DEVELOPMENTAL DOCUMENTATION

PART 1

GENERAL INFORMATION

1. GENERAL

1.01 The purpose of this Bell System Practice is to:

(a) Define the information to be developed and documented during each phase of the system development process.

(b) Define documentation components that can be produced, insofar as possible, as natural byproducts of the system development process.

(c) Define the functional roles that will typically be required to produce the documentation components (see Section 007-200-310, Functional Roles in a Systems Environment).

1.02 Whenever this section is reissued, the reason for reissue will be stated in this paragraph.

1.03 This guideline has been developed by a Multicompany project team under the direction of American Telephone and Telegraph Company (AT&TCo) Technical Support and Standards and the GUARDSMAN Steering Committee.

2. SCOPE OF APPLICATION

2.01 This section should be used for the following types of system development efforts:

(a) *Information systems only:* (The terms "data systems" and "system" may be used interchangeably with information system within the 007-227-series.) While some of the developmental documentation described herein could apply in a general fashion to other kinds of development efforts, these standards are not intended for application to noninformation system projects.

(b) *Systems developed locally, centrally, or by a group of operating companies:* The documentation requirements are appropriate regardless of mode of development, though some tailoring may be necessary for specific projects.

(c) *System development efforts of all sizes:* The documentation requirements are appropriate for development efforts of any size, though the volume and packaging of documentation will obviously vary from project to project.

(d) *Information systems of all types:* The documentation standards are applicable to all information system development projects, including special studies.

2.02 This section is intended to be used by company management, system users, project managers, and others who need a reference to an overview description of system development document requirements. For those project team members actually involved in document preparation, Section 007-227-310, Developmental Documentation Specifications, is recommended.

3. DEVELOPMENTAL DOCUMENTATION TERMINOLOGY

3.01 As system development proceeds, the characteristics of the system being constructed and the procedures by which the system will operate must be recorded. This recording is Documentation.

3.02 There are two levels of Documentation:

(a) *Documentation Component:* A documentation component is a functional module of system information that, to be optimally useful and maintainable, should be documented as a single entity. Because of its modularity, a documentation component can serve the diverse needs of many users.

(b) *Documentation Package:* A documentation package is a set of documentation components which collectively serve the specific need of one or more users (eg, phase-end report, run book, etc).

3.03 Developmental documentation is the total set of documentation (components) generated during the system development process. These components satisfy the system-related information needs of the development team, approval and review bodies, technical support, and operational personnel. The documentation, either components or packages, that is prepared for use by personnel involved in system operation (administration, computer operations,

manual operations, system users, etc) is called Deliverable Documentation.

3.04 The terms "documentation component" and "documentation package" do not carry any connotation regarding volume of information. A component may be a paragraph, a page, a section in a report, or a binder of information. Volume is primarily a function of project type and size. Likewise, a package does not have to be a stand-alone document, through it may be depending on its size and usage requirements.

4. PURPOSE OF DOCUMENTATION

4.01 Documentation is both a means to an end as well as an end itself. The primary role of documentation is to communicate and control meaningful and valid information within the development team and between the development team and project management, approval authorities, operational personnel, and maintenance personnel.

4.02 *Within the Development Team:* Standard documentation facilitates good communication among the personnel engaged in the same development phase. Such communication is essential to ensure the integrity of system design and specification. Because documentation is public, it serves as reference information to specify interfaces among system components, capture and clarify design decisions, provide a vehicle for technical review, and permit identification of design/specification discrepancies. Planned standard documentation also reduces the impact of personnel turnover. It alleviates the danger of distortion during the development process, by permitting the orderly communication of ideas and information from one project phase to another. Documentation is also required in order to accurately communicate system interface requirements to other systems impacted by the development effort.

4.03 *Between the Development Team and Project Management:* Documentation provides the most effective means by which project management can evaluate project progress and system quality. The completion of each component of documentation signals the successful completion of a developmental activity or set of activities. These individual product milestones can be evaluated in order to determine project status and progress. Good developmental documentation is also critical to the conduct of technical walkthroughs and reviews

which permit project management to evaluate the quality of the system development effort. In addition, certain documentation components (eg, test plans, conversion plan, etc) assist project management in determining the project team activities that will be required in later phases of development.

4.04 *Between the Development Team and Approval Authorities:* Developmental documentation is a means of communicating with approval authorities to obtain agreement and commitment of resources to continue system development and to make the system operational. Such information as system overviews, system changes, status and recommendations, and cost/benefit data is needed at the end of each development phase in order to obtain such approvals.

4.05 *Between the Development Team and Operational Personnel:* Documentation provides the means for communicating information about the system in order to obtain user agreement and to ensure that the system will meet the needs of the user. It is vital that the user have a clear understanding of the system throughout its development cycle. Only by doing so is it possible to establish good user relations and enable the user to apply the system effectively. Documentation (deliverable) also provides the means to communicate procedural information to operational and user personnel.

4.06 *Between the Development Team and Maintenance Personnel:* A system is a dynamic entity. Changes are constantly occurring and improvement in system operation is frequently required. As a result, system maintenance is a vital on-going activity. The maintenance staff(s) must have adequate up-to-date documentation in order to understand the system, to evaluate trouble reports and change requests, and to determine how the change or enhancement can best be implemented.

5. USE OF COMPONENT DESCRIPTIONS

5.01 The documentation components related to each phase of development are described in Part 2 of this practice.

5.02 Because of the differences among the types of systems which may be developed, it is possible that a specific project may not need to

produce all of the documentation components specified. It is the responsibility of the Project Management function within each project to determine which components will be required.

5.03 The documentation components (Part 2) are numbered as follows:

- Proposal Phase — Component 1.01

- Feasibility Phase — Components 2.01 through 2.14

- Definition Phase — Components 3.01 through 3.13

- Preliminary Design Phase — Components 4.0 through 4.26

- Detail Design Phase — Components 6.01 through 6.27

- Conversion Phase — Components 7.01 through 7.03

- Performance Review Phase — Components 8.01 through 8.06

5.04 The component descriptions for each phase include:

(a) A Component Network Diagram

(b) A Component Checklist

(c) Component Descriptions.

5.05 The component network diagram indicates the general sequence in which the components are produced and their dependencies. Because developmental activities are highly iterative, and each project has unique documentation requirements, the component sequence must be tailored to the individual project.

5.06 The component checklist is provided as a quick reference to the phase components.

5.07 The component descriptions define the general content of each documentation component. Some component descriptions have the notation (M). This indicates that there will be multiple occurrences of the component (eg, one for each system alternative, for each output, for each position/program/data base, etc).

5.08 Production of each component requires specific skills and knowledge. To obtain the skills necessary to produce the total set of developmental documentation, a variety of functional roles must be represented on the project team. The set of components that will typically be produced by each of these functional roles is shown in Appendix 1. The peformance review components are not assigned to a specific role, as they are usually produced by a team effort.

5.09 For informational purposes, Appendix 2 contains a series of networks that organize the documentation components into eight general functional areas.

PART 2

COMPONENT DESCRIPTIONS

1. PROPOSAL PHASE COMPONENT

COMPONENT DIAGRAM

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┌─────────────────┐
│ 1.01            │
│                 │
│     Project     │
│   Initiation    │
│    Request      │
│                 │
└─────────────────┘
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Fig. 1—Proposal Phase Component Network Diagram

COMPONENT CHECKLIST

____ 1.01—Project Initiation Request

COMPONENT DESCRIPTION

1.01 *Project Initiation Request:* A request to initiate a project, specifying who needs the project to be undertaken, and why. General information about the areas to be studied is provided, and other related studies are referenced. Constraints on project cost and schedules are stated. The problems and opportunities, potential benefits, and possible solutions as seen by those requesting the project are included.

2. FEASIBILITY PHASE COMPONENTS
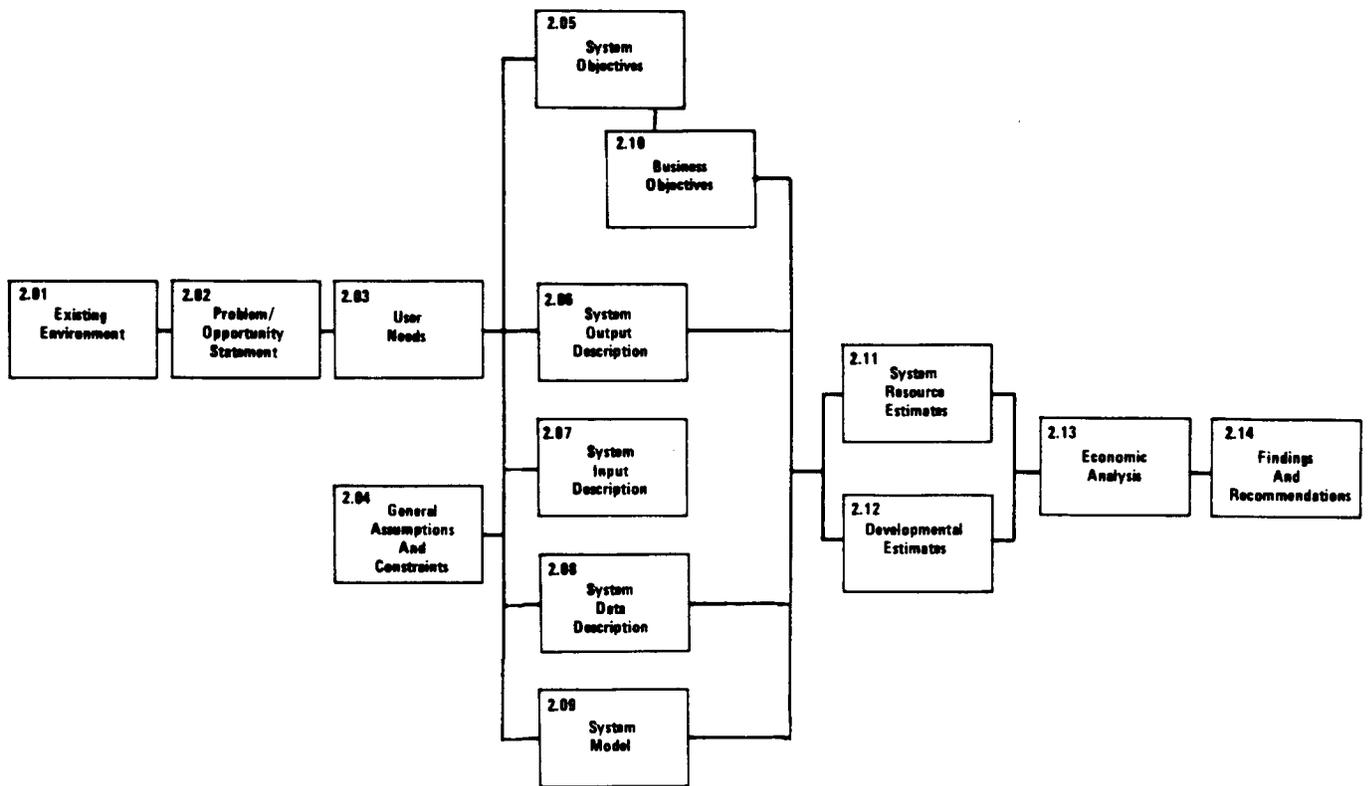
COMPONENT DIAGRAM

Fig. 2—Feasibility Phase Component Network Diagram

COMPONENT CHECKLIST

_____ 2.01—Existing Environment

_____ 2.02—Problem/Opportunity Statement

_____ 2.03—User Needs

_____ 2.04—General Assumptions and Constraints

_____ 2.05—System Objectives

_____ 2.06—System Output Description

_____ 2.07—System Input Description

_____ 2.08—System Data Description

_____ 2.09—System Model

_____ 2.10—Business Objections

_____ 2.11—System Resource Estimates

_____ 2.12—Developmental Estimates

_____ 2.13—Economic Analysis

_____ 2.14—Findings and Recommendations

COMPONENT DESCRIPTIONS

2.01 *Existing Environment:* A description of the existing environment in the organization or functional areas within the scope of the analysis. This would include major functions, operating procedures, inputs, outputs, data bases, resources, and costs. The level of detail should be sufficient to identify the objectives, both formal and informal, of the organization or application and provide a basis for analysis of how effectively and efficiently those objectives are being met.

2.02 *Problem/Opportunity Statement:* A description of the significant problems and opportunities, existing and potential, within the users' environment and their interrelationships. It should describe the nature of the problem/opportunity and associated penalties, desired performance levels, and the desired benefits.

2.03 *User Needs:* A description of the informational and operational needs which the alternative system solutions should address rank ordered on the value of their associated benefits. For each need specific and measureable benchmarks or ranges of performance are stated; higher performance levels resulting in greater incremental benefits are identified. Conditions, assumptions, and constraints which alter the needs significantly if changed are noted. Problems/opportunities addressed by each need are referenced; the reasons for excluding problems/opportunities from further consideration are explained. Possible means of satisfying user needs are described (eg, training, mechanization, procedural changes, etc).

