

## PROTECTIVE CONNECTING ARRANGEMENT TAS

### 1. GENERAL

**1.01** This section provides identification, installation, operation, maintenance, and connection information for the J53050J-2, List 1 interconnecting unit (IU) and associated equipment when used in Protective Connecting Arrangement (PCA) TAS.

**1.02** This section is reissued to:

- Include information on the J53050J-2, List 1 IU which replaces the J53050J-1, List 1 IU now rated MD
- Add the use of the 142A test set.

**1.03** The J53050J-2 IU provides exactly the same circuit functions as the J53050J-1 in an improved mechanical design. Installation, connections, and maintenance are unchanged. Available stock of the MD unit should be used.

**1.04** The J53050J-2, List 1 IU (Fig. 1) provides a means for connecting up to ten secretarial lines from a telephone company central office (CO) to customer-provided equipment (CPE), typically a telephone answering service bureau.

**1.05** When a customer-provided (CP) dc power supply is used with PCA TAS, refer to Section 463-300-109 entitled Connecting Arrangement VCP, Customer-Provided Power, KS-20944 Protector.

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

**1.07** This issue of the section is based on the following drawing:

SD-1E257-01, Issue 2 (J53050J IU)

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

### 2. IDENTIFICATION

#### PURPOSE

- Provides an interface between a CO secretarial line and a one-way line circuit associated with the CPE

