

VOICE CONNECTING ARRANGEMENT DCW J58824CD INTERFACE TRUNK UNIT

1. GENERAL

1.01 This section provides identification, installation, operation, connecting, and maintenance information for Voice Connecting Arrangement DCW (see Fig. 1) when used with the 701A, B, 711A, B, 740E, 756A, 757A, 800A PBX Systems, No. 5 crossbar, No. 1 and No. 101 Electronic Switching Systems, and the No. 400 Switching System to provide interface connections between Bell System and customer-provided (CP) equipment. The equipment used to implement Voice Connecting Arrangement DCW is determined by the requirements of the specific installation (see Table A and Part 2, ORDERING GUIDE). A general description of the SD-66926-01 interface trunk circuit used for this connecting arrangement is covered in Section 981-261-100.

1.02 This section provides information formerly provided in Sections 473-135-201 and 473-135-501, which are hereby cancelled.

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

CD-66926-01, Issue 4B

SD-66926-01, Issue 11B

If this section is to be used with equipment or apparatus reflecting a later issue of the drawing, reference should be made to the CD and SD to determine the extent of the changes and the manner in which the section may be affected.

2. IDENTIFICATION

PURPOSE

- To provide dial access from rotary dial private branch exchange (PBX) stations to the CP equipment.

- To provide for accepting supervisory control signals from CP equipment.
- To provide a second dial tone to the calling party.
- To permit stations to dial additional dial pulse digits or TOUCH-TONE® after access for control of the CP equipment.
- To provide 2-way voice transmission between the Bell System PBX and CP equipment.
- To provide two calling ports for dual operation (not available when more than one circuit is required).
- To protect Telephone Company personnel and facilities from hazardous voltages.
- To limit abnormally high voice and supervisory signal levels from the CP equipment.
- To provide direct access by the attendant via a cord switchboard termination (optional). If the PBX is equipped with a console, the attendant must dial the access code.
- To provide called (paged) party access or "meet me" feature which provides direct telephone access by the called party to the calling party through the arrangement (optional). With certain PBX equipment this feature is provided within the PBX and is not a function of the arrangement.
- To provide for the conversion of dc dial pulse or TOUCH-TONE® signals into special control signals for use by the CP equipment (optional). These signals are available at the interface connecting block and consist of contact closures on a 2- out of 7-lead basis.

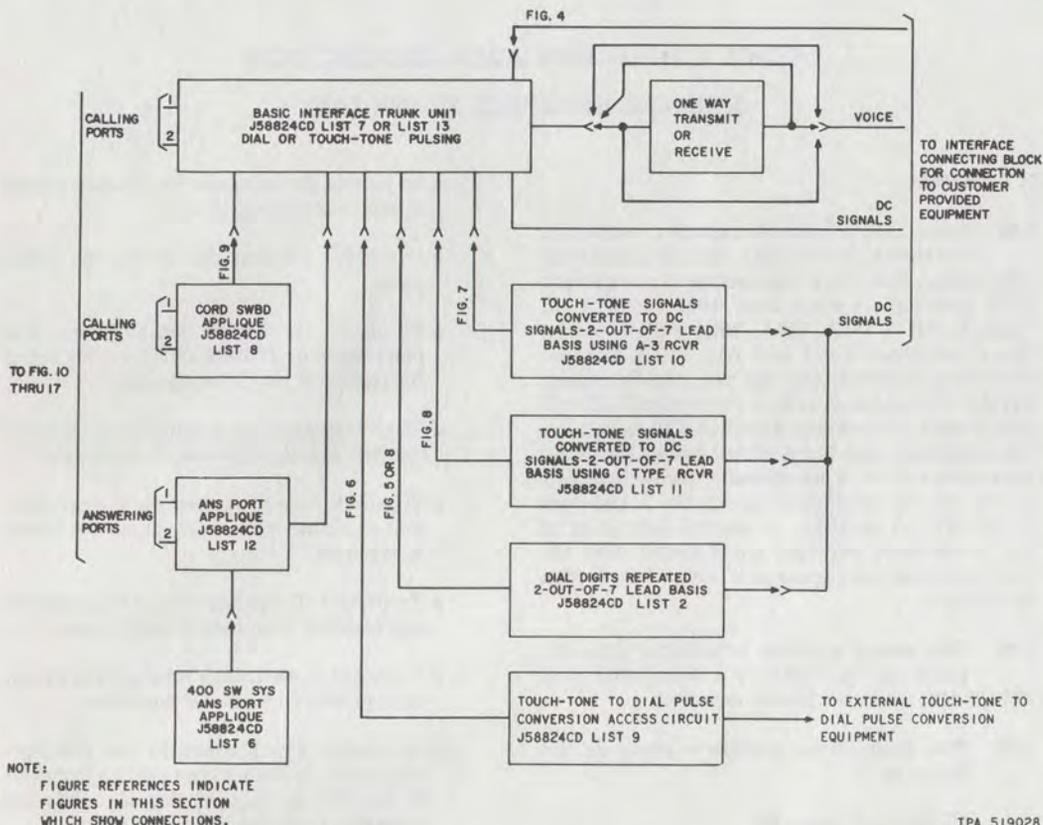


Fig. 1—Block Diagram—Voice Connecting Arrangement DCW (Interface Trunk Circuit SD-66926-01)

- To provide for the conversion of TOUCH-TONE signals to dial pulse signals for use by the CP equipment where PBX equipment configuration permits (optional).

ORDERING GUIDE

- J58824CD, List 7 Interface Trunk Unit—basic interface trunk for connection between CP equipment and Bell System equipment (except 800A PBX)
- J58824CD, List 13 Interface Trunk Unit—basic interface trunk for connection between CP equipment and Bell System 800A PBX
- J58824CD, List 2 Unit—required to convert dial pulse digits to dc signals on a 2-out of 7-lead basis
- J58824CD, List 8 Applique Unit—required for use with 552A, 552B, 552C, 552D, 605A, 608A switchboard
- J58824CD, List 9 Applique Unit—required to convert TOUCH-TONE signals to dial pulses (can be used with J58847N trunk converter or J58847T and J58847U common group TOUCH-TONE unit)
- J58824CD, List 10 Applique Unit—required to convert TOUCH-TONE signals to dc signals on a 2-out of 7-lead basis using an A3-type receiver
- J58824CD, List 11 Applique Unit—required to convert TOUCH-TONE signals to dc signals on a 2-out of 7-lead basis using a C-type receiver

