

LINE CONCENTRATOR NO. 2A
CONTROL AND REMOTE CIRCUITS
LOAD TESTSReplaces Section 928
Dated 11-16-67 and
T.I. Section 928
Dated 6-15-71

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1. GENERAL

1.1 The tests of this section are provided as a further check of the concentrator circuits. This testing is required for each system when the remote and control circuit installations can be coordinated on the same time schedules. Since these tests will involve at least two widely separated sites, coordination required will involve the respective installations with regard to previous tests and the operating company or companies with regard to transmission facilities.

1.2 The respective installations must have applied the tests and adjustment procedures to the individual remote and control circuits; Sections 922, 923 (control) 924 and 925 (remote) of this handbook.

1.3 The operating company or companies must coordinate transmission facilities for a signal control channel and a minimum of eight truck channels for each system. In addition the signaling control channel must meet the following requirement:

Requirement: BSP 951-836-100, "Line Concentrator No. 2A General Description Information," reads: "The quality of the facilities used for the signaling control channel are to be such that the impulse noise, as measured with a 6 type Impulse Counter, should not exceed 35 counts in 15 minutes at a noise level of 48-53 DBM. These measurements should be made at the ROLI or RILI jacks of the control circuit and the ROLI jack of the remote circuit. If these requirements are not met, impulse noise may cause a false ST pulse to be registered by either circuit."

1.4 The respective installations and the operating company or companies must cooperate to adjust and set the power amplifier send levels at both remote and control circuits so that the connecting control or remote circuit will receive the signal frequencies at -18 DBM (ZC OPTION) or -12 DBM (ZD OPTION). These measurements should be made at the remote circuit ROLI jack and the control circuit ROLI and/or RILI jacks. They should also attempt some representative operational tests, such as one each service request, disconnect and terminating, as outlined in BSP 067-109-502, "Five Concentrator No. 2A Systems Tests." This will insure that the system is synchronized and capable of accepting tests of this section.

2. RECORDS AND REQUIREMENTS

2.1 Records: Forms SD-4-1313 and SD-4-1315 are required for recording the results of these tests.

2.2 Requirements: Tests of this section are based on the requirements and information in BSP AA634.009, entitled Performance Requirements for Line Concentrator No. 2A.

3. TEST EQUIPMENT

<u>Amt.</u>	<u>Code</u>	<u>Name</u>
1	ITE-4718	2A Line Concentrator Control Circuit Test Set
1 per Remote Frame	ITE-4719	2A Line Concentrator Remote Circuit Test Set

4. TEST SETUP

4.1 See Figure 1. This test is made using the outside cable facilities between Remote and Control units, that will be used when the Concentrator is put in service. Arrangements should be made prior to the test interval to have these facilities cross-connected.

4.2 A convenient talking circuit should be established between the Remote and Control units to facilitate the tests.

4.3 The load test set ITE-4718 should be located near the Control unit. If there is a Remote circuit used with Group 0, T.S. (0) on the test set connects to the Group 0 part of T.S. (A) on top of the Control frame. If there is a Remote unit used with Group 1, T.S. (1) on the test set connects to the Group 1 part of T.S. (A). If two Remotes are associated with the Control circuit, identical connections in Groups 0 and 1 are maintained at all times. Test set ITE-4719 is located near the Remote unit and the terminal strip on it is connected to the terminal strip near the top of the Remote frame.

4.4 In order to connect up the test sets properly, their operation must be understood.

4.41 The sequence starts with a certain number of "terminating" (control remote) calls being originated at ITE-4718. Lamp (A) is lit on the test set.

4.42 When these calls are completed, they terminate in ITE-4719 at the remote end, which turns each one around and sends it back on a different line as a "service request" (remote control) call.

4.43 When all of these "service request" calls are completed, the test set at the Control end operates a check relay. Lamp (A) goes out and lamp (B) comes on.

