NEW
ELECTRONIC SWITCHING SYSTEMS
CIRCUIT DOCUMENTATION

CONTENTS PAGE

1. GENERAL 2
A. Scope 2
B. SD Types 2
C. SD Sectionalization 2
D. SD Section-to-Circuitry-Level Relationship 3
E. Circuitry-Level Documentation . . 3
2. FUNCTIONAL UNIT SDs 3
A. B Section, Functional Schematics . . 3
General 3
Interconnection and Flow Diagrams . 3
Connection List Tables 15
Composite Diagrams 17
B. A Section, Drawing Indexes . . . 25
C. C Section, Apparatus Figures . . . 25
D. D Section, Notes and Tables . . . 26
E. E Section, Sequence Charts (SCs) . 26
F. G Section, Cabling Diagrams (CADs) 26
G. H Section, Block Diagrams (BDs) . 32

CONTENTS PAGE

3. FRAME UNIT SDs 32
A. General 32
B. B Section 32
C. G Section, CADs 32
D. A Section, Drawing Indexes . . . 35
4. FRAME SDs 35
A. General 35
B. B Section 35
General 35
IFDs 36
Connection List Tables 37
C. C Section, App Figs. 39
D. G Section, CADs 40
E. A Section, Drawing Indexes . . . 40
5. CIRCUIT PACK INFORMATION SDs (CPI SDs) 40
A. General 40
B. D Section, Notes and Tables . . . 40
C. J Section, Circuit Packs (CPs) . . . 44
D. K Section, Circuit Modules (CMs) . 44

1. GENERAL

A. Scope

1.01 This document describes the circuit documentation methods used in the circuit drawings (SDs) of electronic switching systems (ESSs) such as No. 3 and No. 4 and the 1A processor.* In developing wiring details for the extensive circuitry of these systems, machine aids were used almost exclusively. Similar methods have been used, where possible, in the preparation of the circuit documentation. For this reason, information in parts of the SDs described herein will reflect the use of machine-aided methods in their preparation. This document will describe only those areas of SD documentation in which the methods described herein have been used in place of other methods. For all other areas of SD documentation, the methods outlined in Section 005-110-101† apply.

*These systems are the first to use what is referred to as "1A Technology".

†To be issued.

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

B. SD Types

1.03 The documentation arrangements and methods of this document apply to four types of SDs:

(a) Functional unit SDs

(b) Frame unit SDs

(c) Frame SDs

(d) Circuit pack information (CPI) SDs

1.04 ***Functional Unit SDs:*** These SDs cover circuitry capable of functioning on a stand-alone basis. In this SD category, a functional entity has its physical counterpart realized in a corresponding J-coded unit. The quantity of circuitry in these SDs can range from an amount occupying an entire frame, as in the case of the central control circuit of the 1A processor, to smaller units occupying only part of a frame.

1.05 ***Frame Unit SDs:*** These SDs cover circuit units used more than once either in a single frame or in a number of separate frames. The circuitry of these frames is covered in 1.06. Frame unit SD documentation is intended to be used only in conjunction with documentation of frame SDs.

1.06 ***Frame SDs:*** The principal purpose of these SDs is to document the interconnecting circuitry between the frame units covered in 1.05. In this type of SD, connections are also shown between frame units and nonframe unit circuit packs (CPs) that are part of the circuitry covered by a frame SD. It is through the interconnections documented in frame SDs that functions comparable to those of functional unit SDs are realized on a frame basis.

1.07 ***Circuit Pack Information (CPI) SDs:*** These CPI SDs serve two purposes: to list all of the CPs used in a system and to collect, on a system basis, all of the circuit documentation on circuit modules (CMs) and integrated circuits (ICs).

C. SD Sectionalization

1.08 The SD types described in 1.03 through 1.06 are all sectionalized, and the sections are identified with standard section letters. Sectional content corresponding to each of these section letters is given below.

SECTION	CONTENT
A	Drawing Indexes
B	Functional Schematics (FSs)
C	Apparatus Figures (App Fig.)
D	Circuit Notes and Tables
E	Sequence Charts (SCs)
F*	Circuit Requirements Tables (CRTs)
G	Cabling Diagrams (CADs)
H	Block Diagrams (BDs)
J	Circuit Pack Schematics (CPSs)
K	Circuit Module Schematics (CMSs)

*Little use of this section is likely because of the relatively small use of relays and similar wired-in-place components.

D. SD Section-to-Circuitry-Level Relationship

1.09 In general, circuitry in circuit units occurs at four separate levels: the backplane, CP, CM, and IC levels. The SD sections in which these circuitry levels are documented are listed below.

CIRCUITRY LEVEL	SD SECTION
Backplane	B
CP	J
CM	K
IC	D

1.10 ***SD Section Categories:*** The ten sections listed in 1.08 fall into two categories; circuitry and auxiliary sections. The circuitry sections are B, J, and K, and the auxiliary sections are A, C, D, E, F, G, and H. The auxiliary sections are those whose information generally supplements the information in the B section, nominally the focal point of the SD.

E. Circuitry-Level Documentation

1.11 ***CP Level:*** The first three SD types listed in 1.03, namely, the functional unit, frame unit, and frame SDs, do not usually have J and K sections. For these SDs, the J-section documentation for CPs appears in separate CPS drawings with drawing numbers consisting of the prefix CPS followed by the alphanumeric apparatus code of the documented CP (eg, CPS-FA123). With respect to information content and arrangement, these CPS drawings approximate the standard format for the J section of SDs.

1.12 ***CM and IC Levels:*** The K-section information on CMs for a system as a whole is shown in a CPI SD. This SD also contains a D section for all of the information on ICs used in the system's CMs and CPs. This SD will also have a brief J section that lists all of the system CPs by code number and with references to the using system SDs. (See 5.)

1.13 ***Backplane Level:*** The functional unit, frame unit, and frame SD types differ from each other and from SDs in general with respect to the documentation of backplane circuitry in the B section. For this reason, this document will focus on the documentation methods for the B sections of these SD types. The G section for CADs will also receive particular attention with respect to some of the SD types.

2. FUNCTIONAL UNIT SDs

A. B Section, Functional Schematics (FSs)

General

2.01 B-section circuitry as documented in the functional unit SD consists of three parts:

(a) Interconnection and flow diagrams (IFDs) that indicate backplane interconnections between CPs and other components in block diagram form and list definitions of mnemonics.

(b) Connection list tables that provide CP and other component terminal connection details of all IFD leads.

(c) Composite diagrams that represent, in one or more composite forms, the circuit functions not readily apparent from IFDs alone.

Interconnection and Flow Diagrams (IFDs)

2.02 IFDs indicate the connections between CPs and other components at the backplane level. The CPs are represented with rectangular symbols and the backplane circuitry is indicated with FS and symbol number, or name destinations, at the stub ends of IFD symbol lines. Signal flow direction is indicated on these lines with directional arrows. Connections between symbols on the same IFD are shown with connecting lines.

2.03 ***FS to IFD Relationship:*** For each FS in the B section there is only one IFD. Despite this kind of B-section makeup, the term FS will continue to be used for the purpose of associating the B-section FSs with the 3-part makeup of the FSs listed (refer to 2.01).

2.04 ***Symbol Numbers:*** To aid in identifying rectangular symbols within IFDs, and referring to them in FSs of the B section and in other parts of the SD documentation, IFD symbols are assigned symbol numbers, eg, SYMBOL NO. 1, SYMBOL

NO. 2, etc. A symbol number is the first line entry in a symbol. Symbol numbers are generally assigned in numerical sequence from left to right and from top to bottom, beginning with the number 1 in each FS.

2.05 ***Other Symbol Entries:*** In addition to number entries in IFD symbols, there are the customary entries for rectangular symbols, as follows:

(a) The functional name or description of the CP represented by the symbol.

(b) The functional designation assigned to (a).

(c) The plug-in location of the CP within the equipment shelf, otherwise referred to as the CP equipment location.

(d) The code number (apparatus or equipment) of the CP.

(e) The CP element identifier (see 2.06).

(f) The composite diagram number (this entry is to be included when it is necessary to establish a particular symbol-to-composite diagram relationship).

Typical symbol entries corresponding to (a) through (e) are shown in Fig. 1 in their usual arrangement.

2.06 ***CP Element Identifier:*** The CP element-identifier letter, the last line within an IFD symbol, identifies one or more separately identifiable circuitry subdivisions on a CP. These subdivisions can comprise the same or different circuitry. CP subdivisions are identified with the letters A, B, C, etc. The CP element identifier letter A is entered in a symbol even when there are no CP (circuitry) subdivisions.

2.07 ***Circuit Lead Destination Indication:*** Destinations of IFD leads from FS to FS are indicated in one of two ways. One way is by indication of an FS and symbol number destination at the end of a lead line, as shown in Fig. 1 and Fig. 2, Sheet 1. The other way, also shown in Fig. 2, Sheet 1, is by the indication of an FS destination within a double-line enclosing rectangle. The FS title is also shown in the rectangle. Lead destinations to other SDs are given at the end of lead lines with a circuit name (eg, TO ENABLE VERIFY CKT). As in the case of destinations to FSs, destinations to other SDs may also be shown in double-line enclosing rectangles. Specific information on backplane terminations of FS leads is obtained from the connection list tables that follow the IFDs. Details concerning these tables are covered in Connection List Tables (refer to 2.11 through 2.14).

2.08 ***Circuit Leads—Identification:*** In IFDs, a single line represents one or more backplane circuit leads. The corresponding lead designations are shown above the IFD lead lines. When a lead line represents more than one lead, the number of leads is indicated below the lead line in parentheses, as shown in Fig. 1.

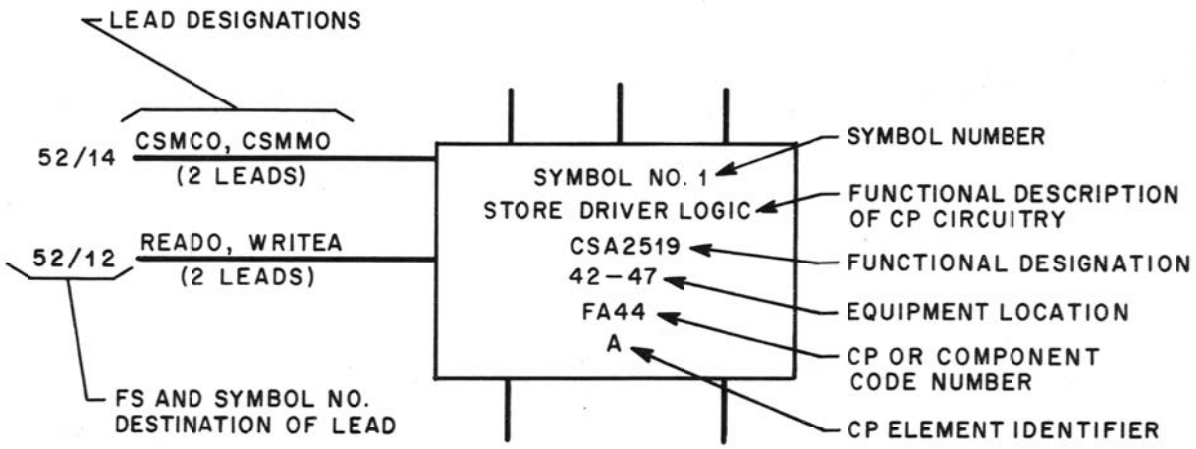


Fig. 1—Typical IFD Symbol Entries, Lead Line Designations, and Method of Indicating Their Destination

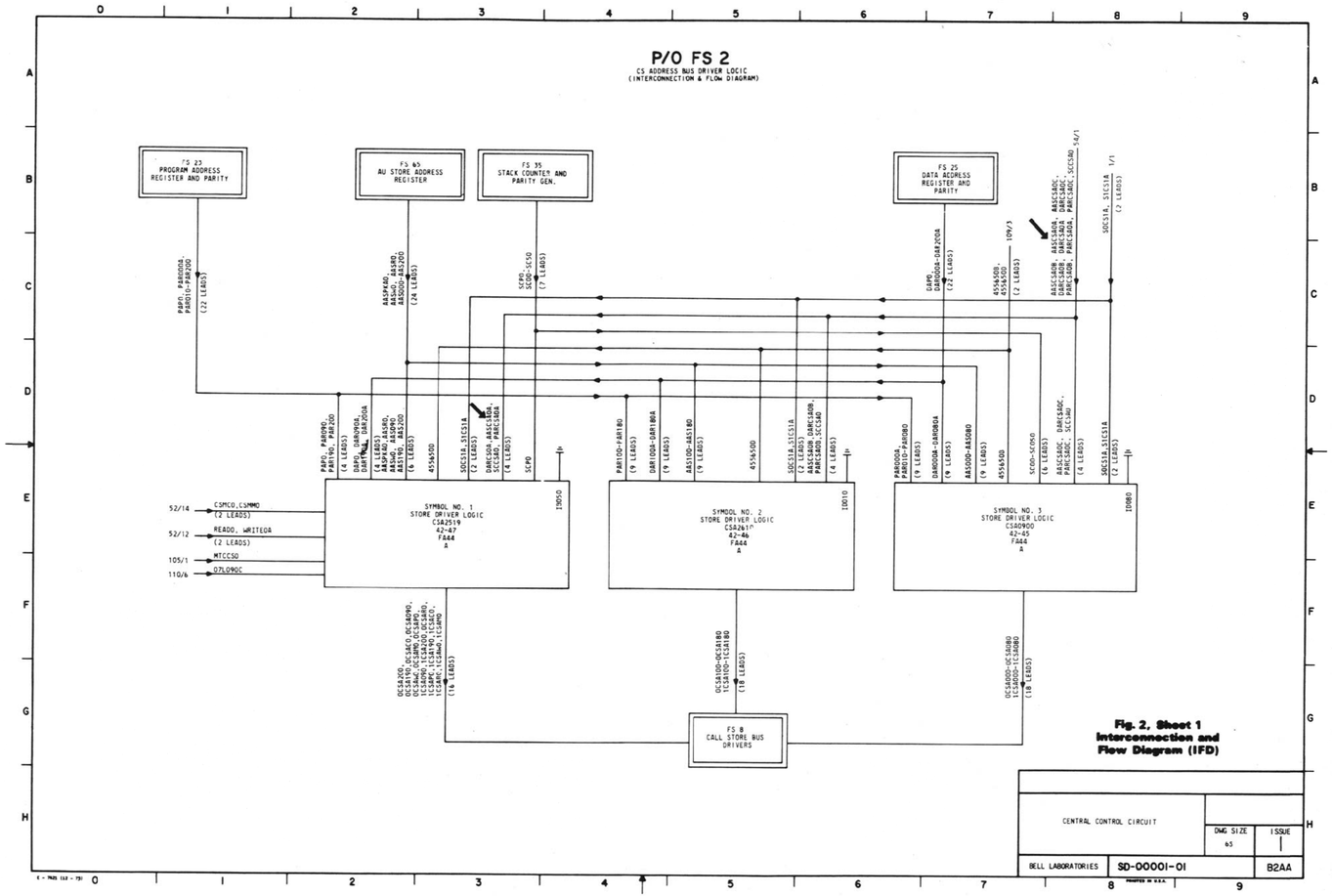


Fig. 2, Sheet 1
Interconnection and Flow Diagram (IFD)

P/O FS 2

CS ADDRESS BUS DRIVER LOGIC

SYMBOL/LEAD DESIGNATION

MNEMONIC	DEFINITION
AASCSA	AUXILIARY UNIT SEQUENCER TO CS ADDRESS BUS
AASPKA	AUXILIARY UNIT STORE ADDRESS REGISTER - PARITY BIT
AASR	AUXILIARY UNIT STORE ADDRESS REGISTER - READ BIT
AASW	AUXILIARY UNIT STORE ADDRESS REGISTER - WRITE BIT
AASXX	AUXILIARY UNIT STORE ADDRESS REGISTER BIT XX (0 THRU 21)
CSMC	CS CONTROL MODE BIT
CSMM	MAINTENANCE MODE BIT
DARCSA	SELECT DAR TO CS ADDRESS BUS
DARXX	DATA ADDRESS REGISTER BIT XX (00-24)
MTCCS	CALL STORE MAINTENANCE MODE CONTROL
PAP	PROGRAM ADDRESS PARITY
PARCSA	SELECT PAR TO CSA
PARXX	PROGRAM ADDRESS REGISTER BIT XX (00-23)
READ	READ BIT ON ADDRESS
SCCSA	SELECT SC TO CS ADDRESS BUS
SCP	STACK COUNTER PARITY
SCXX	STACK COUNTER BIT XX (0 THRU 5)
WRITE	WRITE BIT ON ADDRESS
OCSAC	CALL STORE ADDRESS BUS 0 - CODE BIT
OCSAM	CALL STORE ADDRESS BUS 0 - MODE BIT
OCSAP	CALL STORE ADDRESS BUS 0 - PARITY BIT
OCSAR	CALL STORE ADDRESS BUS 0 - READ BIT
OCSAW	CALL STORE ADDRESS BUS 0 - WRITE BIT
OCSAXX	CALL STORE ADDRESS BUS 0 - BITS 00 THRU 20
1CSAC	CALL STORE ADDRESS BUS 1 - CODE BIT
1CSAM	CALL STORE ADDRESS BUS 1 - MODE BIT
1CSAP	CALL STORE ADDRESS BUS 1 - PARITY BIT
1CSAR	CALL STORE ADDRESS BUS 1 - READ BIT
1CSAW	CALL STORE ADDRESS BUS 1 - WRITE BIT
1CSAXX	CALL STORE ADDRESS BUS 1 - BITS 00 THRU 20
45565	ADDRESS BUS LOW JITTER CLOCK

