SUPPLEMENTARY TEST INSTRUCTION

ORIGINATING AND AUXILIARY SENDER TEST FRAME

CONTENTS

1. GENERAL INFORMATION

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1. GENERAL INFORMATION

1.1 This section describes a method of
    verifying the modification for the
Dial Tone First Feature, Apparatus Figures
49 and 50 and QB, QD and QF wiring of the
Originating and Auxiliary Sender Test Frame,
SD-25221-01.

1.2 When performing the tests of this
    section, that relay operation
listed in the Results Column of Para-
graph 3 is of primary importance. However,
any additional relay operation which appears
to be false should be investigated.

2. TEST EQUIPMENT

2.1 Cords and Accessories

AMT	CODE	DESCRIPTION	WITH ITE
1	R-9572	Test Receiver	4023
As Req.	KS-16887-L1	Tool,Blocking (Wedge)	4023
As Req.	508A	Tool,Blocking	4023
1	ITE-9547 or Equiv.	Cord, 12', 1 Conductor, ITE-2455 Plug Each End	4023
As Req.	ITE-8507	Clip,Alligator	4023
1	ITE-4442	Volt-Ohmmeter	

3. SUPPLEMENTARY TESTS

3.1 Verify that Fuse "G" for Apparatus
    Figures 7, 49 and 50 is installed.

3.2 The following information will
    facilitate locating the appara-
tus used in performing the tests of this
paragraph. Example: Relay C (-103) is
located on the Connector Controller Circuit.

-103 Connector Controller
-108
-109 Route Keys and Revertive Pulsing
     Circuit
-111 Full Selector Dial Pulse Control
     Circuit
-113 Incoming and Final Selections Control
     Circuit
-115 PCI Dial Pulse Control Circuit
-117 PCI Register Circuit
-121 Operator Class Control Circuit for
     Subscriber Senders
-131 Sender Group Test Circuit
-133 Code Test Circuit
-137 AS Area Code Circuit
-139 AS Dial Pulse and Code Check Control
     Circuit
-141 AS MF Pulse Check Control Circuit
-143 Touch Tone Signal Circuit

3.3 Test Operations

NOTE: Unless otherwise specified, the Test Operation, Action and Results apply to
      QB wiring and apparatus.

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
	1		Restore all keys and switches to normal position. Operate key TA.	Time Alarm Circuit disabled.
	2	C(O)(-103)	Operate key CON.	Relay CON operates.
	3		Manually operate and release relay AV(-133).	Relay CNF operates and locks.
	4		Release and reoperate key CON.	Relay CON releases and reoperates. Relay CNF releases.
QD	5		Manually operate and release relay DAS,(-139).	Relay CNF operates and locks.
	6		Manually operate and release relay CK3,(-133).	Relay CNFA operates and locks. Relays LUA, LUB and LUC,(-133) operate and lock.
	7		Release key CON.	Relays CON, CNF, CNFA, LUA, LUB and LUC,(-133) release.
	8		Remove blocking tool from relay C,(-103).	

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
	9	LUC,A5,A4,A2, (-133) and CNF (O)	Verify ground is present 4T, relay LC (-131) (Q and Y opt.) or 4F, relay PD (RB opt.)	
	10	CNFA(O)	Verify ground is absent 4T, relay LC (-131), (Q and Y opt.) or 4F, relay PD (RB opt.).	Relay COK operates. Lamp COK is lighted.
	11		Remove blocking tools from relays CNF, CNFA LUC, A5, A4 and A2.	All relays released.
Y	12		Connect ground to MISC. T.S. pch. 73.	Ground present cn CP Selector (-133) are 3, term 15.
Z	12A		Operate key RVT. Connect ground to 1T relay TR(-121).	Ground present on 6B, relay RLS(-121).
	13	CNFA(O)		Ground absent on CP Selector (-133) arc 3, term 15, (Y opt) or 6B, relay RLS (-121) (Z opt.).
	13A	CK1,CK3(O)		Relay CK4 operates.
	14		Remove blocking tool from relays CNFA. CK1 and CK3. Restore key RVT. Disconnect ground lead.	Relay CK4 releases.
	15	CNF(O)		Ground present CP Selector (-133) arc 4, term 12.
	16		Manually operate relay COK.	Ground absent CP Selector (-133) arc 4, term 12 while relay COK is operated.
	17		Remove blocking tool from relay CNF.	
	18	C(O)(-133)	Manually operate relay LUB(-133).	Relays LUA, LUB and LUC(-133) lock operated.
	19		Manually operate relay CNF.	Relays LUA, LUB and LUC(-133) release.
	20		Remove blocking tool from relay C(-133).	
	21		Connect ground to pch 60, T.S. (T-T) on Sender Select Unit.	
	22		Operate and release key CON.	Relay PSD (-103) operated and releases.
	23		Remove ground connection from T.S.(T-T).	
	24		Insulate contacts 2T, relay BO and 3T, relay TFO(-108). Connect ground to contact 3B, relay TFO(-108).	Lamp FC is lighted.
	25	CON(O)	Apply ground through a test receiver to SP Selector(-113) arc 4, term 11.	Relays FUA and FUB operate. Lamp FC is extinguished.
	26		Remove test receiver ground from SP Selector.	Relay FUA releases, lamp FC is lighted and relay FUB remains operated.
	27		Remove blocking tool from relay CON.	Relay FUB releases.
	28		Remove ground connection from 3B, relay TFO(-108). Remove insulators from relays BO and TFO.	Lamp FC is extinguished. Ground present on SP Selector (-113) arc 3, term 12.
QF	29		Verify ground is absent on: SP Selector(-113) arc 3, term 17 and 19. SP Selector(-115) arc 3, term 15 and 17. DP Selector(-121) arc 3, term 16 and 18. ASDC Selector(-139) arc 4, term 15 and 17.	

