

VOICE CONNECTING ARRANGEMENTS C27 AND C2K

1. GENERAL

1.01 This section provides identification, installation, operation, maintenance, and connecting information for Voice Connecting Arrangements C27 and C2K. Voice Connecting Arrangements C27 and C2K consist of an interconnecting unit J53050C, List 2 and an interconnecting unit J53050D, List 1. Voice Connecting Arrangement C27 provides 2-wire voice transmission with E and M type signaling between a customer-provided (CP) communications facility and a Bell System PBX trunk circuit. Voice Connecting Arrangement C2K provides the same service when used with Bell System Centrex—CU equipment.

1.02 If the customer wants a copy of the Technical Reference which covers this interface specification, the customer should contact the local Telephone Company Business Office or the Marketing Representative.

1.03 This issue of the section is based on the following drawings:

CD-1E207 Issue 1

SD-1E207 Issue 1

CD-1E254 Issue 1

SD-1E254 Issue 1

If this section is to be used with equipment or apparatus reflecting later issue(s) of the drawing(s), reference should be made to the SDs and CDs to determine the extent of the changes and the manner in which the section may be affected.

2. IDENTIFICATION

PURPOSE

- To provide a 2-wire connection between CP communication facilities and Bell System PBX or Centrex System
- To provide E and M signaling from and to CP communication facilities

- To limit excessive levels from CP communication facilities and to provide protection for personnel against hazardous voltages.

ORDERING GUIDE

- J53050C, List 2 Interconnecting Unit, for Voice Connecting Arrangements C27 and C2K—each unit provides four signal isolation (applique) circuits. (See Fig. 1).
- J53050D, List 1 Interconnecting Unit, for use with 2-wire facilities—each unit provides four voice coupler circuits. (See Fig. 2).

Associated Apparatus (Order Separately)

- Cable, Wiring, "D" inside, or equivalent (for cabling from connecting arrangement to interface connecting block)
 - Block, Connecting, 66M1-50 (Fig. 3)
- Note:** Other types of blocks may be used when specified by local engineering.
- Clip, Bridging, B (25 per pkg).

Replaceable Components

- Fuses, 70A (1-1/3 ampere)—J53050C, List 2 Interconnecting Unit
- Relays, 303K—J53050C, List 2 Interconnecting Unit.

DESIGN FEATURES

J53050C, List 2 Interconnecting Unit

- Mounts on standard 23-inch relay rack
- Size—4 by 23 inches
- Four signal isolation (applique) circuits per unit
- Accepts ground and battery supervisory signals over CFM lead from CP facilities

