCTURE field, are used for relative positioning with the On-Line Systems Development function and Pacbench C/S.
	*A	Insertion of a sub-function before an automatic sub-function identified by the data element or the segment it processes.
	*P	Insertion of a sub-function after an automatic sub-function identified by the data element or the segment it processes. (The CONDITION FOR EXECUTION of the automatic sub-function applies to the inserted sub-function if the LEVEL NUMBER of the inserted sub-function is greater than that of the automatic sub-function.)
	*R	Replacement of an automatic sub-function identified by the data element or the segment it processes. (The CONDITION FOR EXECUTION of the automatic sub-

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			function does not apply to the replaced sub-function.) For more information, see the "USE OF STRUCTURED CODE" Chapter, "SPECIFIC PROCEDURES" Subchapter in the ON-LINE SYSTEMS DEVELOPMENT Reference Manual and the "USE OF STRUCTURED CODE" Chapter, "PROCEDURAL CODE" Suchapter in the PACBENCH C/S Reference Manual. The two following values are used for the relative positioning with Pacbench C/S (server components only): *C — Insertion or replacement of the processing on the server or the Logical View. *B — Insertion in the elementary processing called by PERFORM. For more information, see the "USE OF STRUCTURED CODE" Chapter, "PROCEDURAL CODE" Subchapter in the PACBENCH C/S Reference Manual.
13	28		CONDITION FOR EXECUTION The CONDITION FOR EXECUTION statement is coded without using 'IF', 'AND', 'OR', 'GO TO', or a period (.). The first line must be associated with an explicit or implicit LEVEL NUMBER ('05' for a function; '06' to '98' for a sub-function; '99' for an elementary procedure within a function or sub-function). The LEVEL NUMBER need not be specified on continuation lines. For a 'CASE OF' type structure, the name of the variable (which may have alternative values) must be indicated on the first line. For structures dependent on a 'CASE OF', the CONDITION FOR EXECUTION indicates the possible value of the 'CO' variable. $n — In a macro-structure, the CONDITION FOR EXECUTION can be parameterized.

5.3. PROGRAMMER FLAGS AND VARIABLES

PROGRAMMER FLAGS AND VARIABLES

The purpose of this subchapter is to present the programmer with a list of flags, variables, counters and indices generated by the System and which are commonly used in Procedural Code.

The subchapter is divided into two parts, the first pertaining to batch programs, the second to on-line programs.

The chart below lists only those variables recommended for use by programmers.

BATCH PROGRAM VARIABLES

These symbols are used:

```
      cc       = (report) CATEGORY CODE
      dd       = DATA STRUCTURE CODE
      eeeeee   = DATA ELEMENT CODE
      r        = LAST CHARACTER OF REPORT CODE
      ss       = SEGMENT CODE
      st       = (report) STRUCTURE NUMBER
```

DATA NAME	FORMAT	MOST COMMON USAGE
!ddss-eeeeee	!	!
!IK	X	file access error ind.:'1'= error
!DATCE	X(8)	(group) dates with century
!CENTUR	XX	century
!DATOR	X(6)	(group)
!DATOA	XX	year
!DATOM	XX	month
!DATOJ	XX	day
!DAT6	X(6)	(group)
!DAT61	XX	!
!DAT62	XX	!
!DAT63	XX	!
!DAT8	X(8)	(group) dates with slashes
!DAT81	XX	(no century)
!DAT8S1	X	slash
!DAT82	XX	!
!DAT8S2	X	slash
!DAT83	XX	!

DATA NAME	FORMAT	MOST COMMON USAGE
DAT8E		(redefines DAT8)
DAT81E	X(4)	century/year
DAT82E	XX	
DAT83E	XX	
DAT6C	X(8)	(group)
DAT61C	XX	
DAT62C	XX	
DAT63C	X(4)	century/year
DAT8C	X(10)	(group) dates with slashes and
DAT81C	XX	century
DAT82C	XX	(slashes via filler)
DAT83C	X(4)	century/year
FTBn	X	final total break '1'= yes
FBL	9	current final brk lev: rarely used
IBL	9	current init. brk lev: rarely used
ITBn	X	initial total break '1'= yes
dd-FBn	X	final break indicator: '1'= yes
dd-IBn	X	initial break indicator: '1'= yes
dd-CFn	X	record to be processed: '1'= yes
dd-OCn	X	write file: '1' or delete it: '0'
FT		= ALL '1'
dd-FT	X	EOF indicator: '1'= yes
dd-FI	X	ctl brk: last rec. indic. '1'= yes
I01	S9(4)	which rec. type is being processed
I02	S9(4)	which action is being processed
I03	S9(4)	stores a pointer (rank) to the first element of the specific part segment being processed
I04	S9(4)	stores a pointer to the last element of the specific part segment being processed
I06	S9(4)	only in functions not autom. gen'd
I50	S9(4)	stores the rank of the first data element of the common part
I51	S9(4)	stores the number of record types
IddssL	S9(4)	subscript for loading tables
IddssR	S9(4)	subscript for searching tables
IddssM	S9(4)	maximum positions in a table
J00	S9(4)	looks-up for the category table
J01	S9(4)	looks-up for the 3-D table
J05, J06, J07	S9(4)	accumulators
Jddrcc	S9(4)	report repetitive category
JddrccM	S9(4)	report repetitive category
IND	S9(4)	stores the major-most key level of input data structures to be matched
ddIND	S9(4)	stores the current value off the key of the record on data structure dd
5-dd00-RECCNT	S(9)9	record counter
ID-ER	X	error rec. type or action; '0'= ok
ER-ss-eeeeee	X	0-5: (in)valid pres/abs/cont/class
DEL-ER	X	performed validations
ER-PR(n)		
TR-ER	X	any errors on transaction: '1'= no
SEG-ER	X	
GR-ER	X	errors on group of transactions
LE-FIENR	X(4)	to hold the PACBASE code of the segment currently being processed
UT-ERUT		errors detected by user valid.'s
UT-UPR(n)	X	user error messages

DATA NAME	FORMAT	MOST COMMON USAGE
Trst-eeeeee		totaling
Grst-eeeeee		grand totals
5-dd00-rLCM	S999	report line count maximum
5-dd00-rLC	S999	report line count
5-dd00-rPC	S9(7)	page count
LSKP	99	line skips (user spooling)
NUPOL	X	laser printer
CATX	XX	category of report being printed
6-dd00		
6-dd00-r		rarely used
1-ddss		read area - control break files
1-ddss-eeeeee		
2-ddss		update area
2-ddss-eeeeee		
1-dd-TABLE		USAGE OF D.S. = T (Table)
1-ddssT		(group)
1-ddss(n)		
1-ddss-eeeeee(n)		For instance 1-ddss-eeeeee(IddssR)

ON-LINE PROGRAM VARIABLES

These symbols are used:

```
    dd                = DATA STRUCTURE CODE
    ss                = SEGMENT CODE
    eeeeee            = DATA ELEMENT CODE
    scrn              = SCREEN CODE
```

DATA NAME	FORMAT	MOST COMMON USAGE
IK	X	File access error indicator '0' = successful access;'1'= error (set after every file access)
OPER	X	Internal Operation Code Useful to specify conditions for Update, Scrolling, etc. (e.g. F06)
OPERD	X	Deferred Operation Code; used by OSD operator
CATX	X	Identifies category being executed Useful to condition logic in loops (e.g. F21, F31, F66, etc.)
CATM	X	Internal Transaction code governs file access for update Useful when update rules are complex (e.g. F16)
ICATR	99	Number of line item currently being processed
SCR-ER	X	Error on screen: '1' - no error; '4' - error
FT	X	'End-of-file' on read for display in repetitive category (either control break or true eof) Useful to condition structured code for Repetitive display (e.g., CATX = 'R' and FT = '0' and ICATR not > IRR is the best way to condition line item display logic in F66)
ICF	X	Governs execution of Reception Functions (F05 through F40); '0' in ICF generally implies first time processing for screen
OCF	X	Governs execution of Display Functions (F50 through F8Z)

DATA NAME	FORMAT	MOST COMMON USAGE
SESSI	X(5)	Session number of generated prog.
LIBRA	X(3)	Library code
USERCO	X(8)	User code
DATGN	X(8)	Date of generated program
TIMGN	X(8)	Time of generated program
CAT-ER	X	Error in current category: ' ' - no error; 'E' - error Useful for conditioning Reception Functions after edits (e.g., F21, F31, F36, etc.)
CURPOS		Cursor pos. on screen in reception
CPOSL	S9(4)	Line number of cursor Useful for setting transfers on cursor positioning (e.g., F06)
CPOSC	S9(4)	Column number of cursor
CPOSN	S9(4)	Absolute position of cursor in msg
IRR	99	No. of reps in the rep category
INT	999	No. of input fields in screen
IER	99	No. of screen-related error msg
DEL-ER	X	Error in current data element '1' - no error; < '1' - error
DATCE	X(8)	(Group) Dates with century
CENTUR	XX	(century)
DATOR	X(6)	(group)
DATOA	XX	year
DATOM	XX	month
DATOJ	XX	day
DATSEP	X	Separator used in date
DAT6	X(6)	(group) - fields for formatting
DAT61		the date - generated if the
DAT619	99	OPERATOR 'AD_' is used, or if
DAT62		a variable data element has a
DAT629	99	date format.
DAT63	XX	
DAT7		
DAT71	XX	
DAT72	XX	
DAT73	XX	
DAT8		
DAT81	XX	
DAT8S1	X	slash
DAT82	X	
DAT8S2	X	slash
DAT83	XX	