2.04 *General Assumptions and Constraints:* A description of any constraints imposed on or assumptions underlying all proposed alternatives. Included are assumptions and constraints determined by existing systems, legal/regulatory requirements technology, economic conditions, or by the environment in which the solution must function when operational.

2.05 *System Objectives (M):* Statements of the performance requirements which must be attained (for each alternative) in order to meet the business objectives for the alternative. Information system objectives include output, quality, and administrative requirements, each with specific and measurable performance criteria. Also included are ranges within which objectives will be set and the anticipated operating conditions (eg, peak loads, average volumes) for which the objectives apply.

2.06 *System Output Description (M):* A general description (for each alternative solution) of all system outputs in terms of information content, purpose, volume estimates, performance characteristics (quality, timeliness, etc), and uses by other systems. Format, medium, etc, are included as appropriate where these characteristics have already been established as given.

2.07 *System Input Description (M):* A general description (for each alternative solution) of all system inputs in terms of information contents, purpose, volume estimates, performance characteristics (quality, timeliness, etc), and uses by other systems. Format, medium, etc, are included as appropriate when these characteristics have already been established as given.

2.08 *System Data Description (M):* A general description (for each alternative solution) of the data base and transient data, both manual and mechanized, that the system is expected to utilize. The description includes information content, purpose, volume estimates, performance characteristics (integrity, accessibility, etc), and known or potential uses of the data outside the system. The description is in sufficient detail to support the development of System Resource Estimates.

2.09 *System Model (M):* A description of each alternative and its rationale in terms of training, motivational, job engineering, or information system solutions. A description of how the alternative differs from others. Major functions, their interrelationships, and the flow of information among them are illustrated. Inputs, outputs, data bases, and interfaces with other systems are shown. For each major function, procedures are described briefly. Tentative allocations and configurations, upon which feasibility and costs are based, are documented. Any significant considerations for converting the functions are highlighted.

2.10 *Business Objectives (M):* Specific statements of the intended operational impact of each alternative. Measurement criteria should be stated in terms of service levels (new capabilities, index levels, reduced work force, or inventory,

etc), and should include expected short range and long range values for each measurement.

2.11 *System Resource Estimates (M):* Initial estimates (for each alternative) of the types and quantities of resources that are required to operate the proposed system. The estimates cover operational personnel, hardware and software, training and space requirements, etc.

2.12 *Development Estimates (M):* A gross estimate of the one-time development and conversion costs for each alternative. Rough estimates of resource and time requirements are developed for each phase from which approximate phase and total cost are derived.

2.13 *Economic Analysis (M):* A quantification of anticipated benefits (revenue increases, savings, etc) for each alternative, by organization. One time (developmental and conversion) and recurring (operational and maintenance) costs are estimated for each alternative. Projected time frame for expenditures and attaining benefits are identified. The economic worth of each alternative is computed.

2.14 *Findings and Recommendations:* A description of the project team's study and results as of the end of the Feasibility Phase. This includes:

(a) A report of Feasibility Phase activities and expenditures, highlighting any changes in direction from Proposal.

(b) An overview of the problem/opportunity areas that was studied.

(c) A summary of each proposed alternative solution, its objectives, economic worth (costs and benefits) and intangible benefits. The rationale for the alternative and how it addresses the problem/opportunities in terms of information system (forms design, information flow, mechanization, etc) and/or noninformation system (training, motivation, job engineering) solutions.

(d) A recommendation as to which, if any, alternative solution should be developed with reasons supporting the choice. This section will summarize the economic, technical, and operational feasibility of the alternative selected.

3. DEFINITION PHASE COMPONENTS
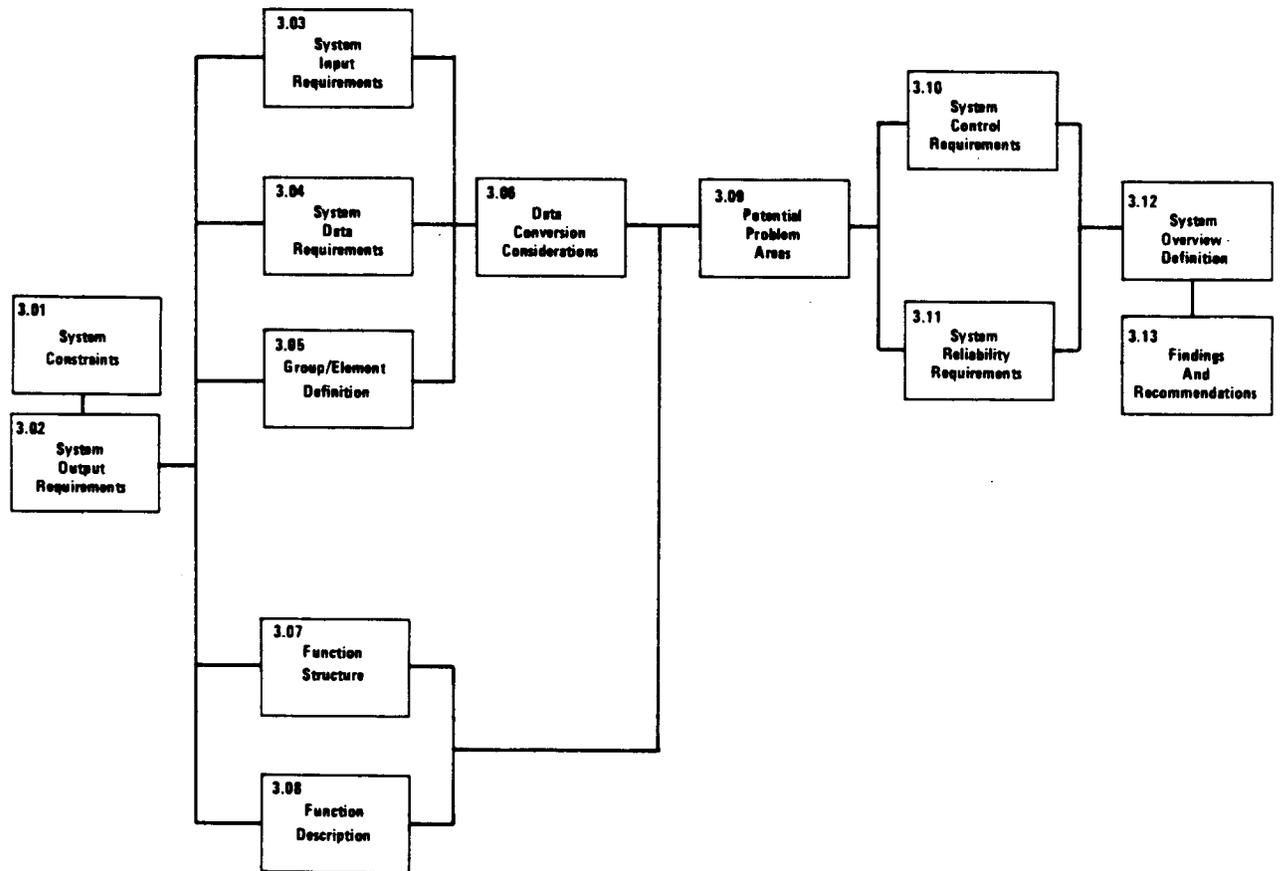
COMPONENT DIAGRAM

Fig. 3—Definition Phase Component Network Diagram

COMPONENT CHECKLIST

___ 3.01—System Constraints

___ 3.02—System Output Requirements

___ 3.03—System Input Requirements

___ 3.04—System Data Requirements

___ 3.05—Group/Element Definition

___ 3.06—Data Conversion Considerations

___ 3.07—Function Structure

___ 3.08—Function Description

___ 3.09—Potential Problem Areas

___ 3.10—System Control Requirements

___ 3.11—System Reliability Requirements

___ 3.12—System Overview—Definition

___ 3.13—Findings and Recommendations

COMPONENT DESCRIPTIONS

3.01 *System Constraints:* Refined description of system constraints including hardware/software availabilities, existing input/output interface restraints, environmental limitations, specification of manpower and training restraints, and the delineation of specific functions that are not included in the system.

3.02 *System Output Requirements (M):* A detailed description of each system output; including group/element content and specific performance characteristics. Also included is a description of the purpose of each output, its users and intended usage. Format, medium, scheduling restrictions, etc, are included where these characteristics have been established as system constraints.

3.03 *System Input Requirements (M):* A detailed description of each system input, including group/element content and specific performance requirements. Also included are input sources and how well the input satisfies, or will be changed to satisfy, the system's performance criteria for accuracy, completeness, timeliness, etc. Format, medium, scheduling restrictions, etc, are included when these characteristics have been established as constraints.

3.04 *System Data Requirements (M):* A detailed description of the data which is processed within the system, including group/element content and performance requirements (eg, accuracy, currency, security, etc). Logical relationships among system data are defined. Also identified are functions which interact with the data and the nature of the interactions.

3.05 *Group/Element Definition (M):* A detailed description of each group/element in the system, including its name, present and future uses, relationships with other group/elements, allowable values, performance criteria (eg, accuracy, security, etc), and synonyms, acronyms, and abbreviations. Occurrences in system inputs, outputs, and data are identified. Functions which process the group/element, and the nature of the processing, are also identified. This component is maintained through Preliminary Design, and becomes the basis for the Group/Element Specifications.

3.06 *Data Conversion Considerations:* A description of data which must be converted into a system data base before operation can begin. Included is the source for the data, its medium, format, and condition, and identification of functions [either normal system functions or special conversion subsystem functions which convert the data (eg, collect, purify, translate, etc)].

3.07 *Function Structure:* A hierarchical representation of major functions to a level of detail that shows enough factual information to permit effective function allocation and design.

3.08 *Function Description:* A detailed description of what each function in the Function Structure must accomplish, including conditions under which the function is performed, formulas, algorithms, decision tables, etc, for performing the function and data which the function processes. Also included are constraints or restrictions on the function or its performance and considerations which could affect its allocation or design.

3.09 *Potential Problem Areas:* Identification of any potential problem, both within the system being defined and beyond the system's boundaries which could contribute to data or performance degradation. Potential problems beyond the system boundary are identified by organizational group. Those intrinsic to the system under definition are identified by problem source. The probable effect upon the system's data and performance if these problems are not solved is documented.

3.10 *System Control Requirements:* A description of measures required to ensure system performance and data integrity, as specified via performance criteria for system outputs, inputs, and data. Also included are measures required for system management and auditing. These measures are partially in response to potential problem areas.

3.11 *System Reliability Requirements:* Requirements for measures which ensure the ability of the system to produce outputs in a useable time frame despite disruptions from any source. These requirements are expressed in terms of the lengths of time the user of the process can tolerate nonavailability of product information. The requirments for such available options as recovery, reconstruction, fall back to alternate or degraded

operations, backup and records retention are described.

3.12 *System Overview—Definition:* An upper management oriented description of the system, describing its scope, objectives, functions, data, interfaces, performance criteria, etc.

3.13 *Findings and Recommendations:* A description of the project team's efforts and results as of the end of Definition Phase, including:

(a) A report on Definition Phase activities and expenditures, highlighting and explaining any significant deviations from the phase plan.

(b) A description of the system as seen at the end of Definition Phase, highlighting and explaining any significant changes to the system's scope, benefits, etc.

(c) A recommendation for the disposition of the project (eg, cancel, defer, study further, continue) along with documentation of the reasons for the recommendations.

