

CIRCUIT DESCRIPTION

CD-65733-01

Issue 5-D

Dwg. Issue 5-D

**P.B.X. SYSTEMS
NO. 507A OR 507B
2 WAY AUTOMATIC TIE TRUNK
CIRCUIT**

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The value for the winding resistance of the (F) relay in Fig. 2 is changed from 1200Ω to 2500Ω to agree with a UA15 relay specified in the Circuit Requirement table. All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

1.1 This circuit is used to connect a 507A or 507B PBX to another manual PBX or to the manual section of a dial PBX and extend the connection from this tie trunk to a station, central office trunk or to another tie trunk circuit.

2. WORKING LIMITS

	<u>Outgoing</u>	
Max. ext. ckt. loop	Max. 50 Volts	Max. 25 Volts
	Min. 16 Volts 1200Ω	2060Ω
	Min. 18 Volts 1400Ω	2340Ω
	Min. 20 Volts 1570Ω	
	Min. 32 Volts 2500Ω	
	Min. 44 Volts 3600Ω	
Min. ins. res.	30,000Ω	30,000Ω

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NO. 507A OR 507B
2 WAY AUTOMATIC TIE TRUNK CIRCUIT

Incoming

Max. ext. ckt. loop	Min. voltage at distant PBX	
	14 Volts	1785 Ω
	20 Volts	2600 Ω
	32 Volts	4200 Ω
	44 Volts	5500 Ω
Min. ins. res.		20,000 Ω

3. FUNCTIONS

- 3.1 Automatic line lamp signaling.
- 3.2 Line lamp supervision.
- 3.3 Outgoing, signaling battery supplied toward the distant PBX.
- 3.4 Incoming, high-low supervision.
- 3.5 Provides talking path between two PBX's.
- 3.6 Provides automatic idle line termination.

4. CONNECTING CIRCUITS

When this circuit is listed on a key sheet the connecting information thereon is to be followed.

- 4.1 No. 507A or 507B Station Line, Trunk, Connecting Telephone, Ringing Buzzer and 2-Way Ring Down Tie Trunk Circuits — (SD-65680-01).
- 4.2 Automatic Tie Trunk Circuit — (SD-66524-01 typical).

DESCRIPTION OF OPERATION

5. OUTGOING CALL FROM A STATION

5.1 An outgoing call with the "Station & Tie Trunk" keys operated, relay (F) operates over the "A" lead to ground on the station key. Relay (F) operated operates relay (A) and opens the operating path for relay (G). Relay (A) operated (1) lights the line lamp for answering supervision by transferring the "S" lead to ground under control of the relay (L), (2) operates relay (C) and (3) removes the idle line termination by disconnecting resistor (F) from terminal 7 of repeating coil BB. Relay (C) operated (1) disconnects relay (S) from the line, (2) connects relay (L) to the line, (3) connects ground to insure its own lockup and (4) partially completes a path across capacitor (F) through resistor (E). Battery and ground are connected to the line through the windings of the

repeating coil, relay (L), and resistance lamp (D). This causes operation of the line relay in the distant tie trunk circuit.

5.2 Outgoing Call From a Central Office Trunk or Another Tie Trunk

When the "trunk" key is operated in connection with a central office trunk or another tie trunk, relay (G) operates. Relay (G) becomes a holding bridge and operates relay (A). The resulting operation of relay (A) is the same as covered in (5.1).

5.3 Call Answered at Distant PBX

The call is answered at the distant PBX by the attendant, causing the line relay at that end to become low resistance which causes the operation of relay (L) in this circuit. Relay (L) extinguishes the line lamp signal.

5.4 Disconnection

When the distant PBX attendant disconnects first, the resistance of the circuit at that end increases causing relay (L) at this end to release and relight the line lamp as a disconnect signal. When the attendant at this end disconnects by restoring the "tie trunk" key relay (F) or (G) releases, releasing (A), which releases (C). During the releasing time of (C) the (E) resistor is connected across capacitor (F) to discharge it to avoid subsequent kickup of relay (S).

When the attendant at this end disconnects first the operation is as described above, except that relay (L) is released by relay (C). Relay (C) released removes battery and ground from the line to transmit a disconnect signal to the distant PBX.

6. INCOMING CALL

6.1 A call originated at the the distant tie trunk supplies battery and ground to the line causing relay (S) in this circuit to operate through both windings. Relay (S) operated lights the line lamp and provides ground for locking relay (LU).