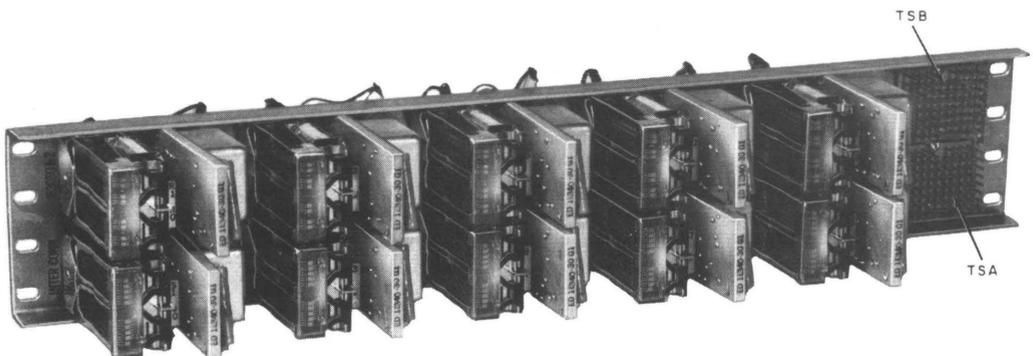


Fig. 1—J53050J-2, List 1 Interconnecting Unit

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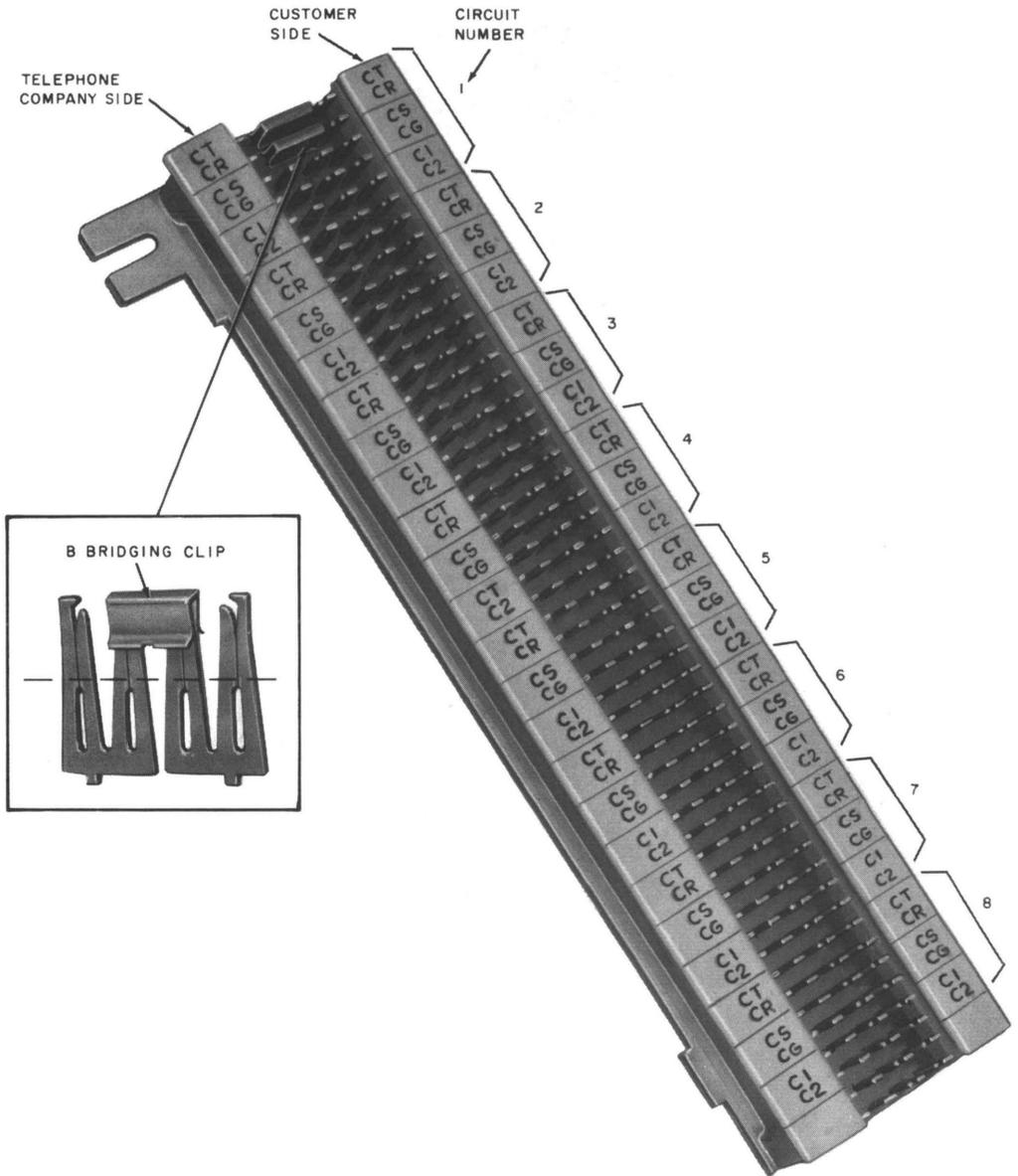


Fig. 2—66M1-50 Interface Connecting Block



Fig. 3—KS-20944, List 2 Protector

- Each circuit provides a 2-wire voiceband transmission path to and from the CPE.
- The maximum dc current drain for each of the ten circuits is 0.080 ampere at 52 volts.
- The typical dc current drain for each of the ten circuits is 0.070 ampere at 48 volts.
- Provides dc isolation and hazardous voltage protection between CPE and telephone company equipment.

### 3. INSTALLATION (Fig. 4 and 5)

- 3.01** Locate the J53050J-2 IU in an area free of dampness and excessive dust with adequate room for access to front and rear of equipment.
- 3.02** Mount the 66M1-50 connecting block close to the IU and near the termination of the CO lines. Select a location convenient for cross-connecting to the CO lines. Mount the two 66M1-50 interface connecting blocks in a location near the IU and convenient for customer access. The maximum dc loop resistance of the CS and CG leads is 700 ohms.
- 3.03** Use the 16-pair "D" inside wiring cable, or equivalent, to terminate the leads to the CO lines and traffic usage (TU) circuits (if used) on the 66M1-50 connecting block. Follow the wiring plan shown in Fig. 4 and 5 and refer to Table A for connections. Use wire-wrap tools to connect to 342A terminal strips. Stencil line number and lead designations on designation strip.
- 3.04** Use the 25-pair "D" inside wiring cable, or equivalent, to terminate the leads associated with the CPE on the two 66M1-50 interface connecting blocks. Refer to Tables B and C for connections. Stencil lead designations on interface connecting block designation strips as shown in Fig. 2.
- 3.05** If power is telephone company supplied, use adapters to mount the KS-15620 rectifier on the 23-inch rack close to the J53050J-2 IU. Use D station wire, or equivalent, to connect the rectifier dc output terminals to the IU. Connect -48V to terminal 81 of TSA and connect GRD to terminal 101 of TSA.
- 3.06** The customer must provide a 117V 60-Hz power outlet within power cord length of the customer-designated mounting location of the rectifier. (See ORDERING GUIDE for cord lengths.) The power outlet must not be under control of a switch and should be fused separately to prevent accidental loss of ac line voltage. Where local instructions permit, secure the power cord plug to the outlet with a power cord plug retainer assembly. Refer to the appropriate section in Division 518 for proper grounding of power plants. Proper grounding of equipment and power unit is important to prevent damage from power line surges.
- 3.07** When dc power is provided by the customer, a KS-20944, List 2 protector must be used as an interface between the CP power supply and the IU. Mount the protector close to the IU and in a location convenient to the customer for connecting his power supply. Use the 14-gauge wire, or equivalent, to make connections from the protector to the 66C1-16 connecting block (see Fig. 7). Terminate one end of the red and black pair on the screw terminals (term. - and +) of the load terminal strip on the protector (see Fig. 6). Solder the other end of the red and black pair to the terminal in column D of the 66C1-16 connecting block as shown in Fig. 7. Strap to as many terminals in column D as required to supply the required number of multiples. Use 18-gauge wire, or equivalent, to make connections from the quick-connect terminals in columns A, B, and C of the connecting block to the -48V (TSA 81) and GRD (TSA 101) terminals on the J53050J-2 IU.
- 3.08** Perform tests shown in Part 5 after installation is completed.