4. PRELIMINARY DESIGN PHASE COMPONENTS
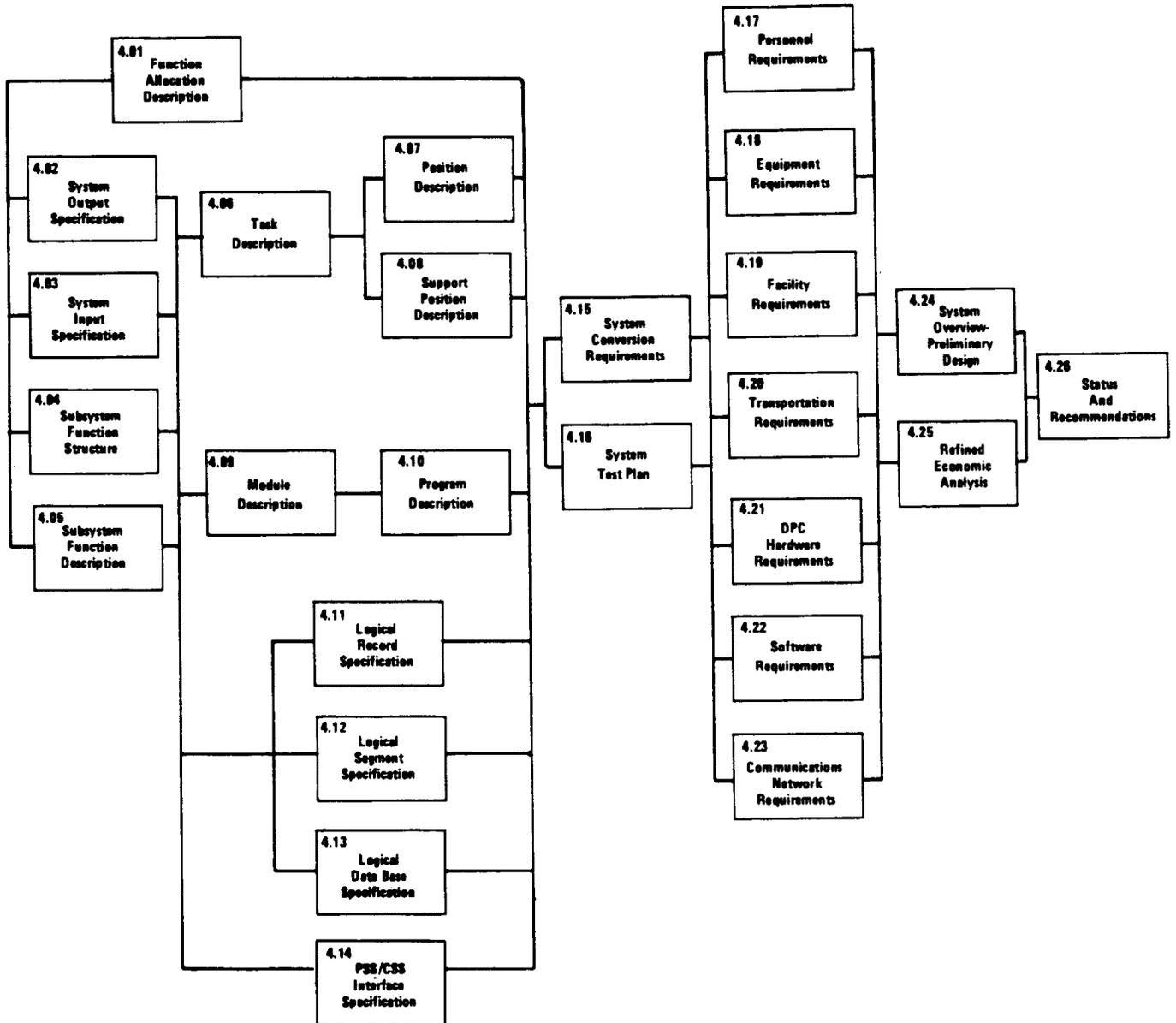
COMPONENT DIAGRAM

Fig. 4—Preliminary Design Phase Component Network Diagram

COMPONENT CHECKLIST

____ 4.01—Function Allocation Description

____ 4.02—System Output Specification

____ 4.03—System Input Specification

____ 4.04—Subsystem Function Structure

____ 4.05—Subsystem Function Description

____ 4.06—Task Description

____ 4.07—Position Description

____ 4.08—Support Position Description

____ 4.09—Module Description

____ 4.10—Program Description

____ 4.11—Logical Record Specification

____ 4.12—Logical Segment Specification

____ 4.13—Logical Data Base Specification

____ 4.14—PSS/CSS Interface Specification

____ 4.15—System Conversion Requirements

____ 4.16—System Test Plan

____ 4.17—Personnel Requirements

____ 4.18—Equipment Requirements

____ 4.19—Facility Requirements

____ 4.20—Transportation Requirements

____ 4.21—DPC Hardware Requirements

____ 4.22—Software Requirements

____ 4.23—Communications Network Requirements

____ 4.24—System Overview—Preliminary Design

____ 4.25—Refined Economic Analysis

____ 4.26—Status and Recommendations

COMPONENT DESCRIPTIONS

4.01 *Function Allocation Description:* A description of the resource to which each function was allocated (eg, computer, equipment, software, personnel), and the reason and criteria for that assignment.

4.02 *System Output Specification (M):* A detailed description for each system output, including its content, physical characteristics (eg, medium, format, symbology, volume, frequency, etc), and performance criteria (eg, accuracy, completeness, quality, timeliness, security, etc). Also identified are the destination(s) and means of transmission or transportation.

4.03 *System Input Specification (M):* A detailed specification for each system input, including its content, physical characteristics (eg, medium, format, symbology, volume, frequency, etc), and performance criteria (eg, accuracy, completeness, timeliness, legibility, security, etc). Also identified are the input source(s) and means of transmission or transportation.

4.04 *Subsystem Function Structure:* A depiction of each subsystem. A subsystem representation may be defined to include PSS functions, CSS functions, a functional subsystem, physically or time-related functions, or any combination of these. The representation depicts the functions to a sufficient level of detail to support task analysis (PSS) and module specifications (CSS).

4.05 *Subsystem Function Description (M):* A detailed specification for how each function on the Subsystem Function Structure is accomplished, including conditions under which its subfunctions are performed, procedures, formulas, algorithms, decision tables, etc, for performing the function, and data which the function processes. Also included are any constraints on the function or its processing, the specific allocation of the function, and any considerations which affect the design or grouping of tasks or modules.

4.06 *Task Description (M):* Identification and description of each task, including system functions it performs and data it processes, physical characteristics (eg, location, equipment), processing characteristics (eg, time per item, frequency of execution, complexity), and personnel requirements (eg, skill, knowledge). Also included are dependencies on other tasks and comments relevant to assigning the task to a position.

4.07 *Position Description (M):* A specification for the grouping of tasks into positions, including a diagram of the tasks within each position and the rationale for each specified grouping. Data processed by the position is identified. Also included are the position's physical characteristics (eg, location, equipment); performance characteristics (eg, through-put, performance criteria, criticality); personnel requirements (eg, skill, knowledge, training), and forms requirements.

4.08 *Support Position Description (M):* A specification for the assignment of system tasks to existing support positions (eg, word processing, keypunching, distribution, etc). Each support position is identified by organization and location. Included for each are inputs and estimated volumes, outputs, expected through-put, and any special equipment, performance, controls, or forms requirements.

4.09 *Module Description (M):* Identification and description of each module, including system functions it performs, data it processes, and processing characteristics (eg, frequency of execution, performance requirements, complexity). Also included are dependencies on other modules, and comments relevant to assigning the module to a program.

4.10 *Program Description (M):* A specification for the grouping of modules into programs and the rationale for each grouping. Included is identification of program inputs and outputs, scheduling requirements (eg, cycle or frequency of execution, input available, output due, dependencies on other programs), and resource requirements (eg, CPU, memory, devices, execution time, and priorities).

4.11 *Logical Record Specification (M):* A detailed specification of how data, which does not reside under a Data Base Management System, is organized into logical records for processing by application programs. Included is a general description of the logical record and its relationships to other system data, identifying group/elements contained in the record, format, functions which process it, the nature of the processing, and performance criteria for the record (eg, accuracy, completeness, security, etc).

4.12 *Logical Segment Specification (M):*
A detailed specification of how data, which resides in a Data Base Management System, is organized into logical segments for processing by application programs. Included is a general description of the logical segment and its relationships to other system data, identifying group/elements contained in the segment, format, functions which process it, the nature of the processing, and performance criteria for the segment (eg, accuracy, completeness, security, etc).

4.13 *Logical Data Base Specification:* A detailed specification of how logical records and/or segments are organized into logical data base(s), depicting relationships among the data, accessing paths, etc, and identifying data which is shared with other systems.

4.14 *PSS/CSS Interface Specification (M):*
A detailed specification of how each interface between the CSS and PSS is accomplished. Included are detailed physical descriptions of the data (eg, medium, format, sequencing, size, etc), performance and controls specifications, and transmission or transportation arrangements.

4.15 *System Conversion Requirements:*
Identification of the requirements and strategies for converting the system into an operational environment. Data collection, purification, and translation requirements, personnel and hardware requirements are described. Critical checkpoints, dependencies, and lead times required for the various activities, and potential problem situations are identified. The descriptions must be in sufficient detail to provide for conversion resources, and to determine if any or all of the conversion subsystem should be separate but parallel projects.

4.16 *System Test Plan:* An overview of system testing, including general test objectives for each level of testing (component verification, system verification, system validation, and system certification), and describing each test to be performed and techniques to be used. Also established are test data base and resource requirements (eg, personnel, facilities, equipment, hardware, networks, etc), and an overall test schedule.

4.17 *Personnel Requirements:* Descriptions of the personnel by skill levels, organization and location, who are required to convert, operate/use, maintain, and administer the system. Also included is a general overview of training requirements, and an approximate schedule for personnel availability.

4.18 *Equipment Requirements:* Descriptions of the equipment (eg, typewriters, terminals, copiers, etc) required to install and operate the system, including for each, as applicable, functional and performance specifications, interfaces with networks or other equipment, environmental and economic constraints, and quantity required.

4.19 *Facility Requirements:* A general description of how well existing facilities (eg, space, lighting, power, etc) accommodate system conversion and operation, highlighting requirements for new or expanded facilities, and for special power, engineering, or construction. An approximate schedule for facility availability is established.

4.20 *Transportation Requirements:*
Descriptions of data transportation requirements, including as applicable, locations involved, physical descriptions of the data to be transported, scheduling considerations, backup and reliability specifications, and special security and handling requirements. Also included is a recommended mode of transportation (eg, trunk, air freight, mail, special courier, etc).

4.21 *DPC Hardware Requirements:* Estimates of the hardware types, quantities, and usage required for installation and operation of the computer subsystem. Included, as applicable, are descriptions of each unit or device type, its intended usage, functional and performance specifications, environmental constraints, and quantity required. Included is an overall configuration showing hardware interfaces.

4.22 *Software Requirements:* Requirements for the software, both general and specific, needed for the operation of the system. Requirements for the general software deals with the programming languages, file structuring, and access method capabilities needed for development and operation of the system. Requirements for special software should deal with the utilities, supportive software (eg, data dictionary, source card maintenance) and other unique software routines (eg, randomizing routines, software monitoring packages, specialized data conversion programs) needed for development and operation of the system.

4.23 *Communications Network Requirements:*
Descriptions of the system's teleprocessing requirements, including locations to be interconnected, mode of transmission (eg, dial-up, private line, etc), hardware/software interfaces, environmental constraints, and backup requirements. Also included are descriptions of the data to be transmitted (eg, message size, volume), schedules and response time considerations. Potentials for shared networks are identified.

4.24 *System Overview—Preliminary Design:*
A concise overview of the system describing its major features and characteristics, basic operation, and capabilities. Also included is a general statement of the system's operational impact and resource requirements.

4.25 *Refined Economic Analysis:* An updated view of the one time and recurring costs and benefits associated with the system, and a recalculated present worth statement.

4.26 *Status and Recommendations:* A description of the project team's efforts and results as of the end of Preliminary Design Phase, including:

(a) A report on the Preliminary Design Phase activities and expenditures, highlighting and explaining any significant deviations from the phase plan.

(b) A description of the system as seen at the end of Preliminary Design Phase, highlighting and explaining any significant changes to the system's scope, objectives, benefits, worth, etc.

(c) A recommendation for the disposition of the project (eg, cancel, defer, recycle, continue, etc), along with documented reasons for the recommendation.