TABLE A
EQUIPMENT SUMMARIZATION

EQPT CODE	TYPE	SCHEMATIC	REMARKS
J58824CD-1, List 1 (Mfr Disc.)	Assembly, wiring, and equipment for one inter- face trunk unit		Replaced by List 7
J58824CD-1, List 2	Assembly, wiring, and equipment required in addition to List 1, 7, or 13 to convert dial pulse digits to dc signals on a 2-out of 7-lead basis	SD-66926-01 Fig. 2	
J58824CD-1, List 3 (Mfr Disc.)	Assembly, wiring, and equipment for one appli- que unit when using 552A, 552B, 552C, 552D, 605A, and 608A swbd		Replaced by List 8
J58824CD-1, List 4 (Mfr Disc.)	Wiring and equipment required in addition to List 1 or 7 to provide called party access		Replaced by List 12
J58824CD-1, List 5 (MD)*	Wiring and equipment required in addition to List 1 or 7 to provide an isolation amplifier		Added to List 7 and List 13
J58824CD-1, List 6	Equipment required in addition to List 4 or 12 when interface trunk is used with No. 400 Switching System	SD-66926-01 Fig. 4	Apparatus option K
J58824CD-1, List 7	Assembly, wiring, and equipment for one inter- face trunk unit for dial pulse or TOUCH-TONE signaling	SD-66926-01 Fig. 1, 2B	Wiring options A, J, ZB, ZE, ZF, ZK, ZL, ZO, HB Apparatus options A, ZL, ZF, HB
J58824CD-1, List 8	Assembly, wiring, and equipment required in addition to List 7 or 13 for one applique unit for use with 552A, 552B, 552C, 552D, 605A, or 608A swbd	SD-66926-01 Fig. 3	Wiring options ZI, ZG, HB Apparatus option ZI
J58824CD-1, List 9	Assembly, wiring, and equipment required in addition to List 7 for one applique unit when TOUCH-TONE signals are converted to dial pulses.	SD-66926-01 Fig. 6	A local trunk converter (J58847N) or common group TOUCH-TONE units (J58847T) and J58847U) is required.
J58824CD-1, List 10	Assembly, wiring, and equipment required in addition to List 7 or 13 for one applique unit when TOUCH-TONE signals are converted to dc signals on a 2-out of 7-lead basis using an A3-type receiver	SD-66926-01 Fig. 7	Requires mounting space of three 2-inch mounting plates because of 275D mercury relay
J58824CD-1, List 11	Assembly, wiring, and equipment required in addition to List 7 for one applique unit when TOUCH-TONE signals are converted to dc signals on a 2-out of 7-lead basis using a C1- type receiver	SD-66926-01 Fig. 8	
J58824CD-1, List 12	Wiring and equipment required in addition to List 7 to provide called party access	SD-66926-01 Fig. 4	Apparatus and wiring option F
J58824CD-1, List 13	Assembly, wiring and equipment for one interface unit for dial or TOUCH-TONE pulsing with additional wiring and equipment required to provide connections to 800A PBX.		Wiring options X and ZS per SD-66926-01

* Circuitry formerly contained in List 5 is now part of the basic List 7 and basic List 13 unit.

- J58824CD, List 7, 12 Interface Trunk Unit—basic interface trunk unit arranged to provide called party access
- J58824CD, List 7, 12, 6 Interface Trunk Unit—basic interface trunk unit arranged to provide called party access when used with No. 400 Switching System.

Associated Apparatus (Order Separately)

- J58866A Auxiliary Power Unit (required when the connecting arrangement is not located in a CENTREX-type central office or when trunk is not located at PBX)

Note: This power unit meets acceptable noise requirements as explained under Power Supplies in Section 332-104-102. Other power units may be used when specified by local engineering.

- J58847N Trunk Converter or J58847T and J58847U Common Group TOUCH-TONE Units (required only when J58824CD, List 9 is provided)
- Cable, Wiring, "D" Inside, 16-Pair, or equivalent (for cabling from connecting arrangement to interface connecting block)
- Block, Connecting, 66M1-50 (Fig. 2)

Note: Other types of blocks may be used when specified by local engineering.

- Clip, Bridging, B (25 per pkg.).

DESIGN FEATURES**J58824CD, List 7 Interface Trunk Unit**

- Mounts on standard 23-inch relay rack
- Size—8 by 23 inches
- Provides basic circuit for connection between CP equipment and Bell System equipment on a PBX trunk level basis
- Provides called party access when equipped with List 12
- May be used with No. 400 Switching System when equipped with List 6.

J58824CD, List 13 Interface Trunk Unit

- Mounts on standard 23-inch relay rack
- Size—8 by 23 inches
- Provides basic circuit for connection between CP equipment and Bell System 800A PBX.

J58824CD, List 2 Unit

- Mounts on standard 23-inch relay rack
- Size—2 by 23 inches
- Provides circuit to convert dial pulse digits to dc signals on a 2- out of 7-lead basis.

J58824CD, List 8 Applique Unit

- Mounts on standard 23-inch relay rack
- Size—2 by 23 inches
- Provides circuit for use with basic unit when used with 552A, 552B, 552C, 552D, 605A, or 608A switchboard.

J58824CD, List 9 Applique Unit

- Mounts on standard 23-inch relay rack
- Size—2 by 23 inches
- Provides circuit to convert TOUCH-TONE signals to dial pulses (must be used with a local trunk converter or common group TOUCH-TONE unit).

J58824CD, List 10 Applique Unit

- Mounts on standard 23-inch relay rack
- Size—2 by 23 inches (requires space of three 2-inch mounting plates for mounting to clear the 275D mercury relay)
- Provides circuit to convert TOUCH-TONE signals to dc signals on a 2- out of 7-lead basis when an A3-type receiver is provided.

J58824CD, List 11 Applique Unit

- Mounts on standard 23-inch relay rack

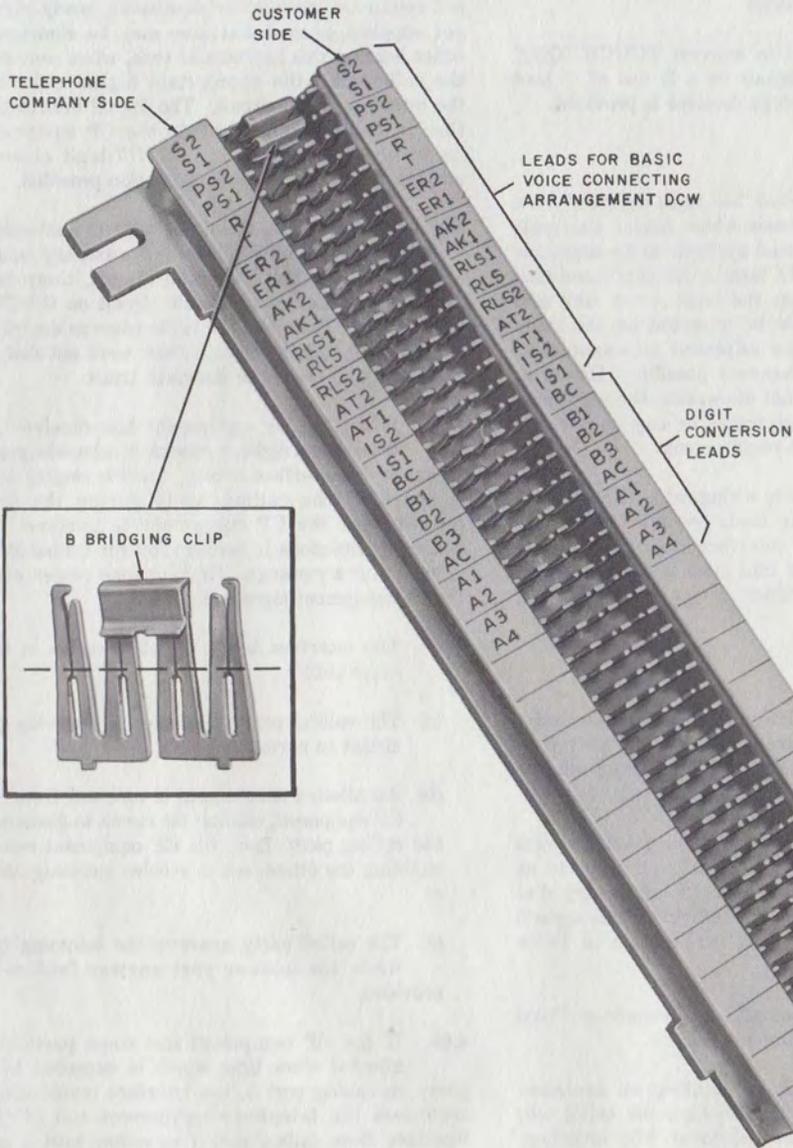


Fig. 2—Typical Interface Connecting Block

- Size—2 by 23 inches
- Provides circuit to convert TOUCH-TONE signals to dc signals on a 2- out of 7-lead basis when a C-type receiver is provided.