### 4. OPERATION (Fig. 5)

#### Incoming Call

- 4.01** When the CO seizes one of the circuits on an incoming call and applies ringing voltage between the T and R leads, the R relay in the ring detector operates. Relay R operated closes the C contact across the C1 and C2 leads. During the silent interval, R relay releases opening the C contact. C contact opening and closing indicates ringing to the customer. The customer answers the call by providing a contact closure across the CS and CG leads to operate relay S. S relay operated removes the ring detector from the CO line and connects transformer T1 across the CO

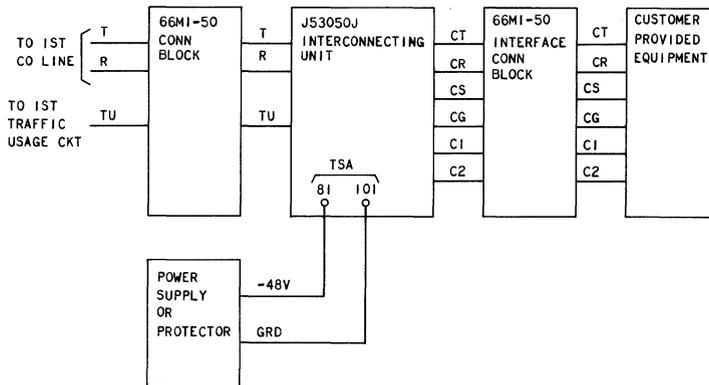


Fig. 4—Block Diagram—PCA TAS

line. The f contact of S relay closes to indicate a call to the traffic usage circuit. The T1 transformer terminated on the CO line trips ringing and provides a voice transmission path to the CPE over the CT and CR leads. Relay R released opens the C1 and C2 leads. Condenser C1 blocks dc from the CPE, and varistors RV1 and RV2 serve to limit excessive voice signals from the CPE.

### Disconnect

**4.02** When the attendant goes on-hook, the CPE opens the contact closure on the CS and CG leads. The S relay releases and the circuit returns to the idle condition.

## 5. MAINTENANCE (Fig. 5)

**5.01** Precautions should be taken when performing tests to avoid adversely affecting service to the customer. Follow local instructions with reference to notifying customer before performing tests.