(2-COLUMN LIST)

SYMBOL/LEAD DESIGNATION

MNEMONIC	FS NO.	TYPE	DEFINITION
AASCSA	54	DC	AUXILIARY UNIT SEQUENCER TO CS ADDRESS BUS
AASPKA	65	DC	AUXILIARY UNIT STORE ADDRESS REGISTER - PARITY BIT
AASR	65	DC	AUXILIARY UNIT STORE ADDRESS REGISTER - READ BIT
AASW	65	DC	AUXILIARY UNIT STORE ADDRESS REGISTER - WRITE BIT
AASXX	65	DC	AUXILIARY UNIT STORE ADDRESS REGISTER BIT XX (0 THRU 21)
CSMC	52	DC	CS CONTROL MODE BIT
CSMM	52	DC	MAINTENANCE MODE BIT
DARCSA	54	DC	SELECT DAR TO CS ADDRESS BUS
DARXX	25	DC	DATA ADDRESS REGISTER BIT XX (00-24)
MTCCS	105	FF	CALL STORE MAINTENANCE MODE CONTROL
PAP	23	DC	PROGRAM ADDRESS PARITY
PARCSA	54	DC	SELECT PAR TO CSA
PARXX	23	DC	PROGRAM ADDRESS REGISTER BIT XX (00-23)
READ	52	DC	READ BIT ON ADDRESS
SCCSA	54	DC	SELECT SC TO CS ADDRESS BUS
SCP	35	DC	STACK COUNTER PARITY
SCXX	35	DC	STACK COUNTER BIT XX (0 THRU 5)
WRITE	52	DC	WRITE BIT ON ADDRESS
OCSAC	2	CL	CALL STORE ADDRESS BUS 0 - CODE BIT
OCSAM	2	CL	CALL STORE ADDRESS BUS 0 - MODE BIT
OCSAP	2	CL	CALL STORE ADDRESS BUS 0 - PARITY BIT
OCSAR	2	CL	CALL STORE ADDRESS BUS 0 - READ BIT
OCSAW	2	CL	CALL STORE ADDRESS BUS 0 - WRITE BIT
OCSAXX	2	CL	CALL STORE ADDRESS BUS 0 - BITS 00 THRU 20
1CSAC	2	CL	CALL STORE ADDRESS BUS 1 - CODE BIT
1CSAM	2	CL	CALL STORE ADDRESS BUS 1 - MODE BIT
1CSAP	2	CL	CALL STORE ADDRESS BUS 1 - PARITY BIT
1CSAR	2	CL	CALL STORE ADDRESS BUS 1 - READ BIT
1CSAW	2	CL	CALL STORE ADDRESS BUS 1 - WRITE BIT
1CSAXX	2	CL	CALL STORE ADDRESS BUS 1 - BITS 00 THRU 20
45565	109	CL	ADDRESS BUS LOW JITTER CLOCK

LEAD TYPES

CL - CLOCK
DC - DC CONDITION
FF - FLIP-FLOP

(4-COLUMN LIST)

Fig. 2, Sheet 2
Symbol/Lead Designation List

CENTRAL CONTROL CIRCUIT		DWG SIZE 65	ISSUE 1
BELL LABORATORIES	SD-00001-01		B2AB

P/O FS 2

CS ADDRESS BUS DRIVER LOGIC

SYMBOL NO. 1

STORE DRIVER LOGIC

DESIG CS42519 | EQPT LOC 42-47 | CODE F444 | ELEM IDENT A | OPT

LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
		302			01010	4H5
		306			ID020	484
		002			00000	4H6
		216			IB090	785
		211			IB060	767
		309			ID040	482
		304			ID010	485
		102			01000	4H6
		003			IA000	1085
		316			ID090	385
		104			IC010	684
		202			00010	4H5
		203			IB000	885
		004			IA010	1084
		103			IC000	685
		303			ID000	486
		308			ID030	483
		016			IA090	985
		204			IB010	884
		114			IC090	585
		113			IC070	586
		213			IB070	786
		313			ID070	387
AASCSA0A	I	107	54/1		GSCB00	581
	I	019	54/1		GSCB10	583
AASPKA0	I	118	65/6		IC100	588
AASR0	I	110	65/6		IC050	588
AASW0	I	111	65/6		IC060	587
AAS090	I	106	65/2		IC020	684
AAS190	I	108	65/4		IC030	683
AAS200	I	109	65/5		IC040	682
CSMC0	I	013	52/14		IA070	986
CSMM0	I	015	52/14		IA080	985
	I	315	52/14		IDOB0	386
DAP0	I	018	25/1		IA100	984
DARCSA0A	I	101	54/1		GSAB10	982
	I	301	54/1		GSAB00	983
DAR090A	I	006	25/2		IA020	1084
DAR190A	I	008	25/1		IA030	1083
DAR200A	I	009	25/1		IA040	1082
GRD042A	GRD	200				
GRD042M0	GRD	000				
GRD042M2	GRD	200				
GRD042T	GRD	319				
GRD4247T	I	210			IB150	788
MTCCS0	I	115	105/1		IC080	585
	I	215	105/1		IB080	785
PAP0	I	218	23/1		IB100	784
PARCSA0A	I	307	54/1		GSB810	782
	I	312	54/1		GSB800	783
PAR090	T	206	23/2		IB020	884
PAR190	I	208	23/1		IB030	883
PAR200	I	209	23/1		IB04C	882
READ0	I	310	52/12		ID050	388
SCCSA0	I	010	52/12		IA050	986
	I	112	54/1		GSD810	382
	I	001	54/1		GSD800	384

SYMBOL NO. 1 (CONT)

STORE DRIVER LOGIC

DESIG CSA2519 | EQPT LOC 42-47 | CODE F444 | ELEM IDENT A | OPT

LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
ICP0	I	318	35/1		ID100	384
SOCS1A	I	201	1/1		SB01A	481
S1CS1A	I	219	1/1		SB11A	481
WRITE0A	I	011	52/12		IA060	987
	I	311	52/12		ID060	387
DCSAC0	O	314	8/4,8/11		00070	3G7
DCSAM0	O	317	8/4,8/11		00080	3G6
DCSAP0	O	017	8/7,8/14		00090	3G5
DCSAR0	O	012	8/4,8/11		00050	3G9
DCSAW0	O	014	8/4,8/11		00060	3G8
DCSA090	O	005	8/4,8/13		00020	4H4
DCSA190	O	205	8/7,8/14		00030	4H3
DCSA200	O	007	8/7,8/14		00040	4H3
27L0MDC	I	300	110/6		C10	381
1CSAC0	O	314	8/18,8/25		01G70	3G6
1CSAM0	O	117	8/18,8/25		01080	3G6
1CSAP0	O	217	8/21,8/28		01090	3G5
1CSAR0	O	212	8/18,8/25		01050	3G8
1CSAW0	O	114	8/18,8/25		01060	3G7
1CSA090	O	105	8/20,8/27		01020	4H4
1CSA190	O	305	8/21,8/28		01030	4H3
1CSA200	O	207	8/21,8/28		01040	4H2
3V042DL	PWR	000				
	PWR	119				
4556500	I	100	109/3		C00	380

SYMBOL NO. 2

STORE DRIVER LOGIC

DESIG CSA2610 | EQPT LOC 42-46 | CODE F444 | ELEM IDENT A | OPT

LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
		316			ID090	385
		315			IDOB0	386
		313			ID070	387
		016			IA090	985
		311			ID060	387
		306			ID020	484
		309			ID040	482
		308			ID030	483
		116			IC090	585
		310			ID050	388
		216			IB090	785
		118			IC100	584
		303			ID000	486
		217			01090	3G5
		318			ID100	384
		017			00090	3G5
		218			IB100	784
		018			IA100	984

SYMBOL NO. 2 (CONT)

STORE DRIVER LOGIC

DESIG CS42610 | EQPT LOC 42-46 | CODE F444 | ELEM IDENT A | OPT

LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
		300			C10	381
AASCSA0B	I	019	54/1		GSCB10	583
	I	107	54/1		GSCB00	582
AAS1C0	I	103	65/3		IC000	685
AAS110	I	104	65/3		IC010	684
AAS120	I	104	65/3		IC020	684
AAS130	I	108	65/3		IC030	683
AAS140	I	109	65/3		IC040	682
AAS150	I	110	65/4		IC050	588
AAS160	I	111	65/4		IC060	587
AAS170	I	113	65/4		IC070	586
AAS180	I	115	65/4		IC080	585
DARC1A0A	I	101	54/1		GSA810	982
	I	301	54/1		GSA800	983
DAR1C0A	I	003	25/2		IA000	1085
DAR110A	I	004	25/2		IA010	1084
DAR120A	I	006	25/2		IA020	1084
DAR130A	I	008	25/2		IA030	1083
DAR140A	I	009	25/2		IA040	1082
DAR150A	I	010	25/2		IA050	988
DAR160A	I	011	25/1		IA060	987
DAR170A	I	013	25/1		IA070	986
DAR180A	T	015	25/1		IA080	985
GRD042B	GRD	200				
GRD042M0	GRD	000				
GRD042M2	GRD	200				
GRD042T	GRD	319				
GRD4246B	I	304			ID010	485
PARC1A0B	I	307	54/1		GSB810	782
	I	312	54/1		GSB800	783
PAR1C0	I	203	23/2		IB000	885
PAR110	I	204	23/2		IB010	884
PAR120	I	206	23/2		IB020	884
PAR130	I	208	23/2		IB030	883
PAR140	I	209	23/2		IB040	882
PAR150	I	210	23/2		IB050	783
PAR160	I	211	23/1		IB060	787
PAR170	I	213	23/1		IB070	786
PAR180	I	215	23/1		IB080	785
SCCS40	I	112	54/1		GSD810	382
	I	001	54/1		GSD800	384
SOCS1A	I	201	1/1		SB01A	481
S1CS1A	I	219	1/1		SB11A	441
0CSA100	O	002	8/6,8/13		00C10	4H6
0CSA110	O	202	8/6,8/13		00010	4H5
0CSA120	O	005	8/6,8/13		00020	4H4
0CSA130	O	205	8/6,8/13		00030	4H3
0CSA140	O	007	8/6,8/13		00040	4H3
0CSA150	O	012	8/6,8/13		00050	3G9
0CSA160	O	014	8/7,8/14		00060	3G8
0CSA170	O	214	8/7,8/14		00070	3G7
0CSA180	O	317	8/7,8/14		00080	3G6
1CSA100	O	302	8/20,8/27		01000	4H6
1CSA110	O	302	8/20,8/27		01010	4H5
1CSA120	O	105	8/20,8/27		01020	4H4
1CSA130	O	305	8/20,8/27		01030	4H3
1CSA140	O	207	8/20,8/27		01040	4H2
1CSA150	O	212	8/20,8/27		01050	3G8
1CSA160	O	112	8/21,8/28		01060	3G7
1CSA170	O	314	8/21,8/28		01070	3G6
1CSA180	O	117	8/21,8/28		01080	3G6
3V042AL	PWR	000				
	PWR	119				
4556500	I	100	109/3		C00	380

Fig. 2, Sheet 3
Connection List
Table - Cont

P/O FS 2
SYMBOL (S) 1,2

CENTRAL CONTROL CIRCUIT	DWG SIZE 65	ISSUE 1
BELL LABORATORIES	SD-00001-01	B2CA

P/O FS 2

CS ADDRESS BUS DRIVER LOGIC

SYMBOL NO. 3

STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA0900	42-45	FA44	A	

FS INFO — CP INFO

LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
		016			IA090	9A5
		216			IB090	7A5
		116			IC090	5A4
		316			ID090	3A5
		311			ID060	3A7
		313			ID070	3A7
		218			IB100	7A4
		318			ID100	3A4
		118			IC100	5A4
		017			00090	3G5
		217			01090	3G5
		300			C10	3A1
		018			IB100	9B4
AA5CSA0C	I	107	54/1		GSCB00	5A2
	I	019	54/1		GSCB10	5A3
AA5000	I	103	65/1		IC000	6A5
AA5010	I	104	65/1		IC010	6A4
AA5020	I	106	65/1		IC020	6A4
AA5030	I	108	65/1		IC030	6A3
AA5040	I	109	65/1		IC040	6A2
AA5050	I	110	65/2		IC050	5A8
AA5060	I	111	65/2		IC060	5A7
AA5070	I	113	65/2		IC070	5A6
AA5080	I	115	65/2		IC080	5A5
DARCSA0C	I	101	54/1		GSAB10	9A2
	I	301	54/1		GSAB00	9A3
DAR000A	I	003	25/3		IA000	10A5
DAR010A	I	004	25/3		IA010	10A4
DAR020A	I	006	25/3		IA020	10A4
DAR030A	I	008	25/3		IA030	10A3
DAR040A	I	009	25/3		IA040	10A2
DAR050A	I	010	25/3		IA050	9A8
DAR060A	I	011	25/3		IA060	9A7
DAR070A	I	013	25/3		IA070	9A6
DAR080A	I	015	25/2		IA080	9A5
GRD042B	GRD	200				
GRD042MO	GRD	000				
GRD042M2	GRD	200				
GRD042T	GRD	319			IB080	3A6
GRD042ST	I	315				
PARCSAD5	I	307	54/1		GSAB10	7A2
	I	312	54/1		GSAB00	7A3
PAR000A	I	203	23/3		IB000	8A5
PAR010	I	204	23/3		IB010	8A4
PAR020	I	206	23/3		IB020	8A4
PAR030	I	208	23/3		IB030	8A3
PAR040	I	209	23/3		IB040	8A2
PAR050	I	210	23/3		IB050	7A8
PAR060	I	211	23/3		IB060	7A7
PAR070	I	213	23/3		IB070	7A6
PAR080	I	215	23/2		IB080	7A5
SCCSA0	I	001	54/1		GSDB00	3A4
	I	112	54/1		GSDB10	3A2
SC00	I	303	35/1		ID000	4A6

SYMBOL NO. 3 (CONT)

STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA0900	42-45	FA44	A	

FS INFO — CP INFO

LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
SC10	I	304	35/1		ID010	4A5
SC20	I	306	35/1		ID020	4A4
SC30	I	308	35/1		ID030	4A3
SC40	I	309	35/1		ID040	4A2
SC50	I	310	35/1		ID050	3A8
S0CS1A	I	201	1/1		SB01A	4A1
S1CS1A	I	219	1/1		SB11A	4A1
CCSA000	O	002	8/5,8/12		00000	4H6
CCSA010	O	202	8/5,8/12		00010	4H5
CCSA020	O	005	8/5,8/12		00020	4H4
CCSA030	O	205	8/5,8/12		00030	4H3
CCSA040	O	007	8/5,8/12		00040	4H3
CCSA050	O	012	8/5,8/12		00050	3G9
CCSA060	O	014	8/5,8/12		00060	3G8
CCSA070	O	214	8/5,8/12		00070	3G7
CCSA080	O	317	8/6,8/13		00080	3G6
1CSA000	O	102	8/19,8/26		01000	4H6
1CSA010	O	302	8/19,8/26		01010	4H5
1CSA020	O	105	8/19,8/26		01020	4H4
1CSA030	O	305	8/19,8/26		01C30	4H3
1CSA040	O	207	8/19,8/26		01040	4H2
1CSA050	O	212	8/19,8/26		01050	3G8
1CSA060	O	114	8/19,8/26		01060	3G7
1CSA070	O	314	8/19,8/26		01070	3G6
1CSA080	O	117	8/20,8/27		01080	3G6
3V042BL	PWR	000				
	PWR	119				
4556508	I	100	109/3		C00	3A0

Fig. 2, Sheet 4
Connection List
Table - Cont

P/O FS 2
SYMBOL(S) 3

CENTRAL CONTROL CIRCUIT

DWG SIZE 65 | ISSUE

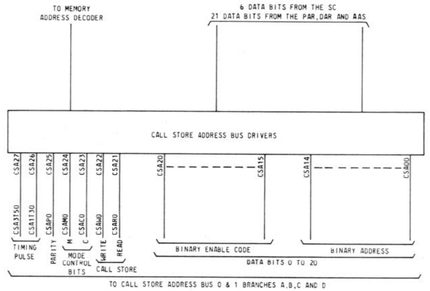
BELL LABORATORIES | SD-00001-01 | B2CB

P/O FS 2

CS ADDRESS BUS DRIVER LOGIC

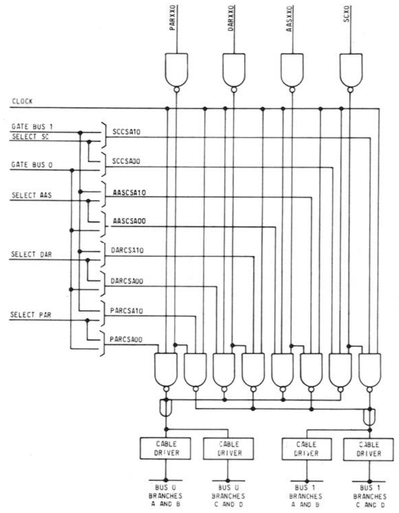
COMPOSITE DIAGRAM 1

FUNCTIONAL BLOCK DIAGRAM OF
CS ADDRESS BUS DRIVER LOGIC



COMPOSITE DIAGRAM 2

CALL STORE ADDRESS BUS BIT X
(REPRESENTATIVE BIT)



CIRCUIT OPERATION

THE PURPOSE OF THE CALL STORE ADDRESS BUS DRIVER LOGIC CIRCUIT IS TO SELECT FROM AMONG FOUR SOURCES OF CALL STORE ADDRESSES AND GATE THE DATA AT THESE SOURCES ON TO THE PROPER CALL STORE ADDRESS BUS. THE FOUR CALL STORE ADDRESSES ARE THE PROGRAM ADDRESS REGISTER (PAR), THE AUXILIARY STORE ADDRESS REGISTER (AAS), THE STACK COUNTER (SC), AND THE DATA ADDRESS REGISTER (DAR).