DATA NAME	FORMAT	MOST COMMON USAGE
DATCTY	XX	field for loading the century
DAT6C	X(8)	fields for loading the non-for-
DAT61C	XX	matted date with the century.
DAT62C	XX	
DAT63C	XX	
DAT64C	XX	
DAT7C		
DAT71C	XX	
DAT72C	XX	
DAT73C	XX	
DAT74C	XX	
DAT8C		
DAT81C	XX	
DAT8S1C	X	slash
DAT82C	XX	(slashes via filler)
DAT8S2C	X	slash
DAT83C	XX	
DAT84C	XX	
DAT8G	X(8)	Gregorian format date: CCYY/MM/DD
TIMCO		TIME; field for loading the time
TIMCOG		
TIMCOH	XX	
TIMCOM	XX	
TIMCOS	XX	
TIMCOC	XX	
TIMDAY		field for loading formatted time
TIMHOU	XX	
TIMS1	X	
TIMMIN	XX	
TIMS2	X	
TIMSEC	XX	
TIMCIC	9(7)	
TIMCI1		REDEFINES TIMCIC
TIMCIG		
TIMCIH	XX	
TIMCIM	XX	
TIMCIS	XX	
DATCIC	9(7)	
DATQTM		REDEFINES DATCIC
DATQUD	999	
DATQUY	99	

DATA NAME	FORMAT	MOST COMMON USAGE
ddss-CF	X	Segment configuration flag 0 - record not found; 1 - successful read To check the status of a read, ddss-CF is preferred to IK (e.g., F25, F26, F60, F61, F66)
G-ddss		PACTABLE table description
G-ddss-eeeeee		PACTABLE fields
K-scrn		Zones common to dialogue
K-Ascrn-eeeeee		-screen top fields
K-Rscrn-eeeeee		-repetitive group fields
K-Rscrn-LINE(1)		Key of the first line item kept in common area for scrolling
K-Rscrn-LINE(2)		Key of the record following the last line item on the screen kept in common area for scrolling
K-Zscrn-eeeeee		-screen bottom fields
T-scrn-eeeeee		("OFF" option only) With modify data tags off, a copy of each input field is stored in the common area. F8135 ensures consistency with the input map.
I-scrn		Group field for input fields
I-scrn-eeeeee		Input field label useful for Validation Transfer (e.g., F21-F24, F31)
E-scrn-eeeeee	alpha	Input field label for numeric fields after formatting
J-scrn-LINE		Group input field containing entire Repetitive group An occurrence of this field can be moved into I-scrn-LINE for manual processing of a specific line item.
Z-scrn-eeeeee		reception - attributes
O-scrn		group field for output fields
X-scrn-eeeeee		Cursor positioning field. This field is set in F70; any override must be made later (e.g., F71)

DATA NAME	FORMAT	MOST COMMON USAGE
Y-scrn-eeeeee		Attribute byte. This field is set in F70; any override must be made later (e.g., F71). Manually setting attributes may also be accomplished by setting the field A-scrn-eeeeee in Display Preparation (e.g., F68 or F69) and letting F70 fill Y-scrn-eeeeee (which is the actual attr. byte)
O-scrn-eeeeee		Output field label Useful for Transfer for Display (e.g., F66)
F-scrn-eeeeee		to test for class (numeric)
9-scrn-eeeeee		numeric fields
DE-ERR		validation table fields
DE-ER (n)	X	
ER-scrn-eeeeee		Data element error code variable used by the ERR operator; for details, see OLSD ref. manual, Documentary and Error Messages, sub-chapter Manual Explicit Error
ddss-FST	X	non-chained segs:'1'= first access '0'= next read
5-ddss-LTH	S9(4)	Segment length
5-dd00-LTH	S9(4)	Length of longest segment in file
I-PFKEY	XX	Attention Identifier variable
A-scrn-eeeeee(1)		For attribute byte processing before F70 (e.g., F68 or F69), move an N, B, or D to this field for normal, bright, or dark
A-scrn-eeeeee(4)		For cursor position processing before F70 (e.g., F68 or F69) move a Y to this field to set the cursor to the field manually
PROGR	X(8)	Program code
K-Sscrn-PROGR	X(8)	External name of the program we just came from. Can be used to check first time processing (e.g., K-Sscrn-PROGR = PROGR is used before F01; but after F01, ICF = 0 is the simpler check)
5-Sscrn-PROGR	X(8)	This field contains the name of the program to branch to
PROGE	X(8)	External name of the program
PRDOC	X(8)	Help program external name

5.4. TITLES AND CONDITIONS SCREEN (-TC)

TITLES AND CONDITIONS SCREEN (-TC)

Programmers who begin using the System may have some difficulty mastering its generation possibilities.

It is not always easy to know beforehand which procedures of a batch or on-line program will be generated.

Here, programming is done in two steps:

1. Call of automatically generated procedures,

2. Customizing the generated program with structured code.

The first step is performed through data access in batch or on-line programs:

1. Program Call of Data Structures screen (CH: P.....CD),

2. On-Line Call of Segments screen (CH: O.....CS),

3. On-Line Call of Data Elements screen (CH: O.....CE).

Depending on the kind of data that is entered on the call lines of these screens, the system either will or will not generate certain automatic (sub-)functions.

EXAMPLES:

1. In a batch program, 'M' entered in the USAGE OF DATA STRUCTURES field on a Call of Data Structures (-CD) screen causes the generation of validation functions.

2. In an on-line program, 'E' entered in the USE IN RECEPTION field on an On-Line Call of Segments (-CS) screen will generate the segment access for validation with the setting of an error code.

The second step in programming is characterized by the use of the Structured Code function which allows you to complete automatically generated procedures with additional lines unique to the program:

1. Call of P.M.S. screens for user-standard procedures

   CH: P.....CP, O.....CP.

2. Direct input of Procedural Code

   CH: P.....P, O.....P.

A program is then made up of automatically generated procedures and structured code.

GENERAL INFORMATION

Titles and Conditions (-TC) screen lines display the titles and conditions of all procedures of a batch or on-line program, whether automatically generated or specified with procedural code.

Using this screen, the user can examine the general structure of a generated program and detect possible errors related to the uses of the program's different parts.

ACCESSING THE TITLES AND CONDITIONS SCREEN

For batch programs, enter the following in the CHOICE field:

CH: PppppppTCfusf<nn or Ppppppp<nnTCfusf

For on-line programs, enter the following in the CHOICE field:

CH: OooooooTCfusf<nn or Ooooooo<nnTCfusf

```
where:
             pppppp = PROGRAM CODE
             ooooo = SCREEN CODE
             fu     = FUNCTION CODE (default:'  ')
             sf     = SUB-FUNCTION CODE (default:'  ')
             nn     = LEVEL NUMBER (default: 05)
```

EXAMPLE:

In order to obtain the complete list of titles and conditions for program PGM001, the following should be entered in the CHOICE field:

CH: P PGM001 TC

In order to focus on a specific part of the program, for instance starting with function F29, sub-function BB, and view the titles and conditions listed to the 15 level inclusive, the following should be entered in the CHOICE field:

CH: P PGM001 TC29BB<15 or CH: P PGM001 <15TC29BB

ORIGIN OF GENERATED LINES

The lines displayed on this screen originate from the following three sources:

1- PACBASE automatic generation:

Displayed lines come from the Program Call of Data Structures (-CD) screen for batch programs, or On-Line Call of Segments (-CS) screen and On-Line Call of Data Elements (-CE) screen for on-line programs, both having been previously entered by the user.

They are identified by a period ('.') in the ACTION CODE field of each line.

2- Macro-structure calls:

Displayed lines come from the Call of P.M.S. (-CP) lines (of programs and screens).

They are identified by an asterisk ('*') in the ACTION CODE field of each line.

3- Procedural Code (-P) lines attached directly to the program or to the screen:

These lines are identified by a 'blank' in the ACTION CODE field for each line.

UPDATE POSSIBILITIES

The Titles and Conditions (-TC) screen displays functions or sub-functions titles with their conditions for execution. Therefore, updating affects a whole function or sub-function.

. FOR GENERATED PROCEDURES AND MACRO-STRUCTURES:

The only updating possibility is the suppression of a function or sub-function generation. This is done with the 'S' OPERATOR (counterpart to the 'SUP' OPERATOR in Procedural Code (-P) lines).

These procedures are identified with a ('.') or an ('*') in the ACTION CODE field. This code must be deleted if the update is to be taken into account.

. SPECIFIC PROCEDURES:

The user may create, modify or delete the title of a function or sub-function written in Procedural Code.

The user may also modify the LEVEL NUMBER, CONDITION TYPE OR S.F. STRUCTURE and CONDITION FOR EXECUTION of a function or sub-function. The corresponding ACTION CODES are: 'C', 'M', 'D' or blank.

Each update is automatically channeled down to the corresponding Procedural Code (-P) screen.

RETURN TO A DISPLAYED (SUB-)FUNCTION

The user may return to the Procedural Code (-P) screen corresponding to a displayed line. In order to do this, the user places the cursor on the desired line and presses the relevant PFkey (standard: PF10).

The user can also branch to the '-PG' screen from the line where the curor is positioned by using the appropriate PFkey (standard: PF9).

Finally, the user can request that the same screen be displayed from the line where the cursor is positioned by using the appropriate PFkey (standard: PF8, except under IMS).

UPDATE OPERATORS ALLOWED IN THIS SCREEN

```
N      Note (title).
S      Suppression (equivalent to 'SUP').
Blank  Continuation of conditioning of a (sub-)function.
```

Any other operator will be refused.

PREREQUISITE

The program or screen must have been previously defined.

NOTE TO ON-LINE SYSTEMS DEVELOPMENT FUNCTION USERS

Differences may appear between the Titles and Conditions (-TC) screen lines display and the actual generated program:

FUNCTION F80

On the Titles and Conditions (-TC) screen, the sequence order of the sub-functions depends on the SEGMENT CODE IN THE PROGRAM, whereas in the generated program, sub-functions are ordered according to the SEGMENT CODE IN THE LIBRARY. For a segment called in on a Call of Segments (-CS) screen, which doesn't have a 'U'-type ORGANIZATION and is not used in display or reception, display is simulated on the Titles and Conditions (-TC) screen.