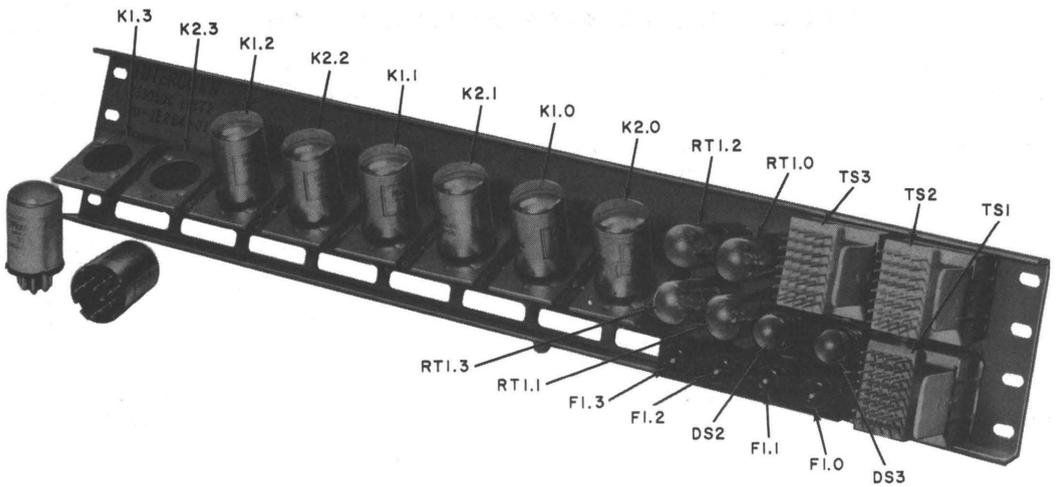


Fig. 1—J53050C, List 2 Interconnecting Unit

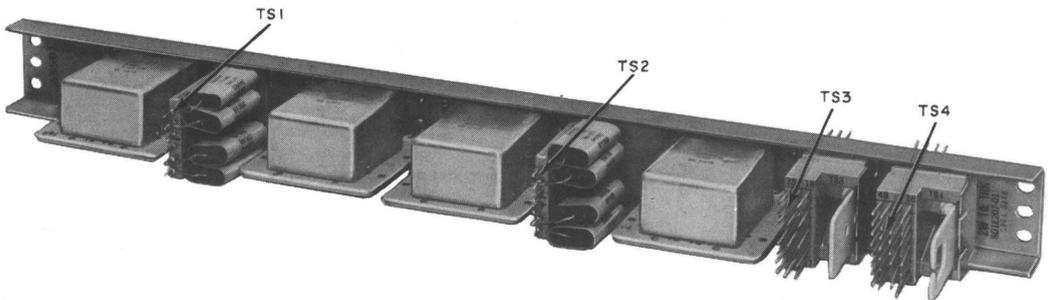


Fig. 2—J53050D, List 1 Interconnecting Unit

- Provides closure (to ground) and open supervisory signals over CFE lead to CP facilities
- Provides DC isolation of the signaling leads between the CP facilities and the signaling lead extension unit.

J53050D, List 1 Interconnecting Unit

- Mounts on standard 23-inch relay rack.
- Four circuits per unit on 2-inch by 23-inch mounting plate.