THE BUS SELECTION FUNCTION IS COMBINED WITH THE SOURCE SELECT LEAD IN THE MEMORY ADDRESS DECODER.

THE STACK COUNTER (SC) HAS ACCESS TO 64 ADDRESS LOCATIONS. THE TOP-OF-THE-STACK ADDRESS HAS A BINARY ENABLE CODE OF OCTAL 00. THE BINARY ADDRESS RANGE FOR THE STACK IS FROM OCTAL 2200 TO OCTAL 2277 OR 64 LOCATIONS.

THE PROGRAM ADDRESS REGISTER (PAR) SUPPLIES THE DATA ADDRESSES AND THE AUXILIARY STORE ADDRESS REGISTER (AAS) CONTAINS THE ADDRESS DATA FOR STORE ACCESSES FROM THE AAS COMMUNITY.

TWO TIMING PULSES ARE SENT TO THIS STORE COMMUNITY FOR EACH CENTRAL CONTROL (CC) CYCLE OVER THE SELECTED BUS. THE PARITY BIT, AASPKR, IS CALCULATED OVER BOTH THE BINARY ENABLE CODE AND ADDRESS BITS, BEING ODD. THIS BIT IS SENT TO THE STORE AT TIME INTERVAL 779. ALL OTHER BITS OF THE CALL STORE ADDRESS BUS ARE GATED OUT AT 577.

Fig. 2, Sheet 5
Composite Diagrams

P/O FS 2 COMPOSITE DIAGRAMS 1 & 2

CENTRAL CONTROL CIRCUIT	DWG SIZE 65	ISSUE 1
BELL LABORATORIES	SD-00001-01	B2GA

2.09 ***Symbol/Lead Designation Leads:*** These lists are part of the IFD information in that they define the mnemonics used in the IFD lead functional designations. The lists may consist of two or four columns as shown with the lists at the right and left of Fig. 2, Sheet 2. Entries in the MNEMONIC columns of these tables are in alpha-mnemonic order. The DEFINITION column entries provide the functional meaning of the mnemonics. Entries in the FS NO. column of the 4-column list indicate the FSs in which leads of a particular mnemonic originate. (These FS numbers are the same as those in the DESTINATION column of Connection List Tables, 2.13, when an I-input entry appears in the FUNC column.) Entries in the TYPE column, mainly indicate the nature of lead signals, whether essentially steady-state (DC CONDITION) or pulse-form (CLOCK, FLIP-FLOP). For the 4-column list, an additional list, titled LEAD TYPE, describes the abbreviated TYPE-column entries, DC, CL, etc.

2.10 ***Test Connectors:*** When test connectors are part of the FS (backplane) circuitry, they will be represented in IFDs with symbols in the same manner as CPs. These test-connector symbols will also include an equipment location entry and a functional designation entry, if one has been assigned.

Connection List Tables

2.11 Connection list tables provide specific CP and other component terminal information not shown in the IFDs. For each IFD symbol within an FS, there is a separate connection list table. This is also done for symbols for test connectors. For each designated IFD lead, there is a corresponding lead designation entry in a connection list table with the same symbol number. The purpose of connection list tables is to provide near-end connection information for backplane leads terminating at specific CP or other component terminals. These tables also provide the far-end destination in the documentation, ie, the FS and symbol number at which a lead terminates. When the destination of a lead is another SD, the title of the SD is given in the table.

2.12 ***Connection List Table Headings:*** Connection list tables have headings that correspond to all of the line entries in IFD symbols. A typical table heading and column entry arrangement is shown in Fig. 3.

2.13 ***Connection List Table Columns:*** Columns in these tables fall into two categories. The columns at the left of the table are for entries pertaining to the FS and are shown under the common heading FS INFO. The columns to the right pertain to CP information and are shown under the common heading CP INFO. The contents of each of the separate columns under these common headings are as follows:

---FS INFO---

COLUMN	EXPLANATION
LEAD DESIG	The same designated leads associated with a particular IFD symbol (input or output) are listed in this column in alphanumeric order. The first entry in this column appears after the last unused (active) CP terminal number entered in the TERM. column. Typical LEAD DESIG column entries are shown in Fig. 2, Sheets 3 and 4.
FUNC	The letters I or O are the usual entries in this column. They indicate whether a lead is essentially an input or output lead of a circuit element, such as a gate on a CP. When the output lead of such a gate is connected to the output lead(s) of another gate(s), located on the same or another CP, the letter combination OT is entered in the column. The letter T indicates that the transistor collectors of two or more gates are connected in a wired-node manner. Other letter functions that may be used are OI (output-input), OIT (output-input-wired-node connection), and LR (load resistor). GRD and PWR entries made in this column indicate that the particular CP leads are, respectively, the ground and power terminals of a CP. These entries are also an indication that these CP terminals connect directly into the respective ground and power layers of the multilayer backplane circuit board.

SYMBOL NO. 1

STORE DRIVER LOGIC

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CSA2519	42-47	FA44	A	

FS INFO					CP INFO	
LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
		302			01010	4H5
		•			•	•
		•			•	•
		•			•	•
		•			•	•
AASCSA0A	I	107	54/1		GSCB00	5A1
•	•	•	•		•	•
•	•	•	•		•	•

Fig. 3—Typical Connection List Table Caption and Column Headings

TERM. Terminal numbers of CPs or other components are entered in this column. Used and unused (active) terminals are listed in this column, with the unused preceding the used terminals. Connections internal to a CP (not part of the backplane) between CP circuit elements A, B, C, etc, are identified with the letters IC (internal connection) or a combination of these letters and a CP terminal number, if a CP terminal is involved.

DESTINATION In this column, the FS-to-FS destinations shown in the IFDs are listed on an individual lead basis. Following the slash line of this entry, the symbol of the FS involved is also shown. Multiple FS and symbol number entries are separated with commas, as shown in Fig. 2, Sheet 3. Option letters, when applicable, are shown in parentheses in front of each optional destination. Also shown in this column are destinations to other circuits.

NOTE This entry is for reference to lead wiring requirements that are usually covered either in FSs with an indication of pairing, or in a 200-series equipment note of the SD. When reference is made to a sheet note in this column, the note will be shown directly below the table. A typical entry for indicating wire pairing would appear as P/3G042H1, indicating that the lead in the LEAD DESIG column is paired with lead 3G042H1.

---CP INFO---

COLUMN	EXPLANATION
TERM. MOD	Entries in this column show the lead designation by which a CP termination is identified in a CPS

drawing. This entry is referred to as the terminal modifier or lead function (Net Name) at the CP level.

LOC This is the TERM. MOD column companion entry that provides the sheet and sheet coordinate information to locate the designated CP termination on a CPS drawing. The first number in this column entry is the sheet number of the drawing and the alphanumeric is the sheet coordinate.

2.14 ***Example Illustrating Use of IFD and Connection List Table Information:***

(a) For the purpose of this example, lead AASCSA0A of symbol No. 1 will be used. This is the same designated lead shown in Fig. 3. At the end of the lead line in the upper right of the IFD (coordinates B8) in Fig. 2, Sheet 1, 54/1 is shown, indicating that the other end of the lead appears in FS54, SYMBOL NO. 1 in the B-section documentation (Fig. 4, coordinates F0). For leads in Fig. 2, Sheet 1 shown terminating in double-line rectangles, the destination to the other FS is arrived at in a similar manner except for the omission of a symbol number.

(b) For the functional meaning of the lead designation, AASCSA0A, the SYMBOL/LEAD DESIGNATION list should be consulted (Fig. 2, Sheet 2). For the mnemonic part of the lead designation AASCSA, this list shows that the lead is associated with the auxiliary-unit-sequencer to call-store-address-bus signal flow. For information on the character significance makeup of lead designations, refer to 2.19.

(c) To determine the specific terminal to which lead AASCSA0A is connected on a CP (designated CSA2519), the CONNECTION LIST TABLE for symbol No. 1 should be consulted. This list shows that the lead FUNC is I, confirming the direction shown in the IFD, and that it connects to CP terminal 107. The CP designation CSA2519 is shown at the top of the table under DESIG. The DESTINATION entry 54/1 indicates that the other end of the connection or lead is at FS54, SYMBOL NO. 1, as shown in Fig. 4. The TERM. MOD entry shows that in the CP drawing, CPS FA44, the CP terminal to which this lead is connected has been assigned the identification GSCB00 and that it is located in the CPS FA44 drawing (Sheet 5) at coordinate A1 as shown in Fig. 5, Sheet 1. This TERM. MOD GSCB00 is also listed in the CP tabular SYMBOL 1, shown in Fig. 5, Sheet 2.

Composite Diagrams

2.15 The purpose of these diagrams is to provide the functional information, normally conveyed in FSs, but which is absent from the IFDs. Composite diagrams provide this information for circuit understanding and are therefore an essential part of the FS documentation in the B section.

2.16 ***Composite Diagram Forms:*** Information in composite diagrams can take one of several forms, ranging from abbreviated diagrammatic functional representations to Boolean algebraic expressions. Diagrammatic representations of different makeup are the forms most commonly used for conveying the time-dependent functions of sequential (synchronous) circuits. Boolean algebraic expressions are restricted mainly to representing the combinational logic of the circuit segments of the larger sequential circuits. The composition of the diagrammatic part of the composite diagram can include some or all of the following specific types of diagrams and information: functional block diagrams; abbreviated logic diagrams, per se; timing diagrams; state diagrams; truth tables; and word descriptions. The composite diagram portion of the sample FS in Fig. 2, Sheet 5 uses three of these types of information forms; a functional block diagram, an abbreviated logic diagram, and a word description. The functional block diagram, Composite Diagram 1 in this case, establishes the overall circuit functions of the call store address bus drivers. With some general functional grouping of leads, those used for accessing, enabling, and selection are indicated. In an abbreviated manner, Composite Diagram 2 shows the essential logic functions involved in the accessing, enabling, and bus selection functions of the FS circuitry. The single line representation used in this diagram is consistent with the abbreviated presentation of such information.

2.17 ***Circuit Operation:*** For each FS, a brief description of circuit objectives and operations, titled CIRCUIT OPERATION, is provided either as part of or separate from composite diagram information as shown in Fig. 2, Sheet 5. The text of this information is presented in a manner that

will permit easy correlation with diagrammatic information in the related IFDs and composite diagrams.

2.18 ***State and Timing Diagrams:*** When circuitry depicted in an FS functions in a sequential mode, information in addition to that shown on the composite diagram, Fig. 2, Sheet 5, will usually be shown. This additional information will define the specific input-output characteristics of the circuit. For this, state or timing diagrams, or both, are shown in addition to abbreviated logic and block diagrams. These additional diagrams are used to depict the succession of output states through which the circuit passes as its input signals vary. Also included are the internal state transitions that a circuit undergoes for each condition of circuit output. Tables of the truth-table type may also be used to supplement the information of the additional state and timing diagrams.

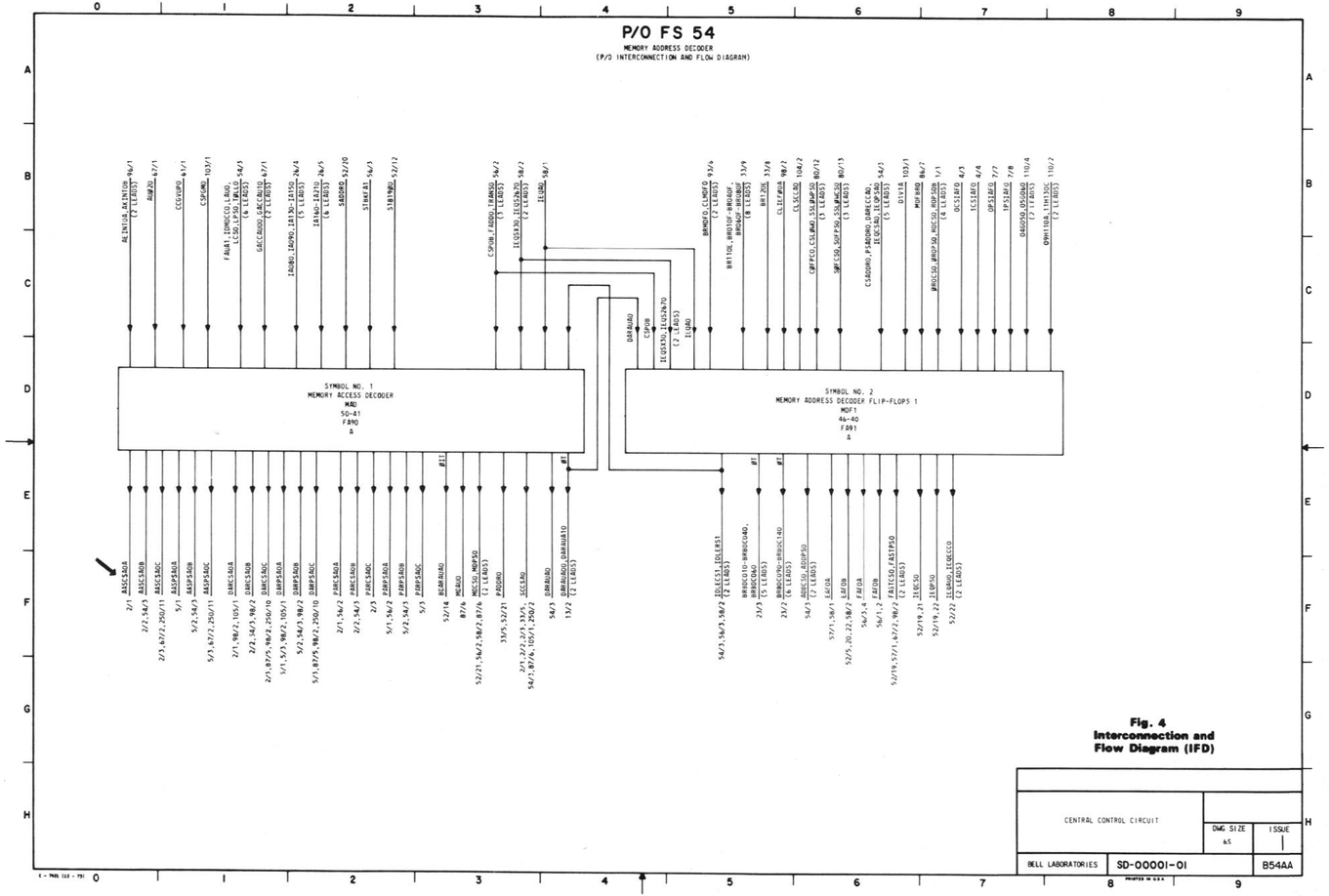


Fig. 4
Interconnection and Flow Diagram (IFD)