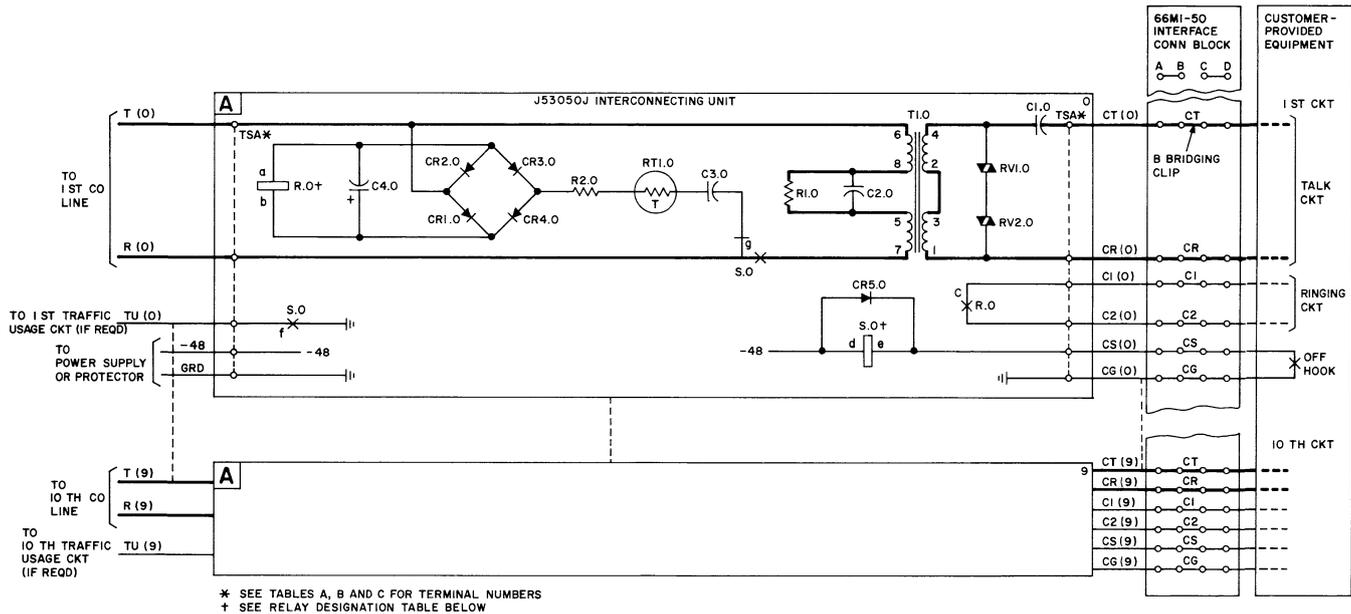
**5.02** When trouble is reported, check for blown fuses, loose or broken connections, and verify that the CO pair is good.

### A. Circuit Test Using the 1013A Hand Test Set and the 81A Test Set

**5.03** Prepare the circuit under test as follows:

**Warning:** *The CS lead will carry a maximum potential of  $-52V$  dc through a 680-ohm relay.*

- (a) Open the six leads to the CPE by removing the B bridging clips (or wire straps) at the 66M1-50 interface connecting block.
- (b) Supply talk battery by connecting a 500-ohm resistor from the  $-48V$  supply to terminal CR and connect ground to terminal CT (make all connections on the telephone company side of the 66M1-50 interface connecting block). A 2A KTU or 31A KTU may be used for battery feed instead of the resistor. Refer to Section 518-112-421 for KTU connections.
- (c) Connect a 1013A hand test set, or equivalent, across terminals CT and CR.
- (d) Connect a strap to terminal CG (to be used later to strap CS to CG).
- (e) Connect an 81A or KS-16990, List 1 test set across terminals C1 and C2 to indicate ringing (switch in C position).



RELAY DESIGNATIONS

RELAY SUFFIX	CONTACT NUMBER						
	R RELAY			S RELAY			
	a	b	c	d	e	f	g
0, 2, 4, 6, 8	1L	2L	4	2L	1L	5	2
1, 3, 5, 7, 9	1U	2U	8	2U	1U	8	11