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
QF	30	SBA(O)		Relays SBB, SBC and SBD operate. Ground is present on selector terminals specified in Step 29.
	31	GTO(O)		Ground is still present on selector terminals specified in Step 29(QF opt) and SP Selector(-113) arc 3, term 12. (QB opt)
	32	FUB(O)		Lamp GTK is lighted. Ground is absent on selector terminals specified in Step 29 (QF opt), and Step 28.
	33	BO1(O)(-108)	Remove blocking tools from relays FUB and GTO.	Lamp GTK is extinguished. Ground is present on: SP Selector(-113) arc 3, term 11(QB opt). SP Selector (-113) arc 3, term 16 and and 18(QF opt). SP Selector(-115) arc 3, term 14 and 16(QF opt). DP Selector (-121) arc 3, term 15 and 17(QF opt). ASDC Selector (-139) arc 4, term 14 and 15 (QF opt).
	34	FUA(O)		Ground is absent on Selector terminals specified in Step 33.
	35	FUB(O)		Ground is present on selector terminals specified in Step 33.
	36	GTO(O)	Remove blocking tool from relay FUB.	Ground is present on selector terminals specified in Step 33.
	37		Operate and release key GTN.	Lamp GTK is lighted and extinguished.
	38		Remove blocking tools from relay BO1, FUA, GTO and SBA.	
QF	39		Connect ground to DP Selector(-111) arc 4, term 13.	Relay SB(-111) operates.
QF	40		Operate and release relay SBC.	Relay SB(-111) releases and reoperates.
QF	41		Remove ground connection from DP Selector(-111).	Relay SB releases.
QF	42	C(O)(-111)	Verify absence of ground 2B, relay TR(-111).	
QF	43		Operate and release relay SBA.	Ground present on 2B, relay TR(-111) when relay SBA is operated.
QF	44		Remove blocking tool from relay C(-111).	
	45	COK(O)	Connect ground to 4T, relay WO(-111).	Relay TR(-111), (Z opt) or TR1(-111), (Y opt) operates.
	46		Remove blocking tool from relay COK.	Relay COK releases. Relay TR (Z opt) or TR1(Y opt) releases.
	47		Remove ground connection from relay WO (-111).	
QF	48	IP(O)(-113)	Verify the absence of ground on 7T, relay IP(-113).	
QF	49		Operate and release relay SBC.	Ground present on 7T, relay IP(-113) when relay SBC is operated.
QF	50		Remove blocking tool from relay IP(-113).	
	51		Connect ground to MISC T.S. pch 28.	Ground present on 2B, relay N(-113).
	52		Operate and release relay FUB.	Ground absent on 2B, relay N(-113) when relay FUB is operated.