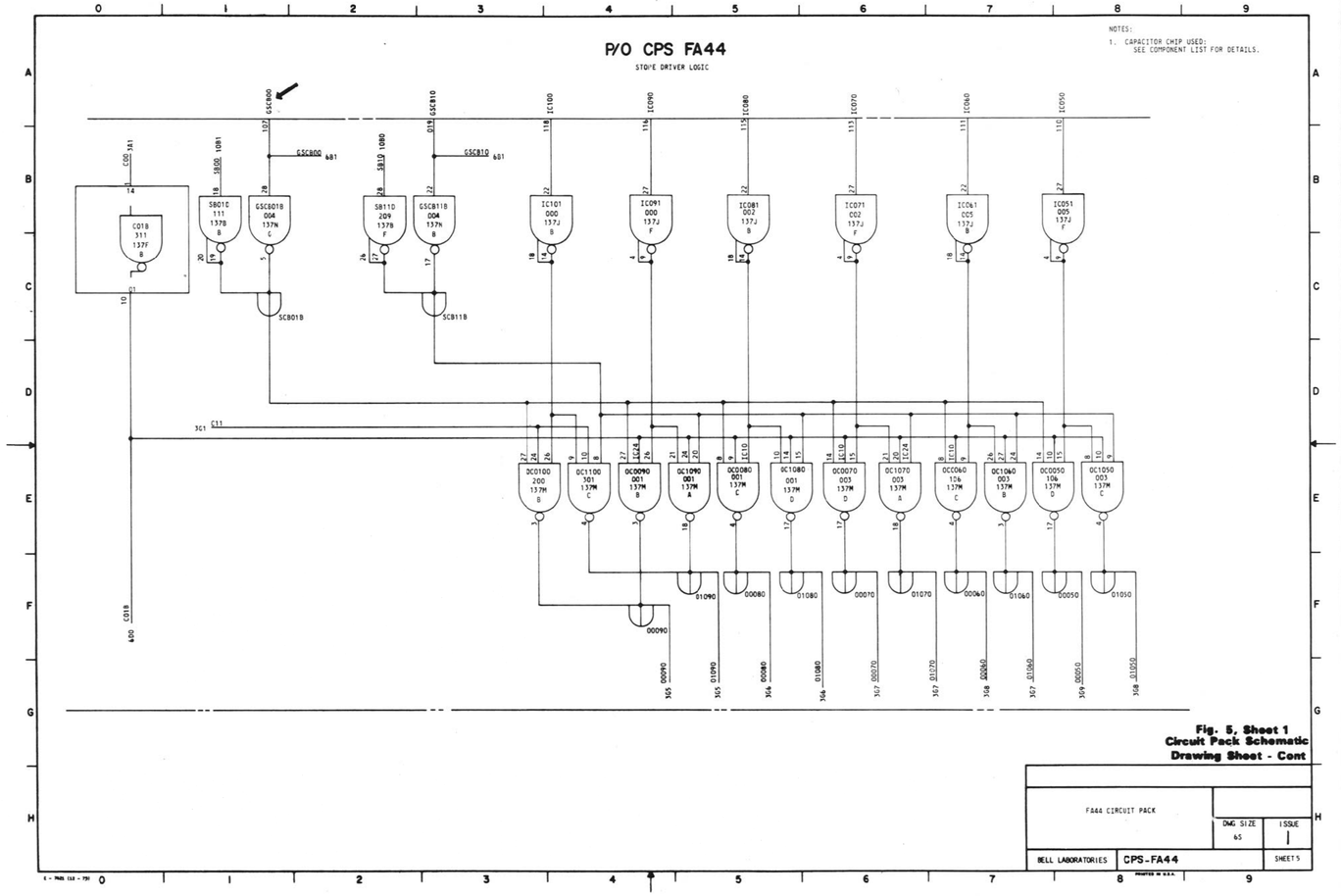


Fig. 5, Sheet 1
Circuit Pack Schematic
Drawing Sheet - Cont

P/O CPS FA44

STORE DRIVER LOGIC

SYMBOL 1
STORE DRIVER LOGIC
ELEMENT IDENT
A

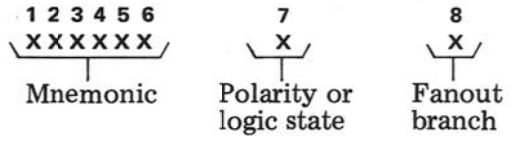
TERM. MOD.	FUNC	TERM.	LOC.
C00	I	100	340
C10	I	300	341
GSA800	I	301	943
GSA810	I	101	942
GSB800	I	312	743
GSB810	I	307	742
GSC800	I	107	581
GSC810	I	019	543
GSD800	I	001	344
GSD810	I	112	342
IA000	I	003	1085
IA010	I	004	1084
IA020	I	006	1084
IA030	I	008	1083
IA040	I	009	1082
IA050	I	010	988
IA060	I	011	987
IA070	I	013	986
IA080	I	015	985
IA090	I	016	985
IA100	I	018	984
IB000	I	203	885
IB010	I	204	884
IB020	I	206	884
IB030	I	208	883
IB040	I	209	882
IB050	I	210	748
IB060	I	211	747
IB070	I	213	746
IB080	I	215	745
IB090	I	216	745
IB100	I	218	744
IC000	I	103	685
IC010	I	104	684
IC020	I	106	684
IC030	I	108	683
IC040	I	109	682
IC050	I	110	548
IC060	I	111	547
IC070	I	113	546
IC080	I	115	545
IC090	I	116	544
IC100	I	118	544
ID000	I	303	486
ID010	I	304	485
ID020	I	306	484
ID030	I	308	483
ID040	I	309	482
ID050	I	310	348
ID060	I	311	347
ID070	I	313	347
ID080	I	315	346
ID090	I	316	345
ID100	I	318	344
SB01A	I	201	681
SB11A	I	219	681

TERM. MOD	FUNC	TERM.	LOC.
00000	0	002	4H6
00010	0	202	4H5
00020	0	005	4H4
00030	0	205	4H3
00040	0	007	4H3
00050	0	012	3G9
00060	0	014	3G8
00070	0	214	3G7
00080	0	317	3G6
00090	0	017	3G5
01000	0	102	4H6
01010	0	302	4H5
01020	0	105	4H4
01030	0	305	4H3
01040	0	207	4H2
01050	0	212	3G8
01060	0	114	3G7
01070	0	314	3G6
01080	0	117	3G6
01090	0	217	3G5

Fig. 5, Sheet 2
Circuit Pack Schematic
Drawing Sheet - Cont

FA44 CIRCUIT PACK	DWG SIZE: 65	ISSUE: 1
BELL LABORATORIES: CPS-FA44		SHEET 2

2.19 ***Designations, Character Significance:*** Component, lead, and symbol designations for the ESS systems and projects are limited to eight characters. The makeup and significance of character grouping within a designation are as follows:



The mnemonic part of a designation usually consists of from one to six characters, but may include as many as seven if the character for indicating fanout branching is not used. Multicharacter designations are usually in an alphanumeric format. The mnemonic part of the designation conveys functional information. The polarity or logic state character is either a 1 or a 0, depending on the state of a lead during its active condition. Positive logic interpretation of the 1 or 0 applies. The fanout branch character is used to distinguish between several leads with the same function (mnemonic).

2.20 ***B Section, Sheet Numbering:*** Sheet numbers of drawing sheets in the B section are made up of the FS number that may appear on one or more sheets and a double alpha suffix, depending on whether the sheets are part of the IFD, the connection list table, or a composite diagram. For example, the first sheet of FS2 (of the IFDs) would be numbered B2AA. The double alpha suffixes used for the IFDs, the connection list tables, and composite diagrams are as follows:

IFDs—AA through AY and BA through BY

Connection list tables—CA through CY, DA through DY, EA through EY, and FA through FY

Composite diagrams—GA through GY, etc

B. A Section, Drawing Indexes

2.21 The A-section indexes facilitate location of circuitry components, leads, and options in the B, C, and G sections of a functional unit SD. There are four indexes, titled sheet, apparatus, lead, and option. As to their use in the functional unit SD, only the contents of the apparatus and lead indexes will be covered in this document. The other indexes, when used, will conform with existing practices.

2.22 ***Apparatus Index:*** This is an index of CPs and similar components used in the circuit. Consistent with the fact that CPs are the most prevalent components in the newer ESS circuits, the apparatus indexes will usually consist mainly of one or more listings pertinent to CPs. Given, for example, the functional designation of a CP, the user of the SD can determine from the apparatus index where CP circuitry is represented in the B section (by FS and symbol number), where a CP is listed in an App Fig. of the C section, and where it is physically located in the equipment. Three kinds of tabular listings are used in the ESS SD apparatus indexes. One is for listing CPs by equipment location and the other two are for listing CPs by functional designation. Of the last two, the one that indicates FS, App Fig., and equipment location, is the one most often used.

2.23 ***Lead Index:*** Headings for indexes of leads to external circuits will consist of titles (names) of the external circuits (eg, PROC PERIPH BUS CKT), listed in alphabetical order. Each lead will refer to an FS symbol and CAD number. Under each of the circuit names, leads are listed in alphanumeric order.

2.24 ***Option Indexes:*** These indexes indicate the documentation locations of optional components and circuitry.

C. C Section, Apparatus Figures

2.25 ***CP App Fig. Tabular Arrangements:*** By their arrangement, CP tables convey the relative physical locations of CPs from bottom to top and left to right of the equipment bay or the frame housing them. This location is shown as the first line entry in the table as EQPT LOC as shown in Fig. 6. For a typical entry, such as 42-47, the coordinate 42 indicates that CP CSA2519 is located on the 42nd CP shelf level, approximately 42 inches up from the bottom of the bay or frame. Coordinate 47 indicates that this CP is located in the 47th slot from the left side of the bay or frame. All coordinate references apply from the front of the equipment. Each App Fig. begins with the lowest shelf of the group of CP shelves comprising

the App Fig. From such CP App Fig. tables, the physical disposition of all CPs within a bay or frame can be determined without consulting an equipment drawing.

2.26 ***CP Circuit Elements:*** When a CP consists of a single circuit element or entity, there is a single entry in the CP table that aligns with the circuit element letter A shown at the end of the table. CPs having more than one identifiable circuit element have additional entries corresponding to the number of such circuit elements. These are shown in alignment with the table letters B, C, etc, as shown in Fig. 6. These circuit element letters are also the last line entries in IFD symbols.

2.27 ***Components:*** The location of components other than CPs is also given in the App Fig. by FS symbol number.

D. D Section, Notes and Tables

2.28 In this section the usual circuit, equipment, and information notes are shown as required. Information likely to appear in functional unit SDs under each of these note categories is described in 2.29 through 2.31.

2.29 ***Fusing Note, 101:*** In the table for this note, a reference may be made to a power distribution type of SD for information relating to the allocation of the on-circuit-frame primary fuses. Otherwise, entries in the table are made in accordance with existing practices.

2.30 ***Circuit Notes, General:*** With respect to other 100-series circuit notes such as the feature or option and record of changes notes, information content and arrangement is in accordance with existing practices.

2.31 ***Equipment Notes:*** These 200-series notes will usually specify such wiring requirements as cannot be indicated or conveyed in the IFDs and connection list tables. Among the requirements usually covered are those related to critical wiring. Typically, these can specify the wiring run limits over which a particular type of wire or coaxial cable is to be used. Another requirement in this same general category concerns spacing between coaxial cable terminating fields and their arrangement in the backplane.

2.32 ***Information Notes:*** The 300-series notes may contain a list of the CP codes used in the circuit. This list will indicate the lowest acceptable CP series numbers and will also indicate that a CP of a higher series number should not be used if coordination is required with an outstanding class A change. This series number list will change to reflect class A changes in CP circuitry and changes which affect software.

E. E Section, Sequence Charts (SCs)

2.33 ***General:*** An E section for SCs is usually included for the ESS synchronous sequential circuits such as are covered in a functional unit SD. Such SC information will consist of diagrammatic representations (DRs), timing charts (TCs), and internal state diagrams (ISDs) in the standard manner. SC information may be shown in some instances as part of the makeup of composite diagrams.

F. G Section, Cabling Diagrams (CADs)

2.34 ***General:*** In functional unit SDs, and in the newer ESS SDs, the G section is generally divided into two subsections, GA and GB. Subsection GA is for graphical manually-prepared CADs and GB is for tabular machine-prepared CADs. Graphical CADs are used in the ESS SDs only when connections to adjacent terminating devices vary frequently and in a manner not easily interpreted from a tabular-type presentation. Since graphical CADs, when used, will conform to standard practice, the remainder of part F will be devoted to explaining the arrangement and interpretation of the newer machine-prepared tabular CADs.

2.35 ***Machine-Prepared Tabular CADs:*** All tabular CADs are supplemented with graphical-equivalent representative notes at the beginning of the GB subsection. A typical tabular CAD with the usual headings and line entries is shown in Fig. 7. In Fig. 8, the headings and line entries of part of the Fig. 7 CAD are shown. The equivalent graphical representation of the tabular entries of Fig. 8 are shown in Fig. 9.

2.36 ***Tabular CAD Headings and Interpretation:*** Immediately under the CAD number caption, a general heading for the entire CAD is indicated (eg, LEVEL 065 TO 069 INTRAFRAME CABLING). Below this heading and above each of the three major tabular columns on a CAD sheet, as shown

PART OF APP FIG. 2

CIRCUIT PACK

EQPT LOC	42-12		42-13		42-14		42-15		42-16		42-23		42-24		42-25		42-26		42-27		42-28		42-30		42-31		EQPT LOC
DESIG	AUAMISC		PSW1400		PSW2620		CSW1400		CSW2615														BR1106		BR1712		DESIG
EQPTCODE	FA48		FA48		FA48		FA48		FA48		FA154		FA154		FA154		FA154		FA154		FA154		FA61				EQPTCODE
OPTION																											OPTION
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT	ELEM IDENT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIC	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	CKT
A	AUAMISC	12/2	PSW1400	6/2	PSW2620	6/1	CSW1400	3/1	CSW2615	3/2	AWF0905	115/2	AWF1410	115/3	AWF1915	115/4	AWF0400	115/1	AWF2320	115/5	AWFMISC	115/6	BR1106	33/3	BR1712	33/2	A
B											AWS0905	115/8	AWS1410	115/9	AWS1915	115/10	AWS0400	115/7	AWS2320	115/11	AWSMISC	115/12					B
C											ARR0905	115/14	ARR1410	115/15	ARR1915	115/16	ARR0400	115/13	ARR2320	115/17	ARRMISC	115/18					C
D											AAS0905	65/2	AAS1400	65/3	AAS1915	65/4	AAS0400	65/1	AAS2120	65/5	AASMISC	65/6					D
E																											E
F																											F

CIRCUIT PACK

EQPT LOC	42-32		42-33		42-34		42-37		42-38		42-39		42-40		42-42		42-43		42-44		42-45		42-46		42-47		EQPT LOC
DESIG	BRP		BR0500		BR2318										PSA0900		PSA2610		PSA2519		CSA0900		CSA2610		CSA2519		DESIG
EQPTCODE	FA62		FA61		FA61		FA71		FA71		FA71		FA71		FA44		FA44		FA44		FA44		FA44		FA44		EQPTCODE
OPTION																											OPTION
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT	ELEM IDENT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	CKT
A	BRP	33/5	BR0500	33/4	BR2318	33/1	AB2200	28/4	AB2301	28/3	AB4624	28/2	AB4725	28/1	PSA0900	5/3	PSA2610	5/2	PSA2519	5/1	CSA0900	2/3	CSA2610	2/2	CSA2519	2/1	A
B							ABPR2	29/4	ABPR1	29/3	ABPL2	29/2	ABP11	29/1													B
C																											C
D																											D
E																											E
F																											F

CIRCUIT PACK

EQPT LOC	42-48		42-49		42-54		42-55		42-56		42-57		42-59		42-60		42-61		42-62		42-63		42-64		42-65		EQPT LOC
DESIG	AUA0900		AUAMISC										CDB7		CDB2		CDD1		CDB4		CDB5		CDB1		RO42G1H1		DESIG
EQPTCODE	FA48		FA48		FA72		FA72		FA72		FA72		FA114		FA117		FA99		FA108		FA111		FA98		FC21		EQPTCODE
OPTION																											OPTION
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT	ELEM IDENT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	CKT
A	AUA0900	13/2	AUAMISC	13/1	HWR0500	31/4	HWR1106	31/3	HWR1712	31/2	HWR2318	31/1	CDB7	52/19	CDB2	52/8	CDD1	52/4	CDB4	52/13	CDB5	52/16	CDB1	52/3	RO42G1H1	113/68	A
B					BOOO24	30/4	BOO630	30/3	BO1234	30/2	BO1842	30/1															B
C					OW0500	32/4	OW1106	32/3	OW1712	32/2	OW2318	32/1															C
D																											D
E																											E
F																											F