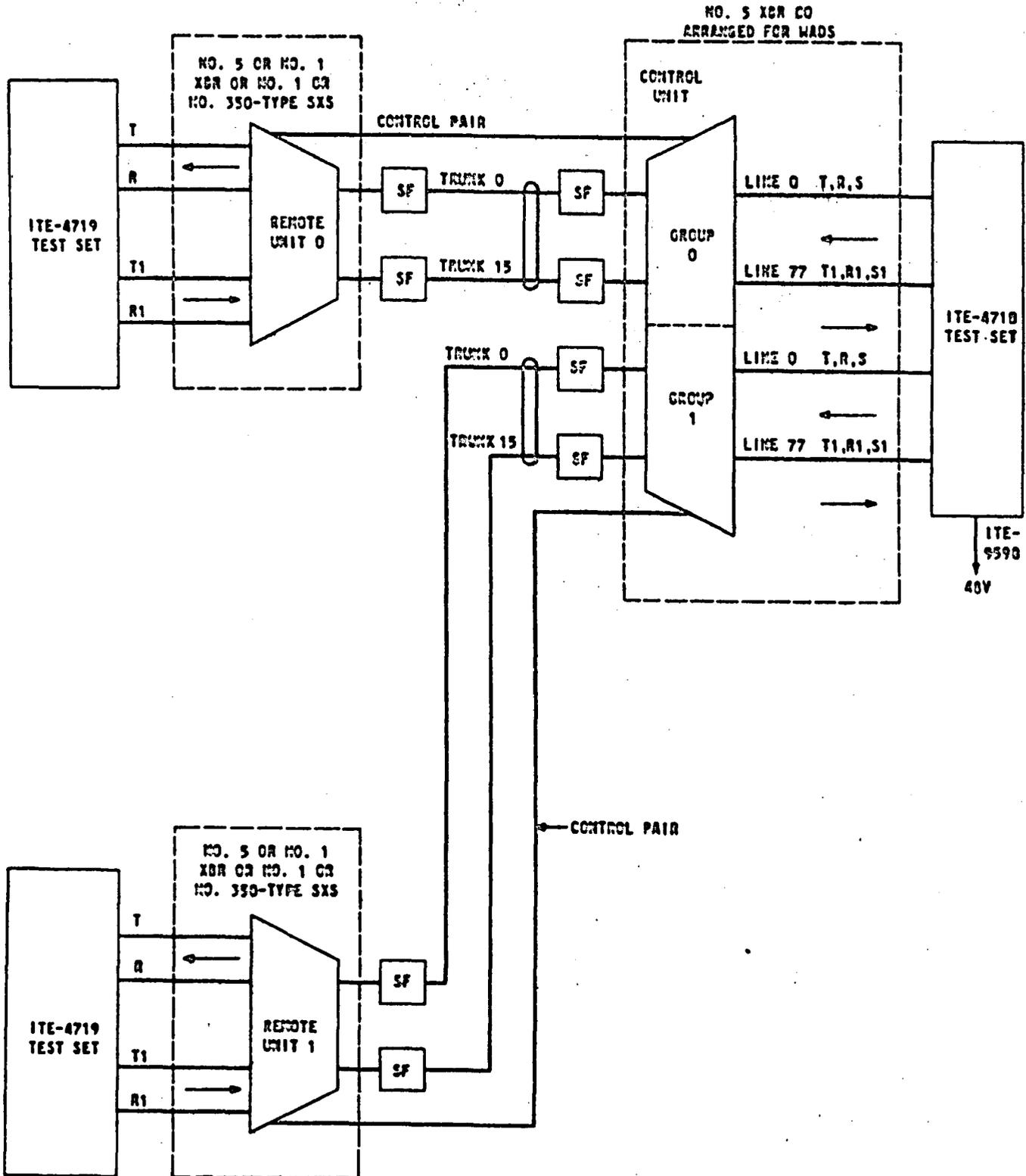


FIG. 1 LOAD TEST SETUP

4.44 ITE-4718 then sends a new group of calls out, but on a new group of lines. These calls are returned by ITE-4719 on still a new group of lines. When they all complete, the check relay operates again.

4.45 Lamp (A) comes on again and lamp (B) goes out. Then the whole sequence is repeated, starting with a repeat of the "terminating" calls on the original group of lines.