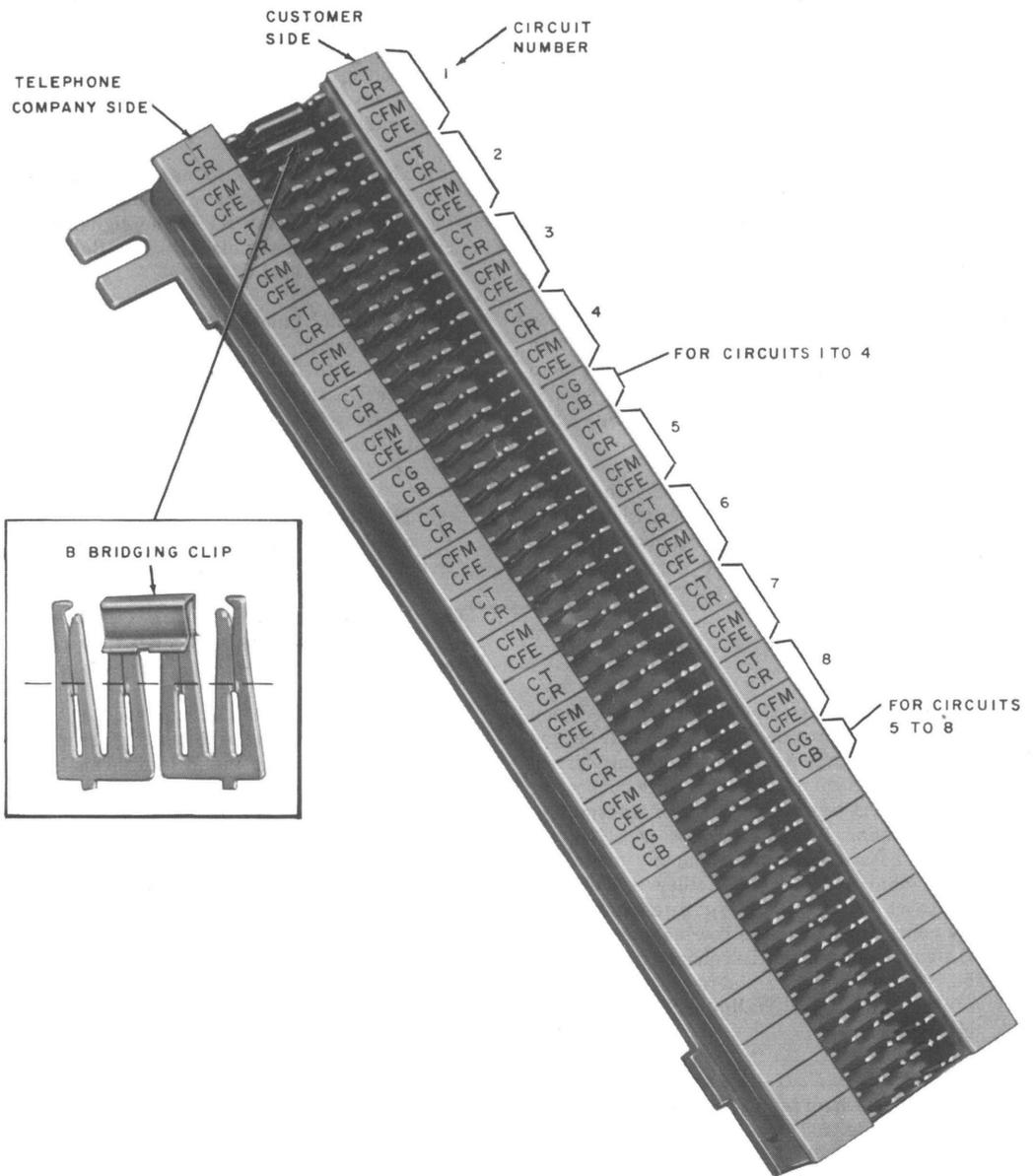


Fig. 3—Typical Interface Connecting Block

- Each circuit provides a 2-wire voiceband transmission path (voice coupler) to and from the CP facilities.
- Provides impedance match of either 600 ohms to 600 ohms (option Z) or 900 ohms to 600 ohms (option Y).
- Provides transformer isolation and hazardous voltage protection between CP facilities and Bell System equipment.

3. INSTALLATION

3.01 Locate the voice connecting arrangements in an area free of dampness and excessive dust or dirt, with adequate room for access to front and rear of equipment and connecting blocks. The associated equipment typically mounts on a standard 23-inch relay rack.

3.02 Use the "D" inside wiring cable or equivalent to terminate the leads associated with the CP equipment on the interface connecting block. Stencil trunk number and lead designations on interface connecting block designation strip (see Fig. 3).

4. OPERATION

Note: The operational details for Voice Connecting Arrangements C27 and C2K depend on the requirements of the switching system to which it is connected. The voice connecting arrangement provides a means of transmitting voice, dialing, and answer/disconnect signals between the Telephone Company switching equipment and the CP facility. When the distant end switching equipment is customer-provided, close coordination between the customer and the Telephone Company will be required to insure end-to-end compatibility of the terminal signaling and supervision circuits.

4.01 *Incoming Call—Voice Connecting Arrangements C27 (PBX) and C2K (Centrex-CU) Fig. 4*

- (a) The CP communications facility seizes the connecting arrangement by placing ground on lead CFE. This operates the K1 relay in the signal isolation (applique) circuit which in turn places ground on the E lead toward the

Bell System PBX tie trunk or the Centrex-CU equipment. The Bell System equipment responds to this seizure by connecting dial pulse receiving equipment to the E lead and returning dial tone, if provided, to the CP communications facility over leads CT and CR to indicate readiness to receive dial pulses.

(b) The CP communications facility transmits dial pulses by alternately opening and closing the CFE lead. Relay K1 in the signal isolation circuit repeats dial pulses to the Bell System equipment over lead E.

(c) When dial pulses have been received, the Bell System equipment transmits answer supervision to the CP communications facility by placing battery on the M lead. This operates the K2 relay in the signal isolation circuit which in turn places battery on the CFM lead toward the CP facility.

(d) The J53050D Interconnecting Unit (voice coupler) provides a 2-wire transmission path from the CP facility to the Bell System equipment.

4.02 *Outgoing Call-Voice Connecting Arrangements C27 (PBX) and C2K (Centrex-CU) Fig. 4*

(a) The Bell System tie trunk or Centrex-CU equipment seizes the connecting arrangement by placing battery on the M lead. This operates the K2 relay in the signal isolation circuit which in turn places battery on the CFM lead toward the CP facility; dial tone, if provided, is returned from the distant end over leads CT and CR. The Bell System equipment then outpulses the digits by alternately applying battery and ground to lead M. The digits are repeated to the CP facility over lead CFM.

(b) The CP facility indicates answer supervision by placing ground on lead CFE which operates K1 relay in the signal isolation circuit in the same manner as an incoming call. The resulting K1 contact closure repeats the answer supervision to the Bell System equipment by grounding the E lead.

(c) The J53050D Interconnecting Unit (voice coupler) provides a 2-wire transmission path from the Bell System equipment to the CP facility.

4.03 *Disconnect—Voice Connecting Arrangements C27 (PBX) and C2K (Centrex-CU) Fig. 4*

- (a) When the Bell System end goes on-hook first, the Bell System equipment removes battery from lead M which releases the K2 relay in the signal isolation circuit. The K2 relay released removes battery from and applies ground to the CFM lead toward the CP facility. This ground is recognized by the CP facility as a disconnect signal. The CP facility subsequently removes ground from the CFE lead which in turn causes the K1 relay in the signal isolation circuit to release, which removes ground from the E lead toward the Bell System equipment restoring the connecting arrangement to the idle condition.
- (b) When the customer end goes on-hook first, the CP facility removes ground from lead CFE toward the signal isolation circuit causing the K1 relay to release which removes ground from lead E toward the Bell System equipment. The Bell System equipment subsequently removes battery from lead M which releases the K2 relay in the signal isolation circuit. Relay K2 released removes battery from and applies ground to the CFM lead toward the CP facility, restoring the connecting arrangement to the idle condition.