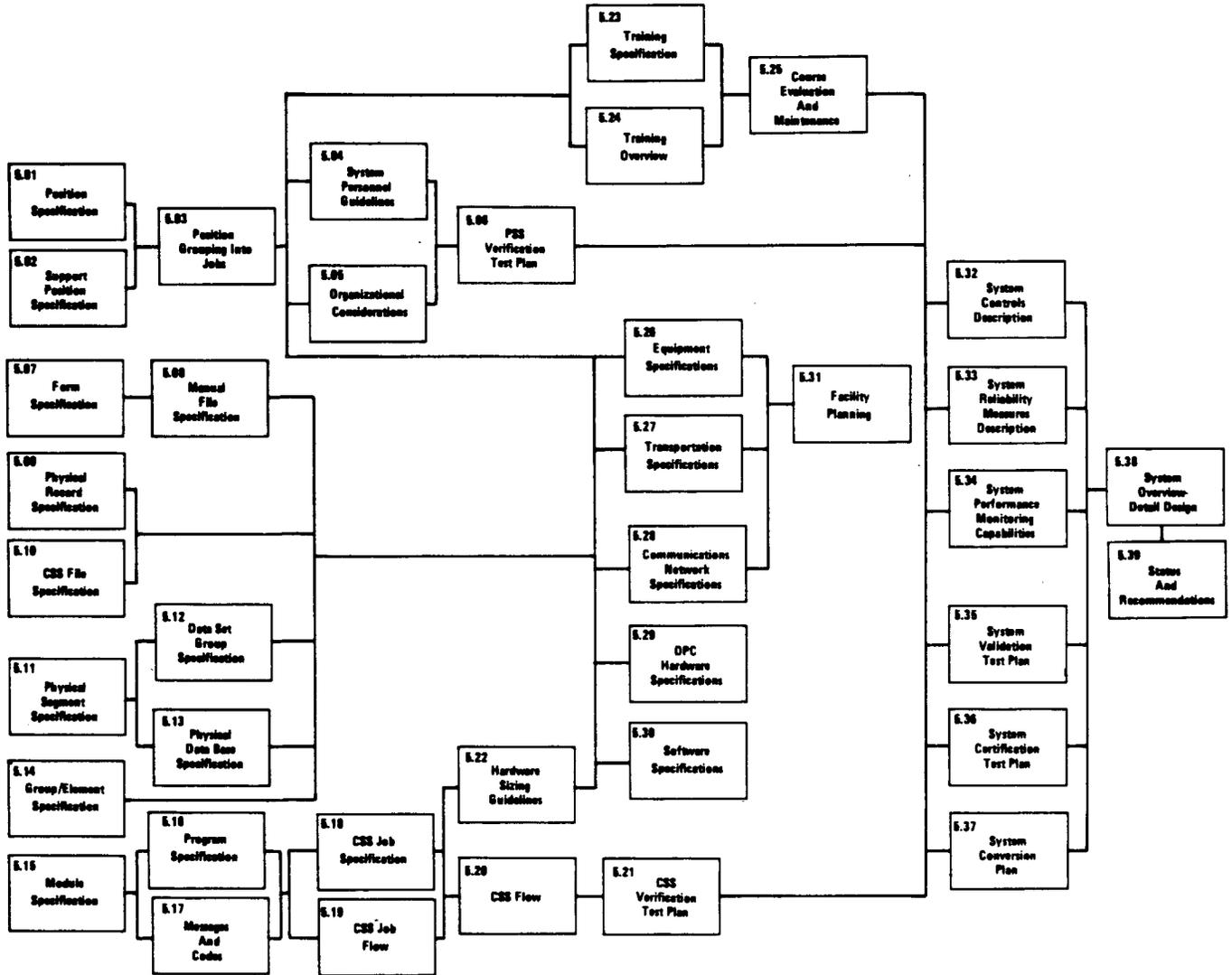## 5. DETAIL DESIGN PHASE COMPONENTS

COMPONENT DIAGRAM

Fig. 5—Detail Design Phase Component Network Diagram

COMPONENT CHECKLIST

____ 5.01—Position Specification

____ 5.02—Support Position Specification

____ 5.03—Position Grouping into Jobs

____ 5.04—System Personnel Guidelines

____ 5.05—Organizational Considerations

____ 5.06—PSS Verification Test Plan

____ 5.07—Form Specification

____ 5.08—Manual File Specification

____ 5.09—Physical Record Specification

____ 5.10—CSS File Specification

____ 5.11—Physical Segment Specification

____ 5.12—Data Set Group Specification

____ 5.13—Physical Data Base Specification

____ 5.14—Group/Element Specification

____ 5.15—Module Specification

____ 5.16—Program Specification

____ 5.17—Messages and Codes

____ 5.18—CSS Job Specification

____ 5.19—CSS Job Flow

____ 5.20—CSS Flow

____ 5.21—CSS Verification Test Plan

____ 5.22—Hardware Sizing Guidelines

____ 5.23—Training Specification

____ 5.24—Training Overview

____ 5.25—Course Evaluation and Maintenance

____ 5.26—Equipment Specifications

____ 5.27—Transportation Specifications

____ 5.28—Communications Network Specifications

____ 5.29—DPC Hardware Specifications

____ 5.30—Software Specifications

____ 5.31—Facility Planning

____ 5.32—System Controls Description

____ 5.33—System Reliability Measures Description

____ 5.34—System Performance Monitoring Capabilities

____ 5.35—System Validation Test Plan

____ 5.36—System Certification Test Plan

____ 5.37—System Conversion Plan

____ 5.38—System Overview—Detail Design

____ 5.39—Status and Recommendations

COMPONENT DESCRIPTIONS

5.01 *Position Specification (M):* A detailed description of the procedures/guidelines for performing each position, including specifications for the exhibits and performance aids which the position will use. Also included is a description of the type of position documentation which is required.

5.02 *Support Position Specification (M):* Specifications of material required to supplement support position documentation (eg, word processing, keypunch, distribution, etc), including procedures/guidelines for performing any special tasks, and specifications for exhibits and performance aids which are required.

5.03 *Position Grouping into Jobs:* Suggested groupings of one or more positions into job assignments for individuals, and alternative groupings when appropriate, including the rationale for each grouping in terms of personnel considerations, system performance, volumes, etc, and the tradeoffs, ie, advantages and disadvantages of alternatives.

5.04 *System Personnel Guidelines:* Descriptions of the numbers and types of personnel required to convert, operate/use, maintain and administer the system, including job levels, skill, knowledge, and training requirements, and a schedule for their availability. Also included is a statement of the impact the system has on the organization's personnel; strategies for meeting new personnel requirements and for employing personnel displaced by the system are described.

5.05 *Organizational Considerations:* Organizational considerations include reporting and administrative lines of control, division of responsibilities among administrative units, interfaces between such units, etc, which may be factors in the overall system performance. Alternative organizational structures and the performance tradeoffs associated with each alternative may also be included.

5.06 *PSS Verification Test Plan:* An overview of the PSS verification testing to be performed to test the logical correctness of each PSS task and position. Included are identification of the task(s) or position(s) to be verified by each test, the test's objectives, and a general description of the techniques to be used. Also included are test schedules and dependencies and resource requirements for each test.

5.07 *Form Specification (M):* A detailed specification of each form processed within the system. Included is form title and number, retention, format, a physical description of the form (eg, size, color, number of copies, etc), rate of use, restrictions on its use or distribution, and stocking/ordering information. Manual files where the form or its parts are stored and positions which process the form are identified.

5.08 *Manual File Specification (M):* A detailed specification of the organization of forms which are retained within the system into manual files. Included for each manual file are its type (eg, binder, bin, folder, etc), forms it contains, method of organization, volume of forms, physical size, volatility and retention requirements. Also included are any special environmental requirements for its storage and any special security or access restrictions. Relationships to other files are described and positions which process the file identified.

5.09 *Physical Record Specification (M):* A detailed specification of how system data which does not reside under a Data Base Management System is organized into physical records for storage in the system's files. Included are the physical characteristics of each record (eg, content, layout, key fields, record length, blocking, etc), its estimated volumes, and any special security or access restrictions. The file(s) which contains the record and modules which process it are identified. Relationships to logical records and to other physical records are described.

5.10 *CSS File Specification (M):* A detailed specification of the organization of physical records into files, including specifications for the file's physical characteristics [eg, record types contained in the file, organization, access method(s), storage device, size, etc], description of the file's relationships to other files, and identification of modules which access it.

5.11 *Physical Segment Specification (M):* A detailed specification of how system data which will reside under a Data Base Management System is organized into physical segments for storage in the system's data base(s). Included are the physical characteristics of each segment (eg,

content, layout, keys, size, etc), its estimated volume, and any special security or access restrictions. Data base(s) and data set group(s) which contain the segment and modules which process it are identified. Relationships to logical segments and to other physical segments are described.

5.12 Data Set Group Specification (M): A detailed specification of the organization of physical segments into manageable data set groups for storage and processing. Included for each data set group are its physical characteristics [eg, segment types contained, structure, access method(s) storage device, size, etc], a description of its relationships to other data set groups and the methods by which the relationships are recorded. Physical data bases which contain the data set group and modules which access it are identified.

5.13 Physical Data Base Specification (M): A detailed specification of the organization of physical segments and data set groups into physical data base(s) for storage and processing. Included for each data base are the physical characteristics [eg, segments and data set groups contained, structure, access method(s), storage device, size, etc], a description of relationships to the logical data base and other physical data bases, and identification of modules which access it. Also identified are data which are shared with other systems.

5.14 Group/Element Specification (M): A detailed specification of how each group/element in the system is stored, transmitted, and processed. This component is an extension of the Group/Element Definition and includes the storage/display format of the element, the name of the record(s) in which it is contained, and the name of the task/module(s) which processes it.

5.15 Module Specification (M): A specification of each CSS module, identifying functions performed by the module, and including detailed logic and data requirements (eg, module inputs, outputs, layouts of transient data and work areas, calls to the data base, etc). Also identified are implementation constraints (eg, storage limitations, etc).

5.16 Program Specification (M): A specification of each program, including the structure of modules within the program, detailed data requirements (eg, transient work files, etc), messages and codes

which the program issues, and program language to be used.

5.17 Messages and Codes (M): An ordered list of messages and codes generated by each program, including for each an identifier, the sample text, media (eg, printed output, CRT display), program(s) and job(s) which issue it, conditions under which it is issued, and actions to be taken.

5.18 CSS Job Specification (M): A specification for each job, listing programs within the job, and the inputs and outputs of the job and of each job step. Also included is a description of the execution characteristics of each program within the job and control requirements.

5.19 CSS Job Flow (M): A flowchart of the job steps within each job and a description of each job step. Included for each job step are program name and number, a title or descriptive phrase, and identification of data processed by the job step (eg, program inputs and outputs, transient work files, etc).

5.20 CSS Flow: A diagram of the flow(s) of jobs within the CSS, depicting flow of data scheduling dependencies, and control requirements among the jobs.

5.21 CSS Verification Test Plan: An overview of CSS verification testing to be performed to test the logical correctness of each program, job, and/or subsystem. Included is identification of the program(s), job(s), or computer subsystem(s) to be verified by each test, the test's objectives, and a general description of the techniques to be used. Also included are test schedules and dependencies and resource requirements for each test.

5.22 Hardware Sizing Guidelines: Algorithms and guidelines to correlate processing volumes, specific performance levels, scheduling options, hardware/software options, and other quantifiable variables to the sizes and quantities of hardware required to operate the system.

5.23 Training Specification (M): Detailed specifications for the development of each training course. Included are statements of the course's purpose and objectives, a course outline, training evaluation methods, test material specifications, and a bibliography of reference documentation.

The type of course to be developed (eg, instructor-led, self-paced, seminar, etc) is specified.

5.24 Training Overview: An overview of the application training provided and identification of nonapplication courses assumed to be available. Included are brief descriptions of each course, course sequences, dependencies or prerequisites, and identification of the types and numbers of personnel who will attend each. Overall strategies for implementing training are described, and general resource requirements (eg, instructors, facilities, etc) are identified.

5.25 Course Evaluation and Maintenance: Procedures for the evaluation and maintenance of training courses, including methods for collecting and evaluating student and instructor feedback, and for evaluating on-the-job training effectiveness.

5.26 Equipment Specifications: The equipment types and quantities required for system conversion and operation (eg, terminals, copiers, typewriters, key entry devices, printers, etc), identified by manufacturer/vendor model and feature numbers. For each, interfaces with other equipment are described (eg, terminal clusters), and operating requirements specified (eg, power, space, light, etc). Ordering information, lead times, and cost breakdowns are included.

5.27 Transportation Specifications: A description of the specific means selected to transport the system data (eg, truck, mail, air freight, special courier, etc). Contracts and agreements which must be entered into are identified, including performance commitments and penalties for noncompliance. Also included is information for establishing the transportation services and a breakdown of basic and special service cost.

5.28 Communications Network Specifications: A detailed specification of the communication network required to transmit system data, including a network diagram showing the network configuration and terminations, types, and quantities of modems and options to be used. Shared use of existing networks is identified. For new network requirements, ordering information and a cost breakdown are provided.

5.29 DPC Hardware Specifications: The types and quantities of hardware required for system conversion and operation are identified by manufacturer/vendor model and special feature numbers. For each, a description or diagram of the hardware configuration is included. For existing or shared hardware, the application's usage requirements are specified.

5.30 Software Specifications: Most general software will be specified in Section 007-203-100, Rules for Centrally Developed Systems, according to the hardware vendor, or defined by Operating Company or local standards. For general software not covered by these, and for special software, this component specifies vendor and product name and/or number, special features, hardware resource requirements, required supporting software, ordering information, and a breakdown of costs.

5.31 Facility Planning: Specification of the work area(s) for each user location, including a floor plan showing work space layout, furniture, and equipment placement. Also included are general work area requirements (eg, lighting, noise level tolerances, etc), and specific equipment requirements (eg, power, temperature tolerances, etc). Diagrams of equipment interconnections are provided, if applicable. Also included are schedules and responsibilities for implementing the physical plan.

5.32 System Controls Description: Descriptions of the control procedures which have been designed to ensure system quality (eg, data security, edits output checks, sign-on procedures, exception reports, security procedures, etc). Included for each control is its purpose and actions which are triggered by out-of-tolerance performance, predefined conditions, or attempted security violations. The position or program in which each control resides is referenced.