Fig. 5—Simplified Schematic—PCA TAS

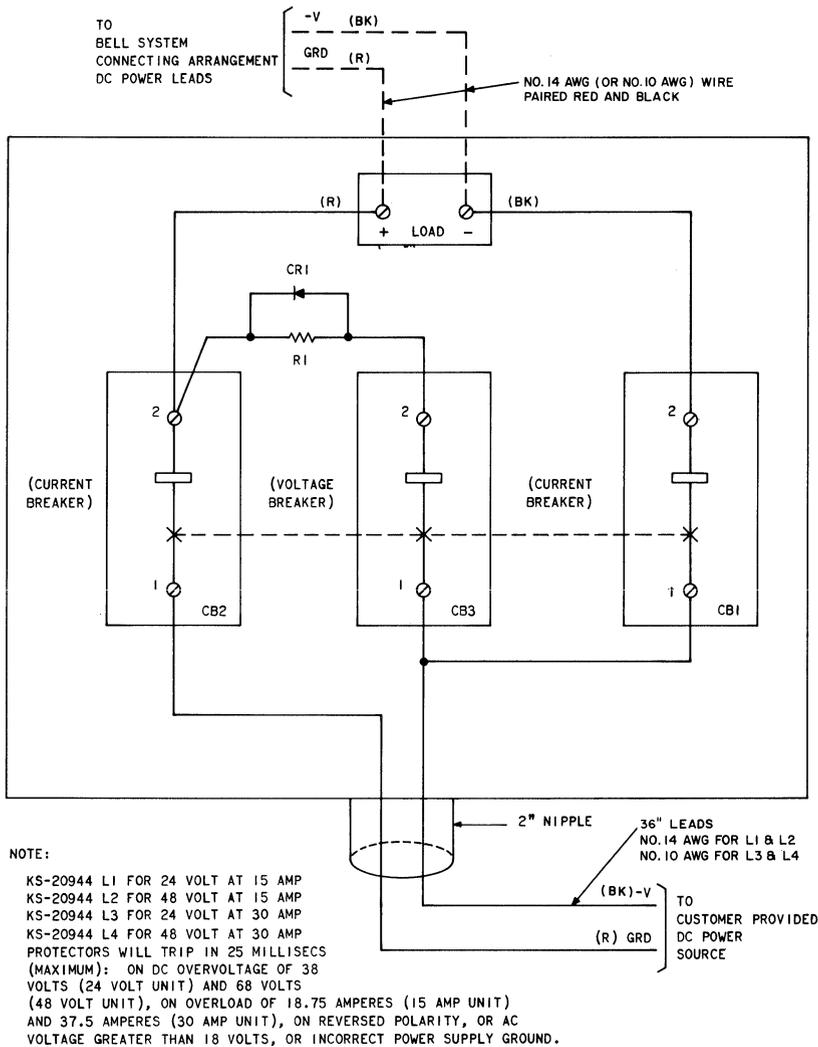


Fig. 6—Schematic—KS-20944 Protector

**Transmission and Ringing Test**

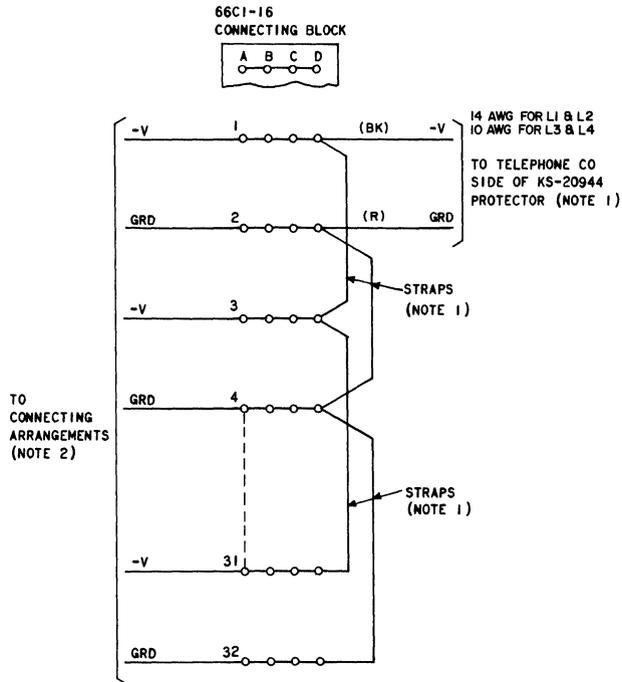
5.04 Perform test as follows:

(1) Have the local test desk call the line under test. At this time quality of transmission can be judged using hand test set.

(2) Operate switch to MON.

(3) When ringing is applied to line, buzzer in 81A test set should follow ringing cycle.

(4) Answer call by operating hand test set switch to TALK and strapping CS and CG. Ringing should be tripped and transmission satisfactory.



## NOTES:

1. USE 14-GAUGE (OR 10-GAUGE) WIRE TO CONNECT FROM KS-20944 PROTECTOR TO CONNECTING BLOCK; PROVIDE MULTIPLE STRAPS AS DETERMINED BY NUMBER OF CONNECTING ARRANGEMENTS TO BE CONNECTED TO. USE SOLDER TO MAKE THE CONNECTION OF THE 14-GAUGE (OR 10-GAUGE) WIRE AND STRAPS TO THE CONNECTING BLOCK.
2. USE 18-GAUGE WIRE OR EQUIVALENT TO MAKE CONNECTIONS FROM CONNECTING BLOCK TO CONNECTING ARRANGEMENTS. EACH CONNECTING BLOCK PROVIDES MEANS FOR CONNECTING TO 16 CIRCUITS, HOWEVER, DO NOT EXCEED THE MAXIMUM CURRENT RATING OF THE KS-20944 PROTECTOR.