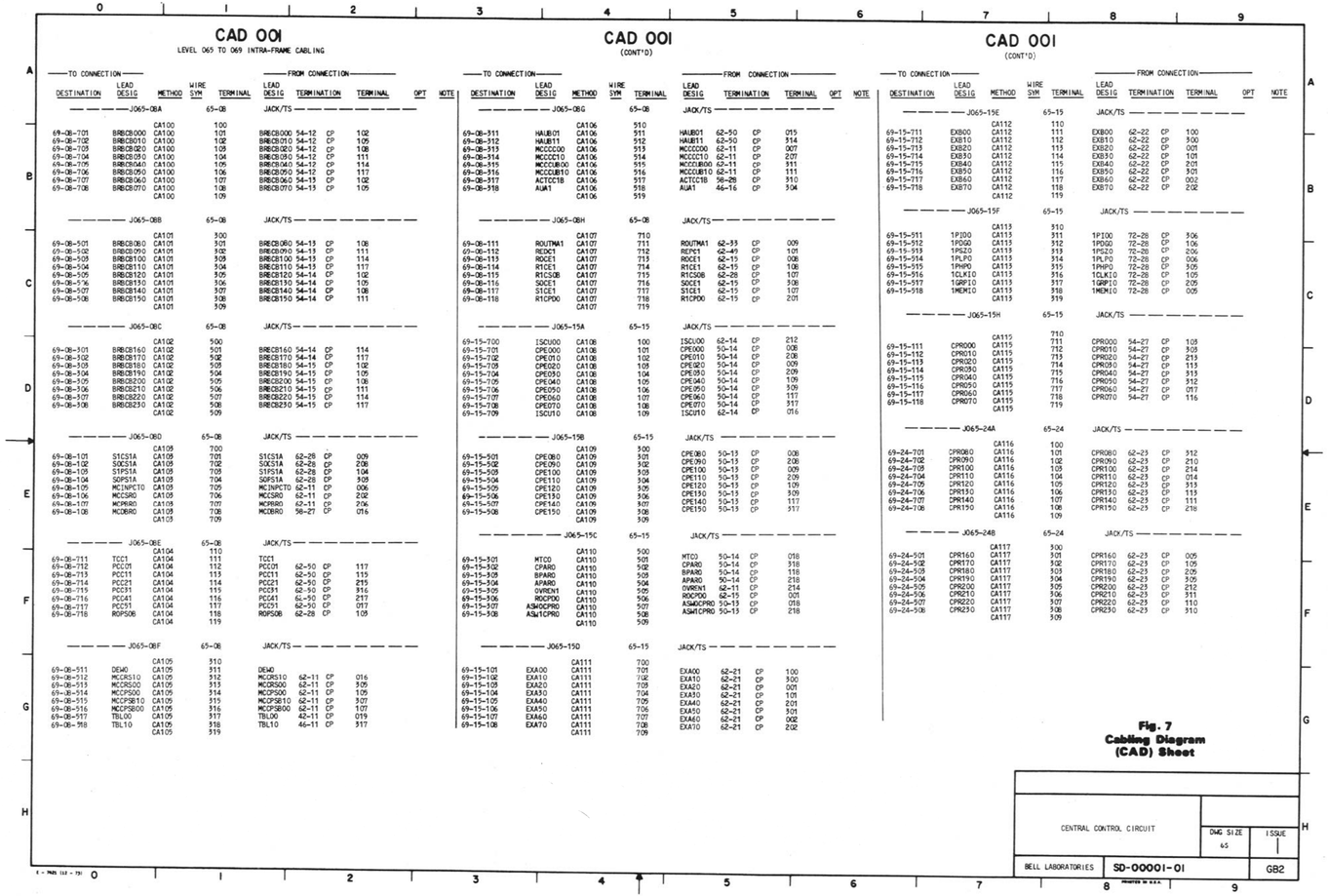
CIRCUIT PACK

EQPT LOC	42-66		46-05		46-06		46-08		46-09		46-11		46-12		46-13		46-14		46-16		46-17		46-18		46-22		EQPT LOC
DESIG	RO42E1F1		RO46A381		RO46A01		PCB		G3ARHG				AUP		AVEE		AVEO				AUG		AUGA		PROTCKT9		DESIG
EQPTCODE	FC21		FC21		FC22		FB5		FA228		FA158		FA152		FA155		FA155		FA159		FA156		FA157		FB6		EQPTCODE
OPTION																											OPTION
ELEM IDENT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT		CKT	ELEM IDENT
CKT	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	DESIG	FS/SYM	CKT
A	RO42E1F1	113/82	RO46A381	113/63	RO46A01	117/65	PCB	113/97	G3ARHG	93/3	AUG	61/1	AUP	60/1	AVEE	62/1	AVEO	62/2	ABS	64/1	AUC	87/1	AUGA	67/2	PROTCKT9	89/10	A
B											AUM	64/1							AUGB	67/3							B
C																			AVM	62/3							C
D																											D
E																											E
F																											F

EQPT LOC / DESIG / EQPTCODE / OPTION / ELEM IDENT / CKT

Fig. 6
Apparatus Figure (APP FIG.)
Circuit Pack Tables

CENTRAL CONTROL CIRCUIT		
	DWG SIZE: 4S	ISSUE: 1
BELL LABORATORIES	SD-00001-01	C5



CAD 001

LEVEL 065 TO 069 INTRA-FRAME CABLING

TO CONNECTION					FROM CONNECTION				
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERMINAL	LEAD DESIG	TERMINATION	TERMINAL	OPT	NOTE
J065-08A			65-08		JACK/TS				
		CA100		100					
69-08-701	BRBCB000	CA100		101	BRECB000	54-12	CP	102	
69-08-702	BRBCB010	CA100		102	BRECB010	54-12	CP	105	
69-08-703	BRBCB020	CA100		103	BRECB020	54-12	CP	108	
69-08-704	BRBCB030	CA100		104	BRECB030	54-12	CP	111	
69-08-705	BRBCB040	CA100		105	BRECB040	54-12	CP	114	
69-08-706	BRBCB050	CA100		106	BRECB050	54-12	CP	117	
69-08-707	BRBCB060	CA100		107	BRECB060	54-13	CP	102	
69-08-708	BRBCB070	CA100		108	BRECB070	54-13	CP	105	
		CA100		109					
J065-08B			65-08		JACK/TS				
		CA101		300					
69-08-501	BRBCB080	CA101		301	BRECB080	54-13	CP	108	
69-08-502	BRBCB090	CA101		302	BRECB090	54-13	CP	111	
69-08-503	BRBCB100	CA101		303	BRECB100	54-13	CP	114	
69-08-504	BRBCB110	CA101		304	BRECB110	54-13	CP	117	
69-08-505	BRBCB120	CA101		305	BRECB120	54-14	CP	102	
69-08-506	BRBCB130	CA101		306	BRECB130	54-14	CP	105	
69-08-507	BRBCB140	CA101		307	BRECB140	54-14	CP	108	
69-08-508	BRBCB150	CA101		308	BRECB150	54-14	CP	111	
		CA101		309					
J065-08C			65-08		JACK/TS				
		CA102		500					
69-08-501	BRBCB160	CA102		501	BRECB160	54-14	CP	114	
69-08-502	BRBCB170	CA102		502	BRECB170	54-14	CP	117	
69-08-503	BRBCB180	CA102		503	BRECB180	54-15	CP	102	
69-08-504	BRBCB190	CA102		504	BRECB190	54-15	CP	105	
69-08-505	BRBCB200	CA102		505	BRECB200	54-15	CP	108	
69-08-506	BRBCB210	CA102		506	BRECB210	54-15	CP	111	
69-08-507	BRBCB220	CA102		507	BRECB220	54-15	CP	114	
69-08-508	BRBCB230	CA102		508	BRECB230	54-15	CP	117	
		CA102		509					
J065-08D			65-08		JACK/TS				
		CA103		700					
69-08-101	S1CS1A	CA103		701	S1CS1A	62-28	CP	009	
69-08-102	S0CS1A	CA103		702	S0CS1A	62-28	CP	208	
69-08-103	S1PS1A	CA103		703	S1PS1A	62-28	CP	104	
69-08-104	S0PS1A	CA103		704	S0PS1A	62-28	CP	303	
69-08-105	MCINPCT0	CA103		705	MCINPCT0	62-11	CP	006	
69-08-106	MCCSR0	CA103		706	MCCSR0	62-11	CP	202	
69-08-107	MCPBR0	CA103		707	MCPBR0	62-11	CP	206	
69-08-108	MCDBR0	CA103		708	MCDBR0	56-27	CP	016	
		CA103		709					
J065-08E			65-08		JACK/TS				
		CA104		110					
69-08-711	TCC1	CA104		111	TCC1				
69-08-712	PCC01	CA104		112	PCC01	62-50	CP	117	
69-08-713	PCC11	CA104		113	PCC11	62-50	CP	119	
69-08-714	PCC21	CA104		114	PCC21	62-50	CP	215	
69-08-715	PCC31	CA104		115	PCC31	62-50	CP	216	
69-08-716	PCC41	CA104		116	PCC41	64-50	CP	217	
69-08-717	PCC51	CA104		117	PCC51	64-50	CP	017	
69-08-718	ROPS08	CA104		118	ROPS08	62-28	CP	109	
		CA104		119					
J065-08F			65-08		JACK/TS				
		CA105		310					
69-08-511	DEM0	CA105		311	DEM0				
69-08-512	MCCRS10	CA105		312	MCCRS10	62-11	CP	016	
69-08-513	MCCRS00	CA105		313	MCCRS00	62-11	CP	305	
69-08-514	MCCPS00	CA105		314	MCCPS00	62-11	CP	109	
69-08-515	MCCPSB10	CA105		315	MCCPSB10	62-11	CP	307	
69-08-516	MCCPSB00	CA105		316	MCCPSB00	62-11	CP	107	
69-08-517	TBL00	CA105		317	TBL00	62-11	CP	019	
69-08-518	TBL10	CA105		318	TBL10	46-11	CP	317	
		CA105		319					

CAD 001

(CONT'D)

TO CONNECTION					FROM CONNECTION				
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERMINAL	LEAD DESIG	TERMINATION	TERMINAL	OPT	NOTE
J065-08G			65-08		JACK/TS				
		CA106		510					
69-08-311	HAUB01	CA106		511	HAUB01	62-50	CP	015	
69-08-312	HAUB11	CA106		512	HAUB11	62-50	CP	314	
69-08-313	MCCCCC00	CA106		513	MCCCCD0	62-11	CP	007	
69-08-314	MCCCCC10	CA106		514	MCCCC10	62-11	CP	207	
69-08-315	MCCCUB00	CA106		515	MCCCUB00	62-11	CP	311	
69-08-316	MCCCUB10	CA106		516	MCCCUB10	62-11	CP	111	
69-08-317	ACTC1B	CA106		517	ACTC1B	56-28	CP	310	
69-08-318	AUA1	CA106		518	AUA1	46-16	CP	304	
		CA106		519					
J065-08H			65-08		JACK/TS				
		CA107		710					
69-08-111	ROUTWA1	CA107		711	ROUTWA1	62-35	CP	009	
69-08-112	REDC1	CA107		712	REPE1	62-49	CP	101	
69-08-113	ROCE1	CA107		713	ROCE1	62-15	CP	008	
69-08-114	R1CE1	CA107		714	R1CE1	62-15	CP	108	
69-08-115	R1CSOB	CA107		715	R1CSOB	62-28	CP	107	
69-08-116	SOCE1	CA107		716	SOCE1	62-15	CP	308	
69-08-117	S1CE1	CA107		717	S1CE1	62-15	CP	107	
69-08-118	R1CPD0	CA107		718	R1CPD0	62-15	CP	201	
		CA107		719					
J065-15A			65-15		JACK/TS				
69-15-700	ISCU00	CA108		100	ISCU00	62-14	CP	212	
69-15-701	CPE000	CA108		101	CPE900	50-14	CP	008	
69-15-702	CPE010	CA108		102	CPE010	50-14	CP	208	
69-15-703	CPE020	CA108		103	CPE920	50-14	CP	009	
69-15-704	CPE030	CA108		104	CPE030	50-14	CP	209	
69-15-705	CPE040	CA108		105	CPE040	50-14	CP	109	
69-15-706	CPE050	CA108		106	CPE050	50-14	CP	309	
69-15-707	CPE060	CA108		107	CPE060	50-14	CP	117	
69-15-708	CPE070	CA108		108	CPE070	50-14	CP	317	
69-15-709	ISCU10	CA108		109	ISCU10	62-14	CP	016	
J065-15B			65-15		JACK/TS				
69-15-501	CPE080	CA109		300	CPE080	50-13	CP	008	
69-15-502	CPE090	CA109		301	CPE090	50-13	CP	208	
69-15-503	CPE100	CA109		302	CPE100	50-13	CP	009	
69-15-504	CPE110	CA109		303	CPE110	50-13	CP	209	
69-15-505	CPE120	CA109		304	CPE120	50-13	CP	109	
69-15-506	CPE130	CA109		305	CPE130	50-13	CP	309	
69-15-507	CPE140	CA109		306	CPE140	50-13	CP	117	
69-15-508	CPE150	CA109		307	CPE150	50-13	CP	317	
		CA109		308					
		CA109		309					
J065-15C			65-15		JACK/TS				
		CA110		500					
69-15-301	MTC0	CA110		501	MTC0	50-14	CP	018	
69-15-302	CPAR0	CA110		502	CPAR0	50-14	CP	318	
69-15-303	BPAR0	CA110		503	BPAR0	50-14	CP	118	
69-15-304	APAR0	CA110		504	APAR0	50-14	CP	218	
69-15-305	OWREN1	CA110		505	OWREN1	62-11	CP	214	
69-15-306	ROCPD0	CA110		506	ROCPD0	62-15	CP	001	
69-15-507	ASM0CPR0	CA110		507	ASM0CPR0	50-13	CP	018	
69-15-508	ASM1CPR0	CA110		508	ASM1CPR0	50-13	CP	218	
		CA110		509					
J065-15D			65-15		JACK/TS				
		CA111		700					
69-15-101	EXA00	CA111		701	EXA00	62-21	CP	100	
69-15-102	EXA10	CA111		702	EXA10	62-21	CP	300	
69-15-103	EXA20	CA111		703	EXA20	62-21	CP	001	
69-15-104	EXA30	CA111		704	EXA30	62-21	CP	101	
69-15-105	EXA40	CA111		705	EXA40	62-21	CP	201	
69-15-106	EXA50	CA111		706	EXA50	62-21	CP	301	
69-15-107	EXA60	CA111		707	EXA60	62-21	CP	002	
69-15-108	EXA70	CA111		708	EXA70	62-21	CP	202	
		CA111		709					

CAD 001

(CONT'D)

TO CONNECTION					FROM CONNECTION				
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERMINAL	LEAD DESIG	TERMINATION	TERMINAL	OPT	NOTE
J065-15E			65-15		JACK/TS				
		CA112		110					
69-15-711	EXB00	CA112		111	EXB00	62-22	CP	100	
69-15-712	EXB10	CA112		112	EXB10	62-22	CP	300	
69-15-713	EXB20	CA112		113	EXB20	62-22	CP	001	
69-15-714	EXB30	CA112		114	EXB30	62-22	CP	101	
69-15-715	EXB40	CA112		115	EXB40	62-22	CP	201	
69-15-716	EXB50	CA112		116	EXB50	62-22	CP	301	
69-15-717	EXB60	CA112		117	EXB60	62-22	CP	002	
69-15-718	EXB70	CA112		118	EXB70	62-22	CP	202	
		CA112		119					
J065-15F			65-15		JACK/TS				
		CA113		510					
69-15-511	1PI00	CA113		511	1PI100	72-28	CP	306	
69-15-512	1PD00	CA113		512	1PD00	72-28	CP	106	
69-15-513	1PE20	CA113		513	1PE20	72-28	CP	206	
69-15-514	1PLP0	CA113		514	1PLP0	72-28	CP	006	
69-15-515	1PWP0	CA113		515	1PWP0	72-28	CP	306	
69-15-516	1CLKI0	CA113		516	1CLKI0	72-28	CP	105	
69-15-517	1GRPI0	CA113		517	1GRPI0	72-28	CP	205	
69-15-518	1MEMI0	CA113		518	1MEMI0	72-28	CP	005	
		CA113		519					
J065-15H			65-15		JACK/TS				
		CA115		710					
69-15-111	CPR000	CA115		711	CPR000	54-27	CP	103	
69-15-112	CPR010	CA115		712	CPR010	54-27	CP	303	
69-15-113	CPR020	CA115		713	CPR020	54-27	CP	213	
69-15-114	CPR030	CA115		714	CPR030	54-27	CP	113	
69-15-115	CPR040	CA115		715	CPR040	54-27	CP	313	
69-15-116	CPR050	CA115		716	CPR050	54-27	CP	312	
69-15-117	CPR060	CA115		717	CPR060	54-27	CP	017	
69-15-118	CPR070	CA115		718	CPR070	54-27	CP	116	
		CA115		719					
J065-24A			65-24		JACK/TS				
		CA116		100					
69-24-701	CPR080	CA116		101	CPR080	62-23	CP	312	
69-24-702	CPR090	CA116		102	CPR090	62-23	CP	210	
69-24-703	CPR100	CA116		103	CPR100	62-23	CP	214	
69-24-704	CPR110	CA116		104	CPR110	62-23	CP	014	
69-24-705	CPR120	CA116		105	CPR120	62-23	CP	313	
69-24-706	CPR130	CA116		106	CPR130	62-23	CP	113	
69-24-707	CPR140	CA116		107	CPR140	62-23	CP	111	
69-24-708	CPR150	CA116		108	CPR150	62-23	CP	218	
		CA116		109					
J065-24B			65-24		JACK/TS				
		CA117		500					
69-24-501	CPR160	CA117		501	CPR160	62-23	CP	005	
69-24-502	CPR170	CA117		502	CPR170	62-23	CP	105	
69-24-503	CPR180	CA117		503	CPR180	62-23	CP	205	
69-24-504	CPR190	CA117		504	CPR190	62-23	CP	305	
69-24-505	CPR200	CA117		505	CPR200	62-23	CP	212	
69-24-506	CPR210	CA117		506	CPR210	62-23	CP	311	
69-24-507	CPR220	CA117		507	CPR220	62-23	CP	110	
69-24-508	CPR230	CA117		508	CPR230	62-23	CP	310	
		CA117		509					

Fig. 7
Cabling Diagram
(CAD) Sheet

CENTRAL CONTROL CIRCUIT	DWG SIZE 65	ISSUE 1
BELL LABORATORIES	SD-00001-01	GB2

CAD SUBCAPTION

--- TO CONNECTION ---					--- FROM CONNECTION ---			
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERM.	LEAD DESIG.	TERMINATION		TERM.
..... J65-47B					65-47 JACK / TS (NOTE 3)			
69-47-505	FPCPBAO	CA141		305	FPCPBAO	72-28CP		316
69-47-506	FPCCBAO	CA141		306	FPCCBAO	72-28CP		311
69-47-507	FPSPBAO	CA141		307	FPSPBAO	72-28CP		216
69-47-508	FPSCBAO	CA141		308	FPSCBAO	72-28CP		211
⋮	⋮	⋮		⋮	⋮	⋮		⋮