5. MAINTENANCE

5.01 Where there is an indication of trouble in the connecting arrangement(s), the circuit at fault must be opened at the interface connecting block to verify in which direction the trouble exists. The circuit can be opened at the connecting block by removing the B bridging clip associated with each lead.

5.02 Precautions should be taken when performing tests to avoid adversely affecting service to the customer. Local instructions should be followed with reference to notifying the customer before performing the test.

5.03 *Apparatus Required to Perform Tests*

- (a) Test cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), one KS-6278 connecting clip, and one 411B (test pick) tool (for connecting battery to alarm bar of 70-type fuses).

Note: To connect battery to the alarm bar of 70-type fuses mounted in a 21A fuse block, insert the tip of the 411B tool (attached to the 1W13B cord) into the aperture provided in the fuse block cover, and touch the alarm bar.

- (b) Volt-ohm-meter capable of measuring —48 volts and 1000 ohms. Two clip leads, one of sufficient length to reach from the interface connecting block to the connecting arrangement.

5.04 *Tests—J53050C, List 2 Interconnecting Unit*

- (a) Using 893 cord, connect battery to alarm bar of fuse(s) on interconnecting unit—fuse alarm lamp DS3 should light.

(b) Open all of the leads of the circuit under test at the interface connecting block except leads CB and CG. Remove leads E and M from the Bell System PBX or Centrex-CU equipment. To check customer battery (—48 volts) connect the volt-ohm-meter across leads CB and CG with the negative lead (black) on CB and the positive lead (red) on CG. The volt-ohm-meter should indicate 48 volts. Apply Bell System battery (—48 volts) to lead M; relay K2 should operate, indicated by battery (—48 volts) present between lead CFM and CG. If K2 relay does not operate, replace it with a relay known to be good; if battery still is not present across leads CFM and CG, measure the resistance between the two leads. If resistance measures zero, check for open on lead M; if resistance measures 1000 ohms, check for faulty RT1 resistance lamp or blown fuse; if resistance measures infinity, check for open on lead CFM or CG.

(c) Connect lead CFE to lead CG. The K1 relay should operate, indicated by a ground on lead E. If K1 relay does not operate, replace it with a relay known to be good; if K1 relay still does not operate, check for open on leads CFE, CG, or E.

(d) On completion of tests, reconnect leads E and M to the signal lead extension unit or the Bell System PBX or Centrex-CU equipment. Replace the B bridging clips at the interface connecting block associated with the circuit under test.