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
	53		Disconnect ground from MISC T.S. pch 28 (QB opt) and connect to SP Selector (-113) arc 4, terminal 15. (QF opt)	Relay F1(-113) operates. (QF opt)
QF	54		Operate key SBA.	Relay F1(-113) releases. Relays SBA, SBB, SBC and SBD operate. Ground is present on SP Selector(-115) arc 2, terminal 13 and 4T, relay RLS(-121).
QF	55	CON(O)	Remove ground connection from SP Selector (-113). Release key SBA.	Relays SBA, SBB, SBC and SBD remain operated.
QF	56		Remove blocking tool from relay CON.	Relays CON, SBA, SBB, SBC and SBD release.
QD	57	EP(O)(-139)		Ground present on ASDC Selector (-139) arc 3, terminal 10.
QD	58	MFCA(O)		Ground absent on ASDC Selector (-139) arc 3, Terminal 10. Ground present on 4T, relay RLS(-121). (QF opt)
QD	59		Remove blocking tools from relays EP and MFCA.	
QF	60		Verify the absence of ground on: SP Selector(-113) arc 3, term 15. SP Selector(-115) arc 3, term 13. ASDC Selector(-139) arc 4, term 13. DP Selector (-121) arc 3, term 14.	
QF	61	COK,SBB, and SBC(O)		Relay SBD operates. Ground is present on Selector terminals specified in Step 60.
QF	62		Remove blocking tools from relays COK, SBB and SBC.	
QF	63	OB(O)(-108)		Lamp OB is lighted.
QF	64	SBB(O)		Lamp OB is extinguished. Lamp OBA is lighted.
QF	65	OG(O)(-108)		Lamp OGA is lighted.
QF	66		Remove blocking tool from relay SBB.	Lamps OBA and OGA are extinguished. Lamps OB and OG are lighted.
QF	67		Remove blocking tools from relays OB and OG (-108).	
QF	68		Verify the absence of ground on: SP Selector (-113) arc 4, term 16. SP Selector(-115) arc 2, term 14. DP Selector(-121) arc 4, term 15. ASDC Selector(-139) arc 6, term 14.	
QF	69		Connect ground to SP Selector(-113) arc 4, term 16.	Ground present on terminals specified in Step 68.
QF	70		Operate and release relay SBB.	Relay OB operates and releases.
QF	71		Verify the absence of ground on: SP Selector(-113) arc 4, term 18. SP Selector(-115) arc 2, term 16. DP Selector(-121) arc 4, term 17. ASDC Selector(-139) arc 6, term 16.	

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
QF	72		Move ground connection on SP Selector(-113) from arc 4, term 16 to arc 4, term 18.	Ground present on terminals specified in Step 71.
QF	73		Operate and release relay SBB.	Relay OG operates and releases.
QF	74		Disconnect ground from SP Selector(-113) and connect to 3T, relay TR(-115).	Ground present on SP Selector (-115) arc 3, term 13, ground absent on term 18.
QF	75	SBB(O)		Ground absent on SP Selector (-115) arc 3, term 13, ground present on term 18.
QF	76		Remove blocking tool from relay SBB. Disconnect ground from 3T, relay TRL(-133).	Ground present on SP Selector (-115) arc 2, term 14 and arc 4, term 14.
QF	77	SBD(O)		Ground absent on SP Selector (-115) arc 2, term 14. Ground present on DP Selector(-121) arc 4, term 20.
QF	78	SBB(O)		Ground absent on SP Selector (-115) arc 4, term 14. Ground present on arc 4, term 19.
QF	79		Remove blocking tools from relays SBB and SBD and remove ground connection from 7T, relay TRL(-133).	
QF	80		Connect ground to SP Selector(-115) arc 4, term 13.	Lamp RLS is lighted.
QF	81	SBA(O)		Lamp RLS is extinguished.
QF	82		Move ground connection on SP Selector(-115) from term 13 to term 18, arc 4.	Lamp RLS is lighted.
QF	83		Remove blocking tool from relay SBA and disconnect ground from SP Selector(-115).	Lamp RLS is extinguished.
QF	84		Connect ground to 1T, relay EP(-139).	
QF	85		Operate and release relay SBA.	ASDC Selector(-139) advances.
QF	86		Remove ground connection from relay EP (-139). Restore ASDC Selector to normal.	
	87	WO1(O)(-113)	Connect ground to 2T, relay SY2(-113).	
	88	COK(O)		Relay L(-108) operates.
QD	89	MFCA(O)		Ground present on 2T, relay EV(-103).
QF	90		Operate and release key SBA.	Relay L(-108) releases and reoperates.
	91		Remove blocking tools from relays COK and MFCA. Disconnect ground from 2T, relay SY2(-113).	
YO	92		Connect ground to 6T, relay F1(-113).	
YN	92A		Connect ground to 1T, relay IA(-113).	
	93		Operate and release key TWD.	Relay L(-108) operates and locks.
	94		Operate and release relay COK.	Relay L(-108) releases.
	95		Insulate contacts 1 and 2B, relay L(-108).	
	96		Operate key TWD.	Relay L(-108) operates.
	97		Momentarily open, one at a time, contacts 8 and 9B of relay CNFA.	Relay L(-108) releases and reoperates in each case.