4.46 The number of lines in each group and the terminals to use on the test sets are as follows:

Number of Trunks between Control and Remote Units	At ITE-4718				At ITE-4719 Use Terminals
	Set GR 0/1 Switch at	Lamp Lit	Type of Call	Use Terminals	
0	0	-	-	See Par. 5.1	-
8 or 9	4	A	Term.	T,R,S 0-3	T,R 1-4
			S.R.	Tl,Rl,Sl 0-3	Tl,Rl 1-4
		B	Term.	T,R,S 8-11	T,R 9-12
			S.R.	Tl,Rl,Sl 8-11	Tl,Rl 9-12
10 or 11	5	A	Term.	T,R,S 0-4	T,R 1-5
			S.R.	Tl,Rl,Sl 0-4	Tl,Rl 1-5
		B	Term.	T,R,S 8-12	T,R 9-13
			S.R.	Tl,Rl,Sl 8-12	Tl,Rl 9-13
12 or 13	6	A	Term.	T,R,S 0-5	T,R 1-6
			S.R.	Tl,Rl,Sl 0-5	Tl,Rl 1-6
		B	Term.	T,R,S 8-13	T,R 9-14
			S.R.	Tl,Rl,Sl 8-13	Tl,Rl 9-14
14 or 15	7	A	Term.	T,R,S 0-6	T,R 1-7
			S.R.	Tl,Rl,Sl 0-6	Tl,Rl 1-7
		B	Term.	T,R,S 8-14	T,R 9-15
			S.R.	Tl,Rl,Sl 8-14	Tl,Rl 9-15
16	8	A	Term.	T,R,S 0-7	T,R 1-8
			S.R.	Tl,Rl,Sl 0-7	Tl,Rl 1-8
		B	Term.	T,R,S 8-15	T,R 9-16
			S.R.	Tl,Rl,Sl 8-15	Tl,Rl 9-16

*NOTE: Arrangement of terminals on ITE-4719

Top row: T 1-20
 2nd row: blank
 3rd row: R 1-20
 4th row: blank
 5th row: Tl 1-20
 6th row: blank
 7th row: Rl 1-20
 8th row: blank

4.5 The manner in which the lines are connected to the test sets depends on the number of trunks between Remote and Control units (setting of GR (0/1) switch). Table A shows which T, R, S terminals on the Concentrators to use. Paragraph 4.46 shows which test set terminals to use.

4.6 The T,R, S terminals of the test sets and concentrator lines must be used in order, so that no calls are crossed. As an example, if there were 9 Remote-Control trunks, Paragraph 4.46 and Table A give the following connection information:

Connected together		Connected together	
ITE-4718	Control Frame	Remote Frame	ITE-4719
TO, RO, SO	T00, R00, S00	T00, R00	T1, R1*
T1, R1, S1	T11, R11, S11	T11, R11	T2, R2*
T2, R2, S2	T22, R22, S22	T22, R22	T3, R3*
T3, R3, S3	T33, R33, S33	T33, R33	T4, R4*
T1-0, R1-0, S1-0	T01, R01, S01	T01, R01	T1-1, R1-1
T1-1, R1-1, S1-1	T12, R12, S12	T12, R12	T1-2, R1-2
T1-2, R1-2, S1-2	T23, R23, S23	T23, R23	T1-3, R1-3
T1-3, R1-3, S1-3	T34, R34, S34	T34, R34	T1-4, R1-4

(Continued)

Connected together		Connected together	
ITE-4718	Control Frame	Remote Frame	ITE-4719
T8, R8, S8	T05, R05, S05	T05, R05	T9, R9*
T9, R9, S9	T16, R16, S16	T16, R16	T10, R10*
T10, R10, S10	T27, R27, S27	T27, R27	T11, R11*
T11, R11, S11	T38, R38, S38	T38, R38	T12, R12*
T1-8, R1-8, S1-8	T06, R06, S06	T06, R06	T1-9, R1-9
T1-9, R1-9, S1-9	T17, R17, S17	T17, R17	T1-10, R1-10
T1-10, R1-10, S1-10	T28, R28, S28	T28, R28	T1-11, R1-11
T1-11, R1-11, S1-11	T39, R39, S39	T39, R39	T1-12, R1-12

*Insulate hold off normal contacts (See Paragraph 4.7)

4.7 At the Remote unit, insulate the crossbar hold off normal switch contacts 3 and 4 of the lines that are connected to the ITE-4719 T- and R- terminals.

