INDEX OF EQUIPMENT CROSS-CONNECTIONS
NO. 2 AND NO. 2B ESS ARRANGED WITH 2-WIRE FEATURES
EQUIPMENT DESIGN REQUIREMENTS
ELECTRONIC SWITCHING SYSTEMS

1. GENERAL

SCOPE

1.01 This specification, together with the supplementary information listed herein, provides a Circuit Index of the optional cross-connections existing in the No. 2 and No. 2B ESS. Table A is a checklist of the cross-connections appearing on No. 2 and No. 2B ESS, No. 1 ESS, and common systems schematic drawings (SDs) used in the No. 2 and No. 2B ESS. This specification should be used in the preparation of the individual wiring lists for each installation.

1.02 This specification is reissued to add No. 2B ESS circuits and to update Table A and the circuit index.

1.03 Traffic conditions, office size, types of circuits, and local circuit conditions generally determine which cross-connections, if any, are required. These connections are designated on the circuit schematics by an option symbol (a circled letter) with arrowheaded leads. These options are then defined in the feature and option table on the schematic. Options that may be defined as those subject to periodic change in the field are called service options. To separate service options from those that are wired into the equipment by the shop, a note is added to the schematic indicating that job records need not be maintained for the service options.

DESCRIPTION

1.04 Only those circuits used in the No. 2 and No. 2B ESS that have cross-connections are listed in the circuit index and in Table A. The circuits, with abbreviated titles, are listed in numerical order beginning with the No. 2 ESS SDs.

1.05 To maintain consistency, all of the optional cross-connections shown on the schematics are included in Table A. In those cases where the necessary information is also available from other sources, the connections listed may be wired in the shop instead of in the central office. Cross-connections of this type are identified by a plus (+) symbol in the option column.

1.06 Connections determined by the office size or variable engineering requirements are made by the shop. Occasionally, these options are changed by the installer when the actual conditions are determined or when additions are made. This type of connection is identified by an asterisk (*) in the option column.

1.07 The circuit titles and SD numbers are listed in the first column of the table in numerical order beginning with the No. 2 ESS SDs.

1.08 Brief descriptions of the feature or function to which the cross-connection applies are given in the feature column. These descriptions are not intended to provide detailed cross-connect information but are to be used for associating this index with the broader information of the cross-connect practices or schematic notes.

1.09 In most instances the cross-connection is a wire strap between terminals of the circuit components or terminal strips. In a few cases, however, the cross-connection is effected by means of a plug, terminating connector, or pigtail component. Such conditions are indicated in the cross-connection method column.

1.10 Where detailed cross-connecting or equipping practices have been written to explain the methods of providing these cross-connections, they are shown in the detailed cross-connection information column opposite the drawing number.

1.11 To provide an adequate interval for the installation of the cross-connections and subsequent testing of the wired circuit, the installation forces desire to have the cross-connection information at certain intervals of time that are related to the total installation interval. Circuits that require system tests in the shop (such as the control complex or 2B processor circuits) must have all optional cross-connections wired in the shop. These are indicated by a 0 in the column reflecting the percentage of the total installation interval that may be completed when the cross-connection information is required by the installation forces.

2. SUPPLEMENTARY INFORMATION

820-000-000—Numerical Index—No. 1, No. 1A, No. 2, No. 2A, No. 3, and No. 4A ESS and 1A Processor
800-600-000—Checking List—General Equipment Requirements
966-210-100—General Description—No. 2 ESS
J2H000—820-600-150—Central Office Equipment—Equipment Description—No. 2 ESS
J2H032—820-600-151—Limiting Conductor Conditions—No. 2 ESS
KS-19162—Plug
KS-20203—Plug
Floor Plan Data—Section 820-600-150
Questionnaire E8071—No. 2 and No. 2B ESS
Questionnaire E8100—No. 2 and No. 2B ESS
Current Drain Data—SD-2H100-02

3. DRAWINGS (See Table A.)

SD-2H100-01—Keysheets
ED-1A153-01—Table of Wire Gauges and Types of Insulation—No. 1 or No. 2 ESS
ED-1A227-10—Method of Running and Butting Switchboard Cables-ESS Frames
ED-1A182-10, -11, -13—Specific Requirements For Wiring and Cabling—No. 1 or No. 2 ESS

4. EQUIPMENT

4.01 None.

5. GENERAL NOTES AND INDEXES

5.01 None.

CIRCUIT INDEX

CIRCUIT INDEX (Cont)