3. INSTALLATION

3.01 The interface trunk has been designed on a building block basis which makes the basic trunk unit and its optional applique units adaptable to a wide variety of PBX installation configurations. It is recommended that the basic trunk unit and required applique units be mounted on the same frame or bay, and be adjacent to associated connecting circuits, whenever possible. However, if space conditions do not allow this, the units may be mounted on another frame or bay as dictated by local job installation requirements.

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. 2).

4. OPERATION

4.01 The functional designations and a description of the signals transmitted and received at the interface connecting block for rotary dial or TOUCH-TONE pulsing are shown in Table B.

4.02 The functional designations and a description of the signals transmitted and received at the interface connecting block, when rotary dial or TOUCH-TONE signals are converted to dc signals on a 2- out of 7-lead basis, are shown in Table C.

4.03 Fig. 3 shows a simplified schematic of Voice Connecting Arrangement DCW.

4.04 *Incoming Call:* By dialing an assigned code from a calling station, the caller will be automatically connected to an idle interface trunk circuit. The interface trunk circuit completes the connection to the CP equipment. A second dial tone may be returned to the caller either under control of the CP equipment or immediately upon seizure if no warmup time is required or other reasons for delay exist. In the case of step-by-step PBXs associated with CP equipment which does

not require a warmup or equipment ready signal not supplied, second dial tone may be eliminated. After hearing this second dial tone, when provided, the caller dials the appropriate digital code into the interface trunk circuit. The digital information then is repeated directly into the CP equipment on either a DP or a 2- out of 7-lead closure arrangement depending on the option provided.

4.05 Where it is desirable to give the attendant at a manual PBX or dial auxiliary board access to the interface trunk circuit, there is a direct appearance of the trunk circuit on the PBX switchboard. The operation is the same as described in 4.04 except that the attendant need not dial an access code to reach the interface trunk.

4.06 When the CP equipment has received all the required digits, it returns an acknowledgment signal to the interface trunk. Audible ringing tone is heard by the calling party during the time required for the CP equipment to perform the necessary functions in preparation for transmitting or receiving a message. Ringing tone ceases when the CP equipment signals it is ready.

4.07 The interface trunk circuit remains in this state until:

- (a) The calling party disconnects, restoring the circuit to normal.
- (b) An allotted time signal is received from the CP equipment, causing the circuit to disconnect the calling party from the CP equipment return enabling the other port to receive incoming calls; or
- (c) The called party answers the incoming call when the answer port answer feature is provided.

4.08 If the CP equipment has some particular allotted work time which is exceeded by a party on calling port 1, the interface trunk circuit transfers the telephone equipment end of the interface from calling port 1 to calling port 2 and returns busy tone to the party holding on calling port 1. This frees the CP equipment to handle additional calls. If allotted time is exceeded on calling port 2 and calling port 1 is still held busy, the interface circuit transfers the telephone equipment end of the interface to the first busy port that becomes idle.

TABLE B
INTERFACE CONNECTING BLOCK DESIGNATIONS

TERMINALS	FUNCTION	CIRCUIT OPERATION
ER1, ER2	Equipment Ready	Closed by CP equipment when ready. If customer equipment is always ready, option R should be used in trunk circuit.
RLS, RLS1	Release	Momentarily opened by trunk during transfer from one entry port to another upon disconnect by calling party, an answer-back connection, or a time-out signal from CP equipment.
AK1, AK2	Acknowledgement	Closed by the CP equipment when last digit necessary has been received. Opened by customer equipment when ready to transmit or receive message.
RLS2, RLS	Release	Momentarily closed by trunk during a transfer from one entry port to another on disconnect by calling party, an answer-back connection, or a time-out signal from CP equipment.
AT1, AT2	Time Out	Closed by CP equipment when calling party attempts to exceed allowed time of equipment.
S1, S2	Seizure	Closed by trunk when seized by station. Open on disconnect.
IS1, IS2	In Service	Closed by CP equipment to indicate equipment in service. This is required at all times.
PS1, PS2	Pulsing	Closed by trunk when seized and opened approximately 60 msec for each dial pulse.
T, R	Talking Path	600-ohm termination for either transmitting to customer equipment option Y, or receiving from customer equipment option Z, or 2-way transmission option ZZ.

4.09 Seizure: Seizure of the interface trunk circuit is accomplished by closing the calling party loop to the tip and ring leads of one of the calling ports. Port 1 is always selected when both ports are idle. Closure of the tip and ring leads provides a seizure signal to the CP equipment by the operation of a relay. The sleeve lead is grounded to hold the switching train and make the interface trunk circuit busy to other incoming calls. A busy indication is sent to the attendant when a manual switchboard is associated with the interface circuit. Dial tone, if provided, is sent to the calling party when the CP equipment is ready to receive dial pulses.

4.10 Port 2 is available for seizure when the calling party on port 1 has exceeded the allotted time of the CP equipment or is talking to the called party via an answer connection. When calling port 2 is seized, the interface trunk circuit functions in the same manner as for port 1.

4.11 Seizure by Attendant at Manual Switchboard:

When the interface circuit is idle, an attendant may seize it by inserting a cord plug into the talk or dial jack. A cord plugged into the dial jack causes the operation of a relay which closes through the dialing loop and disconnects the tip (T) and ring (R) leads toward the talk jack.

4.12 A cord plugged into the talk jack will close the T and R leads to the circuit and light a busy lamp when a 552-, 605A-, or 608A-type switchboard is provided.

4.13 Seizure by Step-by-Step PBX: When a station dials the code assigned to the calling end of the interface trunk circuit, the selector or selector connector steps to the assigned level and connects the station to an idle calling port of the interface trunk circuit.

4.14 Seizure by 756A PBX: The 756A PBX may be connected to the originating end of the

TABLE C

INTERFACE CONNECTING BLOCK DESIGNATIONS
WHEN ROTARY DIAL OR TOUCH-TONE SIGNALS
ARE CONVERTED TO DC SIGNALS ON A
2-OUT OF 7-LEAD BASIS

TERMINALS	CLOSURE FOR DIGIT
A1, AC	1
B1, BC	1
A1, AC	2
B2, BC	2
A1, AC	3
B3, BC	3
A2, AC	4
B1, BC	4
A2, AC	5
B2, BC	5
A2, AC	6
B3, BC	6
A3, AC	7
B1, BC	7
A3, AC	8
B2, BC	8
A3, AC	9
B3, BC	9
A4, AC	0
B2, BC	0

interface trunk circuit by using a universal line circuit (20 through 29) modified as a trunk circuit (80 through 89). To seize the interface trunk circuit, the attendant or station dials the trunk code (80 through 89) assigned to the circuit. The marker will make the connections through a link to the modified station circuit.

4.15 Seizure by 757A PBX: The 757A PBX may be connected to the originating end of the interface trunk circuit by using an auxiliary trunk circuit. The interface trunk circuit is seized through the auxiliary trunk circuit when the attendant or station dials two digits (70 through 79 or 80 through 89) assigned to the originating end.

4.16 Seizure by Switching System No. 400: The No. 400 Switching System may be connected to the originating end of the interface trunk circuit by using a universal line circuit (6 through 8). To seize the interface trunk circuit, a station dials the code assigned to the calling end. The marker will complete the connection through a link circuit.

4.17 Seizure by the 800A PBX, No. 5 Crossbar, and No. 1 and No. 101 Electronic Switching

Systems: These systems have auxiliary circuits that seize the interface trunk circuit by closing a loop across the T and R leads at the originating end of the interface trunk circuit.

4.18 Release of Interface Trunk Circuit: If the calling party goes on-hook from a station or the attendant removes the cord plug from the talk jack, a release indication is provided to the CP equipment and the interface trunk circuit returns to normal. A release signal is also given each time the trunk shifts from port 1 to port 2 and each time an answer is received.