FUNCTION F81

Numeric and date validations are always considered to be generated, therefore sub-functions F8110 and F8120 are always displayed on the Titles and Conditions (-TC) screens. However, Sub-function F8110 is generated only if unprotected numeric data elements are called. Sub-function F8120 is generated only if unprotected date-type data elements are called.

SPECIAL PFKEYS

PF8:

Reset screen display starting from the line where the cursor is positioned (not available with the IMS version).

PF9:

From the Titles and Conditions (-TC) screen, branch to the Procedures Generated (-PG) screen and vice-versa, starting from the line where the cursor is positioned.

THE 'TITLES ONLY (-TO)' SCREEN

The Preview Facility includes the Titles Only (-TO) screen. This screen displays the list of program function titles only and illustrates their hierarchical organization.

The screen is accessed in the same manner as the Titles and Conditions (-TC) screen (substitute 'TO' for 'TC'); see Paragraph "ACCESSING THE TITLES AND CONDITIONS SCREEN" above.

The advantage of this screen is that the level numbers of the program functions are indented, showing the user a different view from the Titles and Conditions (-TC) screen. However, this screen cannot be used for updates.

(The Titles Only (-TO) screen image can be found at the end of this sub-chapter).

MODIFYING THE PROCEDURE DIVISION 5
TITLES AND CONDITIONS SCREEN (-TC) 4

```
--------------------------------------------------------------------------------
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! TITLES AND CONDITIONS BBINIT GENERAL PROCESSING                               !
!                       1                                                       !
!                                                                               !
! 2 3 4  5   6 7                               8 9  10                          !
! A FUSF LIN O OPERANDS                        LVTY CONDITION                   !
! . 05       N READ SEQ.FILES NO CONTROL BREAK  05BL                            !
! . 20       N END OF RUN                      05IT FT = ALL '1'                !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
!                                                                               !
! *** END ***                                                                   !
! O: C1 CH: -TC                                                                 !
--------------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	6		PROGRAM CODE OR SCREEN CODE This field contains the six-character program or on-line screen code.
2	1		ACTION CODE
3	2		FUNCTION CODE
		AA to 99	This code determines the placement of the Procedural Code lines in the sequence of functions. This is particularly important when used with the On-Line Systems Development and Batch Systems Development functions in which automatic functions have pre-determined codes.
		$n	In a macro-structure, the FUNCTION CODE can be parameterized.
4	2		SUB-FUNCTION CODE Made up of numeric or alphabetic characters. This code determines the placement of the Procedural Code within the function.
		$n	In a macro-structure, the SUB-FUNCTION CODE can be parameterized.
5	3		LINE NUMBER PARAMETERIZABLE NUMERIC FIELD
		0-999	As a recommendation, number the lines starting with 10 by intervals of 10, thus facilitating future insertions.
		$n0 to $n9	In a macro-structure, only the first two characters of the LINE NUMBER can be parameterized.
6	1		OPERATOR The following OPERATORS are the only ones allowed on this screen:
		N	Title of the function or the sub-function.
		S	Equivalent of 'SUP' in the Procedural Code (-P) lines. Used to suppress a function or sub-function.
		blank	Continuation lines of the CONDITION FOR EXECUTION.
7	32		OPERANDS The title of the corresponding function or sub-function is displayed in this field.
8	2		LEVEL NUMBER

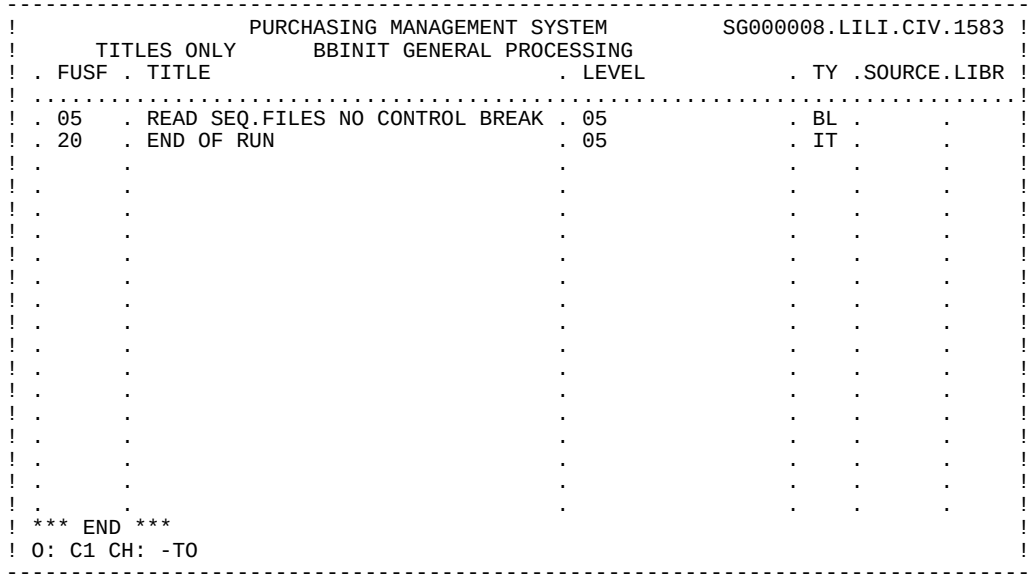
NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			PARAMETERIZABLE NUMERIC FIELD The LEVEL NUMBER is indicated only on the first line of a structure. The CONDITION FOR EXECUTION of a structure at a given level applies to all the logically lower level structures which follow the initial structure, until the next logically higher level structure is encountered.
		05	This level is always assigned to functions. It is also the default level of the first line of a function structure.
		10	This is the default level of the first line of a sub-function structure.
		06 to 98	Possible levels for a sub-function.
		99	Defines an elementary procedure in a function or sub-function. (Maximum number of '99' levels in a sub-function = 98).
		$n	In a macro-structure the LEVEL NUMBER can be parameterized. NOTE: Inserting comments on '99' level and 'IT' type processing lines suppresses the generation of a period at the end of the sentence. On the other hand, you can add comments on '99' level and 'BL' type lines.
9	2		CONDITION TYPE OR S.F. STRUCTURE On the first line of a function or sub-function, the CONDITION TYPE OR S.F. STRUCTURE value indicates the 'structure type' processing to be executed. In a macro-structure the CONDITION TYPE OR S.F. STRUCTURE cannot be parameterized. A (sub-)function constitutes a block of processing or structure. It's also possible to define, within a (sub-)function, elementary structures characterized by a '99' level.
		BL	'Block' type structure. Default value for all non-conditioned structures.
		IT	'IF THEN' type structure. Default value for all conditioned structures. Executed if the condition is satisfied.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		EL	'ELSE' type structure. Prohibited at the function level. Executed if the preceding structure at the same level (which must be an 'IF THEN') was not executed. An 'ELSE' structure cannot have its own condition.
		CO	'CASE OF' type structure. Prohibited at the '05' function level and at the '99' level. A 'CO' structure is used for procedures that are exclusive of each other, and that are executed depending on the possible values of a variable. In a 'CASE OF' structure only the name of the variable is defined (in the condition field and on a single line). The possible values of this variable are specified in the structures at the next lower, non-elementary, hierarchical level. In a Dialog screen, nesting of 'CASE OF' loops is not authorized within another 'CASE OF' loop.
		DW	'DO WHILE' structure. Prohibited at the '05' function level and at the '99' level. This structure is executed repeatedly, as long as its condition is satisfied.
		DU	'DO UNTIL' structure. Prohibited at the '05' function level and at the '99' level. This structure is executed repeatedly until its condition is satisfied. Thus, it is executed at least one time. For the 'DW' and 'DU' type structures, the user must set up the condition status (incrementation of an index, for example).
		DO	'DO' structure ('loop' structure). Cannot be used at an '05' function level or the '99' level. The 'DO' structure is executed in a repetitive way depending upon the conditioning of three variables:

NUM LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		the first variable being the iteration number where the processing should start; the second one, the iteration number where the processing should stop, the third being the incrementing interval. All three variables may be either numbers or data elements. The increment variable is optional and its default value is '1'. (If indicated, its value must be positive.) Both iteration variables must be entered on the first line of the sub-function, separated by a space. The parameters must be entered in the following order: starting limit (positive), ending limit and increment interval. DO calls for 3 parameters, of which the first 2 are required. All 3 must appear on the first line. The System automatically generates an index: JfusfR, 'fu' standing for the FUNCTION CODE, and 'sf' standing for the SUB-FUNCTION CODE.
	OR	Continuation of the condition associated with the preceding lines by a logical 'OR'.
	AN	Continuation of the condition associated with the preceding lines by a logical 'AND'. NOTE: The parentheses which group the terms of a condition must be indicated in the text of the condition. In a macro-structure the type of structure or condi-
	WH	You can use COBOL commands after an EVA or SEA command. Each of these commands indicates one processing to be performed according to the fulfilled condition. In the example below, processing1 will be performed when condition1 is fulfilled. EVA condition ---processing1--- 99WH ---condition1--- ---processing2--- 99WH ---condition2--- ---processing1--- 99WH ---condition2--- ---processing3--- 99WH ---condition3--- ON-LINE SYSTEMS DEVELOPMENT --- The following values, in the CONDITION TYPE OR S.F. STRUCTURE field, are used for relative positioning with the On-Line Systems Development function and Pacbench C/S.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
		*A	Insertion of a sub-function before an automatic sub-function identified by the data element or the segment it processes.
		*P	Insertion of a sub-function after an automatic sub-function identified by the data element or the segment it processes. (The CONDITION FOR EXECUTION of the automatic sub-function applies to the inserted sub-function if the LEVEL NUMBER of the inserted sub-function is greater than that of the automatic sub-function.)
		*R	Replacement of an automatic sub-function identified by the data element or the segment it processes. (The CONDITION FOR EXECUTION of the automatic sub-function does not apply to the replaced sub-function.) For more information, see the "USE OF STRUCTURED CODE" Chapter, "SPECIFIC PROCEDURES" Subchapter in the ON-LINE SYSTEMS DEVELOPMENT Reference Manual and the "USE OF STRUCTURED CODE" Chapter, "PROCEDURAL CODE" Suchapter in the PACBENCH C/S Reference Manual. The two following values are used for the relative positioning with Pacbench C/S (server components only):
		*C	Insertion or replacement of the processing on the server or the Logical View.
		*B	Insertion in the elementary processing called by PERFORM. For more information, see the "USE OF STRUCTURED CODE" Chapter, "PROCEDURAL CODE" Subchapter in the PACBENCH C/S Reference Manual.
10	28		CONDITION FOR EXECUTION The CONDITION FOR EXECUTION statement is coded without using 'IF', 'AND', 'OR', 'GO TO', or a period (.). The first line must be associated with an explicit or implicit LEVEL NUMBER ('05' for a function; '06' to '98' for a sub-function; '99' for an elementary procedure within a function or sub-function). The LEVEL NUMBER need not be specified on continuation lines. For a 'CASE OF' type structure, the name of the variable (which may have alternative values) must be indicated on the first line.

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
			For structures dependent on a 'CASE OF', the CONDITION FOR EXECUTION indicates the possible value of the 'CO' variable.
		$n	In a macro-structure, the CONDITION FOR EXECUTION can be parameterized.


PURCHASING MANAGEMENT SYSTEM SG000008.LILI.CIV.1583
TITLES ONLY BBINIT GENERAL PROCESSING
FUSF TITLE LEVEL TY SOURCE.LIBR
05 READ SEQ.FILES NO CONTROL BREAK 05 BL
20 END OF RUN 05 IT
*** END ***
O: C1 CH: -TO

6. ACCESS COMMANDS

6.1. ON-LINE ACCESS COMMANDS

PROGRAMS: ON-LINE ACCESS

LIST OF PROGRAMS

CHOICE	SCREEN	UPD
LCPaaaaaa	List of programs by code (starting with program 'aaaaaa').	NO
LTPnPaaaaaa	List of programs of type 'n' (starting with program 'aaaaaa').	NO
LEPeeeeeeee	List of programs by external name (starting with external name 'eeeeeeee').	NO

DESCRIPTION OF PROGRAM 'aaaaaa'

CHOICE	SCREEN	UPD
Paaaaaa	Definition of program 'aaaaaa'.	YES
PaaaaaaGbbb	General documentation for program 'aaaaaa' (starting with line 'bbb').	YES
PaaaaaaXVbbbbbb	X-references of program 'aaaaaa' to volumes (starting with volume 'bbbbbb').	NO
PaaaaaaATbbbbbb	Text assigned to program 'aaaaaa' (starting with text 'bbbbbb').	NO
PaaaaaaX	X-references of program 'aaaaaa'.	NO
PaaaaaaXVbbbbbb	X-references of program 'aaaaaa' to volumes (starting with volume 'bbbbbb')	YES
PaaaaaaXPbbbbbb	X-references of program 'aaaaaa' to programs (starting with program 'bbbbbb')	YES
PaaaaaaXObbbbbb	X-references of program 'aaaaaa' to screens (starting with screen 'bbbbbb').	NO
PaaaaaaXQrrrrrr	List of entities linked to program 'aaaaaa' through user-defined relationship 'rrrrrr'.	NO

PaaaaaaCDbb	Call of data structures of program 'aaaaaa' (starting with data structure 'bb').	YES
PaaaaaaHCDbb	ZOOM on data structure 'bb' called into program 'aaaaaa'.	YES
PaaaaaaCPbbbbbb	Call of parameterized macro-structures of program 'aaaaaa' (starting with P.M.S. 'bbbbbb').	YES
PaaaaaaBbbccddd	Beginning Insertions modifications of program 'aaaaaa' (starting with section 'bb', paragraph 'cc', line 'ddd').	YES
PaaaaaaWbbccc	Description of Work Areas of program 'aaaaaa' (starting with work area 'bb' line 'ccc').	YES
PaaaaaaPfusfnnn	Description of Procedural Code of program 'aaaaaa' (starting with function 'fu', sub-function 'sf', line number 'nnn').	YES
PaaaaaaPGfusfnnn	View of Procedures Generated of program 'aaaaaa' (starting with function 'fu', sub-function 'sf', line number 'nnn'), with display of generated procedure titles.	YES
Paaaaaa9bbbbbb	Description of Pure COBOL Source Code of program 'aaaaaa' (starting with -9 line 'bbbbbb').	YES
PaaaaaaTCfusf	View of Titles and Conditions of automatic and specific procedures of program 'aaaaaa' (starting with function 'fu', sub-function 'sf').	YES
PaaaaaaTCfusf<nn or Paaaaaa<nnTCfusf	View of Titles and Conditions of automatic and specific procedures of program 'aaaaaa' up to level 'nn' (starting with function 'fu', sub-function 'sf').	YES

PaaaaaaTOfusf	View of Titles Only of automatic and specific procedures of program 'aaaaaa' (starting with function 'fu', sub-function 'sf').	NO
PaaaaaaTOfusf<nn or Paaaaaa<nnTOfusf	View of Titles Only of automatic and specific procedures of program 'aaaaaa' up to level 'nn' (starting with function 'fu', sub-function 'sf').	NO
PaaaaaaSCfusfnnn	Description of Source Code of "reversed" program 'aaaaaa' (starting with function 'fu', sub-function 'sf', line number'nnn').	YES
PaaaaaaSTRfusf	Program Structure of "reversed" program 'aaaaaa' (starting with function 'fu', sub-function 'sf').	YES

NOTE: After the first choice of type 'Paaaaaa', 'Paaaaaa' can be replaced with '-'.

All notations between parentheses are optional.

6.2. ON-LINE DISPLAY OPTIONS

ON-LINE DISPLAY OPTIONS

PxxxxxxCP

C1: Displays the call lines of macro-structures.

C2: Displays the number of the session in which the line was updated.

PxxxxxxB, -W, -P, -8.

C1: Displays the input format.

C2: Displays information concerning the origin of the lines.

The macro-structure code will appear in the source area for the program lines obtained by a macro-structure call.

For lines that belong to the library in which you are working, the LIB field indicates the number of the session in which the line was updated. For lines that belong to other libraries, it indicates their code.

The 'C2' option cannot be used for updating.

C3: Available only on -W screens. Displays the selected format (I-E-S) of the Data Element.

The 'C3' option cannot be used for updating.

6.3. ON-LINE ACTION CODES

ON-LINE ACTION CODES

On the Program Definition screen:

'C'= Create.

'M'= Modify.

'D'= Delete (possible only if there's no description line).

'?'= Request for documentation ('HELP' function).

On Description screens:

'C'= Create the line.

'M'= Modify the line.

'D'= Delete the line.

'X'= Create or modify the line. When a line contains fields which are automatically transformed into uppercase, for example Pure COBOL Source Code (-9) lines, this transformation is inhibited.

'B'= Multiple deletion beginning with this line,

'R'= Repeat the line.

'I'= Insert lines.

'T'= Transfer the line (enter target line number in the LINE NUMBER field),

'G'= Group transfer of lines (enter target line number in the LINE NUMBER fields), beginning with this line,

'L'= With action codes 'B' or 'G' above: last line to be deleted or transferred,

'?'= Request for documentation (HELP function).

For more details on On-Line Action Codes, refer to the USER'S Reference Manual.

Batch Action Codes are listed in the Batch Form descriptions (refer to subchapter "BATCH ACCESS COMMANDS").

6.4. BATCH ACCESS COMMANDS

BATCH ACCESS COMMANDS

PROGRAM DEFINITION

Batch Form '0' (zero) is used to define a program.

ACTION CODES