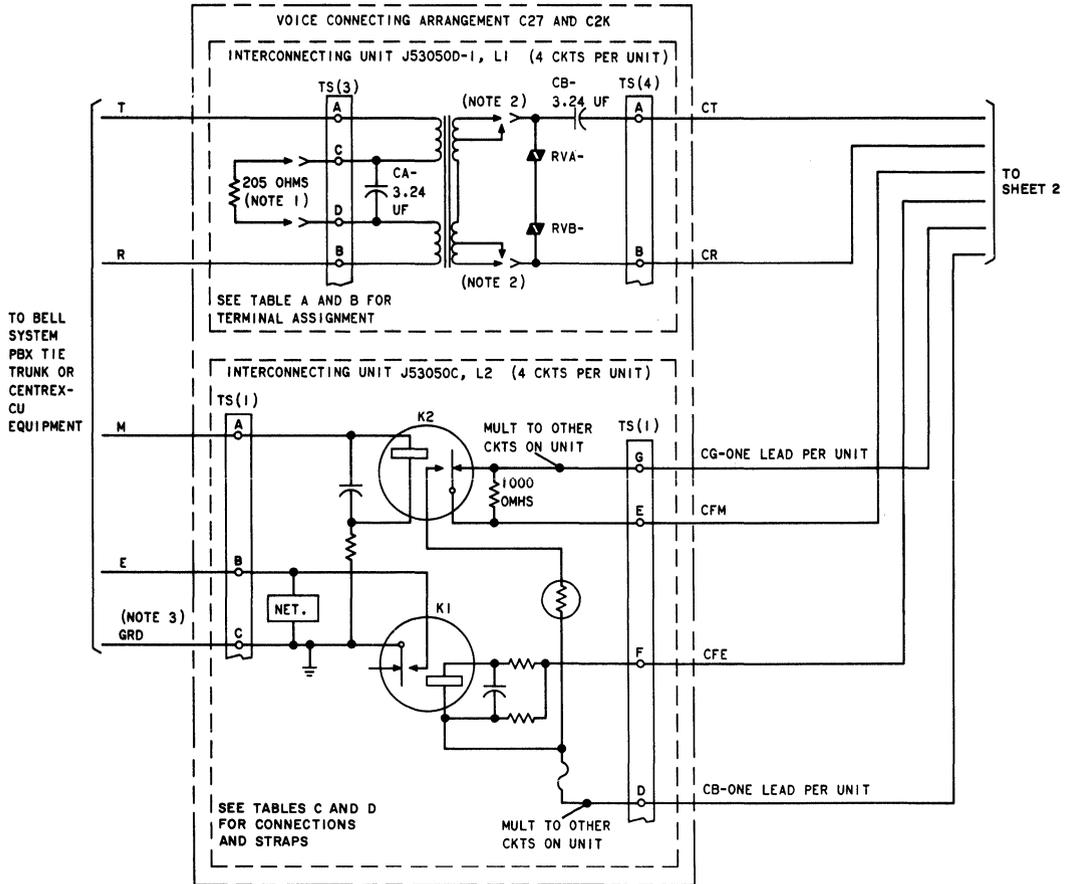


Fig. 4—Connections For Four Circuits—Voice Connecting Arrangements C27 and C2K

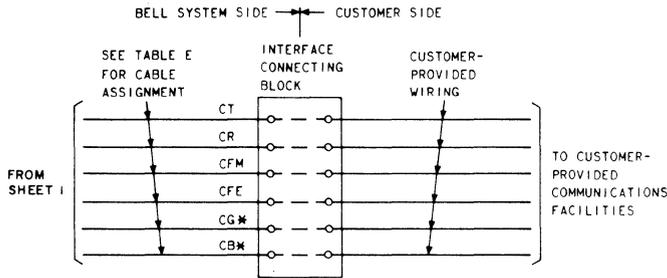


TABLE D
STRAPS ON J53050C, LIST 2

TS(1)		TS(2)		TS(3)	
FROM	TO	FROM	TO	FROM	TO
54	33	58	28	58	28
44	33	48	38	48	38
34	43	38	57	38	57
24	43	47	37	47	37
11	21	27	17	27	17
21	31	56	46	56	46
31	41	23	42	23	42
		13	52	13	52
		52	22	52	22
		12	51	12	51
		41	31	41	31
		21	11	21	11

TABLE A
TERMINALS ON J53050D, L1

CKT NO.	TERMINALS ON J53050D, L1					
	TS(3)			TS(4)		
	A	B	C	D	A	B
1	11	14	13	12	14	16
2	15	18	17	16	24	26
3	21	24	23	22	34	36
4	25	28	27	26	44	46

TABLE C
TERMINALS ON J53050C, L2-TS(1)

CKT NO.	TERMINALS ON J53050C, L2-TS(1)						
	A	B	C	D	E	F	G
0	38	28			48	58	
1	37	27	52	41	47	57	22
2	36	26			46	56	
3	35	25			45	55	

TABLE B
STRAPS ON J53050D, L1 TS(4) - (NOTE 2)

CKT NO.	OPTION Y		OPTION Z	
	FROM	TO	FROM	TO
1	17	16	15	16
	11	12	13	12
2	27	26	25	26
	21	22	23	22
3	37	36	35	36
	31	32	33	32
4	47	46	45	46
	41	42	43	42

TABLE E

CKT NO.	LEAD DESIG	CABLE COLOR	INTERFACE CONN BLK TERM. NO.
1	CT	W-BL	1
	CR	BL-W	2
	CFM	W-O	3
	CFE	O-W	4
2	CT	W-G	5
	CR	G-W	6
	CFM	W-BR	7
	CFE	BR-W	8
3	CT	W-S	9
	CR	S-W	10
	CFM	R-BL	11
4	CFE	BL-R	12
	CT	R-O	13
	CR	O-R	14
1-4	CFM	R-G	15
	CFE	G-R	16
	CG*	R-BR	17
	CB*	BR-R	18

* - ONLY ONE CG AND CB LEAD PER FOUR CIRCUITS

Fig. 4—Connections For Four Circuits—Voice Connecting Arrangements C27 and C2K

5.05 Tests—J53050D, List 1 Interconnecting

Unit: Perform normal circuit order transmission tests. The insertion loss of the interconnecting unit is nominal 1 dB at 1000 Hz.



Do not attempt any tests or repairs to the CP equipment.

6. CONNECTIONS

6.01 For connecting information refer to Fig. 4.