CALLED PARTY ANSWERING FEATURE ASSOCIATED WITH INTERFACE TRUNK CIRCUIT

4.19 A called party answer feature is available in some systems when the interface trunk circuit is used for radio paging. This option allows the called party to dial a predetermined number and be connected directly to the calling party. When the two parties are connected together, the interface trunk transfers the CP equipment from entry port 1 to entry port 2 so that another paging call can be handled while the two parties are talking.

4.20 Called Party Answer in a Step-by-Step PBX:

When the called party is required to answer a page, the called party dials a predetermined number from any telephone in the PBX. This causes a connector or selector connector to select the idle answering terminal of the interface trunk circuit.

4.21 Called Party Answer in a 756A PBX:

The station circuit of the 756A PBX assigned to the answering end of the interface trunk circuit must be in the group 20 through 29. When the called party answers the incoming call, the called party dials the code assigned for answering the call. This code then causes the marker in the 756A PBX to set up a junctor-class call, which connects the called party with a junctor and two links through the station circuit to the answering end of the interface trunk circuit.

4.22 Called Party Answer in a 757A or 800A PBX:

When the called party dials the code assigned to the answering end, the interface circuit is seized through the auxiliary trunk circuit. After

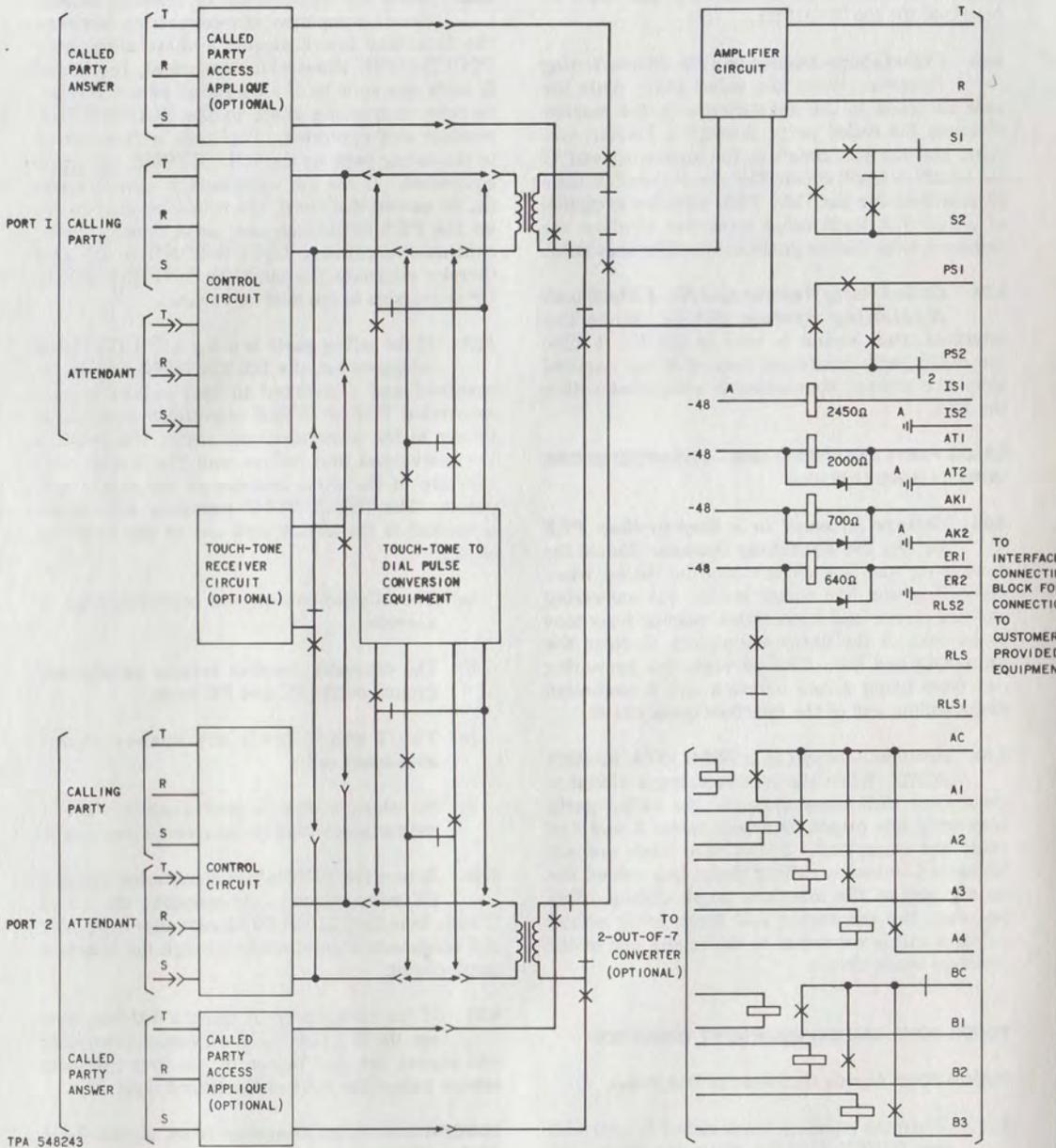


Fig. 3—Simplified Schematic—Voice Connecting Arrangement DCW

seizure, the operation is basically the same as described for the 756A PBX.

4.23 Called Party Answer in a No. 400 Switching System:

When the called party dials the code assigned to the answering end, the marker connects the called party through a junctor, two links, and the line circuit to the answering end of the interface trunk circuit. The circuit then functions as described for the 756A PBX with the exception of S and S1A leads being connected to allow the marker to seize the line circuit assigned for answering.

4.24 Called Party Answer in a No. 1 Electronic Switching System (ESS):

When the interface trunk circuit is used in the No. 1 ESS, the called party answering feature is not required since the answer connection is completed within the ESS.

CALLED PARTY ANSWERING LINE—ATTEMPTED SEIZURE WITH CALLING LINE IDLE

4.25 Seizure Attempt in a Step-by-Step PBX or No. 400 Switching System:

Should the answering end line circuit code be dialed when the calling end line circuit is idle, the answering end line sleeve lead is grounded, causing busy tone to be sent to the party attempting to seize the answering end line. This prevents the answering end from being seized unless a call is connected to the calling end of the interface trunk circuit.

4.26 Seizure Attempt in a 756A, 757A, or 800A PBX:

When the interface trunk circuit is associated with these systems, the called party answering line cannot be seized unless S and S1A leads are connected. S and S1A leads are not connected unless a calling party has seized the calling end of the interface trunk circuit. This prevents the answering end from being seized unless a call is connected to the calling end of the interface trunk circuit.

TOUCH-TONE CALLING EQUIPMENT OPERATION

TOUCH-TONE Signals Converted to Dial Pulses

4.27 When the interface trunk circuit is used with the TOUCH-TONE-to-dial-pulse conversion feature, connections are made to external TOUCH-TONE conversion equipment through an associated access circuit.

4.28 When the trunk finder or crossbar linkage circuit completes the connection between the interface trunk circuit and its associated TOUCH-TONE conversion equipment, the T and R leads are split by the operation of a CV relay, thereby connecting them to the TOUCH-TONE receiver and converter. Dial tone is transmitted to the calling party by the TOUCH-TONE conversion equipment. If the CP equipment is always ready (ie, no second dial tone), the converter used to set up the PBX connection can, on a timeout basis, continue to convert TOUCH-TONE to DP and thereby eliminate the need for TOUCH-TONE to DP conversion in the interface trunk.