```
.C     = Creation of the line in the library.

.M     = Modification of the line.

.Blank = Creation or Modification, depending on the state
         of library.

.X     = Creation or Modification with insertion of
         ampersand ('&').

.B     = Deletion of the program: Definition '0' and Gen-
         eral Documentation (V3), as well as all program
         description lines (D, 7, 1, P, FC, 9, 8 and M).
         Text lines are not deleted.
```

DATA STRUCTURE CALLS

A Data Structure is called using Batch Form '1'.

Since it contains no program code, this form must always be preceded by a Program Definition line.

ACTION CODES

```
.C     = Creation of the line in the library.

.M     = Modification of the line.

.Blank = Creation or modification, depending on the state
         of the library.

.X     = Creation or  modification  with insertion of the
         character '&'.

.D     = Deletion of  the line or all  lines related to a
         file if the code is associated with the first
         one.

.B     = Multiple deletion  of program lines starting
         with, and including, the indicated line.

.R     = End of multiple delete. When no 'R' code follows
         a 'B' code, the delete ends:

         - At the end of the section if the paragraph code
           is absent.

         - At the end of the paragraph, if the paragraph
           code is present.
```

BEGINNING INSERTIONS

The 'Beginning of Program' is modified using Batch Form 'D'.

Since it contains no program code, this form must always be preceded by Batch Form '0' (Program Definition).

ACTION CODES

```
.C     = Creation of the line in the library.

.M     = Modification of the line.

.Blank = Creation or modification, depending on the state
         of the library.

.X     = Creation or  modification  with insertion of the
         character '&', no transformation of lowercases
         into uppercases.

.D     = Deletion of  the line or all  lines related to a
         file if the code is associated with the first
         one.

