

"BELLBOY"
PERSONAL SIGNALING SYSTEM NO. 1A
J1 CONTROL TERMINAL

OVER-ALL VERIFICATION TESTS

CONTENTS

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|-------------------------------|----------------------------------|
| 1. GENERAL INFORMATION | 4. STEP-BY-STEP FEATURES |
| 2. OVER-ALL VERIFICATION TEST | 5. NUMBER CHECK TRANSLATOR TESTS |
| 3. LOAD TEST | |

1. GENERAL INFORMATION

1.1 Description: This section describes a method for an over-all operation verification and load test of the J1 Control Terminal for use with Personal Signaling System 1A (Bellboy). This section also describes procedures and tests for cross-connections and optional wiring not placed during prior tests.

1.2 Application of Test: The tests of this section shall be performed in sequence after Sections 311 through 315 have been completed as outlined in Section 310 of this handbook.

1.21 Verify that test set-up specified in Paragraph 6 of Section 314 has been completed and the various key operations and insulations are in effect.

2. OVER-ALL VERIFICATION TEST

2.1 Test Objectives: Table A is provided to include an over-all operation test of the switching system which will use all circuits in passing "completion" calls.

2.11 The digits dialed are arranged to verify:

- (a) all paths in T-A and T-B,
- (b) the digit registers in RC-A, RC-B, all ITR and all S,
- (c) the "3 out of 32" check circuit of the TC,
- (d) certain central paths of all NCT.

2.12 The arrangement of ITR and S in Table A is such that the test will be effective for any size installation.

2.13 The first and second cycles of Table A must be completed on any size installation to verify both T-A and T-B.

2.14 The second cycle must be completed using S1-10 if S11-20 are not equipped.

2.15 The third and fourth cycles shall be completed only if S 21-30 or S 31-40 are equipped.

2.16 If the installation under test does not have an equipped ITR or S as shown in Table A, the tests assigned to

unequipped ITR or S shall be distributed in re-tests of the equipped ITR or S during first and second cycles.

2.17 If the installation under test does not have S 21-30 equipped, but does have any of ITR 7-9, the third cycle shall be performed only as necessary to cover the equipped ITR using S 1-20 in place of S 21-30.

2.171 For example, in a 600 line job with ITR0-4 and S1-10 equipped, the tests of the first cycle shall be completed, S1-10 shall be used for the second cycle, and when ITR5-6 are required ITR0-4 shall be used to complete the second cycle. The third and fourth cycles are not required as none of the S listed are equipped.

2.172 Another example, in a 2400 line job with ITR0-7 and S1-30, the first, second, and third cycles shall be completed using ITR0-7 in place of ITR0-9 as listed. The fourth cycle is not required as S31-40 are not equipped.

2.173 Another example, in a 3200 line job with ITR0-9 and S1-40, all four cycles would be completed as listed in Table A.

2.18 The order of selection of S by RC-C shall be verified as calls are placed in ITR and passed to S by the RC-C.

2.19 The order of selection of S by SC-C shall be verified as the S are scanned by SC-C for transmission.

2.2 Trouble Indications: Any lamp or alarm indication or transfer of circuits other than as described in Paragraph 2.3 during this test shall be investigated and cleared.

2.21 The RHA, RHB, SHA, and SHB jacks with the 349A plug inserted will cause the trouble condition to hold the circuits used for the call until they may be identified and progress determined. Blocking the TM relay of ITR used or TO relay of SC-C, as described in Paragraph 3 of Section 315, will prevent time-out of circuits to give indefinite interval for troubleshooting.