4.8 To insure that every concentrator line is tested, Table A must be completed, reconnecting lines and running the load test over again as often as required. In the example given before, (9 trunks) after the load test is run, it is rerun after reconnecting as follows:

Connected together		Connected together	
ITE-4718	Control Frame	Remote Frame	ITE-4719
T0, R0, S0	T44, R44, S44	T44, R44	T1, R1*
T1, R1, S1	T55, R55, S55	T55, R55	T2, R2*
T2, R2, S2	T66, R66, S66	T66, R66	T3, R3*
T3, R3, S3	T77, R77, S77	T77, R77	T4, R4*
T1-0, R1-0, S1-0	T45, R45, S45	T45, R45	T1-1, R1-1
T1-1, R1-1, S1-1	T56, R56, S56	T56, R56	T1-2, R1-2
T1-2, R1-2, S1-2	T67, R67, S67	T67, R67	T1-3, R1-3
T1-3, R1-3, S1-3	T70, R70, S70	T70, R70	T1-4, R1-4
T8, R8, S8	T49, R49, S49	T49, R49	T9, R9*
T9, R9, S9	T50, R50, S50	T50, R50	T10, R10*
T10, R10, S10	T61, R61, S61	T61, R61	T11, R11*
T11, R11, S11	T72, R72, S72	T72, R72	T12, R12*
T1-8, R1-8, S1-8	T40, R40, S40	T40, R40	T1-9, R1-9
T1-9, R1-9, S1-9	T51, R51, S51	T51, R51	T1-10, R1-10
T1-10, R1-10, S1-10	T62, R62, S62	T62, R62	T1-11, R1-11
T1-11, R1-11, S1-11	T73, R73, S73	T73, R73	T1-12, R1-12

*Insulate hold off normal contacts (See Paragraph 4.7)

TABLE A

Concentrator Lines Used at Both Ends							
	T, R,S	T, R1,S1	T, R,S	T1, R1,S1	T, R,S	T1, R1, S1	
A	00	01	02	03	04	05	
	11	12	13	14	15	16	
	22	23	24	25	26	27	
	33	34	35	36	37	38	
	44	45	46	47	48	49	
	55	56	57	58	59	50	
	66	67	68	69	60	61	
	77	70	71	72	73	74	
		T R,S	T1, R1,S1	T, R,S	T1, R1,S1	T, R,S	T1, R1,S1
	B	05	06	07	08	09	00
16		17	18	19	10	11	
27		28	29	20	21	22	
38		39	30	31	32	33	
49		40	41	42	43	44	
50		51	52	53	54	55	
61		62	63	64	65	66	
72		73	74	75	76	77	

5. OPERATION OF LOAD TEST

5.1 If only one Group is to be tested, the GR- switch for the opposite Group is set to 0. The S- leads of ITE-4718 should not be connected to the S- leads of lines in the Group not under test. If these connections have been made, a convenient way to break them is to block operate SCO-9 relays. Insert 349A make busy plugs into jacks TB-- associated with trunks not equipped.

5.2 At ITE-4718, the GRO/1 switches should already be set. Operate the ST1 switch to B-G. Connect battery and ground to the test set.

➤ Arrowed lines indicate new or changed information.

5.3 At the Remote end, no preparation other than connecting the test set terminal strip is required.

5.4 There should be no blocking or insulating tools in use in the Concentrator.

5.5 Operate ITE-4718 ST switch to ON (A) lamp lights, and call are started through the Concentrator. If the calls complete successfully, the (B) lamp lights. Thereafter the (A) and (B) lamps are lit alternately.

5.6 As the load test progresses, watch the TPR- relays. They should step in order, as follows:

Disconnect Call	Operates	Releases
1	TPR1	
2	TPR2	
3	TPR3	
4	TPR4	
5	TPR5	TPR1
6		TPR2
7		TPR3
8		TPR4
9	TPR1	TPR5

If both groups are under test, watch both sets of relays..

5.7 The load test must continue for at least ten minutes without a case of trouble (no alarms or displays).

Manager, Crossbar Product Engineering
Control Center

Reason for Reissue:
To include signal levels for ZC and ZD Options.