

CROSS CONNECTS

NO. 5 CROSS BAR MODIFIED FOR "CENTREX"

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1. GENERAL

1.01 This practice describes the cross connects commonly used for Centrex. Description of all cross-connectable equipment is supplied along with sketches illustrating "typical" connections.

2. AUTOMATIC TRANSFER TEST LINE (ST-521143)

2.01 The Automatic Transfer Test Line provides a means of testing transfer features in connection with any incoming

trunk to a plant test number connected to the test line.

2.02 The cross connects necessary are as follows:

(a) A plant test number must be assigned to the A.T.T.L. (ST-521143). This is the number usually assigned to the incoming trunk test line, (1117) with an "SC" relay, and transferable ringing combination.

(b) Connection to an incoming trunk test line. This can be any arbitrary test number with a line-link frame assignment to which the incoming trunk test line (SD-25771-01) or (SD-27640-01) is connected.

(c) Transfer Register, (refer also to par. 3) Automatic Transfer to the I.T.T.L. from the A.T.T.L. is made possible through the proper translation of A, B, C, D, and E (if required) cross connects in the transfer register. These cross connects correspond to the number assigned to the incoming trunk test line along with office indication.

TABLE A

AUTOMATIC TRANSFER TEST LINE				
1. Assignments required are as follows:				
A. Plant test number for A.T.T.L. Example: (ABC-1117) with line-link frame, "SC" relay and CTX. terminal hunting ringing combination. (RC-05).				
B. Incoming trunk test line. Example: (ABC-1121) with line-link frame, CTX. class of service, "SC" relay assignment, and non-CTX ringing combination.				
2. Frame cross connects are as follows: (example)				
FROM	Remarks	TO	Remarks	Refer
NS	"SC" of ABC-1117	NS1	A.T.T.L.	ST-521143
LS1	"LS" of ABC-1117	LS1	"	"
LS	"LS" of ABC-1121	LS	"	"
NS	"SC" of ABC-1121	NS	"	"
R	"R" of ABC-1117	R1	"	"
T	"T" of ABC-1117	T1	"	"
R	"R" of ABC-1121	R	I.T.T.L. (SD-25771-01)	"
T	"T" of ABC-1121	T	"	"

TABLE A (Continued)

3. Transfer Register cross connects (example I.T.T.L. ABC-1121)					
<u>FROM</u>		<u>Remarks</u>	<u>TO</u>		<u>Refer</u>
T.S.	Pchg		T.S.	Pchg	
D	31	"A" digit of ITTL	E	13	A2/5 - 0 ST-521128
D	32	" " " "	E	23	" - 1 "
D	33	"B" " " "	E	14	B - 0 "
D	34	" " " "	E	24	" - 1 "
D	35	"C" " " "	E	15	C - 0 "
D	36	" " " "	E	35	" - 2 "
D	37	"D" " " "	E	16	D - 0 "
D	38	" " " "	E	26	" - 1 "
F	15	Office indication	G	14	Office "A" "

## 3. TRANSFER REGISTER CIRCUIT (ST-521128)

3.01 The Transfer Register receives information in the form of dial pulses from the transfer trunk circuit. And when the entire number is received, it transfers this information to the completing marker so a connection can be set up between the incoming trunk and the (transferred to) PBX station.

3.02 The cross connects necessary in the Transfer Register are as follows:

(a) Office indication. This restricts the "Transferrer" to transfer within the same office in the marker group.

(b) Number match start. The Transfer Register can be arranged to seize the number match circuit after 1, 2, or 3 digits have been received.

(c) Automatic transfer test line. (See 2.02(c)).

Provide proper translation to allow the A.T.T.L. to automatically transfer to a predetermined number.

(d) Marker start. (For five digit transfer only.)