2.22 The ITE-4546 Dry Reed Relay Reader may be used to compare ITR and S digit storage with false F- lead indications.

TABLE A

Dial	Call No.	First Cycle		Second Cycle		Third Cycle		Fourth Cycle		Read:			
		ITR	S	ITR	S	ITR	S	ITR	S	F0	F1	F2	F3
3494	1	0	1	3	11	7	21	2	31	9	3	2	
4597	2		2		12		22		32	4-6			2
4198	3		3		13		23		33		2-4	8	
2498	4		4		14	*B	24	*A	34		4	9	1
4521	5		5		15	#BR	25	#AR	35	2	6		2
3134	6	*B	6		16		26		36	3	3-9		
3203	7		7	4	17		27		37		0-4	0	
1194	8		8		18		28		38	2		6	0
1497	9		9		19		29		39	5		1-3	
3482	10	R	10	R	20		30		40	8	5	2	
1203	11		1	*B	11	8	21	3	31	3		7	1
4576	12		2		12		22		32	7	1		2
3827	13		3		13		23		33	2	0	6	
2487	14		4		14	*A	24	*B	34		4	5-7	
4259	15		5		15	#AR	25	#BR	35	5-8		9	
3578	16		6		16		26		36	7-9		3	
1940	17		7		17		27		37		0	1-4	
2276	18		8		18		28		38		2	4-8	
3089	19		9		19		29		39		3-5-8		
3940	20	*AR	10	R	20		30		40	4-7		7	
2188	21		1	5	11	9	21	4	31		1	0-2	
1370	22		2		12		22		32	4			1-3
4488	23		3		13		23		33	3-5			1
1527	24		4		14	*B	24	*A	34	6	9	7	
1759	25		5		15	#BR	25	#AR	35	8		2-5	
4103	26		6		16	*A	26		36		0-4	8	
2160	27		7		17		27		37		1-8	0	
4566	28		8		18		28		38	6	1		2
1105	29		9		19		29		39	2		7-9	
4307	30	R	10	R	20		30		40		1-3		0
3061	31		1		11	0	21	5	31	6	6-8		
3938	32		2		12		22		32	3-9		7	
2306	33		3		13		23		33		3	0-3	
3760	34	*B	4		14	*A	24	*B	34	1-3		5	
3610	35		5		15	#AR	25	#BR	35	1-7		4	
2682	36		6	6	16		26		36		6	5	2
4670	37		7		17		27		37		4-6		3
1089	38		8		18		28		38	1			0-2
4482	39		9		19		29		39	8	5		1
2438	40	R	10	*BR	20		30		40		4	0-6	
4679	41		1		11	1	21	6	31	2-4			3
2266	42		2		12		22		32		2	3-8	
1610	43	3	3		13		23		33	7	8	4	
4306	44		4		14	*B	24	*A	34	3-6			0
2579	45		5		15	#BR	25	#AR	35		5-9	1	
1861	46		6		16		26		36	9		3	3
3487	47		7		17		27		37	8	0	2	
3305	48		8		18		28		38		0-2	1	
2378	49	*A	9	*A	19		29		39		3	4-6	
1207	50	#BR	10	#AR	20		30	R	40	3		8	0

*A - Operate RT-A key during announcement
 *B - Operate RT-B key during announcement
 #A - Operate SCT-A key during announcement
 #B - Operate SCT-B key during announcement
 R - Read-out by releasing Test Set TB key

2.3 Test Procedure: The calls of each cycle shall be placed in sequence. The operations necessary for transfer of RC-A, RC-B, SC-A and SC-B in one cycle effect the procedure in the next cycle, therefore the required cycles shall be performed in close sequence.

2.31 First Cycle: SC-A and T-A are used for all read-outs and RC-A is alternated with RC-B by operation of the RT key during this cycle. Read-out is done after ten calls are stored.

2.3101 Verify that no tests are being performed on the system and that all keys in all circuits on CCF, ANF, ISF, and TCF are normal.

2.3102 Verify that W1 and Z1 relays in SC-C are not operated. If W1 and Z1 relays are operated, manually release W1 relay.

2.3103 Operate SCT and RT keys on CCF panel both to position A. GL lamp lights.

2.3104 Operate TMT key on CCF. Place 349A plugs in RHA, RHB, SHA and SHB jacks on CCF.

2.3105 Operate MB keys on S11-40 if equipped. Associated TAL lamp lights on S unit.

2.3106 Verify that AS and BS selectors in SC-C, and ASI and BSI selectors in RC-C are at step 1 of indicator and that the brushes of arc 1 (from left) are at terminal 1 (bottom of arc). Never step the selector manually by means of the driving arm if brush is not at proper terminal. Step the selector manually by applying sufficient pressure to the bottom of the armature to force it upward against the core and then release the armature. In some cases, it may be necessary to apply the force with a snap in order to obtain a slight whip of the driving arm so that the driving pawl will engage a tooth of the ratchet wheel.

2.3107 Operate Test Set TB key.

2.3108 Operate ST, TRK-O and MON-O keys on ITE-4608 Bellboy Test Set.

2.3109 Dial the four digits of the first call of Table A. Ringing Tone and then a "completion" announcement (with Customer Dialing ITR only) are heard from speaker on test set. Verify operation of REV relay in ITR (with Operator Dialing ITR only). Verify that ST relay of S1 is operated.