4.29 If the calling party is using a TOUCH-TONE telephone set, the TOUCH-TONE signals are received and converted to dial pulses by the associated TOUCH-TONE conversion equipment. Relays in the interface trunk circuit will react to the converted dial pulses and the circuit will function in the same manner as for rotary dial pulses. The TOUCH-TONE converter will remain connected to the circuit until one of the following occurs:

- (a) The allotted interdigital converter time is exceeded.
- (b) The converter receives reverse battery and ground on the FT and FR leads.
- (c) The T and R leads are opened on an abandoned call.
- (d) It releases due to pretranslation cross connections within the conversion equipment.

4.30 Before the TOUCH-TONE converter releases, CV relay releases, disconnecting the T and R leads from the TOUCH-TONE converter equipment and reconnects them directly through the interface trunk circuit.

4.31 If the calling party is using a dial telephone set, the TOUCH-TONE conversion equipment will repeat the dial pulses of the first digit and release before the start of the second digit.

TOUCH-TONE Signals Converted to DC Signals Using A3-Type Receiver

4.32 The input of the TOUCH-TONE receiver is connected across the T and R leads of the

two incoming ports through contacts of TRA, TPB1, and TPB2 relays. TRA relay, when released, connects the TOUCH-TONE receiver to port 1 and, when operated, connects the receiver to port 2. TPB1 or TPB2 relay, when operated, disconnects the receiver from the T and R leads of its respective port.

4.33 After receiving dial tone, the customer starts keying the desired number. On the first digit and on each succeeding digit, one LF-relay and one HF-relay operate. LF- and HF-relays, when operated, repeat the TOUCH-TONE digit to the CP equipment on a 2-out of 7-lead basis by connecting the AC lead to one of the A1 through A4 leads and the BC lead to one of the B1 through B3 leads. These relays will remain operated for a period approximately equal to the length of time that the button of the telephone is depressed. When the CP equipment receives the required digits, it disconnects the T and R leads from the TOUCH-TONE receiver.

4.34 If the interface trunk circuit is seized by a customer using a rotary dial telephone set, the TOUCH-TONE receiver will not respond to the rotary dial pulses. The rotary dial pulses will be converted to dc signals on a 2-out of 7-lead basis by an applique unit provided for this purpose.

TOUCH-TONE Signals Converted to DC Signals Using C-Type Receiver

4.35 Connections to the T and R leads for the C-type and A3 receivers are the same. After receiving dial tone, the calling party starts keying the desired number. On the first and each succeeding digit, one of the corresponding D(0-9) digit relays is operated. D(0-9) digit relay, when operated, repeats the digit to the CP equipment on a 2-out of 7-lead basis by connecting the AC lead to one of the A1 through A4 leads and the BC lead to one of the B1 through B3 leads. The operated D(0-9) relay will remain operated for a period approximately equal to the length of time that the TOUCH-TONE button on the telephone set is depressed. When the calling party is using a rotary dial telephone set, the TOUCH-TONE receiver will not respond to the rotary dial pulses which are converted to dc signals on a 2-out of 7-lead basis by an applique unit provided for this purpose.

5. CONNECTIONS

5.01 Features and options are shown in Table D.

5.02 Table E shows the method of connecting the DT lead. Read the table horizontally; for instance, if step-by-step PBX equipment ready signal is supplied by the CP equipment, use regular dial tone.

5.03 Connections between the basic interface trunk unit, the interface connecting block, and the applique units required to provide the desired operating features are shown in Fig. 4 through 9.

5.04 Connections between the interface trunk equipment and the associated PBX switching equipment are shown in Fig. 10 through 17.

6. MAINTENANCE

6.01 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.

6.02 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.

6.03 The tests covered are:

A. Operational Test: This test consists of three subtests which determine the ability of calling ports 1 and 2 to be seized; test the reaction of these ports to dial pulse, acknowledgement, and allotted time signals; and test for proper operation of the pulse counting chain.

B. TOUCH-TONE Calling Test: This test checks the proper response of the calling ports to TOUCH-TONE signals and checks the response of the following components when provided:

- (a) A3-type receiver
- (b) C-type receiver.

TABLE D

FEATURE			OPTION	
Interface trk ckt	when TOUCH-TONE signals are converted to:	Dial Pulses		ZD, ZX
		dc signals on a 2- out of 7- lead basis	Type A3 revr	ZC
			Type C1 or C2 revr	ZC
DIAL PULSING			ZC	
Number of busy lamps connected to leads	BL	1	V	
		2	V, S	
		3	T	
		4	V, T	
		5	V, T, S	
		6	Q	
		7	S, Q	
		8	V, S, Q	
		9	T, Q	
		10	T, S, Q	
	BL1	11	V, T, S, Q	
Isolation amplifier for:	Transmitting		Y	
	Receiving		Z	
	Two-way Transmission		ZZ	
Called port access *	SXS PBX		W	
	756A, 757A CSBR		X	
	800A PBX		X, ZS	
	No. 400 Sw Sys		K, X	
Equipment ready signal not supplied by customer			R	
Repeat dial digits to customer on a 2- out of 7- lead basis				
608A Switchboard			M	
552 (A, B, D, E) or 605A Switchboard			N	
Without Swbd			ZV	
Busy Condition	No. 1 ESS Centrex	With Swbd	E, ZG	
		Without Swbd	B	
	Other		E	

* Called port access is provided on internal basis (No. 1 ESS and No. 101 ESS).

TABLE E
CONNECTION OF DT LEAD
READ PARAGRAPH 5.02 BEFORE USING TABLE E

	EQUIPMENT READY SIGNAL SUPPLIED BY CP EQUIPMENT		TYPE OF DIAL TONE REQUIRED		DIAL TONE CONNECTION NOT REQUIRED
	YES	NO	TOUCH-TONE	REG	
STEP BY STEP PBX	X			X	
CSBR PBX, 800A PBX, or CENTREX	X			X	X
SXS PBX with TOUCH-TONE Signaling	X		X		
TOUCH-TONE CONVR IN CSBR PBX, 800A PBX, or CENTREX	X				X *
TOUCH-TONE RCVR in CSBR PBX, 800A PBX, or CENTREX	X		X		X *
		X	X		

* Precision dial tone provided by local trunk converter.

6.04 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 7 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column and all steps governed by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

APPARATUS

Test A

6.05 Handset (dial hand test set) equipped with 310 plug.

Test B

- 6.06** TOUCH-TONE station set equipped with 310 plug.
- 6.07** KS-14510, List 1 volt-ohm-milliammeter (volt-ohmmeter).