6.2 Answering

The attendant answers by operating the "tie trunk" key. Relay (G) operates from battery and ground furnished by the connecting path. Relay (G) operated operates relay (A). Relay (A) operated:

- (1) shunts the high winding of relay (S) to give supervision to the distant PBX.
- (2) extinguishes the line lamp and transfers the "S" lead to the back contact of relay (S) for a disconnect signal,

- (3) completes the circuit for the operation of relay (LU),
- (4) provides a locking path for relay (LU).
- (5) Removes the idle line termination by disconnecting resistor (F) from terminal 7 of repeating coil BB.

Relay (LU) operated:

- (1) locks to ground under control of relay (S) and relay (A).
- (2) opens the operating path of relay (C).

If the call is for a central office trunk, or another tie line circuit, relay (G) remains operated and becomes a holding bridge. If the call is for a station, ground from the station key operates relay (F). Relay (F) operated:

- (1) releases relay (G) by opening its operating path,
- (2) provides ground to keep relay (A) operated.

6.3 Disconnection

If the attendant at the distant PBX disconnects first, battery and ground are removed from the line causing relay (S) to release. Relay (S) released lights the line lamp as a disconnect signal.

If the attendant at this end disconnects first relay (F) or (G) releases causing relay (A) to release. Relay (A) released:

- (1) removes the shunt from the high winding of relay (S) sending a disconnect signal to the distant PBX.
- (2) Connects the idle line termination.

Relay (LU) remains operated until relay (S) releases which provides a locked out line lamp.

7. MISCELLANEOUS

- 7.1 (D) resistor is provided to make relay (LU) slow releasing.

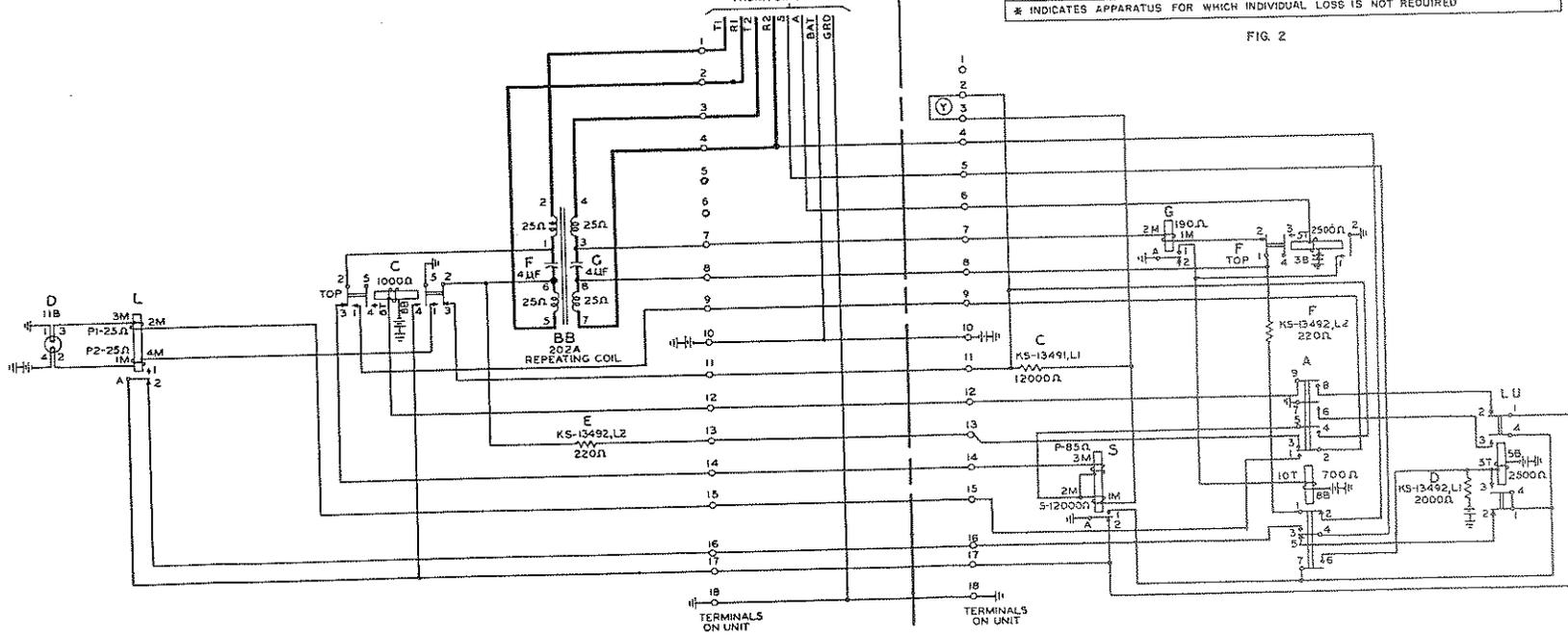
CIRCUIT NOTES

FEATURE OR OPTION	PROVIDE	
	APP. FIG. OR WIR.	QUANTITY
2 WAY TIE TRUNK	1, 2	1 PER CIRCUIT
WHEN TIE TRUNK AT DISTANT PBX REQUIRES 12000Ω HIGH BRIDGE AT THIS PBX.	Y	1 PER CIRCUIT
OTHER	1, 2	1 PER CIRCUIT