2.3110 Release ST key of test set. After ITR has restored to normal, operate ST key and dial second call of Table A.

2.3111 Repeat Paragraphs 2.3109 and 2.3110 until sixth call of Table A has been dialed and the "completion" announcement heard or REV relay of ITR operates. Operate RT key on CCF lamp panel to position B. (Operation indicated on Table A by "★B".)

2.3112 Repeat Paragraph 2.3110 dialing digits of seventh call. Verify that RC-B is used by observing RC-B during ringing period.

2.3113 Continue to dial calls and observe storage until the "completion" announcement or REV relay operation after tenth call. Release the ST key on the test set. Release Test Set TB key. Observe F1-33 lamps on test set and compare with Table A for ten displays in order calls were placed. Verify selection of S in numerical order on index wheel indicator of AS (or BS) selector of SC-C as calls read-out. After read-out and all ST relays of S1-10 have released, operate Test Set TB key. (Operation indicated on Table A by "R").

2.3114 Operate ST key on test set and repeat Paragraphs 2.3109 through 2.3113 for the next four calls of the first cycle on Table A.

2.3115 After "completion announcement" is heard or REV relay of ITR operates when fourteenth call is dialed, release ST, TRK-O and MON-O keys of test set. Operate TRK-1, MON-1 and ST keys of test set to use ITR1 for calls 15 through 28.

2.3116 Repeat Paragraphs 2.3109 through 2.3115 for the other calls of first cycle on Table A, changing ITR and operating RT key as indicated.

2.3117 After "completion" announcement is heard or REV relay of ITR operates when forty-ninth call is dialed, operate SCT on CCF lamp panel to position B and RT key to position A. (Operation indicated on Table A by "★B ★A".) Complete first cycle by dialing fiftieth call and read-out.

2.32 Second Cycle: SC-B and T-B are used for all read-outs and RC-A is alternated with RC-B by operation of the RT key during this cycle. Read-out is done after ten calls are stored.

2.3201 Operate MB keys of S1-10 and S21-40, if equipped, to use S11-20 for this cycle. If S11-20 are un-equipped, use S1-10 for this cycle by having MB keys of S1-10 normal.

2.3202 Verify that W1 and Z1 relays in SC-C are operated.

2.3203 Continue to place calls and read-out as in Paragraph 2.31 using the portion of Table A for second cycle to determine ITR changes and RT and SCT key operations.

2.3204 After read-out of fiftieth call, begin third cycle as required. If none of third cycle is required, restore all keys to normal.

2.33 Third Cycle: Read-outs use SC-A and T-A alternated with SC-B and T-B by operation of SCT key, and RC-A is alternated with RC-B by operation of the RT key during this cycle. Read-out is done after ten calls are stored, except for a read-out after the first five calls to enable transfer to SC-B and T-B, and,

unless the fourth cycle is not required, the last five calls read-out during the fourth cycle to enable a transfer to SC-A and T-A.

2.3301 Operate MB keys of S1-20, and S31-40, if equipped, and release MB keys of S21-30, if equipped, to use S21-30 for this cycle. If S21-30 are unequipped, use S1-10 or S11-20 for this cycle, by having MB keys of S1-10 or S11-20 normal as required.

2.3302 Verify that W1 and Z1 relays in SC-C are not operated.

2.3303 Continue to place calls and read-out as in Paragraph 2.31 using the portion of Table A for third cycle as required to determine ITR changes and RT and SCT key operations.

2.3304 After storage of fiftieth call, begin fourth cycle as required. If not all of the third cycle is required, or if the fourth cycle is not required, restore all keys to normal after the last assigned call has read-out.

2.34 Fourth Cycle: Read-outs use SC-A and T-A alternated with SC-B and T-B by operation of SCT key, and RC-A is alternated with RC-B by operation of the RT key during this cycle. Read-out is done after ten calls are stored, except for a read-out after the first five calls with the last five calls of the third cycle to enable a transfer to SC-A and T-A, and the last five calls are read-out alone.

2.3401 Operate MB keys of S1-30, if equipped, and release MB keys of S31-40 to use S31-40 for this cycle.

2.3402 Verify that W1 and Z1 relays in SC-C are operated.

2.3403 Continue to place calls and read-out as in Paragraph 2.31 using the portion of Table A for the fourth cycle to determine ITR changes and RT and SCT operations.