.B     = Multiple deletion  of program lines starting
         with, and including, the indicated line.

.R     = End of multiple delete. When no 'R' code follows
         a 'B' code, the delete ends:

         - At the end of  the section if the paragraph code
           is absent.

         - At the end of  the paragraph,   if the paragraph
           code is present.
```

WORK AREAS AND LINKAGE AREAS

The work areas and linkage areas are described using Batch Form '7'.

Since it contains no program code, this form must always be preceded by Batch Form '0' (Program Definition).

ACTION CODES

```
.C     = Creation of the line in the library.

.M     = Modification of the line.

.Blank = Creation or Modification, depending on the state
         of the library.

.X     = Creation or  Modification with  insertion of the
         character '&', no transformation of lowercases
         into uppercases.

.D     = Deletion of  the line or all  lines related to a
         file if the code is associated with the first
         one.

.B     = Multiple deletion of  program lines starting
         with, and including, the indicated line.

.R     = End of multiple delete. When no 'R' code follows
         'B' code, the delete ends at the end of the Work
         Areas (-W) lines.
```

PROCEDURAL CODE

Procedural code is written using Batch Form 'P'.

Since it contains no program code, this form must always be preceded by Batch Form '0' (Program Definition).

ACTION CODES

```
.C     = Creation of the line in the library.

.M     = Modification of the line.

.Blank = Creation or Modification, depending on the state
         of the library.

.X     = Creation or  Modification with  insertion of the
         character '&', no transformation of lowercases
         into uppercases.

.D     = Deletion of a line.

.B     = Multiple  deletion of program lines starting
         with, and including, the indicated line.

.R     = End of  multiple delete.   When no 'R' code fol-
         lows a 'B' code, the delete ends:

       - At the end of the function when there is no sub-
         function code.

       - At the end of the sub-function  when the code of
         the sub-function is present.
```

CALL OF MACRO-STRUCTURES

Macro-structures are called using Batch Form 'M'.

Since it contains no program code, this form must always be preceded by Batch Form '0' (Program Definition).

ACTION CODES

.C = Creation of the line in the library.

.M = Modification of the line.

.Blank = Creation or Modification, depending on the state of the library.

.X = Creation or Modification with insertion of the character '&', no transformation of lowercases into uppercases.

.D = Deletion of a line.

.B = Multiple delete of macro-structure lines inserted in a program starting with, and including, the indicated line.

.R = End of multiple delete. When no 'R' code follows a 'B' code, the delete ends at the last line of the called macro-structure.

6.5. GENERATION AND/OR PRINTING

GENERATION AND/OR PRINTING

Programs can be generated and printed by entering certain commands, either on-line, on the Generation and Print Commands (GP) screen (used for documentation and generation requests), or in batch mode, by using Batch Form 'Z'. The COMMANDS FOR PRINT REQUESTS are listed below:

LCP: List of all programs.

C1 option: without keywords,
C2 option: with keywords.

LKP: List of programs by keywords. The user may limit the keywords to explicit or implicit only. The keywords are specified on a continuation line (on-line mode, corresponding to columns 31 to 80 in batch mode; see User's Manual).

C1 option: same as LCP.

DCP: Description information for the program whose code is entered in the ENTITY CODE field; if no code has been entered, the description information for all programs will be provided.

C1 option: without assigned text,
C2 option: with the assigned text.

GCP: Generation & description of a program whose code must be indicated.

C1 option: without assigned text,
C2 option: with the assigned text.

FLP: Specify the flow of the programs. The user may specify the environment (PEI), control card options, and parameters (as needed).

C1 option only.

7. EXAMPLE OF A GENERATED PROGRAM

7.1. INTRODUCTION

INTRODUCTION

This chapter is designed to provide examples of how certain input will affect the automatically generated program.

Only those portions of the program that can be modified by Structured Code will be described in this chapter.

The displayed examples are not from the same program. They are simply examples.

A batch program structure was used; however the principle is the same for on-line programs.

7.2. ENVIRONMENT DIVISION

ENVIRONMENT DIVISION

The ENVIRONMENT DIVISION may be adapted as needed, via the Beginning Insertions (-B) screen entries.

The example below illustrates how the Beginning Insertions lines may be used to modify the INPUT-OUTPUT SECTION. The user entered the following lines in order to code the SELECT statements for ESDS and RRDS VSAM files.

```
+-----------------------------------------------------------+
!  A SE PA LIN INSTRUCTION TO BE INSERTED                   !
!    01 DD 090  * ENTRY-SEQUENCED DATA SET EXAMPLE          !
!    01 DD 100      SELECT DD-FILE                          !
!    01 DD 120             ASSIGN TO ESMSTR                 !
!    01 DD 140             ORGANIZATION IS SEQUENTIAL       !
!    01 DD 160             ACCESS MODE IS SEQUENTIAL        !
!    01 DD 180             FILE STATUS IS DD00-STATUS.      !
!    01 EE 090  * RELATIVE RECORD DATA SET EXAMPLE          !
!    01 EE 100      SELECT EE-FILE                          !
!    01 EE 120             ASSIGN TO RRMSTR                 !
!    01 EE 140             ORGANIZATION IS RELATIVE         !
!    01 EE 160             ACCESS MODE IS DYNAMIC           !
!    01 EE 170             RELATIVE KEY IS WS00-RRN         !
!    01 EE 180             FILE STATUS IS EE00-STATUS.      !
!                                                           !
!O: C1 CH: -B                                              !
+-----------------------------------------------------------+
```

The Call of Data Structures (-CD) lines are coded as follows:

```
+-----------------------------------------------------------+
! DP   DL  EXTERN  OARFU        U    SELECTION             !
! DD   BL  ESMSTR  VSFID        C    *10                   !
!          STAT.FLD: DD00STATUS                           !
! EE   BL  RRMSTR  VSFID        C    *20                   !
!          STAT.FLD: EE00STATUS                           !
!                                                         !
!O: C1 CH: -CD                                            !
+-----------------------------------------------------------+
```

NOTE: For more input entered for the RELATIVE KEY IS statement on the RRDS file, see subchapter "WORKING-STORAGE SECTION".

The excerpt of COBOL that is generated as a result of these lines follows.

```
ENVIRONMENT DIVISION.                                    BLPROG
CONFIGURATION SECTION.                                   BLPROG
SOURCE-COMPUTER. IBM-370.                                BLPROG
OBJECT-COMPUTER. IBM-370.                                BLPROG
INPUT-OUTPUT SECTION.                                    BLPROG
FILE-CONTROL.                                            BLPROG
* ENTRY-SEQUENCED DATA SET EXAMPLE                       D01DD
    SELECT DD-FILE                                       D01DD
          ASSIGN TO ESMSTR                               D01DD
          ORGANIZATION IS SEQUENTIAL                     D01DD
          ACCESS MODE IS SEQUENTIAL                      D01DD
          FILE STATUS IS DD00-STATUS.                    D01DD
* RELATIVE RECORD DATA SET EXAMPLE                       D01EE
    SELECT EE-FILE                                       D01EE
          ASSIGN TO RRMSTR                               D01EE
          ORGANIZATION IS RELATIVE                       D01EE
          ACCESS MODE IS DYNAMIC                         D01EE
          RELATIVE KEY IS WS00-RRN                       D01EE
          FILE STATUS IS EE00-STATUS.                    D01EE
DATA DIVISION.                                           BLPROG
FILE SECTION.                                            BLPROG
```

7.3. WORKING-STORAGE SECTION: BEGINNING

WORKING-STORAGE SECTION: BEGINNING

The WORKING-STORAGE SECTION and other sections belonging to the end of the DATA DIVISION may be supplemented via the Work Areas (-W) screen. The example shows the implementation of this feature using the Formatted Line for a Work Areas screen with an alphabetic CODE FOR COBOL PLACEMENT.

The CODE FOR COBOL PLACEMENT, when alphabetic, causes the data to be placed in the beginning of the WORKING-STORAGE SECTION, with this code and the LINE NUMBER producing a sequencing number.

The Work Areas (-W) screen appeared as follows:

```
+-------------------------------------------------------+
!CODE FOR PLACEMENT..:  BB                              !
!A LIN T LEVEL OR SECTION WORK AREA DESCRIPTION          !
!* 020 F PC: XW  LC: XW SEL: 02___PICT: I DESC: 2 LEV: 1 !
!  110 F DP: WK  DL: BB SEL: _____PICT: I DESC: 2 LEV: 1 !
!  120 F DP: WA  DL: WA SEL: 00___PICT: I DESC: 2 LEV: 1 !
+-------------------------------------------------------+
```

NOTE: The formatted line that appears as line 020 in this example comes from a macro-structure. (Notice the asterisk in the ACTION CODE field for this line.) The field labels that appear on the screen for this macro ('PC:' and 'LC:') result from an older version of this line, and are exactly the same as those fields labeled 'DP:' and 'DL:'.

In the generated COBOL, the WORKING-STORAGE SECTION will begin with the description of segment XW02, followed by the descriptions of all the segments that belong to data struc- ture WK. Segment WA00 follows.

Another Work Areas (-W) screen was entered for this example, to illustrate setting up a search field for an RRDS file. In this example, the user did not use a formatted line. The CODE FOR COBOL PLACEMENT used was higher than the code used for the screen with the formatted lines above, thus the COBOL corresponding to this entry follows those lines.

This Work Areas (-W) screen appeared as follows:

```
+-------------------------------------------------------+
!CODE FOR PLACEMENT..:  CC                              !
!A LIN T LEVEL OR SECTION WORK AREA DESCRIPTION          !
!  020 * RELATIVE RECORD DATA SET SEARCH FIELD          !
!  040   01              WS00-RRN   PIC 99 VALUE ZEROS.  !
+-------------------------------------------------------+
```

The System-generated 'WSS-BEGIN' will be generated after these supplementary lines.