NO. 507A OR 507B
2 WAY AUTOMATIC TIE TRUNK
CIRCUIT

FIG. 1

TO 507A OR 507B STATION
LINE TRUNK, CONNECTING,
TELEPHONE RINGING,
BUZZER AND 2-WAY TIE
TRUNK CIRCUIT



WORKING LIMITS

AX. EXT. CKT. LOOP	OUTGOING MAX. 50V	MAX. 25V	INCOMING MIN. VOLTS AT DIST. PBX
MIN. 16V	1200Ω	2060Ω	14V 1785Ω
MIN. 18V	1400Ω	2340Ω	20V 2600Ω
MIN. 20V	1570Ω	32V 4200Ω	32V 5500Ω
MIN. 32V	2500Ω		
MIN. 44V	3800Ω		
MIN. 45V	3700Ω		

IN. INS. RES 30000Ω 30000Ω 20000Ω

TRANSMISSION TEST REQUIREMENTS
(1000 CYCLE LOSS BETWEEN 600Ω LINES)

MAX ALLOWABLE CIRCUIT LOSS (db)	
(bb)	1.5
(g)*	
(f)	
(l)*	

ALLOWABLE INDIVIDUAL APPARATUS LOSSES (db)

APPARATUS	DESIG	CODE	MAX. LOSS	MIN. LOSS	REMARKS
CAPACITOR	F, G	4 μF	19.6	17.5	
REP. COIL	BB	202A	1.5	0.6	

* INDICATES APPARATUS FOR WHICH INDIVIDUAL LOSS IS NOT REQUIRED

FIG. 2

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5D	4A	DWG. ISS.
5D	4A	C.D. ISS.

SD-65733-01 NO. 507A OR 507B 2 WAY AUTOMATIC TIE TRUNK CIRCUIT
ISS. 14A50

SD-65733-01															CIRCUIT REQUIREMENTS															A
2 WAY AUTOMATIC TIE TRUNK CIRCUIT (2 WY AUTO TIE TRK)																														
APPARATUS				MECH REQ			CIRCUIT PREPARATION					TEST SET PREP			DIRECT CURRENT FLOW REQ					REMARKS										
DESC	CODE	OPTION	CAT FIG.	BSP FIG.	CONT PRESS	ARM TRVL	BLOCK OR INSULATE	TEST CLIP DATA		TEST SET PREP	SEE TEST NOTE NO.	TEST WDG	TEST FOR	AFTER SOAK MA.	TEST MA.	READ MA.														
								CONN BAT.	CONN CRD																					
RELAYS																														
A	U1317		2	117 / 148		47				T(A)	GRD			0	19	18														
C	U352		1	108 / 108		47				T(C)	GRD			0	14.4	12.7														
F	UA15		2	110 / 101		35				T(F)	GRD			0	5.3	5														
G	B1136		2	11		30				1M(G)	2M(G)	B/G		0	17	4.2	4													
L	B1165		1	14		40				2M(L)	4M(L)	H	P1/P2	0	65	10.8	10.2	MAX. 50V SUPPLY												
						30				2M(L)	4M(L)	H	P1/P2	R	65	5.9	6.3													
						30				2M(L)	4M(L)	H	P1/P2	0	65	6.5	6.1	MAX. 25V SUPPLY												
						30				2M(L)	4M(L)	H	P1/P2	R	65	3.2	3.4													
LU	UA93		2	110 / 110		35				T(LU)	GRD			0	5.2	4.9	WDG ALONE													
							5B(A)			T(LU)	GRD			0	12.6	12	2000Ω RES													
S	B1098		2	8		30				3B(C)	3T(C)	B/G	P/S	0	0.8	0.7														
							(C)O			3B(C)	3T(C)	B/G	P/S	R	0.1	0.2														
										5T(A)	3T(C)	B/G	P	0	6.2															
										5T(A)	3T(C)	B/G	P	R	1.3															

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