All Tests

6.08 Blocking and insulating tools as required. Use tools and apply as covered in Section 069-020-801.

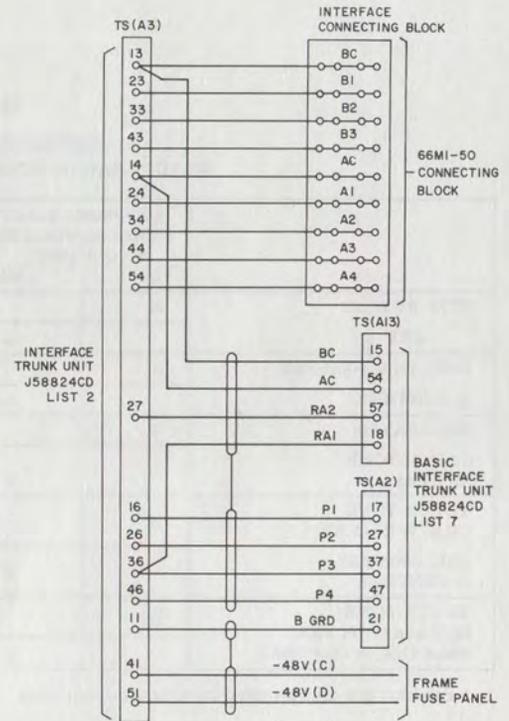
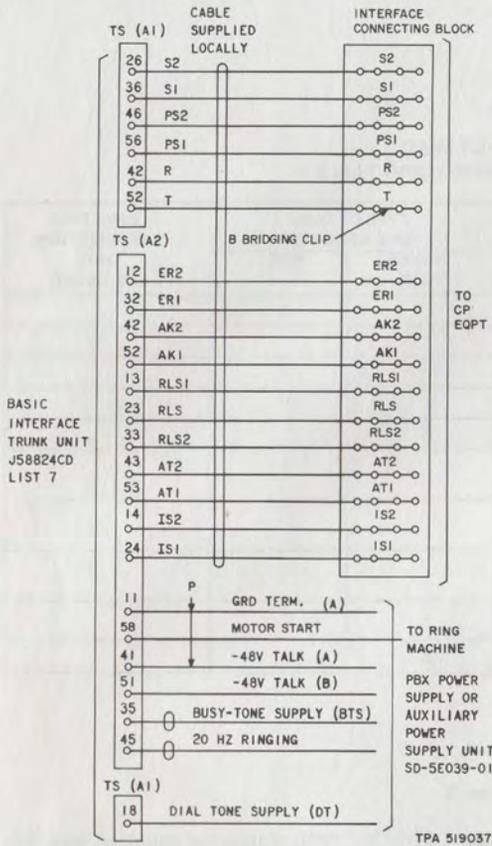
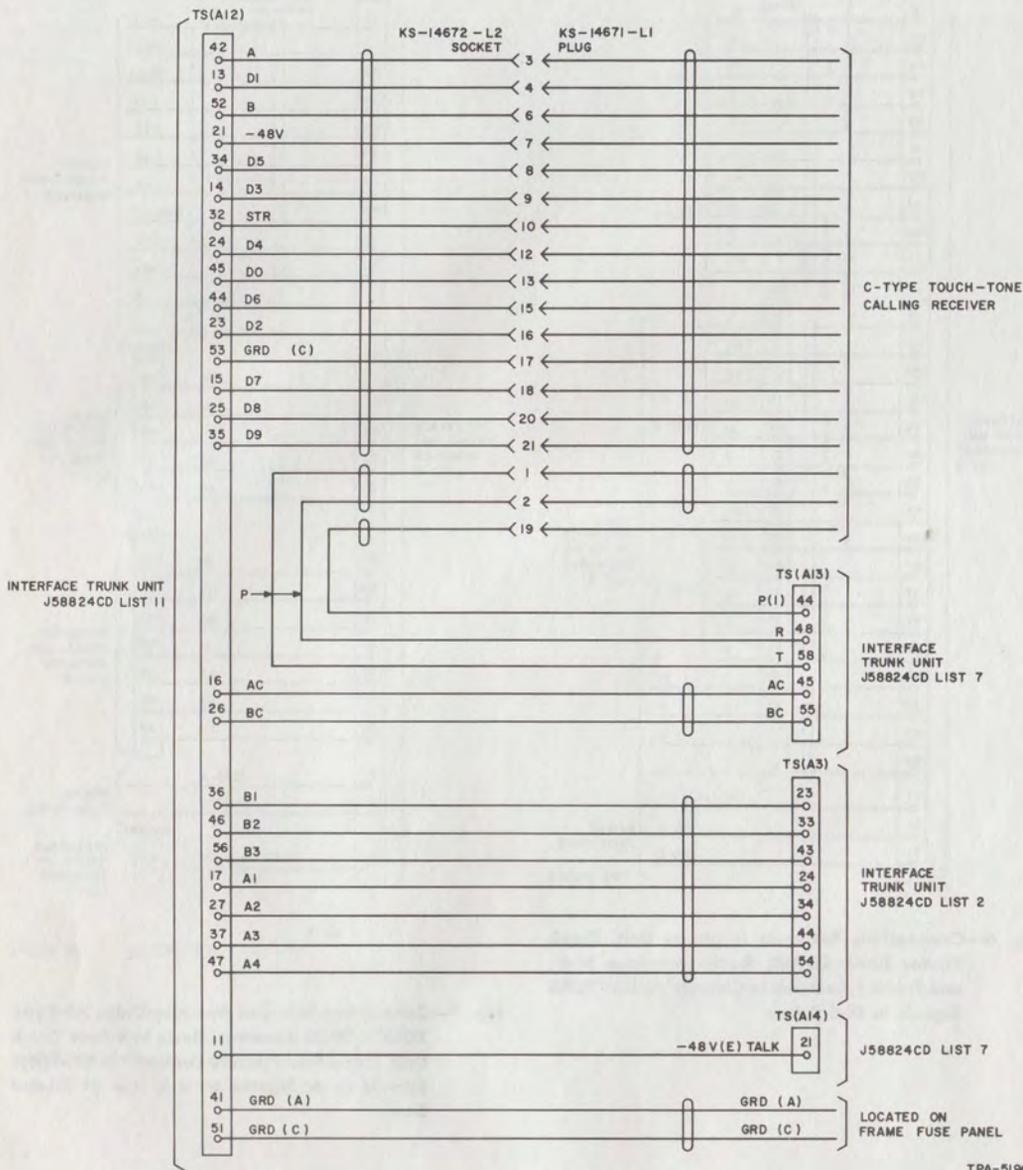


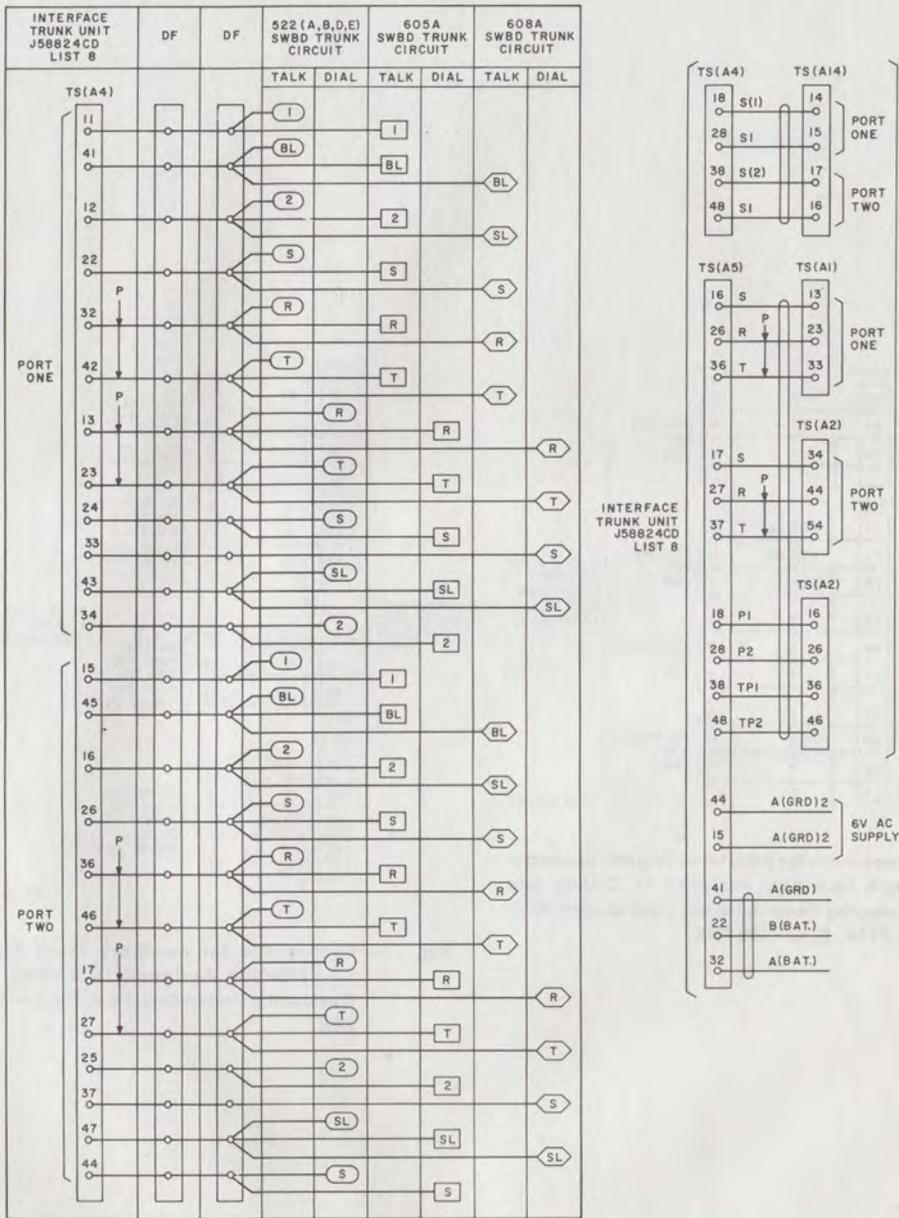
Fig. 4—Connections Between Basic Interface Trunk Unit, Interface Connecting Block, Frame Fuse Panel, Busy-Tone Supply and 20-Cycle Ringing Supply for Rotary Dial Pulsing or TOUCH-TONE Signaling