TABLE B

TRANSFER REGISTER CIRCUIT					
1. Cross connects necessary are as follows:					
A. "Office indication." This is accomplished by cross connecting the class of service of the PBX station to either OA, OB, or AB.					
Example: PBX sta. cls. svc. is .05. PBX located in OA					
<u>FROM</u>	<u>Remarks</u>	<u>TO</u>	<u>Remarks</u>	<u>Refer</u>	
T. S. Pchg	CS-05	T. S. Pchg	OA	ST-521128	
J 12		K 56		FS-4C	
B. Number match start (ref. ST-521128 FS 6)					
<u>FROM</u>	<u>Remarks</u>	<u>TO</u>	<u>Remarks</u>		
T. S. Pchg	NMS	T. S. Pchg			
X 48		F 16		When one digit number matching is required.	
or					
X 48	NMS	F 26		When two digit number matching is required.	
or					
X 48	NMS	F 27		When three digit number matching is required.	

TABLE B (Continued)

C. Automatic transfer test line (Refer to Par. 2.01C, and Sketch A Par. 3)					
D. Marker start. (This cross connect is necessary only when five digit transfer is provided.)					
<u>FROM</u>		<u>Remarks</u>	<u>TO</u>		<u>Remarks</u>
T. S.	Pchg		T. S.	Pchg	
B	18	MST	F	47	"E" Steering

4. NUMBER MATCH CIRCUIT (ST-521131)

4.01 The Number Match Circuit receives customer class of service and dialed digit information from the Transfer Register. It determines whether to restrict or complete a dial transfer call. This is accomplished by associating the class of service of the "transferer" with the A, AB, or ABC digits of the number dialed.

5. INTRAOFFICE METALLIC TRUNK CIRCUIT (ST-521138)

5.01 All cross connects are the same as for any IAO trunk group with the exception of the tie line test feature. This feature tests the ability of the trunk "LS" relay to operate under a maximum loop condition. This test is performed from the master test frame using a tie line code and an official class of service.

5.02 It is also necessary to connect the CP-Punching of the associated route relay to ground. This can be done by using the CP3P terminal.

6. EXTRA NUMBER TRANSLATOR FRAME (ST-521140)

6.01 The Extra Number Translator, on all tie line operations, translates a cus-

tomers dialed tie line code (1XX) into a tie line group pilot number.

6.02 Cross connects are necessary to:

(a) Translate 1XX code to 3-digits of a directory number.

(b) Cause operation of a route relay for seizure of a IAO metallic or flat rate trunk group.

(c) Allow the marker to seize the tie line number group. (See 6.03).

6.03 Completing marker (ENT functions) (ST-521120) (SD-26002)

(a) A tie line call is signaled to the marker from the originating register by ground on the "2DT" lead. This (thru cross-connection) operates the (ET) and (ETA) relays to ground one of the ETOO-99 code points. The selected code grounds (ENT-) punchings thru class of service sorting relays to operate an (ENT-) relay in the extra number translator frame. This, in turn, operates the (EXN-) relay which connects "NGS" battery to the "ENST" lead in the marker. The (ENST) lead is cross connected to the (ST-) lead associated with the "extra number group."

TABLE C

EXTRA NUMBER TRANSLATOR CIRCUIT	
1. Typical cross connects are as follows: (refer ST-521140)	
A. Translating IXX to a 3-digit directory number and route relay operation.	
Example: tie-line code assigned is 121	
pilot number assigned to ABC-2140	
ENT relay assigned is 03	
Extra route assignment is 01	

TABLE C (Continued)

<u>FROM</u>		<u>TO</u>		<u>Remarks</u>
T. S.	Pchg	T. S.	Pchg	
HB	2	ENT-03	HE	X-Conn for each mkr.
TB	4	"	TE	" " " "
U	0	"	UE	" " " "
ER	1	"	R	" " " "

NOTE: Translation for the thousands digit 2 (in this case) is not necessary because the tie-line number group has already been pre-determined by the marker

7. DIAL TONE MARKER (ST-521120)  
(SD-26001)

7.01 On a dial tone request, the Dial Tone Marker functions are the same as on a regular call except a Centrex subscriber initiating the call must indicate to the marker that it is a "PBX" class. This is accomplished by cross connecting the "PBX" punch-

ing in the marker to those classes of service within the PBX. (CS-punchings).

7.02 On transfer, the marker is signaled over the "LMF" lead to operate the "MF" relay which routes the call to a transfer trunk group. Therefore, all transfer trunks are assigned to "TB-0" and "TG-01" in the trunk link frames.