5.33 System Reliability Measures Description: Description of the features which have been designed, both internal and external to the processing system, to ensure system reliability and continuity (eg, fallback, recovery, reconstruction, reconfiguration, data retention, etc). Included is a description of each reliability measure and its relationships to others, its purpose, guidelines, and responsibilities for its use. Positions and programs in which each feature resides are referenced.

5.34 System Performance Monitoring Capabilities: A description of system performance which must be measured and the system capabilities for monitoring it (eg, indices,

work summaries, performance and results summaries, exception reporting, etc). Included are guidelines for interpreting the information and statistics provided.

5.35 *System Validation Test Plan:* An overview of the system validation testing to be performed to test the logical correctness of the system in its operating environment. Included are identification of positions, programs, jobs, and/or subsystems validated by each test; the test's objectives and a general description of the techniques to be used. Also included are test schedules, dependencies, and resource requirements for each test. Differences between the testing and ultimate operating environments and assumptions regarding testing validity in light of those differences are described.

5.36 *System Certification Test Plan:* An overview of system certification testing to be conducted to certify the system performance (eg, processing times, capacity, resource utilization, recoverability, etc) under operating conditions (eg, operational volumes and schedules, etc). Included are identification of the positions, programs, jobs, and/or subsystems to be certified by each test, the test's objectives, and a general description of the techniques to be used. Also included are test schedules and dependencies, and resource requirements for each test. Differences between the testing and ultimate operating environments, and assumptions regarding testing validity in light of those differences are described.

5.37 *System Conversion Plan:* A detailed plan for system installation, outlining conversion strategies and schedules, and providing procedures and guidelines for installing the PSS and CSS, converting data, and coordinating the conversion activities. Also included is a checklist of documentation required for installation and operation.

5.38 *System Overview—Detail Design:* A concise overview of the system as seen at the end of Detail Design. The system's intended usage, impact on the organization, overall architecture, operating characteristics, and conversion strategies and schedules are described. Overall resource requirements are identified.

5.39 *Status and Recommendations:* A description of the status of the project and the system at the end of Detail Design Phase, including:

(a) A report on Detail Design Phase activities and expenditures, highlighting and explaining any significant deviations from planned.

(b) A description of the system as seen at the end of Detail Design Phase, highlighting and explaining any significant design modifications, or changes to the system objectives, scope, constraints, or worth.

(c) A recommendation for the disposition of the project (eg, cancel, defer, recycle, continue), along with the reasons for the recommendation.

6.   IMPLEMENTATION PHASE COMPONENTS
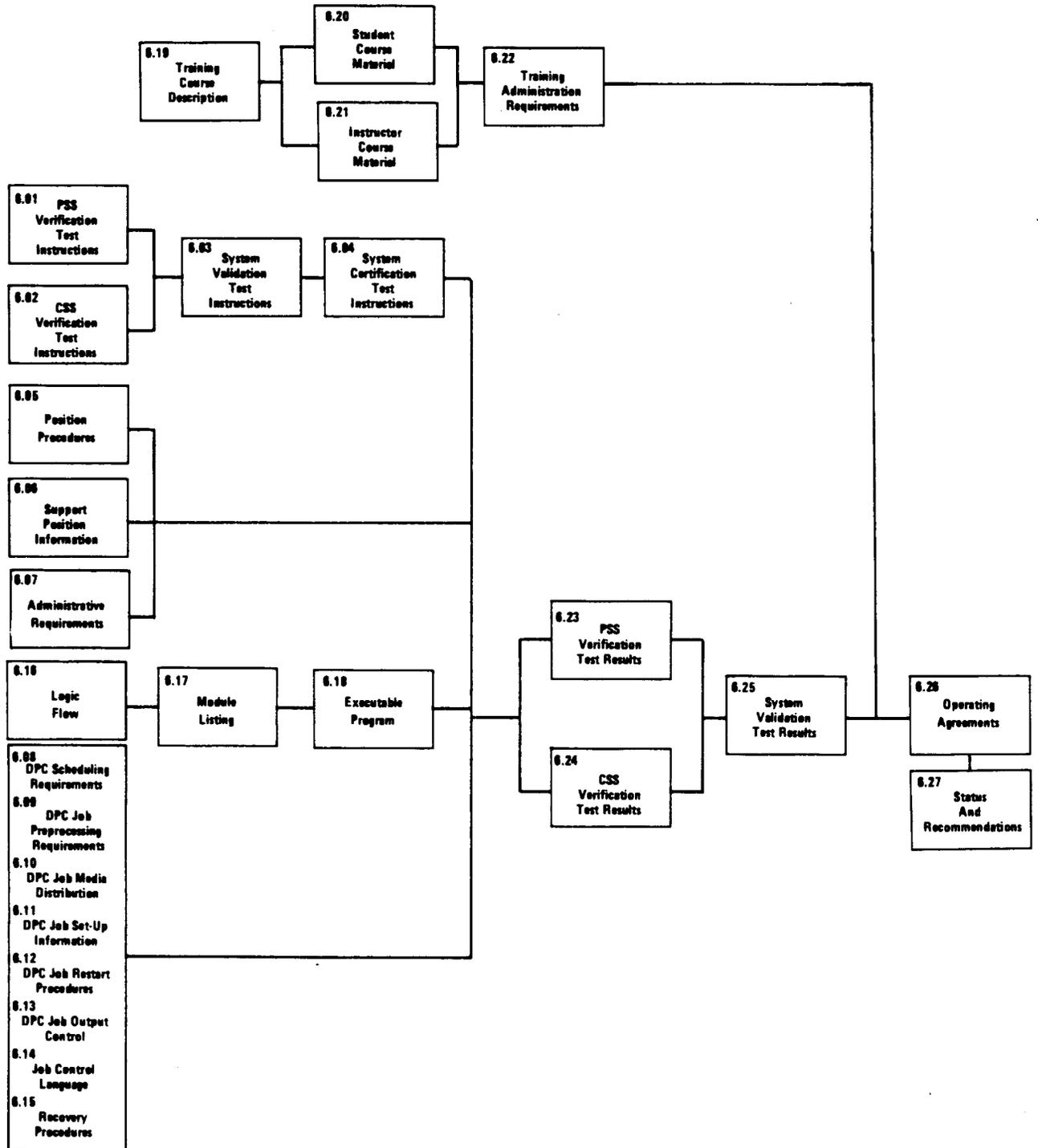
COMPONENT DIAGRAM

Fig. 6—Implementation Phase Component Network Diagram

COMPONENT CHECKLIST

____ 6.01—PSS Verification Test Instructions

____ 6.02—CSS Verification Test Instructions

____ 6.03—System Validation Test Instructions

____ 6.04—System Certification Test Instructions

____ 6.05—Position Procedures

____ 6.06—Support Position Information

____ 6.07—Administrative Requirements

____ 6.08—DPC Scheduling Requirements

____ 6.09—DPC Job Preprocessing Requirements

____ 6.10—DPC Job Media Distribution

____ 6.11—DPC Job Set-Up Information

____ 6.12—DPC Job Restart Procedues

____ 6.13—DPC Job Output Control

____ 6.14—Job Control Language

____ 6.15—Recovery Procedures

____ 6.16—Logic Flow

____ 6.17—Module Listing

____ 6.18—Executable Program

____ 6.19—Training Course Description

____ 6.20—Student Course Material

____ 6.21—Instructor Course Material

____ 6.22—Training Administration Requirements

____ 6.23—PSS Verification Test Results

____ 6.24—CSS Verification Test Results

____ 6.25—System Validation Test Results

____ 6.26—Operating Agreements

____ 6.27—Status and Recommendations

COMPONENT DESCRIPTIONS

6.01 *PSS Verification Test Instructions (M):* A detailed description of each PSS verification test. The task(s) or position(s) to be tested are identified. Included are objectives of the test, test cases, techniques, and procedures for conducting the test, test analysis procedures, and expected results. Conditions for the test are stated (eg, prerequisite training, environmental requirements). Resources required for the test are identified (eg, personnel, materials, equipment, facilities).

6.02 *CSS Verification Test Instructions (M):* A detailed description of each CSS component and subsystem verification test. The module, program, job, or subsystem to be tested is identified. Included are objectives for the test, test data, techniques, and procedures for conducting the test, test analysis procedures, and expected results. Conditions for the test are stated. Resources required for the test are identified (eg, hardware, software, personnel).

6.03 *System Validation Test Instructions (M):* A detailed description of each validation test. The PSS positions and CSS jobs or subsystem to be tested are identified. Included are the objectives of the test, test data, techniques, and procedures to be used for conducting the test, test analysis procedures, and expected results. Conditions upon which the validity of the test is dependent are stated (eg, prerequisite training, environmental conditions). Resources required for the test are identified (eg, personnel, hardware, software, material).

6.04 *System Certification Test Instructions (M):* A detailed description of each certification test. The PSS positions and CSS jobs or subsystem to be tested are identified. Included are objectives of the test, test data, techniques, and procedures to be used for conducting the test, system performance criteria, test analysis procedures, and expected results. Conditions upon which the validity of the test is dependent are stated (eg, volumes, environmental conditions). Resources required for the test are identified (eg, personnel, hardware, software, material).

6.05 *Position Procedures (M):* Instructions and supporting information needed to perform each position. The instructions may be highly proceduralized for those positions which are step by step in nature or in guideline form for positions which are not highly proceduralized. Performance aids and copies of forms and displays are also included.

6.06 *Support Position Information (M):* Information required by support positions (eg, keypunch, typing, distribution, etc) to support the operation of the system. Included, as applicable, are descriptions of the tasks which the support positions perform, schedules and work volumes, inputs, outputs, performance aids, and special equipment requirements.

6.07 *Administrative Requirements (M):* A definition of management responsibilities for administering system functions, and detailed descriptions of procedures and guidelines for accomplishing the responsibilities. Included for each management position is an overview of tasks performed by subordinates, personnel requirements, data responsibilities, and guidelines for scheduling and control.

6.08 *Data Processing Center (DPC) Scheduling Requirements:* A detailed description of the system scheduling requirements for use by appropriate personnel within the DPC. This includes input and output due times, job execution times, computer resource requirements, and job dependencies.

6.09 *Data Processing Center (DPC) Job Preprocessing Requirements (M):* A detailed description of the variable conditions which must be considered to set up and execute a computer job, as well as actual instructions for handling these conditions [eg, special job transmittal instructions, punching volume serial numbers into job control language (JCL), etc].

6.10 *Data Processing Center (DPC) Job Media Distribution (M):* Identification of all media (eg, tapes, printouts, microfiche) produced within the DPC, and instructions for their distribution within and from the DPC.

6.11 *Data Processing Center (DPC) Job Set-Up Information (M):* Identification of the hardware and software required to run the computer job, including data sets, peripheral devices, printer carriage tapes, etc. Job frequency and execution times also are included.

6.12 Data Processing Center (DPC) Job Restart Procedures (M): Instructions to be followed by DPC personnel to restart or rerun a job in the event of a hardware or job malfunction.

6.13 Data Processing Center (DPC) Job Output Control (M): Instructions for the DPC personnel to verify manually the accuracy of the job. These instructions contain detailed explanations for actions to be taken as a result of the occurrence of particular printed messages or other unique job oriented conditions.

6.14 Job Control Language (JCL) (M): The job control statement decks required to execute the computer job, and a printed listing both of the control card decks and of any library members or cataloged procedures on which the job's JCL resides.

6.15 Recovery Procedures: A description of procedures for recovery and restoration of the system data base, specific guidelines for their use, and detailed instructions for executing them.

6.16 Logic Flow (M): A description of the processing steps and decisions, and their sequence of flow within a module.

6.17 Module Listing (M): A computer produced source code listing, compilation output, and list of external references.

6.18 Executable Program (M): A fully compiled or assembled program that is ready to be executed by the computer.

6.19 Training Course Description (M): A description of each course including course name, course and unit objectives, course prerequisites, course length, and intended audience.

6.20 Student Course Material (M): Information and material which the student requires to take the course, including course outline and objectives, schedule, work and reference material, and sources of additional course related information.

6.21 Instructor Course Material: Information for a course instructor to conduct a class, seminar, or workshop session, including lesson plans, guidelines for administering the course (eg, class size), instructions for the use of student materials and exams, training aids, instructor's answer masks, foils, film strips, slides, tape recordings, etc. Also included are specifications for required equipment (eg, screens, easels, video display units, slide projectors) and facilities (eg, classrooms, study carrels).

6.22 Training Administration Requirements: Recommended training activities to be conducted during system conversion and operation, including instructor recruiting and training information, information on courses which require local modification or development, information for ordering material and supplies for each course, the recommended course sequence, a description of student skill and knowledge levels, and course evaluation methods and criteria.