Fig. 5—Connections Between Appique Unit, Interface Connecting Block, Basic Interface Trunk Unit, and Frame Fuse Panel to Convert Dial Pulse Digits to CP Equipment for 2- out of 7-Lead dc Signals



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Fig. 8—Connections Between Applique Units, C-Type TOUCH-TONE Receiver, Basic Interface Trunk Unit, and Frame Fuse Panel to Convert TOUCH-TONE Signals to dc Signals on a 2-out of 7-Lead Basis



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Fig. 9—Connections Between 552A, B, D, E, 605A, 608A Switchboard Talk and Dial Jack Circuits, Applique Unit, Basic Interface Trunk Unit, Frame Fuse Panel, and 6-Volt Supply to Provide Calling Party Access From Switchboard

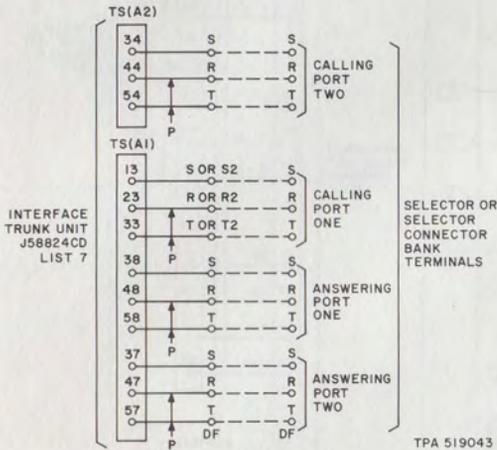


Fig. 10—Connections for Selector or Selector Connector Bank Terminals Assigned to Calling and Answering Ports—Interface Trunk Circuit—701A, B, 711A, B, or 740E PBX

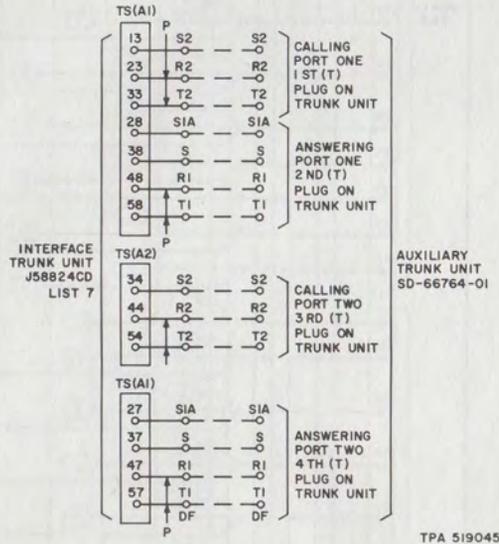


Fig. 11—Connections for Auxiliary Trunk Circuit SD-66764-01 Assigned to Calling and Answering Ports—Interface Trunk—757A PBX



Fig. 12—Connections for Line, Link, and Marker Circuit Assigned to Calling and Answering Ports—Interface Trunk—756A PBX

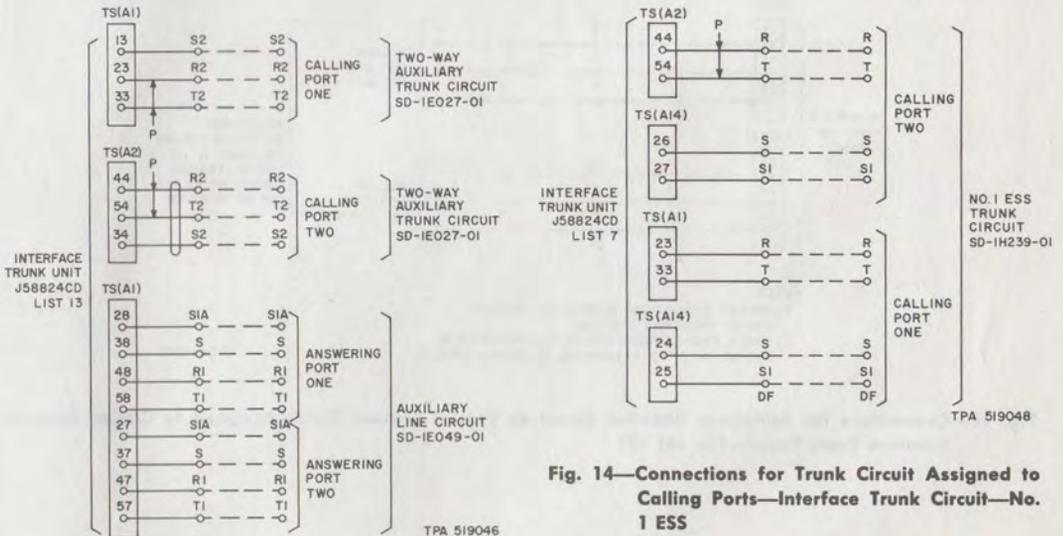


Fig. 14—Connections for Trunk Circuit Assigned to Calling Ports—Interface Trunk Circuit—No. 1 ESS

Fig. 13—Connections for 2-Way Auxiliary Trunks and Auxiliary Line Circuit Assigned to Calling and Answering Ports—Interface Trunk Circuit—800A PBX

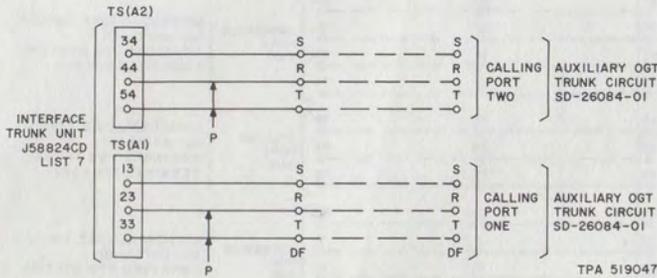
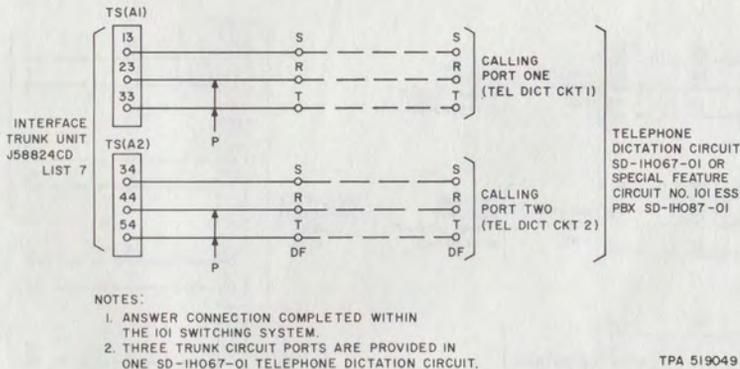


Fig. 15—Connections for No. 5 Crossbar Auxiliary Outgoing Trunk Assigned to Calling Ports—Interface Trunk Circuit



- NOTES:
1. ANSWER CONNECTION COMPLETED WITHIN THE IOI SWITCHING SYSTEM.
 2. THREE TRUNK CIRCUIT PORTS ARE PROVIDED IN ONE SD-1H067-01 TELEPHONE DICTATION CIRCUIT.