Fig. 8—Typical Tabular CAD Headings and Line Entries

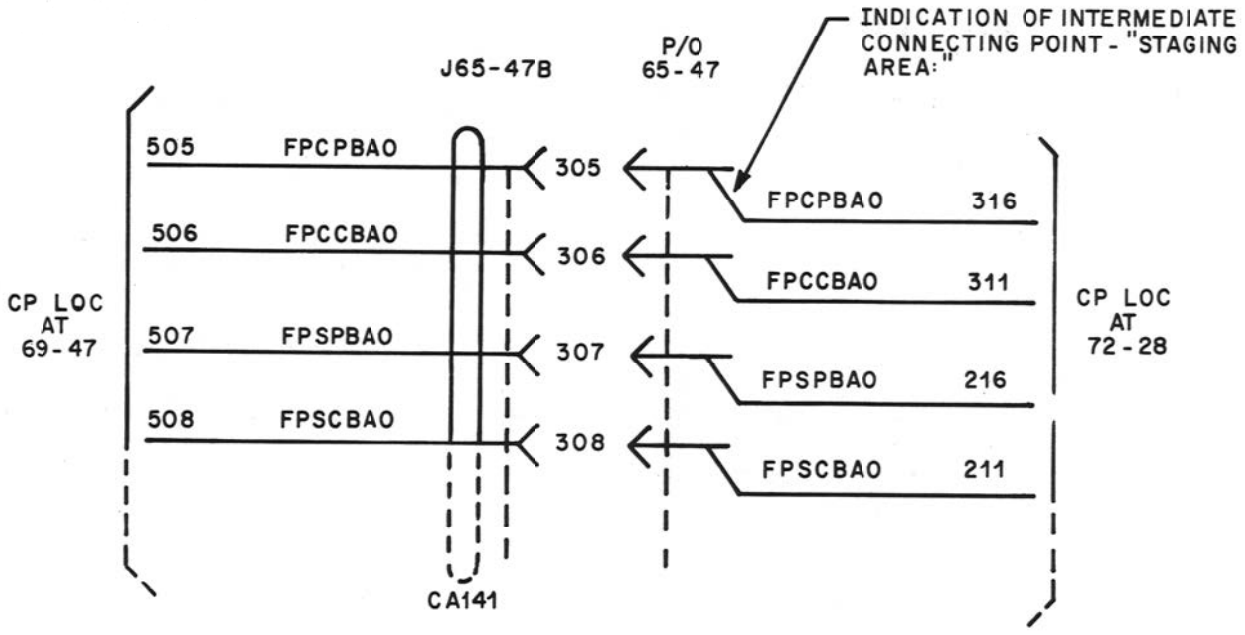


Fig. 9—Equivalent Graphical Representation of Entries in Tabular CAD of Fig. 8

in Fig. 7, there is a subcaption for each set of columns of the tabular arrangement, such as is shown at the top of Fig. 8. The FROM CONNECTION and TO CONNECTION headings on the first line of this subcaption convey the equivalent of the "shop" and the "installer" information side, respectively, of CADs. The significance of the other parts of the subcaption can be seen from the equivalent graphical representation shown in Fig. 9. The JACK/TS below the subcaption to the right in Fig. 8 indicates that the right side (shop side) of the CAD involves connections (wire

runs) from a CP connector located at coordinate 72-28, to another CP connector located at coordinate 65-47, with no CP plugged into it. This connector serves as an intermediate connecting point device (staging area). Over the backplane pins of this connector, there is a Berg (female) connector designated J65-47B, as shown in the subcaption. To this Berg connector a flex cable, CA141, is attached, as shown in Fig. 8 and 9. The other end of this cable is terminated directly to the CP connector pins at location 69-47, as shown in Fig. 8 and 9. The particular lead designations and terminal numbers on CP connectors are also indicated as part of the tabular information. An entry in the subcaption of JACK/CP rather than JACK/TS would indicate the omission of an intermediate connecting point from location 72-28 to location 65-47. In this case, the initial CP location could be, for example, at 65-47. The note in parentheses in the subcaption, to the right of JACK/TS, is a reference to the graphical equivalent representation shown at the beginning of the CAD section.

G. H Section, Block Diagrams (BDs)

2.37 ***General:*** When H sections for BDs are included in functional unit or other ESS SDs, they will be presented in the usual manner.

3. FRAME UNIT SDs

A. General

3.01 Frame unit SDs document the circuitry of units that are used more than once in a frame, such as the multiple use of a CP in a circuit unit. This being the case, the documentation in these SDs is arranged substantially the same as in functional unit SDs. The most significant area in which the two SD types differ is in the G-section documentation, as covered in 3.03 and 3.04.

B. B Section

3.02 The more-than-one use of frame unit SDs in a frame precludes the indication of connections to specific frame units within a frame. For this reason, lead destinations to these other frame units are indicated in the B section with the notation TO CONN CKT.

C. G Section, Cabling Diagrams (CADs)

3.03 The principal difference in the G sections of frame unit SDs is that CAD1 is set aside to list all of the FS leads for which the destination TO CONN CKT is shown. The frame unit SD CAD1 format is similar to the tabular symbol presentation used on CP drawings, as shown in Fig. 5, Sheet 2. Under an overall CAD1 heading, the several circuitry subdivisions of a frame unit are identified with a subheading ELEMENT IDENTIFIER A, B, C, etc, plus a title, as shown in Fig. 10. Under each of these subcaptions is a tabular listing of the ELEMENT leads involved.

3.04 ***Unit Symbol, CAD1 Tabular Arrangement:*** The specific tabular arrangement used in CAD1, below each of the ELEMENT IDENTIFIER and title subheadings, is shown in Fig. 11. In the example shown in this figure, entries in the ACCESS TERM. and FS TERM. columns differ. This indicates that the intraframe leads from a frame unit CP terminate at a terminating device (a connector unused by a CP) at another location.

3.05 ***Unit Symbol, CAD1 Tabular Headings:*** Information covered by entries in the tabular columns of Fig. 11 is as follows:

COLUMN	EXPLANATION
TERM. MOD	Alphanumeric lead designation used as a terminal modifier at the frame SD level.
FUNC	Lead function: input, output, etc.
ACCESS TERM.	Terminals on a frame unit terminating device to which input and output connections to the frame unit are made.
FS TERM.	FS backplane CP terminations of a unit from which connections are made to ACCESS TERMs. Inputs and outputs to the frame unit can also be made directly to or from FS TERMs. In this case the entries in the ACCESS and FS TERM. columns would be identical.

CAD I

UNIT SYMBOL

ELEMENT IDENTIFIER
A
PERIPHERAL UNIT BUS 0

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	NOTE
(JNC()	I	06-22-212	06-22-212	20/1	
CCLCBR00	I	10-20-016	10-20-016	22/2	
CPSCI00	I	10-20-217	10-20-217	22/2	
CPSCI10	O	10-20-019	10-20-019	22/2	
CPSCI0G	G	10-20-018			P/CPSGI0
CPSCI00	I	10-20-314	10-20-314	22/2	
CPSMIB0G	G	09-27-02			P/CPSMIB00
CPSMIB00	I	09-27-03	10-27-003	21/2	
CPSMIB1G	G	09-28-00			P/CPSMIB10
CPSMIB10	I	09-28-01	10-28-003	21/3	
CPSMIB2G	G	09-27-10			P/CPSMIB20
CPSMIB20	I	09-27-11	10-27-002	21/2	
CPSMI0	O	10-20-219	10-20-219	22/2	
CPSMI0G	G	10-20-218			P/CPSMI0
CPSMI00	I	10-20-215	10-20-215	22/2	
CSYNC00	I	05-20-23	06-20-206	16/11	
DBPEO0A0	I	10-18-212	10-18-212	1/8	
DBPEO10	I	10-19-010	10-19-010	1/7	
DBPEQ2A0	I	10-25-212	10-25-212	1/6	
DBPEQ3A0	I	10-26-114	10-26-114	1/5	
DBPEQ4A0	I	10-25-114	10-25-114	1/6	
DBPEO5A0	I	10-26-318	10-26-318	1/3	
DBPEO6A0	I	10-25-318	10-25-318	1/6	
DBPEO7A0	I	10-19-212	10-19-212	1/7	
DBPEO8A0	I	10-18-114	10-18-114	1/8	
DBPEO9A0	I	10-19-114	10-19-114	1/7	
DBPE10A0	I	10-18-318	10-18-318	1/8	
DBPE11A0	I	10-19-318	10-19-318	1/7	
DBPM0DA0	I	10-18-010	10-18-010	1/8	
DBPPEVA0	I	10-25-010	10-25-010	1/6	
DBPP0DA0	I	10-26-212	10-26-212	1/5	
DBPP00A0	I	10-27-012	10-27-012	1/1	
DBPP01A0	I	10-28-012	10-28-012	1/2	
DBPP02A0	I	10-27-314	10-27-314	1/1	
DBPP03A0	I	10-28-314	10-28-314	1/2	
DBPP04A0	I	10-27-118	10-27-118	1/1	
DBPP05A0	I	10-28-118	10-28-118	1/2	
DBPP06A0	I	10-17-012	10-17-012	1/3	
DBPP07A0	I	10-16-012	10-16-012	1/4	
DBPP08A0	I	10-17-314	10-17-314	1/3	
DBPP09A0	I	10-16-314	10-16-314	1/4	
DBPP10A0	I	10-17-118	10-17-118	1/3	
DBPP11A0	I	10-16-118	10-16-118	1/4	
DBPP12A0	I	10-26-012	10-26-012	1/5	
DBPP13A0	I	10-25-012	10-25-012	1/6	
DBPP14A0	I	10-26-314	10-26-314	1/5	
DBPP15A0	I	10-25-314	10-25-314	1/6	
DBPP16A0	I	10-26-118	10-26-118	1/5	
DBPP17A0	I	10-25-118	10-25-118	1/6	
DBPP18A0	I	10-19-012	10-19-012	1/7	
DBPP19QA	I	10-18-012	10-18-012	1/8	
DBPP20A0	I	10-19-314	10-19-314	1/7	
DBPP21A0	I	10-18-314	10-18-314	1/8	
DBPP22A0	I	10-19-118	10-19-118	1/7	
DBPP23A0	I	10-18-118	10-18-118	1/8	
DBPP24A0	I	10-28-212	10-28-212	1/2	
DBPP25A0	I	10-27-212	10-27-212	1/1	
DBPP26A0	I	10-28-114	10-28-114	1/2	
DBPP27A0	I	10-27-114	10-27-114	1/1	
DBPP28A0	I	10-28-318	10-28-318	1/2	
DBPP29A0	I	10-27-318	10-27-318	1/1	
DBPP3QA0	I	10-16-212	10-16-212	1/4	
DBPP31A0	I	10-17-212	10-17-212	1/3	
DBPP32A0	I	10-16-114	10-16-114	1/4	
DBPP33A0	I	10-17-114	10-17-114	1/3	
DBPP34A0	I	10-16-318	10-16-318	1/4	

ELEMENT IDENTIFIER (CONT)
A
PERIPHERAL UNIT BUS 0

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	NOTE
DBPP35A0	I	10-17-318	10-17-318	1/3	
DBPBQAS0	O	07-23-35	06-23-35	21/1	
DBPP0PA0	I	06-23-019	06-23-019	21/1	
DRPB00000	O	10-27-100	10-27-100	21/2	
DRPB00010	O	10-28-100	10-28-100	21/3	
DRPB00020	O	10-27-001	10-27-001	21/2	
DRPB00030	O	10-28-001	10-28-001	21/3	
DRPB00040	O	10-27-009	10-27-009	21/2	
DRPB00050	O	10-28-005	10-28-005	21/3	
DRPB00060	O	10-17-100	10-17-100	21/4	
DRPB00070	O	10-16-100	10-16-100	21/5	
DRPB00080	O	10-17-001	10-17-001	21/4	
DRPB00090	O	10-16-001	10-16-001	21/5	
DRPB00100	O	10-17-005	10-17-005	21/4	
DRPB00110	O	10-16-009	10-16-009	21/5	
DRPB00120	O	10-26-100	10-26-100	21/6	
DRPB00130	O	10-25-100	10-25-100	21/7	
DRPB00140	O	10-26-001	10-26-001	21/6	
DRPB00150	O	10-25-001	10-25-001	21/7	
DRPB00160	O	10-26-005	10-26-009	21/6	
DRPB00170	O	10-25-009	10-25-005	21/7	
DRPB00180	O	10-19-100	10-19-100	21/8	
DRPB00190	O	10-18-100	10-18-100	21/9	
DRPB00200	O	10-19-001	10-19-001	21/8	
DRPB00210	O	10-18-001	10-18-001	21/9	
DRPB00220	O	10-19-005	10-19-005	21/8	
DRPB00230	O	10-18-009	10-18-005	21/9	
EAPUF00	O	10-20-014	10-20-014	22/2	
HDUP1	I	05-19-09	06-19-005	16/10	
HDUP1G	G	05-19-02			P/HDUP1
HNM00	I	07-28-15	06-28-111	9/1	
HNM00G	G	07-28-14			P/HNM00
HNM10	I	07-28-37	06-28-311	9/1	
HNM10G	G	07-28-36			P/HNM10
HPE1	I	06-17-306	06-17-306	3/2	
HPE1G	G	06-17-206			P/HPE1
HP01	I	06-17-305	06-17-305	3/1	
HP01G	G	06-17-304			P/HP01
PPA(00)	I	10-41-311	10-41-311	22/1	
PPA(01)	I	10-41-312	10-41-312	22/1	
PPB(00)	I	10-41-211	10-41-211	22/1	
PPB(01)	I	10-41-212	10-41-212	22/1	

ELEMENT IDENTIFIER
B
TIME SLOT MEMORY ADDRESS BUS

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	NOTE
ATSPAA0	O	02-19-100	02-19-100	17/8	
ATSPAB0	O	02-19-300	02-19-300	17/8	
ATSPAC0	O	02-19-001	02-19-001	17/8	
ATSPAD0	O	02-19-201	02-19-201	17/8	
ATSPEA0	O	02-19-002	02-19-002	17/8	
ATSPEB0	O	02-19-102	02-19-102	17/8	
ATSPEC0	O	02-19-302	02-19-302	17/8	
ATSPED0	O	02-19-203	02-19-203	17/8	
ATSPCA0	O	02-19-303	02-19-303	17/8	
ATSPCB0	O	02-19-004	02-19-004	17/8	
ATSPCC0	O	02-19-104	02-19-104	17/8	
ATSPCD0	O	02-19-005	02-19-005	17/8	
ATSPDA0	O	02-19-205	02-19-205	17/8	
ATSPDB0	O	02-19-305	02-19-305	17/8	
ATSPDC0	O	02-19-006	02-19-006	17/8	
ATSPDD0	O	02-19-106	02-19-106	17/8	
ATSPEA0	O	02-19-213	02-19-213	17/8	
ATSPEB0	O	02-19-313	02-19-313	17/8	
ATSPEC0	O	02-19-014	02-19-014	17/8	
ATSPED0	O	02-19-114	02-19-114	17/8	
ATSPFA0	O	02-19-314	02-19-314	17/8	
ATSPFB0	O	02-19-215	02-19-215	17/8	
ATSPFC0	O	02-19-315	02-19-315	17/8	
ATSPFD0	O	02-19-016	02-19-016	17/8	
ATSPGA0	O	02-19-116	02-19-116	17/8	
ATSPGB0	O	02-19-017	02-19-017	17/8	
ATSPGC0	O	02-19-217	02-19-217	17/8	
ATSPGD0	O	02-19-317	02-19-317	17/8	
ATSPHA0	O	02-19-118	02-19-118	17/8	
ATSPHB0	O	02-19-318	02-19-318	17/8	
ATSPHC0	O	02-19-019	02-19-019	17/8	
ATSPHD0	O	02-19-219	02-19-219	17/8	
ATSOAA0	O	02-20-100	02-20-100	17/1	
ATSOAB0	O	02-20-300	02-20-300	17/1	
ATSOAC0	O	02-20-001	02-20-001	17/1	
ATSOAD0	O	02-20-201	02-20-201	17/1	
ATSOBA0	O	02-20-002	02-20-002	17/1	
ATSOBB0	O	02-20-102	02-20-102	17/1	
ATSOBC0	O	02-20-302	02-20-302	17/1	
ATSOBD0	O	02-20-203	02-20-203	17/1	
ATSOCA0	O	02-20-303	02-20-303	17/1	
ATSOCB0	O	02-20-004	02-20-004	17/1	
ATSOCC0	O	02-20-104	02-20-104	17/1	
ATSOCD0	O	02-20-005	02-20-005	17/1	
ATSODA0	O	02-20-205	02-20-205	17/1	
ATSODB0	O	02-20-305	02-20-305	17/1	
ATSODC0	O	02-20-006	02-20-006	17/1	
ATSODD0	O	02-20-106	02-20-106	17/1	
ATSOEA0	O	02-20-213	02-20-213	17/1	
ATSOEB0	O	02-20-313	02-20-313	17/1	
ATSOEC0	O	02-20-014	02-20-014	17/1	
ATSOED0	O	02-20-114	02-20-114	17/1	
ATSOFA0	O	02-20-314	02-20-314	17/1	
ATSOFB0	O	02-20-215	02-20-215	17/1	
ATSOFC0	O	02-20-315	02-20-315	17/1	
ATSOG00	O	02-20-016	02-20-016	17/1	
ATSOGA0	O	02-20-116	02-20-116	17/1	
ATSOGB0	O	02-20-017	02-20-017	17/1	
ATSOGC0	O	02-20-217	02-20-217	17/1	
ATSOGD0	O	02-20-317	02-20-317	17/1	
ATSOHA0	O	02-20-118	02-20-118	17/1	
ATSOHB0	O	02-20-318	02-20-318	17/1	
ATSOHC0	O	02-20-019	02-20-019	17/1	
ATSOHD0	O	02-20-219	02-20-219	17/1	
ATS1AA0	O	02-22-100	02-22-100	17/2	
ATS1AB0	O	02-22-300	02-22-300	17/2	