6.23 PSS Verification Test Results (M): A statement of the actual results obtained from PSS verification tests, including an evaluation of any deviations from the expected results as specified in the PSS verification test instructions, and a description of the agreed-to solutions for correcting the unacceptable deviations.

6.24 CSS Verification Test Results (M): A statement of the actual results obtained from CSS verification tests, including an evaluation of any deviations from the expected results as specified in the CSS verification test instructions, and a description of the agreed-to solutions for correcting the unacceptable deviations.

6.25 System Validation Test Results (M): A statement of the actual results obtained from the system validation test, including an evaluation of any deviations from the expected results as specified in the system validation test instructions, and a description of the agreed-to solutions for correcting the unacceptable deviations.

6.26 Operating Agreements: Agreements among operating groups (users, DPC, support services, etc) defining responsibilities and commitments. The operating agreements cover system media (input/output schedules, quality control, etc), performance (availability, response times, etc) and operation (trouble shooting, recovery, etc). A plan for administering the operating agreements is included.

6.27 *Status and Recommendations:* A description of the project team's efforts and results as of the end of the Implementation Phase. This includes:

(a) A report on activities and expenditures, highlighting any deviations from plans.

(b) Current system status, including a summary of testing and the state of system documentation (both deliverable and nondeliverable).

(c) A description of mandated changes from the Detail Design Phase, and their impact.

(d) A recommendation for the disposition of the project (eg, convert, defer for further testing), along with documented reasons for the recommendation. Recommended schedules are included.

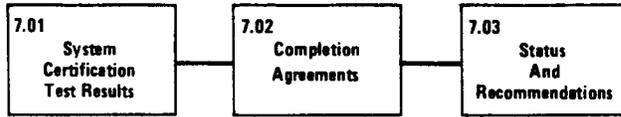## 7. CONVERSION PHASE COMPONENTS

COMPONENT DIAGRAM

Fig. 7—Conversion Phase Component Network Diagram

COMPONENT CHECKLIST

____ 7.01—System Certification Test Results

____ 7.02—Completion Agreements

____ 7.03—Status and Recommendations

COMPONENT DESCRIPTIONS

7.01 *System Certification Test Results (M):* A statement of the actual results obtained from the system certification test, including an evaluation of any deviations from the expected results, as specified in the system certification test instructions, and a description of agreed-to solutions for correcting unacceptable deviations.

7.02 *Completion Agreements:* A statement of agreement among the developmental team and various operating groups upon the handover of the system, including:

(a) An agreed-to schedule for resolving certification testing problems.

(b) Items for future maintenance versus development.

(c) Dates when the system begins operation and enters the maintenance mode of its life cycle.

(d) Schedules for any remaining conversion activities.

7.03 *Status and Recommendations:* A description of the project team's efforts and results during the Conversion Phase. This includes:

(a) A report on the Conversion Phase activities and expenditures, highlighting any deviation from the phase plan.

(b) A description of areas where the project team had difficulties, and negotiated changes to performance specifications of the Operating Agreement. An analysis of the impact, if any, of changes on system objectives, cost, or worth.

(c) A recommendation for the disposition of the system (eg, proceed into operation, defer operation, abandon) along with documented reasons to support the recommendation.

(d) A recommendation for the system's Performance Review schedule.
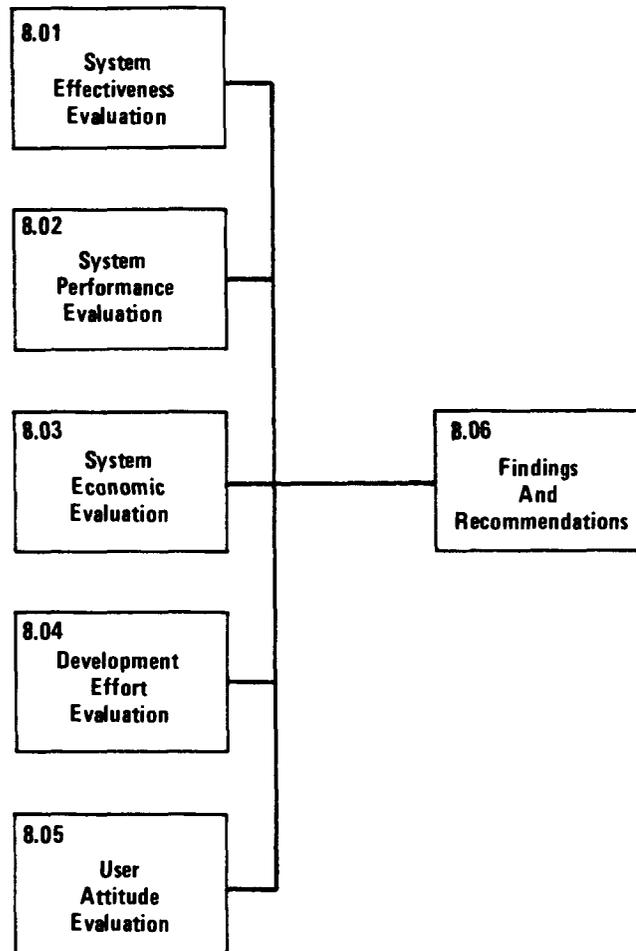
8.   PERFORMANCE REVIEW PHASE COMPONENTS

COMPONENT DIAGRAM

Fig. 8—Performance Review Phase Component
Network Diagram

COMPONENT CHECKLIST

____ 8.01—System Effectiveness Evaluation

____ 8.02—System Performance Evaluation

____ 8.03—System Economic Evaluation

____ 8.04—Development Effort Evaluation

____ 8.05—User Attitude Evaluation

____ 8.06—Findings and Recommendations

COMPONENT DESCRIPTIONS

8.01 *System Effectiveness Evaluation:* An analysis of how well the system is attaining the documented business objectives and resolving the problems/opportunities identified in feasibility. Also included is an evaluation of any unanticipated positive and/or negative impact of the system. Possible future system uses and integration with other systems are recommended as appropriate.

8.02 *System Performance Evaluation:* A description of how well the operational system is meeting the system objectives for performance which were established in feasibility and refined through the design phases. Included is an evaluation of the operational effectiveness and efficiency of the various system components (eg, employee performance, equipment performance, operating documentation usefulness, training effectiveness, etc), and an evaluation of the operational, technical, and economic adequacy of the design. The impact of inadequate or excessive performance on the effectiveness and/or economics of the system is analyzed. Actions for correcting system performance are recommended.

8.03 *System Economic Evaluation:* A comparison of actual versus estimated costs and benefits associated with the operation of the system, and a new analysis of actual system worth. Cost are quantified in terms of dollars for salaries, machines, materials, training, and maintenance. Both anticipated and unanticipated economic benefits are identified. Developmental costs are not included.

8.04 *Development Effort Evaluation:* A statement of the total project schedule, costs and resource usage, highlighting and explaining significant deviations between actual and planned. Included are analysis of methods, procedures, and techniques used to plan, coordinate, and control the project, interface with the user, and to develop and install the system. Recommendations for improving the developmental process are made.

8.05 *User Attitude Evaluation:* An analysis of the attitudes of users and operators regarding system effectiveness and usability. This may pinpoint problems with the system (eg, lack of reliability), and/or problems resulting from user attitudes toward the system (eg, resistance to change). Changes or future development for increasing user satisfaction is recommended.

8.06 *Findings and Recommendations:* A summary of the findings and results of the Performance Review phase, including:

(a) A summary of the operational review, noting benefits attained, user acceptance, and highlighting outstanding problems in performance and effectiveness.

(b) A summary of the developmental review, highlighting and explaining significant deviations from schedule and cost estimates.

(c) Recommendations for the disposition of the system (eg, operate as is, modify, discard, etc).

APPENDIX 1

DOCUMENTATION COMPONENTS BY
FUNCTIONAL ROLES

1.01 The Documentation Components by functional roles
are listed on the following pages of this appendix.

COMPONENTS PRODUCED BY

APPLICATION EXPERTISE

1.01   Project Initiation Request

COMPONENTS PRODUCED BY

PROJECT MANAGEMENT

2.12   Developmental Estimates

6.26   Operating Agreements
6.27   Status and Recommendations (Implementation Phase)

7.02   Completion Agreements
7.03   Status and Recommendations (Conversion Phase)

COMPONENTS PRODUCED BY

SYSTEM ANALYSIS

2.01	Existing Environment
2.02	Problem/Opportunity Statement
2.03	User Needs
2.04	General Assumptions and Constraints
2.05	System Objectives
2.06	System Output Description
2.07	System Input Description
2.08	System Data Description
2.09	System Model
2.10	Business Objectives
2.11	System Resource Estimates
2.13	Economic Analysis
2.14	Findings and Recommendations (Feasibility Phase)

3.01	System Constraints
3.02	System Output Requirements
3.03	System Input Requirements
3.04	System Data Requirements
3.05	Group/Element Definition
3.06	Data Conversion Considerations
3.07	Function Structure
3.08	Function Description
3.09	Potential Problem Areas
3.10	System Control Requirements
3.11	System Reliability Requirements
3.12	System Overview - Definition
3.13	Findings and Recommendations (Definition Phase)

COMPONENTS PRODUCED BY

SYSTEM DESIGN

4.01	Function Allocation Description
4.02	System Output Specification
4.03	System Input Specification
4.04	Subsystem Function Structure
4.05	Subsystem Function Description
4.14	PSS/CSS Interface Specification
4.15	System Conversion Requirements
4.17	Personnel Requirements
4.18	Equipment Requirements
4.19	Facility Requirements
4.20	Transportation Requirements
4.23	Communications Network Requirements
4.24	System Overview - Preliminary Design
4.25	Refined Economic Analysis
4.26	Status and Recommendations (Preliminary Design Phase)
5.26	Equipment Specifications
5.27	Transportation Specifications
5.28	Communications Network Specification
5.31	Facility Planning
5.32	System Controls Description
5.33	System Reliability Measures Description
5.34	System Performance Monitoring Capabilities
5.37	System Conversion Plan
5.38	System Overview - Detail Design
5.39	Status Recommendations (Detail Design Phase)

COMPONENTS PRODUCED BY

COMPUTER SUBSYSTEM DESIGN

*	4.08	Support Position Description
	4.09	Module Description
	4.10	Program Description
	4.11	Logical Record Specification
	4.12	Logical Segment Specification
	4.21	DPC Hardware Requirements
	4.22	Software Requirements
*	5.02	Support Position Specification
*	5.04	System Personnel Guidelines
	5.15	Module Specification
	5.16	Program Specification
	5.17	Messages and Codes
	5.18	CSS Job Specification
	5.19	CSS Job Flow
	5.20	CSS Flow
	5.22	Hardware Sizing Guidelines

*   Produced jointly with Personnel Subsystem Design.

COMPONENTS PRODUCED BY

PERSONNEL SUBSYSTEM DESIGN

	4.06	Task Description
	4.07	Position Description
*	4.08	Support Position Description
	5.01	Position Specification
*	5.02	Support Position Specification
	5.03	Position Grouping into Jobs
	5.04	System Personnel Guidelines
	5.05	Organizational Considerations
	5.07	Form Specification
	5.08	Manual File Specification

*   Produced jointly with Computer Subsystem Design

COMPONENTS PRODUCED BY

DATA BASE DESIGN

4.11	Logical Record Specification
4.12	Logical Segment Specification
4.13	Logical Data Base Specification
5.09	Physical Record Specification
5.10	CSS File Specification
5.12	Data Set Group Specification
5.13	Physical Data Base Specification
5.14	Group/Element Specification

COMPONENTS PRODUCED BY

DATA COMMUNICATIONS DESIGN

4.23   Communications Network Requirements

COMPONENTS PRODUCED BY

POSITION DEVELOPMENT

6.05   Position Procedures
6.06   Support Position Information
6.07   Administrative Requirements

COMPONENTS PRODUCED BY

PROGRAMMING

COMPONENTS PRODUCED BY

TRAINING DEVELOPMENT

5.23   Training Specification
5.24   Training Overview
5.25   Course Evaluation and Maintenance

6.19   Training Course Description
6.20   Student Course Material
6.21   Instructor Course Material
6.22   Training Administration Requirements

COMPONENTS PRODUCED BY

TEST

4.16	System Test Plan

5.06	PSS Verification Test Plan
5.21	CSS Verification Test Plan
5.35	System Validation Test Plan
5.36	System Certification Test Plan

6.01	PSS Verification Test Instructions
6.02	CSS Verification Test Instructions
6.03	System Validation Test Instructions
6.04	System Certification Test Instructions
6.23	PSS Verification Test Results
6.24	CSS Verification Test Results
6.25	System Validation Test Results