TABLE A

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Program Control, SD-2H007-01	When associated call store (2)	Is not provided	KS-19162, L17 Plug, E/W straps	X+		
		Is provided		W+		
	When associated call store (3)	Is not provided	KS-19162, L17 Plug, E/W straps	V+		0
		Is provided		U+		
Input-Output Control, SD-2H008-01	Required for use in No. 2 ESS			M, K+		
	Terminate one end of	SZ10 and RL10 bus		T+		
		SZ20 and RL20 bus		P+		
		DAT bus		W+		
	Terminate both ends of	SZ10 and RL10 bus		U+		
		SZ20 and RL20 bus		R+		0
		DAT bus		X+		
	Termination not required on	SZ10 and RL10 bus		S+		
		SZ20 and RL20 bus		N+		
		DAT bus		V+		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Maintenance Center, SD-2H009-01	Single card writer not required			X+		0
TTY Control, SD-2H010-01	When circuit is equipped for	TTY		Z+		0
		DS		Y+		
		TTY and DS		X+		
Trunk Test, SD-2H075-01	Voice frequency oscillator			U+		0
	PAR meter generator			V+		
	Impulse counter			W+		
	Transmission measuring set			X+		
	Noise measuring set			Y+		
	PAR meter, receiver			Z+		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Line Scanner, SD-2H076-01	Type of line	Loop start		Y		40
		Ground start		Z		
		Trunk or no test termination		None		
	Scanner control	512 lines		J,K,M,N, Q,U		20
		1024 lines		J,K,M,U		
		1536 lines		J,K,V		
		2048 lines		V		
	Readout shorting plug			W+		0
	Readout patch cord			X+		0
Incoming Trunk Local Tandem, SD-2H101-01	In idle state orig office expects battery on	Tip	429A plug on protector frame or jumper on MDF	Z		50
		Ring		Y		
Outgoing Trunk Local Tandem, SD-2H103-01	When idle incoming trunk circuit provides battery on	Tip	429A plug on protector frame or jumper on MDF	Z		40
		Ring		Y		
Incoming Trunk Local Tandem, SD-2H104-01	In idle state originating office expects battery on	Tip	429A plug on protector frame or jumper on MDF	Z		50
		Ring		Y		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
OGT Trk No. 3CL in Distant BLDG Coin Control, SD-2H105-01	Coin or coin and non-coin trunk circuit			Z,W		25
	Non-coin trunk circuit only			Y,W		
	Dial tone first coin trunk circuit			Z,X		
Incoming Trunk No. 3CL in Distant Bldg, SD-2H108-01	When the resistance of the separate conductors (CC or T) is greater than 350 ohms			X		25
	In idle state originating office expects battery on	Tip	429A plug on protector frame or jumper on MDF	Y		50
		Ring		Z		
INC Trunk LTD No. 14 or LTC No. 3, SD-2H109-01	Test trunk ring circuit has 200-ohms resistance in the tip and ring conductors		Strap across R2 and R4 res on unit	Z	Eqpt Note 201 on SD	25
	Office is arranged for range extension	Yes		Y		
		No		X		
Two-Way Trunk No. 3CL in Distant Bldg, SD-2H110-02	In idle state originating office expects battery on	Tip	429A plug on protector frame or jumper on MDF	Z		50
		Ring		Y		
	Coin first			X		25
	Dial tone first			W		
Incoming Trunk Distant SXS Offices, SD-2H111-01	In idle state originating office expects battery on	Tip	429A plug on protector frame or jumper on MDF	Z		50
		Ring		Y		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Two-Way Trunk E&M Lead Supv, SD-2H112-01	Noncoin or prepay coin service			Q,G		25
	MF pulsing or inc dial pulsing			R		
	When ckt connects to E&M applique circuit			S,H		
	When ckt connects to F-type signaling sets			T,J		
	When used as outgoing trunk to intercept systems			F		
	Dial tone first coin service	Outgoing to TSP or TSPS		W,G		
		Incoming or outgoing to 3CL swbd		V,G		25
	Last unit on dial pulse timing bus	Yes		X	Info Note 305 on SD	25
		No		Y		
Overtime Coin, Local Coin, Overtime & Stuck Coin Swbd No. 3CL, SD-2H113-01	Coin first			Z		25
	Dial tone first			Y		
Audible Ring and Recorded Announcement, SD-2H119-01	Balance termination			Z	X-Conn Notes 401 and 402 on SD	25