Fig. 16—Connections for Telephone Dictation Circuit or Special Feature Circuit Assigned to Calling Ports of Interface Trunk Circuit—No. 101 ESS

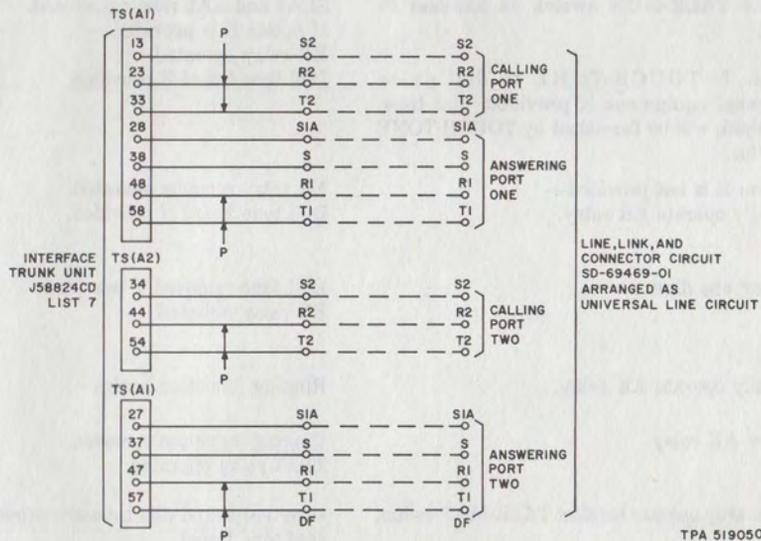


Fig. 17—Connections for Universal Line Circuits Assigned to Calling and Answering Ports of Interface Trunk Circuit—No. 400 Switching System

7. METHOD

STEP	ACTION	VERIFICATION
A. Operational Test		
Calling Port 1 Test		
1	Operate TALK-MON switch on handset to MON.	
2	Connect handset to TST1 jack.	
3	Operate TALK-MON switch on handset to TALK. <i>Note:</i> If TOUCH-TONE to dial pulse conversion equipment is provided, dial tone, if required, will be furnished by TOUCH-TONE converter.	SLA1 and AA1 relays operated. If option R is provided— ER relay operated. Dial tone heard if provided.
4a	If option R is not provided— Manually operate ER relay.	ER relay remains operated. Dial tone heard if provided.
5	Dial any one digit.	Dial tone removed if provided. ER relay released.
6	Manually operate AK relay.	Ringing induction heard.
7	Release AK relay.	Ringing induction removed. TPA1 relay operated.
8	Momentarily operate handset TALK-MON switch to MON.	If option R and dial tone are provided— Dial tone heard.
9a	If option R is not provided— Repeat Step 4a.	
10	Block nonoperated TR1 relay.	
11	Block operated AT relay.	RLS relay operated. Busy tone heard.
12	Remove blocking tools from AT, TR1 relays.	
Calling Port 2 Test		
13	Repeat Steps 1 through 9a using TST2 jack and correspondingly designated relays in port 2.	
14	Block operated AT relay.	RLS relay operated. Busy tone heard.
15	Remove blocking tool from AT relay.	RLS relay released.

STEP	ACTION	VERIFICATION
Pulse Counting Circuit Test		
16	Repeat Steps 1 through 3.	Dial tone heard if provided.
17a	If option R is not provided— Repeat Step 4a.	
18	Insulate contacts 2 and 4 of RA1 relay.	
19	Successively dial digits 1 through 0.	After each digit dialed— P- and PA-relays operated in accordance with Table F.

TABLE F

DIGIT	P- RELAYS OPERATED
1	P1, P2
2	P3
3	P1, P2, P3, P4, P4A
4	P3, P4, P4A
5	P1, P2, P4, P4A
6	P4, P4A, P5, P5A
7	P1, P2, P4, P5, P4A, P5A
8	P3, P4, P5, P4A, P5A
9	P1, P2, P3, P5, P5A
0	P3, P5, P5A

- 20 Remove insulating tools from contacts 2 and 4 of RA1 relay.

B. TOUCH-TONE Calling

Calling Port 1 Test

- 1 Connect TOUCH-TONE station set to TST1 jack.
- 2 Remove handset from switchhook.
- Note:** If TOUCH-TONE to dial pulse conversion equipment is provided, dial tone, if required, will be furnished by TOUCH-TONE converter.
- SLA1 and AA1 relays operated.
If option R is provided—
ER relay operated.
Dial tone heard if provided.

STEP	ACTION	VERIFICATION
3a	If option R is not provided— Manually operate ER relay.	ER relay remains operated. Dial tone heard if provided.
4	Dial any one digit.	Dial tone removed. ER relay released.
5	Manually operate AK relay.	Ringing induction heard.
6	Release AK relay.	Ringing induction removed. TPA1 relay operated.
7	Replace handset on hook.	SLA1 and AA1 relays released.

Calling Port 2 Test

- 8 Repeat Steps 1 through 7 using TST2 jack and correspondingly designated relays in port 2.

Test of TOUCH-TONE to DC Signal Conversion Using A3-Type Receiver Circuit

- 9 Repeat Steps 1 and 2.
- 10a If option R is not provided—
Repeat Step 3a.
- 11 At TS A11—
Connect BLK lead of volt-ohmmeter to terminal 21.
- 12 Insulate contacts 11 and 12 of AK relay.
- 13 At TOUCH-TONE station set—
Dial digit 1.
- 14 At TS A11—
Connect RED lead of volt-ohmmeter in turn to terminals 13 and 14.
- 15 Repeat Steps 13 and 14 substituting digits and terminals shown in Table G.
- 16 Remove insulating tools from contacts 11 and 12 of AK relay.
- 17 Replace receiver on hook.
- While TOUCH-TONE key is depressed—
—48 volts present at each terminal.

STEP	ACTION	VERIFICATION
Test of TOUCH-TONE to DC Signal Conversion Using C-Type Receiver Circuit		
18	Repeat Steps 1 and 2.	
19a	If option R is not provided— Manually operate ER relay.	ER relay remains operated. Dial tone heard if provided.
20	At TS A12— Connect BLK lead of volt-ohmmeter to terminal 21.	
21	Insulate contacts 11 and 12 of AK relay.	
22	At TOUCH-TONE station set— Dial digit 1.	
23	At TS A12— Connect RED lead of volt-ohmmeter to terminal 13.	While TOUCH-TONE key is depressed— -48 volts present at terminal.
24	Repeat Steps 22 and 23, substituting digits and terminals as listed in Table H.	
25	Remove insulating tools from contacts 11 and 12 of AK relay.	
26	Replace receiver on hook.	

TABLE G

DIGIT DIALED	-48 VOLTS PRESENT AT TS A11 TERMINALS
2	14, 23
3	14, 43
4	24, 13
5	24, 23
6	24, 43
7	34, 13
8	34, 23
9	34, 43
0	44, 23

TABLE H

DIGIT DIALED	-48 VOLTS PRESENT AT TS A12 TERMINALS
2	23
3	14
4	24
5	34
6	44
7	15
8	25
9	35
0	45