7.01	System Certification Test Results

COMPONENTS PRODUCED BY

TECHNICAL SUPPORT

DATA MANAGEMENT

5.11	Physical Segment Specification
5.12	Data Set Group Specification
5.13	Physical Data Base Specification
5.14	Group/Element Specification

INTERNAL DATA NETWORK SUPPORT

5.28	Communication Network Specification

HARDWARE SUPPORT

5.29	DPC Hardware Specifications

SOFTWARE SUPPORT

5.30	Software Specifications

APPENDIX 2

DOCUMENTATION COMPONENT

NETWORKS FOR TECHNICAL
AREAS

2.01 The Documentation Component Networks
for technical areas are shown
in the following diagrams.
(See Figures 1 through 8.)

```
+------------------+      +------------------+      +------------------+      +------------------+      +------------------+
| 2.12             |      | 6.26             |      | 6.27             |      | 7.02             |      | 7.03             |
|  Developmental   |------|    Operating     |------|     Status       |------|   Completion     |------|     Status       |
|   Estimates      |      |   Agreements     |      |      And         |      |   Agreements     |      |      And         |
|                  |      |                  |      | Recommendations  |      |                  |      | Recommendations  |
+------------------+      +------------------+      +------------------+      +------------------+      +------------------+
```
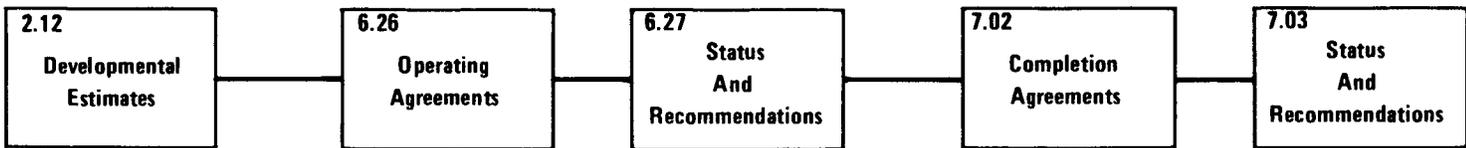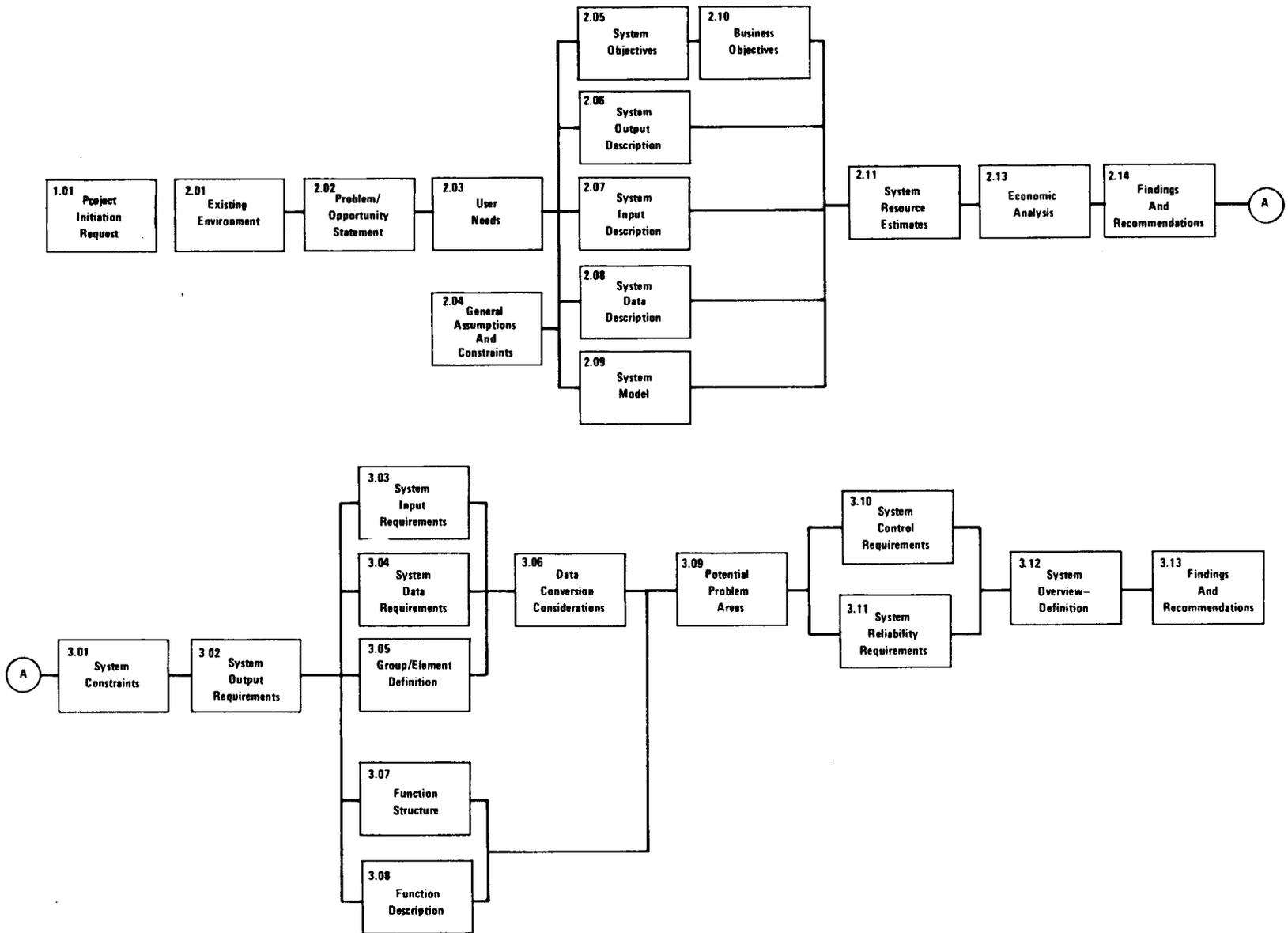
Fig. 1 — Project Management Components

Fig. 2 — System Analysis Components
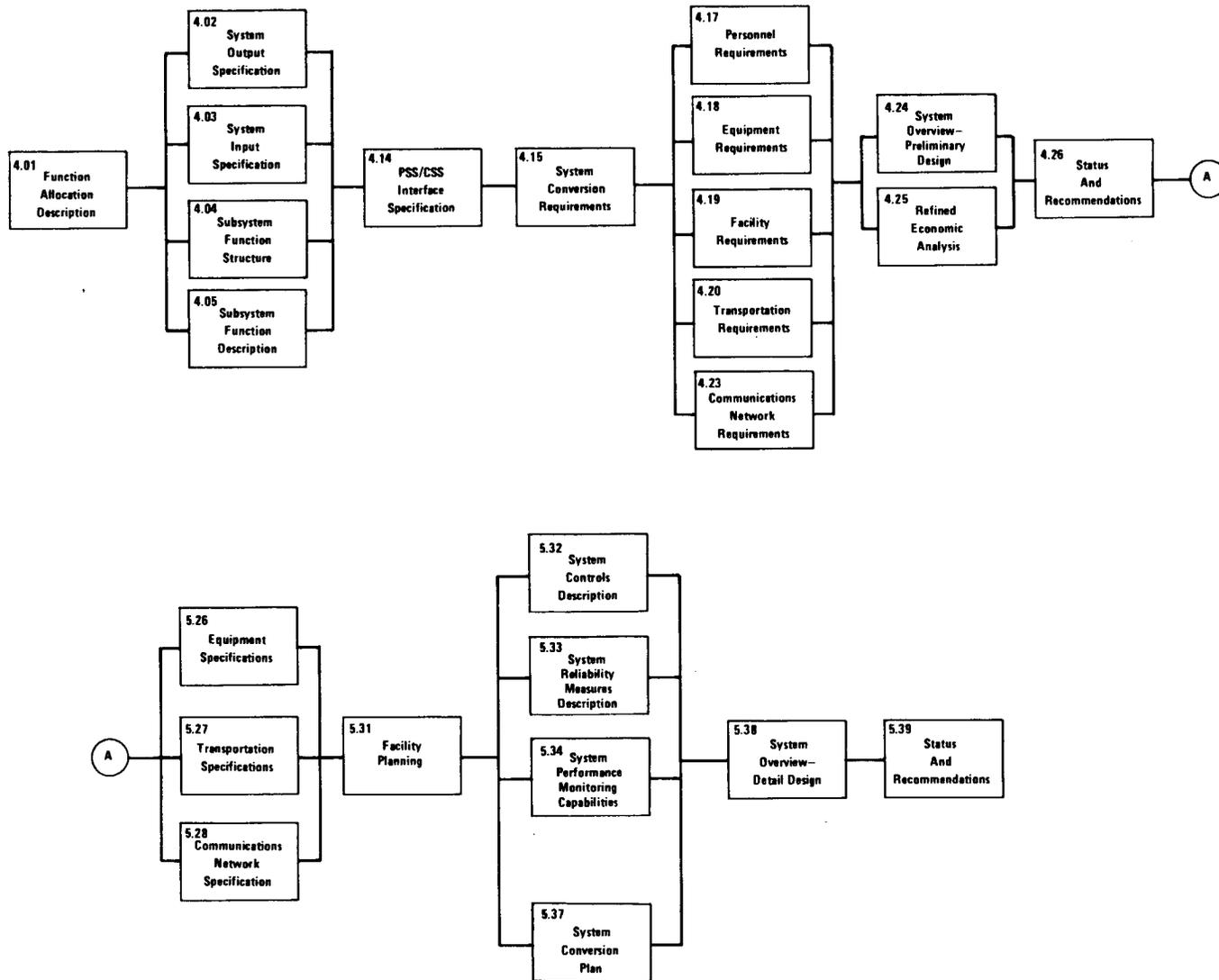
Fig. 3 — System Design Components