```
 WORKING-STORAGE SECTION.                                          FL10UP
*PC: XW  LC: XW SEL: 02______ PICT: I DESC: 2 LEV: 1 ORG: _ SS: _ 7BB020
 01               XW02.                                           FL10UP
      10          XW02-XDATE.                                     FL10UP
      11          XW02-XDAT1.                                     FL10UP
      12          XW02-XDAT19 PICTURE  99                         FL10UP
                  VALUE                ZERO.                      FL10UP
      11          XW02-XDAT2.                                     FL10UP
      12          XW02-XDAT29 PICTURE  99                         FL10UP
                  VALUE                ZERO.                      FL10UP
      11          XW02-XDAT3.                                     FL10UP
      12          XW02-XDAT39 PICTURE  99                         FL10UP
                  VALUE                ZERO.                      FL10UP
      10          XW02-XLEAPY PICTURE  99                         FL10UP
                  VALUE                ZERO.                      FL10UP
*DP: WK  DL: BB SEL: ________ PICT: I DESC: 2 LEV: 1 ORG: _ SS: _ 7BB110
 01               WK00.                                           FL10UP
      10          WK00-FLTKEY.                                    FL10UP
      11          WK00-LIBKEY PICTURE  X                          FL10UP
                  VALUE                SPACE.                     FL10UP
      11          WK00-FLM    PICTURE  999                        FL10UP
                  VALUE                ZERO.                      FL10UP
      11          WK00-FLDDEP PICTURE  X(6)                       FL10UP
                  VALUE                SPACE.                     FL10UP
      11          WK00-PSNAME PICTURE  X(4)                       FL10UP
                  VALUE                SPACE.                     FL10UP
      11          WK00-PANFI  PICTURE  X                          FL10UP
                  VALUE                SPACE.                     FL10UP
 01               WK10.                                           FL10UP
      10          WK10-FLDCAN PICTURE  X(6)                       FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK10-FLCADE PICTURE  XXX                        FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK10-FLCAAR PICTURE  XXX                        FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK10-FLTDEP PICTURE  9(4)                       FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK10-FLTARR PICTURE  9(4)                       FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK10-ACMSER PICTURE  9(6)                       FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK10-FLCFS  PICTURE  X                          FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK10-FLQSTP PICTURE  9                          FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK10-FLQRFC PICTURE  9(3)                       FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK10-FLQRCC PICTURE  9(3)                       FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK10-FILLER PICTURE  X(31)                      FL10UP
                  VALUE                SPACE.                     FL10UP
 01               WK20.                                           FL10UP
      10          WK20-PANTTL PICTURE  XXX                        FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK20-PANL   PICTURE  X(12)                      FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK20-PAMPHH PICTURE  9(10)                      FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK20-PAMPHW PICTURE  9(10)                      FL10UP
                  VALUE                ZERO.                      FL10UP
      10          WK20-RECCLA PICTURE  X                          FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK20-RECSMK PICTURE  X                          FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK20-REDCAN PICTURE  X(6)                       FL10UP
                  VALUE                SPACE.                     FL10UP
      10          WK20-FILLER PICTURE  X(22)                      FL10UP
                  VALUE                SPACE.                     FL10UP
*DP: WA  DL: WA SEL: 00______ PICT: I DESC: 2 LEV: 1 ORG: _ SS: _ 7BB120
 01               WA00.                                           FL10UP
      10          WA00-1TSTD.                                     FL10UP
      11          WA00-1HSTD  PICTURE  99                         FL10UP
                  VALUE                ZERO.                      FL10UP
      11          WA00-1RRCOL PICTURE  X                          FL10UP
                  VALUE                SPACE.                     FL10UP
      11          WA00-1MSTD  PICTURE  99                         FL10UP
                  VALUE                ZERO.                      FL10UP
```

```
        11            WA00-1AMPM  PICTURE  X                    FL10UP
                      VALUE                SPACE.               FL10UP
        10            WA00-1TMIL.                               FL10UP
        11            WA00-1HMIL  PICTURE  99                   FL10UP
                      VALUE                ZERO.                FL10UP
        11            WA00-1MMIL  PICTURE  99                   FL10UP
                      VALUE                ZERO.                FL10UP
        10            WA00-1FCCTR PICTURE  999                  FL10UP
                      VALUE                ZERO.                FL10UP
        10            WA00-1CCCTR PICTURE  999                  FL10UP
                      VALUE                ZERO.                FL10UP
   *RELATIVE RECORD DATA SET SEARCH FIELD                       7CC020
    01              WS00-RRN       PIC 99 VALUE ZEROS.        7CC040
    01   WSS-BEGËN.                                            FL10UP
         05   FILLER PICTURE X(7) VALUE 'WORKING'.             FL10UP
         05   BLANC  PICTURE X    VALUE SPACE.                 FL10UP
         05   IK     PICTURE X.                                FL10UP
```

7.4. WORKING-STORAGE SECTION: END

WORKING-STORAGE SECTION: END

When the CODE FOR COBOL PLACEMENT is numeric, the data description is placed after those with alphabetic codes, and after most data structures descriptions which come from the Call of Data Structures (-CD) or On-line Screen Call of Elements (-CE) or Call of Segments (-CS) screens.

The lines entered on the screen used for this example are generated just before the PROCEDURE DIVISION statement.

The Work Areas (-W) screen was coded as follows:

```
+-------------------------------------------------------+
!CODE FOR PLACEMENT..:  90                              !
! LIN T LEVEL OR SECTION WORK AREA DESCRIPTION           !
! 000 F DP: WB  DL: WG SEL: 01_____PICT: I DESC: 4 LEV: 3!
+-------------------------------------------------------+
```

```
*DP: WB  DL: WG SEL: 01______ PICT: I DESC: 4 LEV: 3 ORG: _ SS: _ 790000
 01                WB00.                                          PJJPS1
      02           WB01T.                                         PJJPS1
      03           WB01.                                          PJJPS1
      10           WB01-FILLER PICTURE  X(18).                    PJJPS1
      10           WB01-FILLER PICTURE  X(4).                     PJJPS1
      10           WB01-TABCPT PICTURE  X(44).                    PJJPS1
 PROCEDURE DIVISION.
```

7.5. PROCEDURE DIVISION

PROCEDURE DIVISION

The user may modify the PROCEDURE DIVISION in any number of ways. The lines that are generated may be overridden, supplemented, or suppressed. New functions may be created for a program by calling in macros or by attaching Procedural Code (-P) lines directly to the program. Lines of the macro may be overridden, supplemented or suppressed.

The Procedural Code lines below illustrate different types of modifications that the user may make to the PROCEDURE DIVISION.

MODIFYING AUTOMATICALLY GENERATED FUNCTIONS

The Procedural Code (-P) lines below illustrate the overriding of the generation of the OPEN of the TR-FILE that would normally have occurred in Function F01.

```
+-----------------------------------------------------------+
!                                          FUNCTION:  01 !
!A SF LIN OPE OPERANDS                    LVTY CONDITION  !
!* TR     N   INITIALIZATION OF FILE TR    10BL            !
!* TR     M   '1'  TR-FT                                   !
+-----------------------------------------------------------+
```

Although the source of the lines above is a macro which was called into the program, the lines themselves are generated exactly as those lines that are attached directly would be.

Without these lines, the OPEN of the TR file would look just like that of the EM file.

Specific lines in certain automatically generated functions may be suppressed. The lines below illustrate suppressing the CLOSE of the TR-FILE that would normally occur in F20.

```
+-----------------------------------------------------------+
!                                          FUNCTION:  20 !
!A SF LIN OPE OPERANDS                    LVTY CONDITION  !
!* TR     SUP                                              !
+-----------------------------------------------------------+
```

The next excerpt shows the supplementation of Function F76. Here, the lines identified with an asterisk in the ACTION CODE field come from a macro. The user has supplemented the lines of the macro using Procedural Code (-P) lines attached directly to the program. They are interspersed with lines of the macro. This is controlled by the key : FUNCTION CODE, SUB-FUNCTION CODE, and LINE NUMBER. The example with F76AL shows that the user can override lines of a macro with Procedural code lines of the same key:

```
+-----------------------------------------------------------+
!                                          FUNCTION:  76 !
!A SF LIN OPE OPERANDS            LVTY CONDITION           !
!* AL     N   SEARCH              15DW I06 NOT > 27        !
!  AL  10 M   6    EM00-ERTYP     99IT UT-PR (I06) NOT = 0 !
!* AL  10 M   6    EM00-ERTYP     99IT UT-UPR (I06) NOT = 0!
!* AL  20 M   I06   EM00-ERCOD9                            !
!* AL  30 P   F76AU                                        !
!* AL  40 A   1    I06                                     !
+-----------------------------------------------------------+
```

In F76AT, lines have been added to those of the macro.

```
+-----------------------------------------------------------+
!                                          FUNCTION:  76 !
!A SF LIN OPE OPERANDS            LVTY CONDITION           !
!* AT     N   PRINT GOOD TRANS..  10IT XW01-XERRCT = ZERO  !
!  AT   2 P   F92                 99IT 1-MB00-STRUCT = 'P' !
!  AT   5 GT  10                  99IT XW01-XERRCT NOT = 0 !
!* AT  10 M   SPACE  EM00                                  !
!* AT  20 P   F8RBB  F8R-FN       99IT XW01-XIPRIN = '1'   !
!* AT  30 GT  10                  99BL                     !
+-----------------------------------------------------------+
```

Note that the generated code contains lines that are generated automatically by the System as well as these lines.

CREATING NEW FUNCTIONS

New functions may be added to the generated skeleton simply by using a FUNCTION CODE that is not generated. The lines will be placed within the program according to the value of the FUNCTION CODE. Our example uses Function F93.