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
MF Transmitter, SD-2H121-01	−9 dB output			Z		25
	−8 dB output			Y		
	−6 dB output			X		
Trunk Dial Pulse Transmitter, SD-2H122-01	Last unit on communication bus circuit dial pulse timing bus	Yes		X+	Eqpt Notes 203 and 204 on SD	25
		No		Y+		
Trunk Dial Pulse Receiver, SD-2H123-01	When associated with a tie-line cut-through service circuit			W,T+	Eqpt Notes 202 and 203 on SD	25
	For TOUCH-TONE on incoming trunks			T+		
Ringing Circuit, SD-2H126-01 SD-2H126-02	Office with ac-dc ringing plant		Remove straps from TS(A) on unit	Z	Eqpt Note 206 on SD	25
	Office with superimposed ringing plant			Y		
Station Ringer Test Circuit, SD-2H129-02	−130V coin return			X		25
	+130V coin return			Y		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS (Cont)

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Remote Trunk, Peripheral Decoder Applique SD-2H130-01	Remote ckt requires signaling over single wire			X,Y	Circuit Note 103 on SD	25
	Remote ckt requires —48V signaling over a pair			X,Y		
	Remote ckt requires 72V signaling over a pair			X,Z		
	Remote ckt requires a contact closure over a pair			W		
Dial Pulse Rcvr Test, SD-2H133-01	Last unit on communication bus circuit data timing bus	No		Y	Eqpt Note 203 on SD	25
		Yes		X		
MF Test Environment, SD-2H134-01	—9 dBm from XMTR			Z		25
	—8 dBm from XMTR			Y		
	—6 dBm from XMTR			X		
Ringing and Coin Control Test Circuit, SD-2H135-01	For superimposed offices using the SD-2H126-02 ringing circuit			X		25
	For offices using the SD-2H126-01 ringing circuit			Y		
	For ac-dc offices using the SD-2H126-02 ringing circuit and for ac-dc offices that do not use SD-2H126-01 or SD-2H126-02			W		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Combined Milliwatt and Loop-Around Test, SD-2H136-02	When 60A control unit is	Provided		W	Eqpt Notes 201 and 204 on SD	25
		Not Provided		X		
	To provide loop around			Z		
OGT Local Test Desk, No. 14, SD-2H141-01	Test trk ringing ckt in same building has 200Ω in tip and ring		Straps across R7 and R8 on unit	Z*	Eqpt Note 201 on SD	25
Auxiliary Line, SD-2H143-01	Loop start option			X		25
OGT Trunk X-Bar TDM, CAMA or TSP, SXS CAMA or TSPS No. 1 or AIS SD-2H144-01	When idle incoming trunk provides battery on	Tip	429A Plug on protector frame or jumper on MDF	Z		50
		Ring		Y		
	When used with crossbar tandem, TSPS No. 1 or AIS.			X		
	When used with SXS CAMA offices			W		
	When used with TSP or TSPS arranged for dial tone first coin operation	Yes		S		
		No		V		
Two-Way Trunk Start Pulse Signal, SD-2H148-01	In idle state orig office expects battery on	Tip		Z		25
		Ring		Y		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS (Cont)

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Incoming Trunk Local Tandem Delay Dial, SD-2H149-01	In idle state orig office expects battery on	Tip		Z		25
		Ring		Y		
Outgoing Trk Ckt, SD-2H151-01	Dial tone first	Yes		Y	Info Note 302 on SD	25
		No		Z		
Inc Trk Office Dist SXS, SD-2H154-01	In idle state orig office expects battery on	Tip		Z		25
		Ring		Y		
	Connections to SXS outgoing trunk circuit in the same building			T		
	Connections to SXS outgoing trunk circuit in distant building			S		
	Improves transmission quality on lines with high longitude noise			Q		
Two-Way Long Haul Trunk Ckt Dial Pulsing, SD-2H157-01	Last unit on communication bus ckt dial pulse timing bus	Yes	Terminating Resistor	Z	Eqpt Notes 209 and 210 on SD	25
		No		Y		
	When circuit connects to E&M applique circuit, type III interface (see SD-99421-01)			X		
	When circuit connects to F-type signaling application schematic and bay wiring circuit, type II interface (see SD-99421-01)			W		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS (Cont)