Fig. 7—Typical Power Distribution For Multiple Connecting Arrangements

**5.05 Traffic Usage Test:** Connect the 81A test set from TU lead to ground. Strap CS to CG and the 81A test set should buzz indicating continuity.

**B. Circuit Test Using 142A Test Set (Fig. 8)**

**5.06** Prepare the circuit under test as follows:

- (a) Disconnect the CPE by removing the B bridging clips or wire straps at the interface block.
- (b) Connect the 10-conductor test set interface cord to the terminals on the telephone company side of the block as shown in Fig. 8. Use 841720527 lead assembly (with 961A connector) or 841224330 lead assembly (with clips).
- (c) Connect the leads from the 2-conductor power cord, 841224322 lead assembly, to -24 volts and ground as shown in Fig. 8. This voltage should be obtained from the same source used to power the IU under test. The PWR lamp on the test set should light.
- (d) Connect a 1013A hand test set to the HNDST terminals on the test set. Set the MON-TALK switch on the hand test set to MON position.
- (e) On the 142A test set, set the CS-CG LOOP switch to the 100-ohm position (switch position 3).

**5.07** After circuit preparation, proceed as follows:

- (1) Operate switch on 1013A hand test set to the TALK position. The S relay in the 142A test set will operate, lighting the CS lamp and providing a ground path on the CG lead through the 100-ohm resistor on the CS-CG LOOP switch. Ground on the CS lead causes the S relay in the IU to operate and seize the CO trunk. Since this is a one-way incoming service, dial tone should not be heard in the hand test set. Return the hand test set switch to MON position.
- (2) Dial the local test desk using another line and request that an incoming call be placed on the trunk under test.
- (3) When the trunk is seized by the incoming call from the test desk and ringing is applied

to the trunk, the C- lamp lights and follows the ringing cycle.

- (4) Operate the hand test set switch to TALK. The C- lamp should extinguish and the CS lamp light indicating ringing has been tripped and the call answered. The trunk should now be cut through the IU, and satisfactory transmission may be judged by using the hand test set. If the CS lamp lights but ringing is not tripped, change the CS-CG LOOP switch to the 18-ohm position (switch position 2). If ringing is now tripped, IU operation may be considered marginal or it may indicate the CS-CG loop is of too high resistance.
- (5) Have the test desk release the trunk. Operate the hand test set switch to MON. The CS lamp should be extinguished and the IU should be in the idle condition.◆

**5.08** When trouble is indicated in the J53050J-2 IU, transfer the line to another circuit, if available, or replace the defective unit with another unit known to be functioning properly. Tag the defective IU and return it for repair.

**5.09** If trouble is indicated in the KS-20944, List 2 protector, refer to Section 463-300-109 for testing procedures.

**5.10** If tests are satisfactory, remove all test connections to restore the circuit to normal and replace the B bridging clips (or wire straps).