ELEMENT IDENTIFIER (CONT)
B
TIME SLOT MEMORY ACCESS BUS

TERM. MODIFIER	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	NOTE
ATS1AC0	O	02-22-001	02-22-001	17/2	
ATS1AD0	O	02-22-201	02-22-201	17/2	
ATS1BA0	O	02-22-002	02-22-002	17/2	
ATS1BB0	O	02-22-102	02-22-102	17/2	
ATS1BC0	O	02-22-302	02-22-302	17/2	
ATS1BD0	O	02-22-203	02-22-203	17/2	
ATS1CA0	O	02-22-303	02-22-303	17/2	
ATS1CB0	O	02-22-004	02-22-004	17/2	
ATS1CC0	O	02-22-104	02-22-104	17/2	
ATS1CD0	O	02-22-005	02-22-005	17/2	
ATS1DA0	O	02-22-205	02-22-205	17/2	
ATS1DB0	O	02-22-305	02-22-305	17/2	
ATS1DC0	O	02-22-006	02-22-006	17/2	
ATS1DD0	O	02-22-106	02-22-106	17/2	
ATS1EA0	O	02-22-213	02-22-213	17/2	
ATS1EB0	O	02-22-313	02-22-313	17/2	
ATS1EC0	O	02-22-014	02-22-014	17/2	
ATS1ED0	O	02-22-114	02-22-114	17/2	
ATS1FA0	O	02-22-314	02-22-314	17/2	
ATS1FB0	O	02-22-215	02-22-215	17/2	
ATS1FC0	O	02-22-315	02-22-315	17/2	
ATS1FD0	O	02-22-016	02-22-016	17/2	
ATS1GA0	O	02-22-116	02-22-116	17/2	
ATS1GB0	O	02-22-017	02-22-017	17/2	
ATS1GC0	O	02-22-217	02-22-217	17/2	
ATS1GD0	O	02-22-317	02-22-317	17/2	
ATS1HA0	O	02-22-118	02-22-118	17/2	
ATS1HB0	O	02-22-318	02-22-318	17/2	
ATS1HC0	O	02-22-019	02-22-019	17/2	
ATS1HD0	O	02-22-219	02-22-219	17/2	
ATS2AA0	O	02-23-100	02-23-100	17/3	
ATS2AB0	O	02-23-300	02-23-300	17/3	
ATS2AC0	O	02-23-001	02-23-001	17/3	
ATS2AD0	O	02-23-201	02-23-201	17/3	
ATS2BA0	O	02-23-002	02-23-002	17/3	
ATS2BB0	O	02-23-102	02-23-102	17/3	
ATS2BC0	O	02-23-302	02-23-302	17/3	
ATS2BD0	O	02-23-203	02-23-203	17/3	
ATS2CA0	O	02-23-303	02-23-303	17/3	
ATS2CB0	O	02-23-004	02-23-004	17/3	
ATS2CC0	O	02-23-104	02-23-104	17/3	
ATS2CD0	O	02-23-005	02-23-005	17/3	
ATS2DA0	O	02-23-205	02-23-205	17/3	
ATS2DB0	O	02-23-305	02-23-305	17/3	
ATS2DC0	O	02-23-006	02-23-006	17/3	
ATS2DD0	O	02-23-106	02-23-106	17/3	
ATS2EA0	O	02-23-213	02-23-213	17/3	
ATS2EB0	O	02-23-313	02-23-313	17/3	
ATS2EC0	O	02-23-014	02-23-014	17/3	
ATS2ED0	O	02-23-114	02-23-114	17/3	
ATS2FA0	O	02-23-314	02-23-314	17/3	
ATS2FB0	O	02-23-215	02-23-215	17/3	
ATS2FC0	O	02-23-315	02-23-315	17/3	
ATS2FD0	O	02-23-016	02-23-016	17/3	

Fig. 10
Frame - Unit SD
CAD 1 Symbol

CONTROLLER AND BUS INTERFACE CIRCUIT

DWG SIZE: 65 | ISSUE: |

BELL LABORATORIES | SD-00002-01 | GB2

ELEMENT IDENTIFIER
A

PERIPHERAL UNIT BUS 0

TERM. MOD	FUNC	ACCESS TERM.	FS TERM.	LOC FS/SYM	NOTE
ATSP0A0	0	06-19-106	02-09-010	1/2	
ATSP0B0	0	06-19-213	02-17-010	1/3	
ATSP1A0	0	06-19-107	02-19-110	1/4	

TERM. NO.

CONNECTING DEVICE LOCATION ON FRAME UNIT

Fig. 11—Frame Unit SD CAD1 Tabular Arrangement

LOC FS/SYM Location of FS TERM. given by FS and symbol number.

NOTES Unique information concerning ACCESS TERM. connections that may be covered in either an equipment or sheet note.

3.06 ***Interunit CADs:*** Leads of frame units that connect externally to circuits outside of the frames in which they are housed are generally accounted for in the CADs of the associated frame SDs, as described in 4.10. Other external leads of frame units not covered in CADs of frame SDs would be shown in CAD2, 3, etc, of the frame unit SDs.

3.07 ***Intraunit CADs:*** CADs for frame unit intraunit connections may also be included in the G section of frame unit SDs. This may occur when there is a need to identify backplane wiring convenience-connecting devices which are not shown in the FSs of the B section.

D. A Section, Drawing Indexes

3.08 Over the title box on sheet A1, a USED ON table appears that lists the frame SDs in which references are made to the frame unit SD. Also included in this table is the name of the Bell Laboratories control location for the system or project, as shown in Fig. 12. Lead indexes are omitted from this type of SD because they are accounted for in the unit symbol CAD1.

4. FRAME SDs

A. General

4.01 The purpose of frame SDs is to document the connecting circuitry between the frame units within a frame. In this documentation, the interconnections in the backplane between frame units are comparable to those shown between CPs in functional unit SDs. Frame units are represented in the frame SD by the contents of one or more symbols. The frame SD documentation may also include the circuitry for frame auxiliaries such as power supplies and fuse alarms. This circuitry is presented in the same format used for functional unit SDs. The frame unit interconnecting circuitry is also presented in essentially the same format except for minor differences, which are covered in the following paragraphs.

B. B Section

General

4.02 Each FS in a frame SD consists of the same three parts as a functional unit SD: IFDs, connection list tables, and composite diagrams.

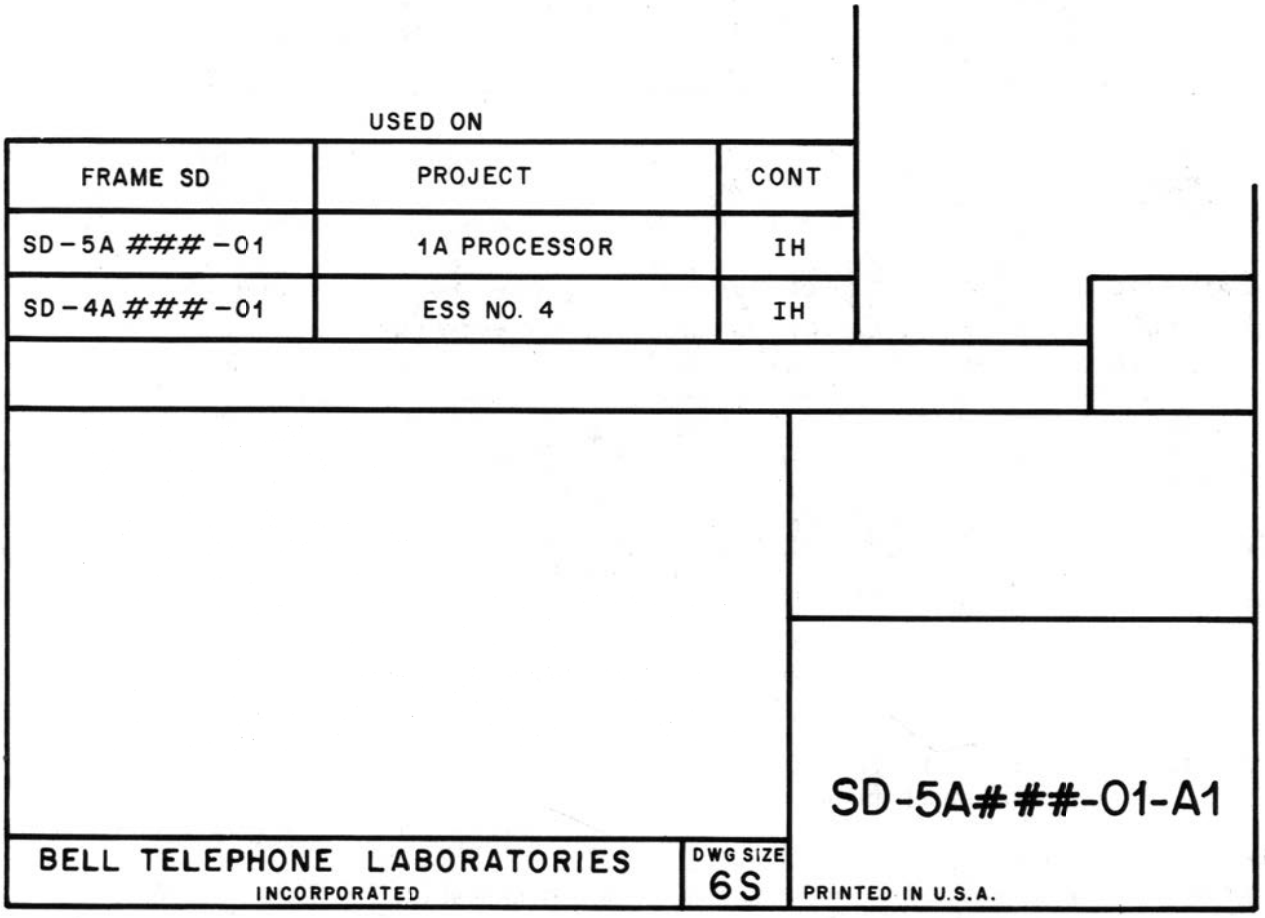


Fig. 12—"Used On" Table on Sheet A1 of a Frame Unit SD

The information in each of these parts as they apply to frame SDs is as follows:

(a) ***IFDs:*** These diagrams indicate the backplane interconnections between frame units and any auxiliary circuitry. In this part of the B section FSs, a list of mnemonic definitions is also provided.

(b) ***Connection List Tables:*** These tables provide frame unit and other component terminal connection details for all IFD leads.

(c) ***Composite Diagrams:*** These diagrams represent, in one or more composite forms, the circuit functions not readily apparent from IFDs alone.

Interconnecting and Flow Diagrams (IFDs)

4.03 IFDs indicate the connections between frame units and other components at the backplane level. The frame units themselves are represented with rectangular symbols and the backplane circuitry is shown with FS and symbol number destinations indicated at the stub ends of IFD symbol lines. Destinations to other circuits are also indicated at the ends of these lines. Signal flow direction is indicated on these lines with directional arrows. Connections between symbols may also be shown on the same IFD.

4.04 ***Symbol Numbers:*** Same as 2.04.

4.05 ***Frame SD Symbol Entries:*** In addition to symbol number entries in IFD symbols, there are the standard entries for rectangular symbols, as follows:

(a) The functional name or description of the unit represented by the symbol.

(b) The functional designation assigned to (a).

(c) The location of the frame unit in the frame. This location is given by the coordinates that locate the lower left-hand corner of the frame unit as viewed from the front.

(d) The code number (equipment) of the frame unit. The SD number of the frame unit SD is also shown sometimes in parentheses above the code.

(e) The frame unit element identifier (see 2.06, frame unit is substituted for circuit pack).

Typical symbol entries corresponding to (a) through (e) are shown in Fig. 13 in their usual arrangement.

Connection List Tables

4.06 Connection list tables provide specific frame unit and other component terminal information not shown in the IFDs. For each IFD symbol within an FS, there is a separate connection list table. For each designated IFD lead, there is a corresponding lead designation entry in a connection list table of the same symbol number. The purpose of connection list tables is to provide near-end connection information for backplane leads terminating at specific frame unit or other component terminals. These tables also provide the far-end destination in the documentation, ie, the FS and symbol number at which a lead terminates. When the destination of a lead is to another SD, the title of the SD is given in the tables.

4.07 ***Connection List Table Headings:*** Connection list tables have overall headings corresponding to all of the line entries in the IFD symbols. A typical table heading and column entry arrangement is shown in Fig. 14.

4.08 ***Connection List Table Columns:*** Columns in these tables fall into two categories. The columns at the left of the table are for entries pertaining to the FS and are shown under the common heading FRAME INFO. The columns to the right pertain to frame unit information and are shown under the common heading UNIT INFO.

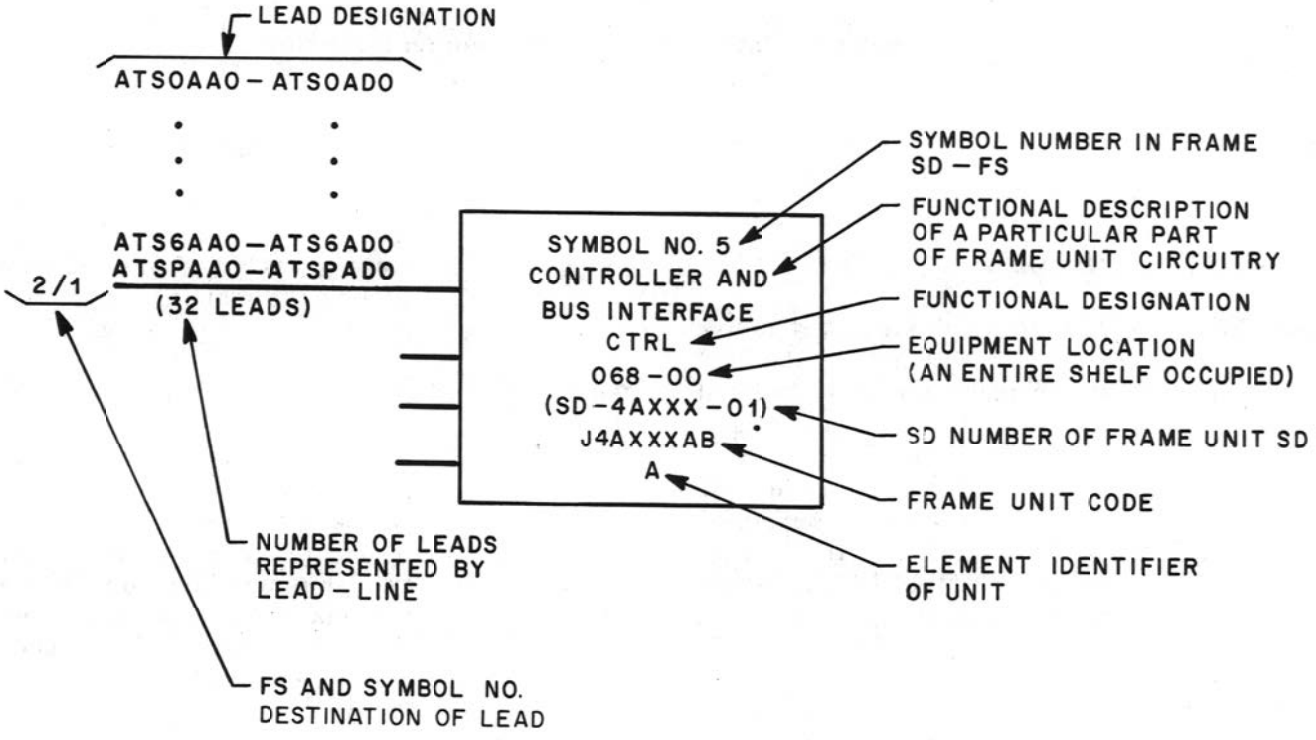


Fig. 13—Typical IFD Symbol Entries, Lead Line Designations, and One Method of Indicating Destinations of Lead Lines

SYMBOL NO. 5

CONTROLLER AND BUS INTERFACE

DESIG	EQPT LOC	CODE	ELEM IDENT	OPT
CTRL	068-00	J4AXXXAB	A	

FRAME INFO					UNIT INFO	
LEAD DESIG	FUNC	TERM.	DESTINATION	NOTE	TERM. MOD	LOC
.	.	.	.	.	.	.
.	.	.	.	.	.	.
ATSOAAO	0	02-19-100	2/1		ATSPAAO	17/8
ATSOABO	0	02-19-300	2/1		ATSPABO	17/8
ATSOACO	0	02-19-001	2/1		ATSPACO	17/8
ATSOADO	0	02-19-201	(Z) 2/1, (Y) 3/2		ATSPADO	17/8

OPTIONS

Fig. 14—Connection List Table and Column Headings for Frame SDs

The contents of each of the separate columns under these common headings are described as follows:

---FRAME INFO---

COLUMN **EXPLANATION**

LEAD DESIG The same designated leads associated with a particular IFD symbol (input or output) are listed in this column in alphanumeric order. The first entry in this column appears after the last unused unit access terminal number entered in the TERM. column. Typical LEAD DESIG column entries are shown in Fig. 14.