```
N01.      NOTE ************************************.          FL10UP
               *                                    *          FL10UP
               *        INITIALIZATIONS             *          FL10UP
               *                                    *          FL10UP
               ************************************.          FL10UP
F01.      EXIT.                                               FL10UP
N01BB.    NOTE *INITIALIZATION OF FILE  BB-FILE    *.         FL10UP
F01BB.    OPEN I-O                      BB-FILE.              FL10UP
F01BB-FN. EXIT.                                               FL10UP
N01EM.    NOTE *INITIALIZATION OF FILE  EM-FILE    *.         FL10UP
F01EM.    OPEN INPUT                    EM-FILE.              FL10UP
F01EM-FN. EXIT.                                               FL10UP
N01MB.    NOTE *INITIALIZATION OF FILE  MB-FILE    *.         FL10UP
F01MB-10. RETURN   MB-FILE      AT END                        FL10UP
          MOVE  1 TO                    MB-FI.                FL10UP
F01MB-FN. EXIT.                                               FL10UP
N01TR.    NOTE *INITIALIZATION OF FILE TR          *.         P000
F01TR.                                                        P000
    MOVE        '1' TO TR-FT.                                 P010
F01TR-FN. EXIT.                                               P010
N01XE.    NOTE *INITIALIZATION OF FILE  XE-FILE    *.         FL10UP
F01XE.    OPEN OUTPUT                   XE-FILE.              FL10UP
F01XE-FN. EXIT.                                               FL10UP
F01-FN.   EXIT.                                               FL10UP
                           .
                           .
                           .
                           .
N20.      NOTE ************************************.          FL10UP
               *                                    *          FL10UP
               *           END OF RUN               *          FL10UP
               *                                    *          FL10UP
               ************************************.          FL10UP
F20.      IF FT =            ALL '1'                          FL10UP
          NEXT SENTENCE ELSE GO TO     F20-FN.                 FL10UP
F20BB.    CLOSE    BB-FILE.                                   FL10UP
F20BB-FN. EXIT.                                               FL10UP
F20EM.    CLOSE    EM-FILE.                                   FL10UP
F20EM-FN. EXIT.                                               FL10UP
F20XE.    CLOSE    XE-FILE.                                   FL10UP
F20XE-FN. EXIT.                                               FL10UP
                           .
                           .
                           .
                           .
N76.      NOTE ************************************.          FL10UP
               *                                    *          FL10UP
               * STORE ERRORS, RETRIEVE INIT. STATE*          FL10UP
               *                                    *          FL10UP
               ************************************.          FL10UP
N76-A.    NOTE *      STORE ERRORS                  *.         FL10UP
F76-A.    IF ID-ER NOT = '0' MOVE ID-ER TO TR-ER               FL10UP
          GO TO F76-C. MOVE SE-ER (I01) TO SEG-ER.            FL10UP
          IF SEG-ER < '0' OR SEG-ER > '1'                     FL10UP
          MOVE SEG-ER TO TR-ER GO TO F76-C.                   FL10UP
          MOVE 1 TO I06.                                      FL10UP
F76-B.    MOVE DE-ER (I06) TO DEL-ER.                         FL10UP
     IF DEL-ER = '1'  OR DEL-ER = '0' GO TO F76-B1.           FL10UP
          MOVE 4 TO TR-ER GO TO F76-C.                        FL10UP
F76-B1.   IF I06 = I50 MOVE I03 TO I06 GO TO F76-B.           FL10UP
          IF I06 < I04 ADD  1   TO I06 GO TO F76-B.           FL10UP
F76-C.    IF TR-ER NOT = '1' MOVE '1' TO GR-ER.               FL10UP
N76AB.    NOTE *INITIALIZATIONS                 *.          P000
F76AB.                                                        P000
    MOVE        SPACE TO EM00                                 P010
    MOVE        ZERO TO XW01-XERRCT                           P020
    MOVE        '0' TO XW01-XIPRIN                            P030
    MOVE        1-MB00 TO XW01-XTRAIM.                        P040
F76AB-FN. EXIT.                                               P040
N76AC.    NOTE *IDENTIFICATION ERROR            *.          P000
F76AC.    IF    ID-ER NOT = ZERO                              P000
          NEXT SENTENCE ELSE GO TO     F76AC-FN.              P000
    MOVE        '1' TO EM00-ERTYP                             P010
    MOVE        ID-ER TO EM00-ERCOD                           P020
    PERFORM     F76AU THRU F76AU-FN.                          P030
F76AC-900. GO TO F76AD-FN.                                    P030
F76AC-FN. EXIT.                                               P030
```

```
N76AD.    NOTE *ELEMENT/RECORD ERROR              *.          P000
F76AD.         EXIT.                                          P000
N76AE.    NOTE *RECORD ERROR                      *.          P000
F76AE.                                                        P000
    MOVE        SE-ER (I01) TO EM00-ERCOD.                    P010
          IF    EM00-ERCOD NOT = '0  '                        P020
          AND   EM00-ERCOD NOT = '1  '                        P030
    MOVE        '0' TO EM00-ERTYP                             P020
    PERFORM     F76AU THRU F76AU-FN.                          P030
F76AE-FN. EXIT.                                               P030
N76AF.    NOTE *ERROR IN COMMON PART OF SEGMENT   *.          P000
F76AF.                                                        P000
    MOVE        1 TO I06.                                     P010
N76AG.    NOTE *SEARCH                            *.          P000
F76AG.    IF    I06 NOT > I50                                 P000
          NEXT SENTENCE ELSE GO TO     F76AG-FN.              P000
    MOVE        DE-ER (I06) TO EM00-ERTYP.                    P010
          IF    EM00-ERTYP NOT = ZERO                         P020
          AND   EM00-ERTYP NOT = '1'                          P030
    MOVE        I06 TO EM00-ERCOD9                            P020
    PERFORM     F76AU THRU F76AU-FN.                          P030
    ADD         1 TO I06.                                     P040
F76AG-900. GO TO F76AG.                                       P040
F76AG-FN. EXIT.                                               P040
F76AF-FN. EXIT.                                               P040
N76AH.    NOTE *ERROR IN SPECIFIC PART OF SEGM.   *.          P000
F76AH.                                                        P000
    MOVE        I03 TO I06.                                   P010
N76AI.    NOTE *SEARCH                            *.          P000
F76AI.    IF    I06 NOT > I04                                 P000
          NEXT SENTENCE ELSE GO TO     F76AI-FN.              P000
    MOVE        DE-ER (I06) TO EM00-ERTYP.                    P010
          IF    EM00-ERTYP NOT = ZERO                         P020
          AND   EM00-ERTYP NOT = '1'                          P030
    COMPUTE     EM00-ERCOD9 = I06 - I03 + 1                   P020
    PERFORM     F76AU THRU F76AU-FN.                          P030
    ADD         1 TO I06.                                     P040
F76AI-900. GO TO F76AI.                                       P040
F76AI-FN. EXIT.                                               P040
F76AH-FN. EXIT.                                               P040
F76AD-FN. EXIT.                                               P040
N76AK.    NOTE *USER ERRORS                       *.          P000
F76AK.                                                        P000
    MOVE        1 TO I06.                                     P010
N76AL.    NOTE *SEARCH                            *.          P000
F76AL.    IF    I06 NOT > 27                                  P000
          NEXT SENTENCE ELSE GO TO     F76AL-FN.              P000
          IF    UT-PR (I06) NOT = ZERO                        P010
    MOVE        6 TO EM00-ERTYP                               P010
    MOVE        I06 TO EM00-ERCOD9                            P020
    PERFORM     F76AU THRU F76AU-FN.                          P030
    ADD         1 TO I06.                                     P040
F76AL-900. GO TO F76AL.                                       P040
F76AL-FN. EXIT.                                               P040
F76AK-FN. EXIT.                                               P040
N76AR.    NOTE *TRANSACTION ERROR (GROUP)         *.          P000
F76AR.    IF    FTB7 = 1                                      P000
          NEXT SENTENCE ELSE GO TO     F76AR-FN.              P000
    MOVE        1 TO I06.                                     P010
N76AS.    NOTE *SEARCH                            *.          P000
F76AS.    IF    I06 NOT > I51                                 P000
          NEXT SENTENCE ELSE GO TO     F76AS-FN.              P000
          IF    SE-ER (I06) = '2'                             P010
    MOVE        SE-ER (I06) TO XW01-XERRN1                    P010
    MOVE        I06 TO XW01-XERRN2                            P020
    MOVE        XW01-XERRNU TO EM00-ERCOD                     P030
    MOVE        '0' TO EM00-ERTYP                             P040
    PERFORM     F76AU THRU F76AU-FN.                          P050
    ADD         1 TO I06.                                     P060
F76AS-900. GO TO F76AS.                                       P060
F76AS-FN. EXIT.                                               P060
F76AR-FN. EXIT.                                               P060
N76AT.    NOTE *PRINT GOOD TRANSACTIONS           *.          P000
F76AT.    IF    XW01-XERRCT = ZERO                            P000
          NEXT SENTENCE ELSE GO TO     F76AT-FN.              P000
          IF    1-MB00-STRUCT = 'P'                           P002
    PERFORM     F92 THRU F92-FN.                              P002
```