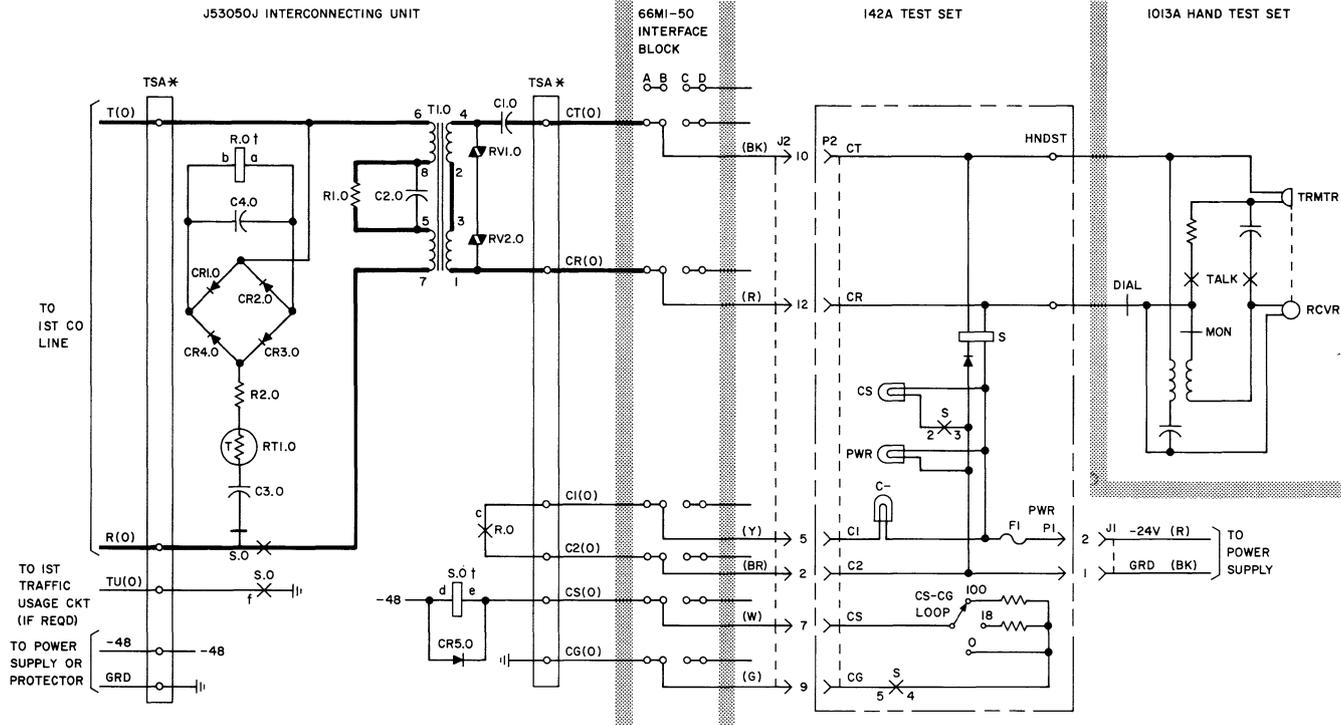


***Do not attempt any tests or repairs to CPE.***

**5.11** When in the repairman's judgment the trouble is located in the CPE, the Repair Service Bureau should be notified so that proper Maintenance of Service Charge billing can be initiated as outlined in Section 660-101-312 entitled Maintenance of Service Charge on Services With Customer-Provided Equipment (CPE).

## 6. CONNECTIONS

**6.01** For connection information to the 342A terminal strips (TSA and TSB) on the J53050J-2 IU, refer to Fig. 4 and 5 and Tables A, B, and C.



RELAY DESIGNATION TABLE

RELAY SUFFIX	CONTACT NUMBER						
	R RELAY			S RELAY			
	a	b	c	d	e	f	g
.0, .2, .4, .6, .8	1L	2L	4	2L	1L	5	2
.1, .3, .5, .7, .9	1U	2U	8	2U	1U	8	11

Fig. 8—Simplified Schematic—PCA TAS With 142A Test Set

**SECTION 463-350-110**

- 6.02** For connection information using the KS-20944, List 2 protector, refer to Fig. 6 and 7.
- 6.03** The following are typical connecting circuits:
- (a) Step-by-Step System, No. 1, 350A, 355A and 356A Subscriber Line Circuit—SD-32133-01.
  - (b) Crossbar System No. 5, Line, Link and Marker Connector Control Circuit—SD-26030-01.
  - (c) Panel System Subscriber Line Circuit—SD-21712-01.