2.3404 After read-out of fiftieth call, restore all keys to normal.

3. LOAD TEST

3.1 This test is arranged to subject the system to maximum service load conditions for all types of calls. This test shall be completed in one sequence without alarms to take advantage of rapid repeated operation of equipment.

3.11 All tests of Sections 311 through 315, Sections 410 and 411, and Paragraph 2 of this Section shall be completed prior to this test.

3.2 Test Preparation:

3.21 Remove TNC lead from the Test Set "A" T.S. punching O.

3.22 Remove insulator from 8B of TCR relay in TC.

3.23 Operate TMT key in CCF lamp panel. GL lamp lights.

3.24 Place 349A plugs in RHA, RHB, SHA, and SHB jacks on CCF lamp panel.

3.25 Verify that all keys in TCF are normal.

3.3 Test Procedure:

3.301 Operate Test Set TRK keys for all equipped ITR.

3.302 Operate Test Set ST key.

3.303 Dial 3491. RC-C serves each ITR. Calls are passed to TC.

3.304 After RC-C serves last ITR, release Test Set ST key.

3.305 Repeat Paragraphs 3.302 through 3.304 until RCSB lamp lights on CCF lamp panel indicating that all Storage Circuits are busy.

3.306 Operate Test Set ST key. Dial 4711, RC-C serves each ITR.

3.307 After RC-C serves last ITR, release Test Set ST key.

3.308 Repeat Paragraphs 3.301 through 3.307 when RCSB lamp goes out.

3.309 Continue in the manner of Paragraphs 3.301 through 3.308 for at least 10 minutes.

3.310 Reconnect TNC lead to Test Set "A" T.S. punching O.

3.311 Replace insulator at 8B of TCR relay in TC.

3.312 Remove 349A plugs from SHA, SHB, RHA and RHB jacks and release TMT key on CCF lamp panel. GL lamp goes out.

3.313 This test shall be performed once without any alarms occurring during Paragraphs 3.301 through 3.309.

4. STEP-BY-STEP FEATURES

4.1 Determine telephone company assignment of ITR for ABS to BS terminals and AO-4 to GRD terminals.

4.2 Remove temporary ABS to AS connections and place connections determined in Paragraph 4.1.

4.3 Operate Test Set ST key.

4.4 Operate Test Set TRK- key for first ITR arranged for SXS features.

4.5 Dial digits of Table B corresponding to A- to GRD connections placed in first ITR.

4.6 Verify F- lamp indications of Table B for digits dialed while displayed on Test Set.

4.7 Release Test Set TRK- key.

4.8 Repeat Paragraphs 4.4 through 4.7 for each ITR with SXS features.

TABLE B

<u>A- to GRD</u>	<u>Dial</u>	<u>F- lamps</u>
0,1	105	2, 27, 29
0,2	266	12, 23, 28
1,2	061	6, 16, 18
0,4	521	2, 16, 32

4.9 Release Test Set ST key.

5. NUMBER CHECK TRANSLATOR TESTS

5.01 Determine telephone company assignment of NCT by connection of HG-- to X-- and Y-- terminals and HG-- to INT terminals.

5.02 Remove temporary HG-- connections of Section 314 Table B and place connections determined in Paragraph 5.01.

5.03 Operate Test Set ST key.

5.04 Operate Test Set TRK-0 and MON-0 key.

5.05 Dial hundreds (HG) group digits and digits 11 for X group of first NCT.

5.06 Verify "completion" announcement from Test Set speaker.

5.07 Release Test Set ST key.

5.08 Operate Test Set ST key and repeat Paragraphs 5.05 through 5.07 for Y group of first NCT.

5.09 Repeat Paragraphs 5.03 through 5.08 for each NCT with HG-- connections.

5.10 Repeat Paragraphs 5.03 through 5.05 for each NCT with INT connections. Verify "intercept" announcement or operator answer from Test Set speaker.

5.11 Remove all connections to Test Set indicated in Section 314 Table A.

5.12 Remove insulators from TCR and CKA relays of TC.

5.13 Remove ITE-4647 Trunk Simulators from OT OUT jacks of TCF.

5.14 The "R", "Y" and "N" options of SD96564-01 should be determined from telephone company and changed as necessary.

5.15 Verify that all keys are normal and all lamps in CCF and TCF are out.

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