TITLE SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Two-Way Long Haul Trunk Ckt MF Pulsing, SD-2H158-01	When circuit connects to E&M applique circuit, type III interface, (see SD-99421-01)			Y		25
	When circuit connects to F-type signaling application schematic and bay wiring circuit, type II interface (see SD-99421-01)			Z		
Univ Trunk Scanner, SD-2H161-01	Required on home frame when mate frame and home master scanner are not provided		KS-20203, L2 Plug E/W terminating resistors and straps furnished on home frame	W+		25
Program Store, SD-2H162-01	When frame is	PS-0		Z+		10
		PS-1		Y+		
		PS-2		X+		
		PS-3		W+		
Line and/or Trunk Switch, SD-2H163-01	Line scanner unit			S+		30
	Grid switch unit arranged for range extension			Z+		
	Line scanner unit connectorization			T+		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Trunk Peripheral Decoder Applique For Use with Switch Gain Repeaters, SD-2H170-01	Used as trunk peripheral decoder applique			Z+	Eqpt Note 202 and Info Note 305 on SD	25
	When used with switched gain repeater and no-test 2-way trunk ckt			Y+		
	When used to connect switched gain repeater to test circuits which do not require an applique			X+		
Attendant Loop Circuit with Autonomous Termination, SD-2H172-01	Idle Trunk Termination			Z+		25
Foreign Exchange Trunk Circuit, SD-2H174-01	Without E2S signaling			Z*	Eqpt Note 203 on SD	25
Customer Dial Pulse Receiver Circuit, SD-2H177-01	Circuit is associated with tandem tie-line cut-through ckt			Z		25
Foreign Exchange Trunk Circuit, SD-2H180-01	Used in tie-line cut-through service circuit	Yes		Fig. 2		25
		No		Z		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE			CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Line Access Trunk Circuit, SD-2H186-01	When the circuit is in 60-ipm state battery is provided on		Tip		Y		25
			Ring		Z		
Emergency Manual Line, SD-1A156-01	PBX lines require GRD on tip and individual lines				Z		60
	Transmission facility transferred from info and intercept trks				X		
	Ground start PBX lines				Y		
	When associated idle outgoing trunk provides battery on		Tip		N		
			Ring		M		
	For E/M lead supv		When associated with F-type signaling		K		
			When associated with E/M lead applique ckt		L		
	Transfer Circuit	Information and intercept emergency line group			3,S		
		Recording completing emergency line group	With master control center control		3,T		
			Without master control center control		3		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS (Cont)

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
TOUCH-TONE Station Test, SD-1A199-01	Circuit arranged for TOUCH-TONE® card dialer speed check	No		Q		50
		Yes		P		
Master Scanner, SD-1A209-01	2-wire ferrod sensor operation		Connect ckt			20
Remote Master Scanner Applique, SD-1A210-01	Battery and ground provided by ESS office			Y Per 8 ckts		20
	Battery and ground provided by distant office			Z Per 8		
Emergency Manual 3C or 3CL Switchboard, SD-1A243-01	PBX lines require ground on tip and individual lines			Z		
	GRD start PBX lines			Y		60
	Fixed pad operation	2 dB pad reqd		X		
		No pad reqd		W		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Processor Frame, SD-1C910	Processor frame equipment and wiring	ESS No. 2B		Z		0
	Supplementary store wiring	Required		X		
		Not Required		S		
	Second 64K memory (128K total	Required		W		
		Not Required		R	See Note 202 on SD	
	Third 64K memory (192K total	Required		V		
		Not Required		Q	See Note 202 on SD	
	Fourth 64K memory (256K total)	Required		T	See Note 202 on SD	
		Not Required		N	See Note 202 on SD	
	$\binom{O}{1}$ SZ1 $\binom{O}{1}\binom{N}{P}$ and $\binom{O}{1}$ RL1 $\binom{O}{1}\binom{N}{P}$ bus termination resistors	Required Both Buses		J		
		Required West Bus		K		
		Not Required		M		

TABLE A (Cont)

NO. 2 ESS CIRCUITS WITH CROSS-CONNECTIONS

TITLE AND SD NUMBER	FEATURE		CROSS-CONNECTION METHOD	OPTION	DETAILED X-CONN INFO	% INSTALLATION INTERVAL COMPLETED
Processor Frame, SD-1C910 (Cont)	$\binom{O}{1}$ DAT $\binom{P}{N}$ East and $\binom{O}{1}$ DAT $\binom{P}{N}$ West bus termination resistors	Required Both Buses		E		
		Required West bus		F		
		Not Required		G		
Maintenance Frame, SD-1C912-01	Maintenance frame	ESS 2B		Z		0
Ringing and Tone, SD-81870-01	Ringing generators, tone generators, transfer, control, distribution, and interruptions	Ac-dc ringing		Z+		25
		Superimposed ringing		2,Y+		