**TABLE A**  
**CONNECTIONS TO CO LINES AND TRAFFIC USAGE CIRCUITS**

LINE NO.	LEAD DESIG*	TERM STRIP		CONN CABLE COLOR	66M1-50 CONN BLK ROW NO.
		A	B		
1	T	107		W-BL	1
	R	97		BL-W	2
	TU	27		W-O	3
	SPARE			O-W	4
2	T	106		W-G	5
	R	96		G-W	6
	TU	26		W-BR	7
	SPARE			BR-W	8
3	T	105		W-S	9
	R	95		S-W	10
	TU	25		R-BL	11
	SPARE			BL-R	12
4	T	104		R-O	13
	R	94		O-R	14
	TU	24		R-G	15
	SPARE			G-R	16
5	T	103		R-BR	17
	R	93		BR-R	18
	TU	23		R-S	19
	SPARE			S-R	20
6	T		107	BK-BL	21
	R		97	BL-BK	22
	TU		27	BK-O	23
	SPARE			O-BK	24
7	T		106	BK-G	25
	R		96	G-BK	26
	TU		26	BK-BR	27
	SPARE			BR-BK	28
8	T		105	BK-W	29
	R		95	S-BK	30
	TU		25	Y-BL	31
	SPARE			BL-Y	32
9	T		104	Y-O	33
	R		94	O-Y	34
	TU		24	Y-G	35
	SPARE			G-Y	36
10	T		103	Y-BR	37
	R		93	BR-Y	38
	TU		23	Y-S	39
	SPARE			S-Y	40
SPARE				V-BL	41
				BL-V	42
				V-O	43
				O-V	44
				V-G	45
				G-V	46
				V-BR	47
				BR-V	48
				V-S	49
				S-V	50

TABLE B

## CONNECTIONS TO CUSTOMER-PROVIDED EQUIPMENT

CIRCUIT NO.	LEAD DESIG*	TERM STRIP		CONN CABLE COLOR	66M1-50 INTERFACE CONN BLK 1 ROW NO.
		A	B		
1	CT	87		W-BL	1
	CR	77		BL-W	2
	CS	67		W-O	3
	CG	57		O-W	4
	C1	47		W-G	5
	C2	37		G-W	6
2	CT	86		W-BR	7
	CR	76		BR-W	8
	CS	66		W-S	9
	CG	56		S-W	10
	C1	46		R-BL	11
	C2	36		BL-R	12
3	CT	85		R-O	13
	CR	75		O-R	14
	CS	65		R-G	15
	CG	55		G-R	16
	C1	45		R-BR	17
	C2	35		BR-R	18
4	CT	84		R-S	19
	CR	74		S-R	20
	CS	64		BK-BL	21
	CG	54		BL-BK	22
	C1	44		BK-O	23
	C2	34		O-BK	24
5	CT	83		BK-G	25
	CR	73		G-BK	26
	CS	63		BK-BR	27
	CG	53		BR-BK	28
	C1	43		BK-S	29
	C2	33		S-BK	30
6	CT		87	Y-BL	31
	CR		77	BL-Y	32
	CS		67	Y-O	33
	CG		57	O-Y	34
	C1		47	Y-G	35
	C2		37	G-Y	36
7	CT		86	Y-BR	37
	CR		76	BR-Y	38
	CS		66	Y-S	39
	CG		56	S-Y	40
	C1		46	V-BL	41
	C2		36	BL-V	42
8	CT		85	V-O	43
	CR		75	O-V	44
	CS		65	V-G	45
	CG		55	G-V	46
	C1		45	V-BR	47
	C2		35	BR-V	48
	SPARE			V-S	49
	SPARE			S-V	50

\* Stencil lead designations on fanning strip.

**TABLE C**  
**CONNECTIONS FOR CUSTOMER-PROVIDED EQUIPMENT**

CIRCUIT NO.	LEAD DESIG*	TERM STRIP		CONN CABLE COLOR	66M1-50 INTERFACE CONN BLK 2 ROW NO.
		A	B		
9	CT		84	W-BL	1
	CR		74	BL-W	2
	CS		64	W-O	3
	CG		54	O-W	4
	C1		44	W-G	5
	C2		34	G-W	6
10	CT		83	W-BR	7
	CR		73	BR-W	8
	CS		63	W-S	9
	CG		53	S-W	10
	C1		43	R-BL	11
	C2		33	BL-R	12
SPARE	SPARE	SPARE		R-O	13
				O-R	14
				R-G	15
				G-R	16
				R-BR	17
				BR-R	18
				R-S	19
				S-R	20
				BK-BL	21
				BL-BK	22
				BK-O	23
				O-BK	24
				BK-G	25
				G-BK	26
				BK-BR	27
				BR-BK	28
				BK-S	29
				S-BK	30
				Y-BL	31
				BL-Y	32
				Y-O	33
				O-Y	34
				Y-G	35
				G-Y	36
				Y-BR	37
				BR-Y	38
				Y-S	39
				S-Y	40
				V-BL	41
				BL-V	42
				V-O	43
				O-V	44
				V-G	45
				G-V	46
				V-BR	47
				BR-V	48
	V-S	49			
	S-V	50			

\* Stencil lead designations on fanning strip.