Fig. 4 — Computer Subsystem Components

4.06 Task Description

4.07 Position Description

4.08 * Support Position Description

5.01 Position Specification

5.02 * Support Position Specification

5.03 Position Grouping Into Jobs

5.04 * System Personnel Guidelines

5.05 Organizational Considerations

5.07 Form Specification

5.08 Manual File Specification

6.05 Position Procedures

6.06 Support Position Information

6.07 Administrative Requirements
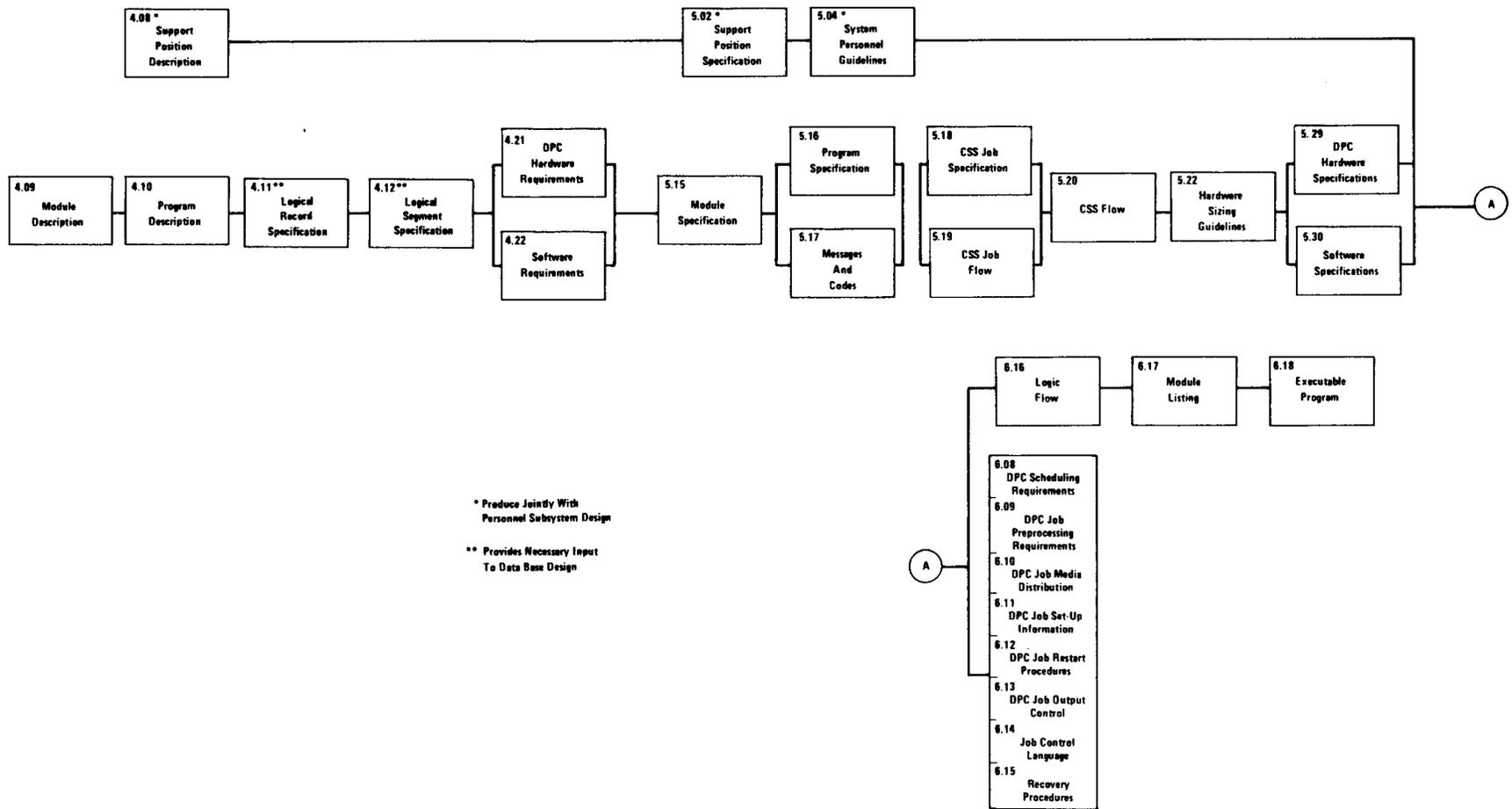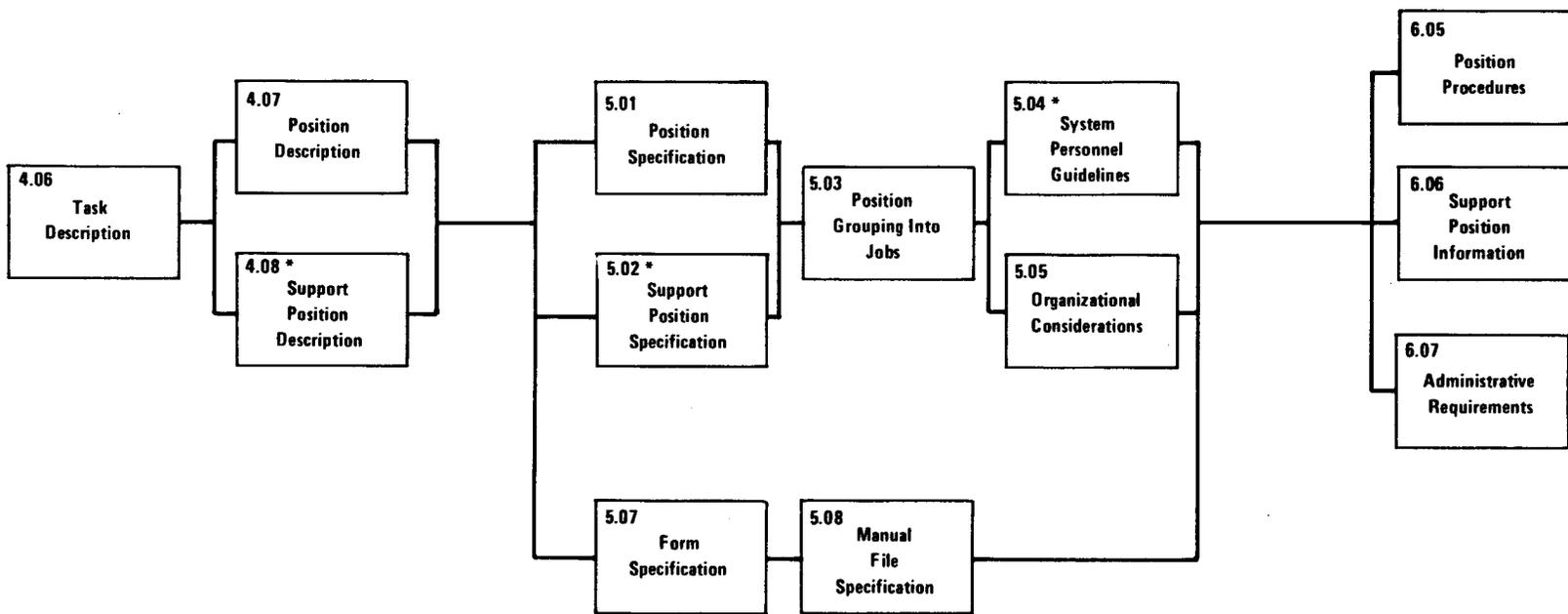
*Produced Jointly With
 Computer Subsystem Design

Fig. 5 — Personnel Subsystem Components
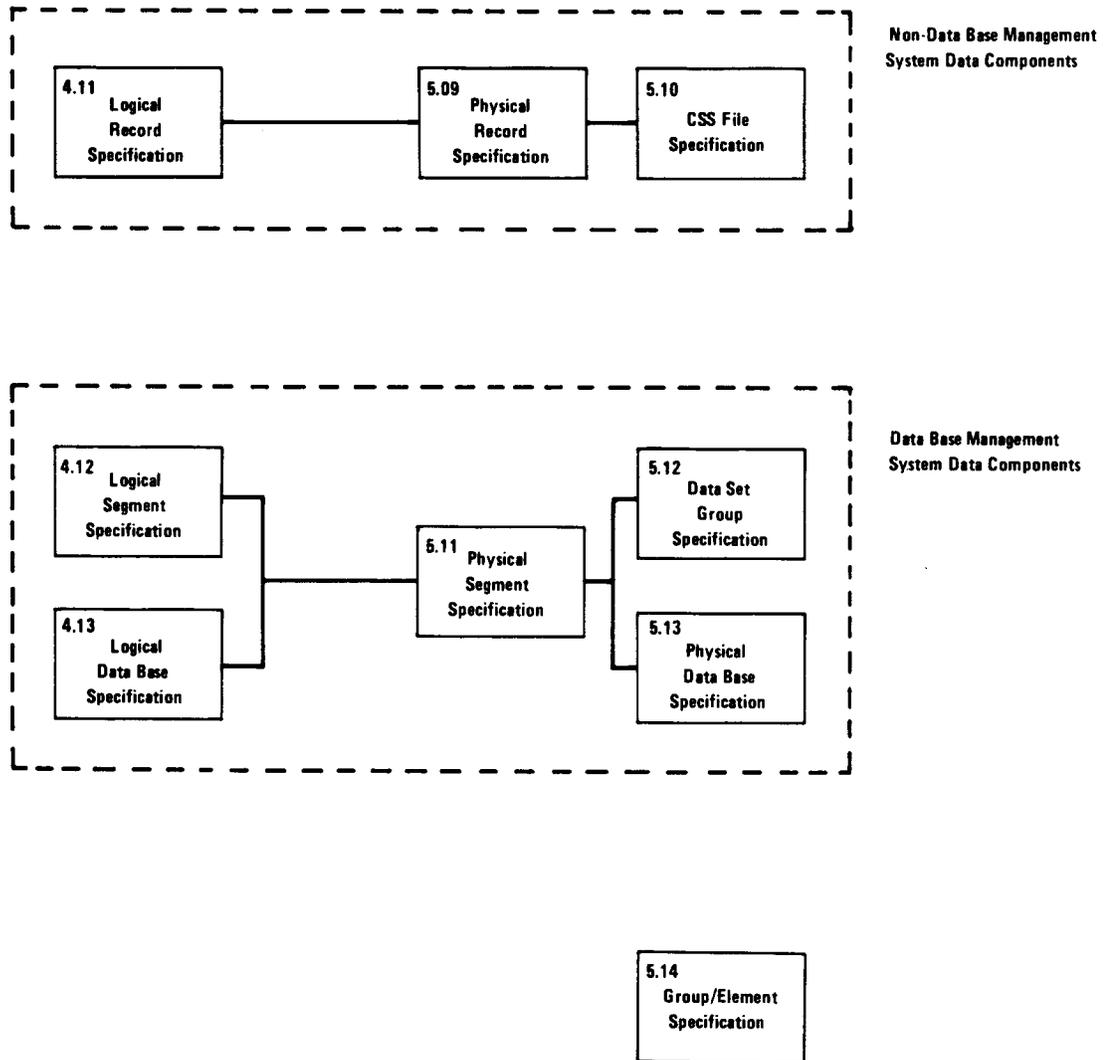
Fig. 6 — Data Base Components

```
┌─────────────┐
│ 5.23        │
│   Training  │
│ Specification│
└─────────────┘          ┌─────────────┐
                         │ 5.25  Course│         ┌─────────────┐      ┌─────────────┐
                         │   Evaluation│         │ 6.19        │      │ 6.20        │
                         │   And       │─────────│   Training  │──────│   Student   │
┌─────────────┐          │ Maintenance │         │   Course    │      │   Course    │
│ 5.24        │          └─────────────┘         │ Description │      │   Material  │
│   Training  │                                  └─────────────┘      └─────────────┘
│ Overview    │                                                       ┌─────────────┐      ┌─────────────┐
└─────────────┘                                                       │ 6.21        │      │ 6.22        │
                                                                      │   Instructor│      │   Training  │
                                                                      │   Course    │      │ Administration│
                                                                      │   Material  │      │ Requirements│
                                                                      └─────────────┘      └─────────────┘
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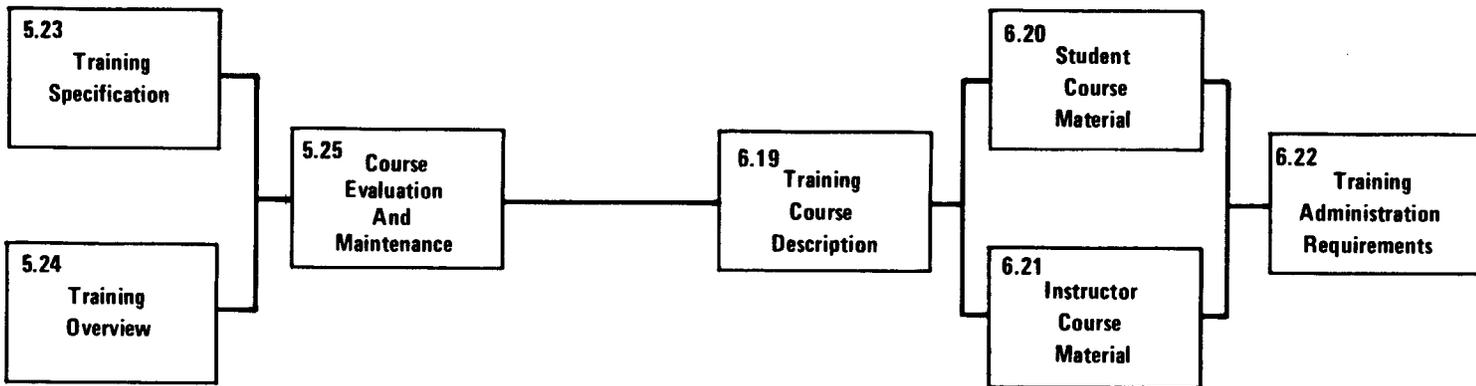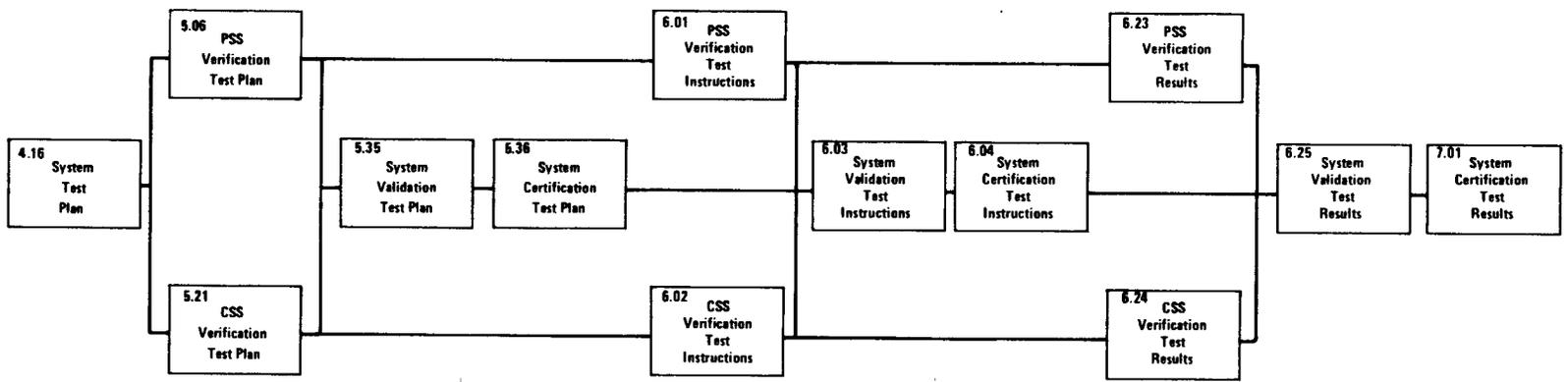
Fig. 7 – Training Components

Fig. 8 — Testing Components