FUNC The letters I or O are the usual entries in this column. They indicate whether a lead is essentially an input or output lead of a circuit element. When an output lead connects to one or more additional outputs, the letter combination OT is entered in the column. The letter T indicates that the transistor collectors of two or more gates are connected in a wired-node manner. (See also 2.13.)

TERM. Access terminal numbers of the frame units are entered in this column. Used and unused terminals are listed, with the unused preceding the used terminals. The access terminal number is made up of the physical location of the terminal strip or connector on the frame unit and the terminal or pin number on the connecting device.

DESTINATION In this column, the FS-to-FS destinations shown in the IFDs are shown again on an individual lead basis. Following the slash

line of this entry, the symbol of the FS involved is also shown. Destinations to other circuits are also indicated. Separate FS and symbol number entries are separated with commas, as shown in the last entry in Fig. 14. Option letters, when applicable, are shown in parentheses in front of each of the destinations for the options.

NOTE This entry is for reference to lead wiring requirements that are usually covered in FSs with the indication of pairing or in a 200-series equipment note of the SD. When reference is made in this column to a sheet note, the note will be shown directly below the table. A typical entry for indicating wire pairing would appear as P/3G042H1, indicating that the lead in the LEAD DESIG column is paired with lead 3G042H1.

---UNIT INFO---

COLUMN **EXPLANATION**

TERM. MOD Entries in this column show the lead designation by which a frame unit termination is identified in a frame unit SD. This entry is also referred to as the terminal modifier or function Net Name at the frame unit level.

LOC This is the TERM. MOD column companion entry that provides the FS and symbol number information to locate the designated frame unit termination in its frame unit SD.

C. C Section, App Fig.

4.09 In general, the content of an App Fig. in part 2C of this document pertaining to functional unit SDs also applies to frame SDs. App Fig. of frame SDs account mainly for the frame units represented in FSs of the B section of the frame SD. Also covered in these App Fig. are the CPs and other components in the remainder of the frame. The frame unit information in the App Fig. is in tabular form with an arrangement essentially the same as for CPs, as described in 2.26. The only notable difference concerns equipment location coordinates of frame units. Since frame units occupy the full width of a frame shelf, their locations are given by the coordinates of the lower lefthand corner of the frame unit as viewed from the front. In specifying frame unit coordinates with the lower left as the reference point, the X-coordinate*, for this reason, is always −00. Typical frame unit entries in a frame SD App Fig. are shown in Fig. 15.

*The left-to-right coordinate.

4.10 ***Duplicate Frame Units:*** Frame SDs, in which duplicate frame units are shown, have components of these frame units listed in separate App. Fig., with the same basic number but

APP FIG. 1

UNIT

EQPT LOC	044-00	068-00	EQPT LOC
DESIG	SW06-07	CTRL	DESIG
EQPTCODE	J4AxxxAE	J4AxxxAB	EQPTCODE
OPTION			OPTION
ELEM IDENT			ELEM IDENT
CKT	DESIG FS/SYM	DESIG FS/SYM	CKT
A	SW06-07 2/4	CTRL 2/5	A

Fig. 15—Typical Frame Unit Entries in a Frame SD App Fig.

distinguished with the suffix letter A, as in App. Fig. 1 and App. Fig. 1A.

D. G Section, CADs

4.11 The CADs in the G section of frame SDs account for all leads that leave the frame and that connect to external circuits. Listed, therefore, in these CADs are the externally connected frame unit leads that are not covered in CADs of frame unit SDs. Also included in frame SD CADs are the connections, mainly via cables, between frame units within the frame. The format for all of this CAD information is generally the same as for functional unit SD CADs, described in part 2F of this document and illustrated in Fig. 7, 8, and 9. Fig. 16 illustrates how CAD information is presented when CP terminations to an external circuit are from a CP that has a location in the frame other than in a frame unit. Fig. 17 shows another frame SD CAD representation. This is for the situation in which CP terminations of a frame unit terminate in a terminal strip on the frame.

E. A Section, Drawing Indexes

4.12 The frame-SD A-section indexes are essentially the same as those for functional unit SDs, described in part 2B of this document. One difference is the listing of equipment J-coded frame units in an apparatus index. Another difference is the use of a special lead index for intraframe leads.

4.13 ***Apparatus Index:*** In this index, frame units are listed first under the heading UNIT. CPs are listed next and are followed by all other component categories in the usual alphabetical order.

4.14 ***Lead Indexes:*** Frame SDs have two lead indexes, the interframe lead index and the intraframe lead index. The interframe lead index serves the same purpose as a conventional lead index: it lists all of the leads externally connected to the frame. The external circuits to which the frame SD leads connect are listed by name in alphabetical order with their locations in the B and G sections of the frame SD indicated as FS and CAD symbol numbers. Leads are listed in alphanumeric order.

4.15 ***Intraframe Lead Indexes:*** An intraframe lead index is provided on a frame SD to correlate lead designations on frame unit SDs with lead designations on the frame SD. As shown in Fig. 18, intraframe lead indexes consist of tables with three principal columns, as follows:

(a) The ON-UNIT column lists frame unit SD lead designations that are referred to in the frame SD documentation as TERM. MODs (terminal modifiers).

(b) The ON-FRAME column lists designations corresponding to those in the ON-UNIT column assigned for identifying interframe leads from a frame connectivity standpoint.

(c) The FS/SYM LOC column lists the location of leads designated in the ON-FRAME column in terms of FS and SYMBOL numbers in the B section of the frame SD.

Intraframe lead indexes permit users of frame unit SDs to work with a frame SD with only frame unit lead designations that can be converted to frame lead designations. In the FS/SYM LOC column, the location of these leads in the B section of the frame SD is indicated. Illustrated in Fig. 18 is a situation in which the same frame unit is used more than once (duplicated) in a frame SD, namely the SWITCH UNIT CKT. The distinction between such similar units within this index is indicated by the addition of frame equipment locations after circuit unit names, eg, 034-00 and 042-00.

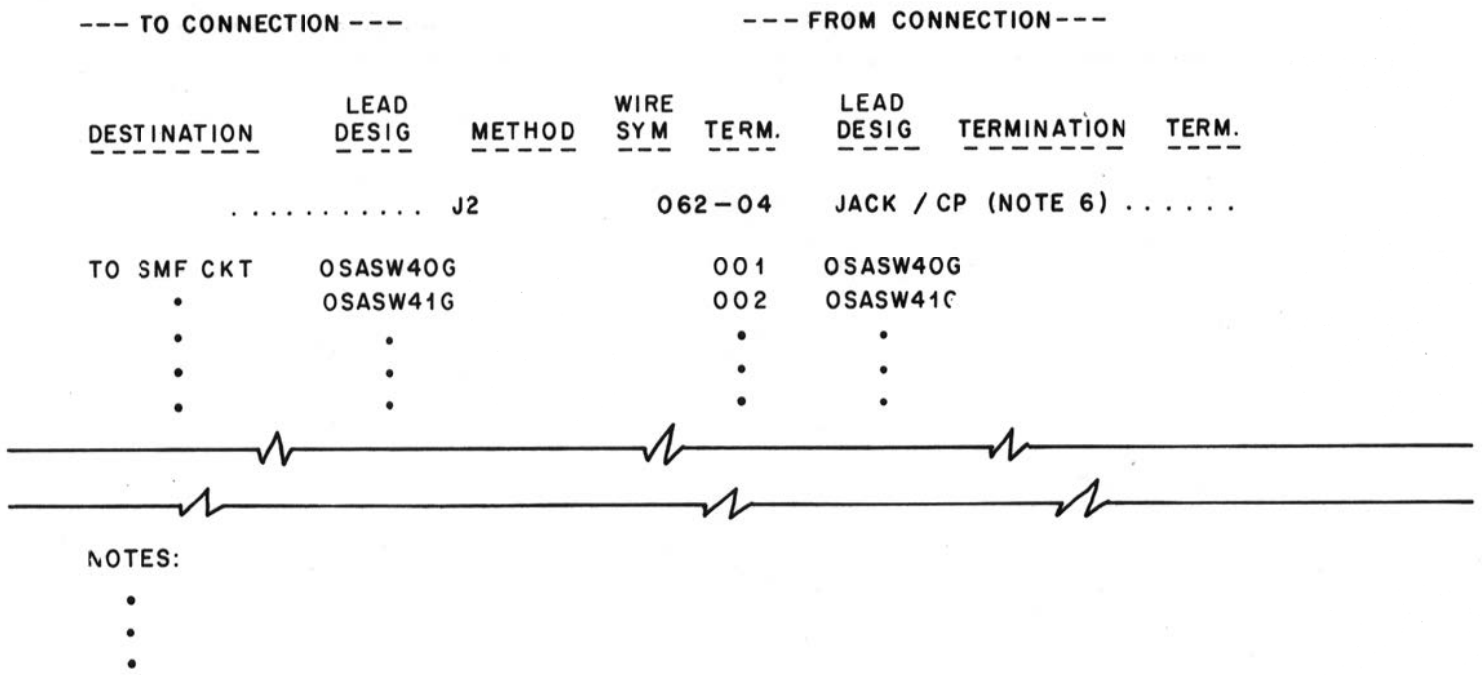
5. CIRCUIT PACK INFORMATION SDs (CPI SDs)

A. General

5.01 As indicated in 1.07, CPI SDs contain information applicable on a system or project basis. These SDs, therefore, provide a list of CPs used in a system or project, and the circuit documentation for the CMs and ICs used in a system. These SDs consist of four sections: A, D, J, and K. The A section sheet index content is generally the same as that covered in 2.21. The content of the remaining three sections is covered in 5.02 through 5.04.

B. D Section, Notes and Tables

5.02 This section of the SD contains the IC reference information usually shown in the



NOTES:

6 THE FOLLOWING SHOWS THE SYMBOLIC EQUIVALENT TABULAR PRESENTATION

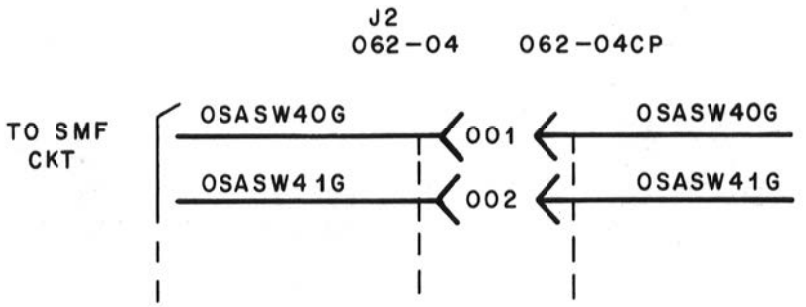


Fig. 16—CP Termination to External Circuit When CP Has a Frame Location Other Than in a Frame Unit—Tabular and Graphical Equivalent Representations Shown

--- TO CONNECTION ---					--- FROM CONNECTION ---		
DESTINATION	LEAD DESIG	METHOD	WIRE SYM	TERM.	LEAD DESIG	TERMINATION	TERM.
..... TSA				080-03	(NOTE 3)		
(NOTE 203)	DTESD10A			030	DTESD10A	048-00 UNIT	10-31-003
	DTESD20A			031	DTESD20A	048-00 UNIT	10-31-202

NOTES:

3. THE FOLLOWING SHOWS THE SYMBOLIC EQUIVALENT TABULAR PRESENTATION

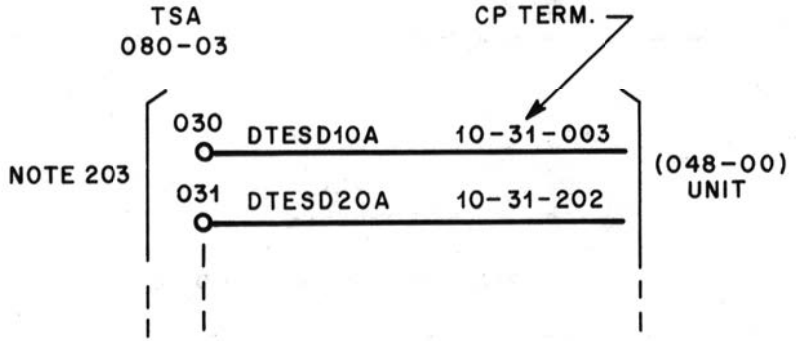


Fig. 17—CP Termination From Frame Unit to Terminal Strip on Frame—Tabular and Graphical Equivalent Representations Shown

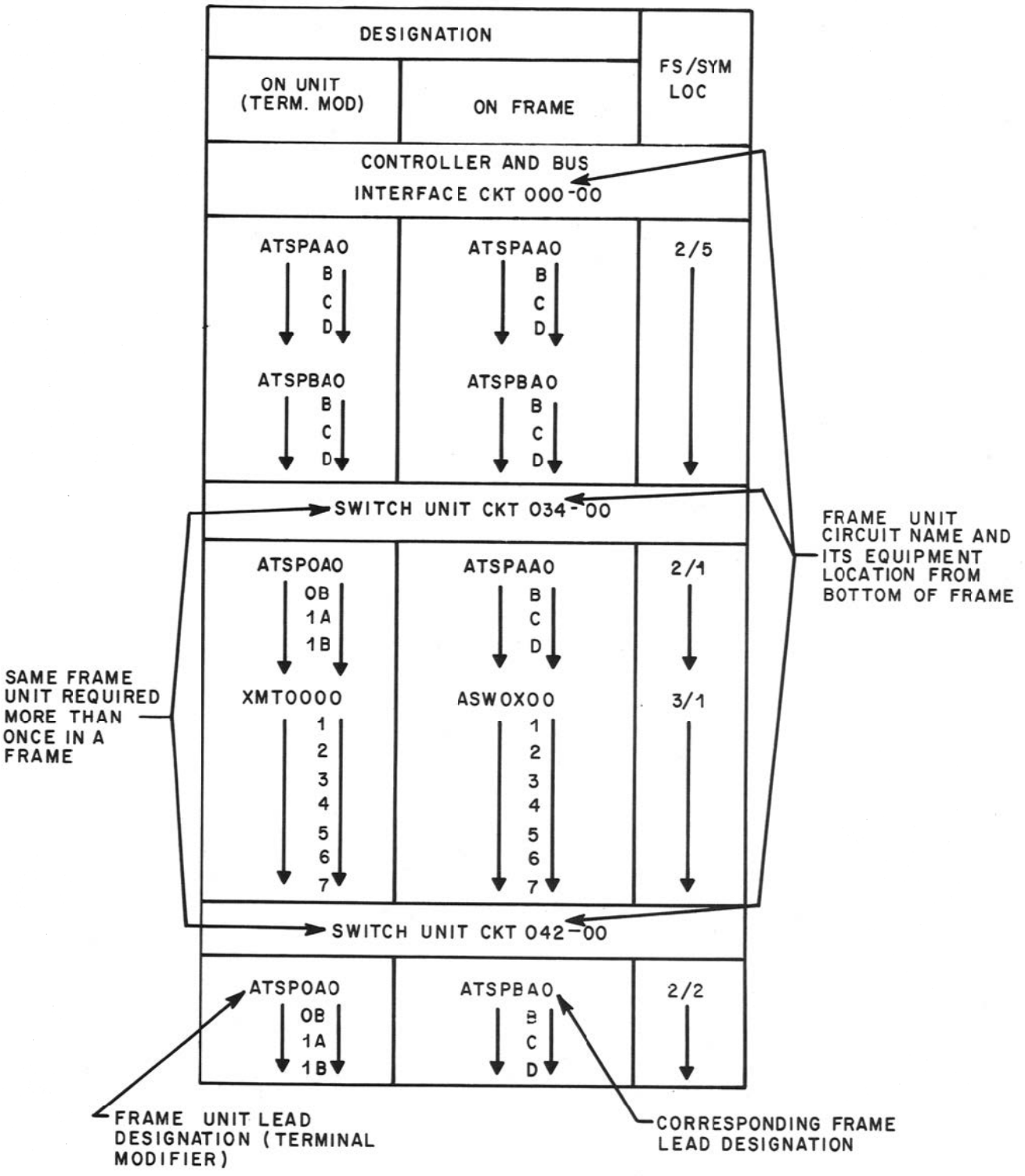


Fig. 18—Typical Intraframe Lead Index Illustrating Column Headings and Entries

D section of an SD. The ICs covered in this SD section are those that have been used on the CPs and CMs of the system or project.

C. J Section, CPs

5.03 This section of the SD lists all the SDs of a system or project that contain references to CPs. The listing is by SD number with an adjacent listing of all of the apparatus codes of CPs referred to in each SD. These CPs are documented in CPS drawings. See Fig. 5, Sheets 1 and 2 for typical circuit documentation and tabular symbol sheets.

D. K Section, CMs

5.04 This section of the SD contains all of the documentation for the CMs used in the system or project.