```
           IF    XW01-XERRCT NOT = ZERO                          P005
         GO TO     F76AT-FN.                                    P005
     MOVE        SPACE TO EM00.                                 P010
           IF    XW01-XIPRIN = '1'                              P020
     PERFORM     FBRBB THRU FBR-FN.                             P020
         GO TO     F76AT-FN.                                    P030
N76AU.    NOTE *PRINT BAD TRANSACTIONS            *.           P000
F76AU.                                                         P000
     MOVE        'A' TO EM00-ENTYP                              P010
     ADD         1 TO XW01-XERRCT.                              P020
N76AW.    NOTE *READ ERROR MESSAGE FILE           *.           P000
F76AW.                                                         P000
     MOVE        LE-FIENR TO EM00-PROGR                         P005
     MOVE        LIBRA TO EM00-LIBRA                            P010
     MOVE        0 TO EM00-LINUM                                P015
     MOVE 0 TO IK                                               P020
     READ           EM-FILE                                     P020
     INVALID KEY MOVE 1 TO IK                                   P020
     MOVE        'UNKNOWN MESSAGE' TO EM00-ERMSG                P030
     DISPLAY     '  UNKNOWN MESSAGE, KEY IS '                   P040
     EM00-EMKEY.                                                P050
F76AW-FN. EXIT.                                                 P050
N76AX.    NOTE *STORE ERROR                       *.           P000
F76AX.                                                         P000
     MOVE        4 TO TR-ER.                                    P010
F76AX-FN. EXIT.                                                 P010
N76AZ.    NOTE *PERFORM THE PRINT ROUTINE         *.           P000
F76AZ.                                                         P000
     PERFORM     FBRBB THRU FBR-FN.                             P010
F76AZ-FN. EXIT.                                                 P010
F76AU-FN. EXIT.                                                 P010
F76AT-FN. EXIT.                                                 P010
F76-FN.   EXIT.                                                 P010
                              .
                              .
                              .
                              .
N93DA.    NOTE *DATE VALIDATION                   *.           P000
F93DA.                                                         P000
     MOVE        1 TO DEL-ER.                                   P010
           IF    XW02-XDATE NOT NUMERIC                         P020
     MOVE        4 TO DEL-ER                                    P020
         GO TO     F93DA-FN.                                    P030
           IF    XW02-XDAT1 > '12'                              P040
           OR    XW02-XDAT1 = '00'                              P050
           OR    XW02-XDAT2 > '31'                              P060
           OR    XW02-XDAT2 = '00'                              P070
     MOVE        5 TO DEL-ER                                    P040
         GO TO     F93DA-FN.                                    P050
           IF    XW02-XDAT2 > '30'                              P080
           AND   (XW02-XDAT1 = '04'                             P090
           OR    XW02-XDAT1 = '06'                              P100
           OR    XW02-XDAT1 = '09'                              P110
           OR    XW02-XDAT1 = '11')                             P120
     MOVE        5 TO DEL-ER                                    P080
         GO TO     F93DA-FN.                                    P090
           IF    XW02-XDAT1 NOT = '02'                          P130
         GO TO     F93DA-FN.                                    P130
           IF    XW02-XDAT2 > '29'                              P140
     MOVE        5 TO DEL-ER                                    P140
         GO TO     F93DA-FN.                                    P150
           IF    XW02-XDAT3 = '00'                              P160
     MOVE        1 TO XW02-XLEAPY                               P160
           ELSE                                                 P170
     COMPUTE     XW02-XLEAPY = XW02-XDAT39 -                    P170
     (XW02-XDAT39 / 4) * 4.                                     P180
           IF    XW02-XLEAPY NOT = ZERO                         P190
           AND   XW02-XDAT2 > '28'                              P200
     MOVE        5 TO DEL-ER                                    P190
         GO TO     F93DA-FN.                                    P200
F93DA-FN. EXIT.                                                 P200
```

8. APPENDIX: PURE COBOL SOURCE CODE (-9)

PURE COBOL SOURCE CODE

The Pure COBOL Source Code (-9) screen contains COBOL source code statements.

It is used for the following:

. To use data descriptions generated by the System in COBOL programs,
. To use library and documentation components to manage existing COBOL source code.

DATA GENERATION

It is possible to generate the first three Divisions of a COBOL program (using the System's functions) and to write the PROCEDURE DIVISION exclusively with Pure COBOL Source Code (-9) lines.

This kind of program is defined with a 'D' value in the TYPE AND STRUCTURE OF PROGRAM field and the appropriate variant in the TYPE OF COBOL TO GENERATE field.

The program will be made up of Call of Data Structures (-CD) lines, of Beginning Insertions (-B) lines, of Work Areas (-W) lines and of Pure COBOL Source Code (-9) lines for the PROCEDURE DIVISION.

It is also possible to generate the data description only, and to write the rest of the program using Pure COBOL Source Code (-9) lines.

The program would then have an 'F' in the TYPE AND STRUCTURE OF PROGRAM field and a corresponding variant in the TYPE OF COBOL TO GENERATE field.

This program will be made up of Call of Data Structures(-CD) lines and Pure COBOL Source Code (-9) lines. The positioning of the generated descriptions in the program is determined by a Pure COBOL Source Code (-9) line for each Call of Data Structures (-CD) line. This Pure COBOL Source Code (-9) line must have an 'F' value in COBOL column '7', followed by a blank, and the DATA STRUCTURE CODE IN THE PROGRAM. The generated descriptions begin on the first '01' level and do not include the COBOL 'FD' clause.

PURE COBOL SOURCE

It is possible to manage pure COBOL Source Code (-9) in the System Database. It can be extracted by generating the program with the 'C' variant in the TYPE OF COBOL TO GENERATE field.

There can be two versions of a program:

COBOL (Pure COBOL Source Code (-9) lines); and PACBASE (Call of Data Structures (-CD), Call of a P.M.S. (-CP), Beginning Insertions (-B), Work Areas (-W), and Procedural Code (-P) lines).

If the variant is 'C' in the TYPE OF COBOL TO GENERATE field, the Pure COBOL Source Code (-9) lines will be generated and the programming lines will be ignored.

If the value in the TYPE OF COBOL TO GENERATE field specifies a COBOL variant, the program will be generated with programming lines, and the Pure COBOL Source Code (-9) lines will be ignored.

If the user wishes to see the information found in the 'CONSTANTS' area of a generated program in the Pure COBOL Source program, he/she must use the Pure COBOL Source Code (-9) lines to code this information, being sure to use line numbers in the WORKING-STORAGE SECTION to ensure that this information is properly placed.
The -9 line must be coded in the following way:

```
01   PACBASE-CONSTANTS PIC X(20) VALUE '20 characters..'
col  12                   35           48
```

For example:
01 PACBASE-CONSTANTS PIC X(20) VALUE
'XXXXXXXXXXXXXXXXXXXX'

The result will have the following structure:
AAA9999V000 DDDDDDDD, where:

- (AAA) is the application code,
- (9999V) is the number of the session during which the the program was extracted,
- (DDDDDDDD) the date of the extraction.

If the user wishes to see more information (e.g. database code, user code...), he must code the -9 line in the following way:

```
col  12                    35
 01  PACBASE-CONSTANTS PIC  X(60) VALUE
-              'PACBASE-C20
       'DATGNC    '.
```

The result will be composed of the following concatenated elements:

. Session number (5 char.),

. Application code (3 char.),

. Generation date (8 char.),

. System Program code (6 char.),

. User code (8 char.),

. Time of Program generation (8 char.),

. COBOL Program-Id (8 char.),

. Database code (4 char.),

. Date of Program generation with century (10 char.).

OPERATION FIELD

```
C1: default value.
C2: source and complementary input field display.
```

```
--------------------------------------------------------------------------------
!                  PURCHASING MANAGEMENT SYSTEM         SG000008.LILI.CIV.1583 !
! PURE COBOL PROCEDURE    LTVAL1 FIRST TEST PROGRAM                             !
!                          1                                                   !
!                                                                              !
! 2 3      4 6      5                                                          !
! A LINE   C COMPL. COBOL INSTRUCTION                          : SOURCE LIBR.  !
!   006000 * PJJPS1 DUPLICATE RECORD VALIDATION                   0318          !
!   006001   PJJPS1 F36.                                         0318          !
!   006002   PJJPS1     IF CATX  = 'HA'                          0318          !
!   006003   PJJPS1     MOVE '1' TO W-WW00-REC                   0318          !
!   006004   PJJPS1     ELSE MOVE ZERO TO W-WW00-REC.            0318          !
!   006005   PJJPS1 F36-FN.                                      0318          !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
!                                                                              !
! *** END ***                                                                  !
! O: C2 CH: -9                                                                 !
--------------------------------------------------------------------------------
```

NUM	LEN	CLASS VALUE	DESCRIPTION OF FIELDS AND FILLING MODE
1	6		PROGRAM CODE Code identifying the program in the library.
2	1		ACTION CODE
3	6	NUMER. 0-999999 nn00 - nn99	COBOL LINE NUMBER FALSE NUMERIC FIELD The line number can be entered for each COBOL instruction and renumbered after an update. It is advisable to use a line increment of 100 in COBOL. In a macro-structure, the COBOL line number can be parameterized on the four leftmost digits by two-digit groups.
4	1	 - *	CONTINUATION (COBOL COLUMN 7) Continuation of a literal (normal COBOL use). Comment line (ANSI COBOL only).
5	65		COBOL INSTRUCTION First part of the COBOL line. The end of the line (column 66 to 72) is displayed with the C2 OPERATION (O: C2).
6	6		END OF COBOL LINE This field is displayed as a complementary field which is viewed only with the C2 OPERATION (O: C2). (1) This field is used to complete a COBOL line up to 72 positions. (2) It also corresponds to the Identification area on a COBOL coding form (columns 73 to 80) for a program identification entry. This entry appears on the far right side of a PACBASE generated program.

BATCH ACCESS

Pure COBOL Source Code (-9) lines may be entered on Batch Form '9'.

Since it contains no program code, this form must always be preceded by Batch Form '0' (Program Definition).

ACTION CODES

.'C' = Creation of a line in the library.

.'M' = Modification of a line in the library.

. Blank = Creation or modification, depending on the state of the library.

.'D' = Deletion of a line in the library.

.'B' = Multiple deletion of program lines starting with, and including, the indicated line.

.'R' = End of multiple deletion beyond this line.