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
	98		Restore key TWD.	Relay L(-108) releases.
QF	99	COK(O)	Operate and release key SBA.	Relay L(-108) operates and releases.
QF	100	L2(O)(-108)		Relay L(-108) operates and locks.
QF	101		Operate and release relay SBD.	Relay L(-108) releases and reoperates.
	102		Disconnect ground from relay F1(-113). Remove insulator from relay L(-108). Remove blocking tools from relays COK and L2 (QF opt).	Relay L(-108) releases.
	103	IP(O)(-113) FUB(O)	Verify ground is absent on 6B, relay EV(-103).	Ground is present on 2T, relay SY(-113).
	104		Operate and release relay COK.	Ground is absent on 2T, relay SY(-113) when relay COK is operated.
	105	FUA(O)		Ground is absent on 2T, relay SY(-113).
	106		Remove blocking tool from relay FUB.	Ground is present on 2T, relay SY(-113).
	107	CNFA and COK(O)	Remove blocking tool from relay FUA.	Ground is absent on 2T, relay SY(-113). Ground is present on 6B, relay EV(-103) and 2B, relay C1(-111).
QF	108	C1(O)(-111)	Verify ground is absent on 3B, relay OG (-108).	
QF	109	SBD(O)		Ground is present on 3B, relay OG(-108).
QF	110		Remove blocking tools from relay C1(-111) and SBD.	Ground is absent on 3 and 4B, relay OG(-108).
QD, QF	111	MFCA(O)		Ground present on 4B, relay OG(-108).
QF	112		Operate key SBA.	Ground present on 2T, relay SY(-113). Ground is absent on 6B, relay EV(-103).
QD, QF	113		Restore key SBA and remove blocking tools from relays CL(-111), MFCA and SBD.	
	114		Remove blocking tools from relays CNFA and COK.	Ground is absent on 6B, relay EV(-103).
	115		Operate key TWD.	Ground is present on 6B, relay EV(-103).
QF	116		Operate and release relay SBC.	Ground is absent on 6B, relay EV(-103) when relay SBC is operated.
	117		Operate and release relay CNFA.	Ground is absent on 6B, relay EV(-103) when relay CNFA is operated.
	118		Restore key TWD.	Ground is absent on 6B, relay EV(-103).
	119		Verify absence of ground on SP Selector (-115) arc 3, terminal 22.	
	120	CON(O)		Ground is present on SP Selector (-115) arc 3, terminal 22.
	121		Remove blocking tools from relays IP(-113) and CON.	
QD	122	MFCA(O)		Ground present on 8F, relay COK.
QD	123		Remove blocking tool from relay MFCA.	Ground absent on 8F, relay COK.
	124		Connect ground to SP Selector(-115) arc 4, terminal 12.	Relay SB(-115) operates.

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
	125		Operate key CON.	Relay SB(-115) releases. Ground is present on 5B, relay G(-115).
	126		Operate key TWU.	Relay SB(-115) operates. Ground is absent on 5B, relay G(-115).
	127		Remove ground from SP Selector(-115). Restore keys CON and TWU.	Relay SB(-115) releases.
	128	C(O)(-115)	Manually operate relay SB.	Relay SB(-115) locks operated.
	129		Operate and release key TWU.	Relay SB(-115) releases.
	130		Remove blocking tool from relay C(-115). Connect ground to 1B, relay G(-117).	Ground absent on 1T, relay WO1 (-117).
	131		Operate and release key TWU.	Ground present on 1T, relay WO1(-117) when key TWU is operated.
	132		Disconnect ground from relay G(-117) and connect to 2B, relay LK(-115).	
	133		Operate and release relay COK.	Relay TR(-115) operates and releases.
	134		Disconnect ground from relay LK(-115).	
	135	GTA(O)	Connect -48V battery to contact 5, relay GTA.	Relays GTB and C (-103) operate.
	136		Operate key DGT.	Relay BK(-103) operates, lamp DGT is lighted and relays GTB and C(-103) release.
	137		Disconnect battery from relay GTA. Restore key DGT and remove blocking tool from relay GTA.	Relay BK is released and lamp DGT is extinguished.
	138		Operate and release key GTO.	Relay GTO operates and releases.
	139		Verify ground is present on DP Selector (-111) arc 3, terminals 18 and 19.	
	140		Operate key GTN.	Ground is absent on DP Selector (-111) arc 3, terminals 18 and 19.
	141		Restore key GTN and operate key GTO.	Ground is absent on DP Selector (-111) arc 3, terminals 18 and 19.
	142	GTB(O)	Connect ground to DP Selector(-111) arc 4, terminal 18.	Ground is present on DP Selector (-111) arc 3, terminals 18 and 19 and arc 4, terminal 19.
	143		Restore key GTO and operate key GTN.	Ground is present on DP Selector (-111) arc 3, terminals 18 and 19.
	144		Operate and release key DGT.	Relay RLS(-121) operates and releases.
	145		Remove blocking tool from relay GTB.	Relay GTA operates.
	146		Restore key GTN.	Relay GTA releases.
	147		Operate key GTO.	Relay GTA operates.
	148		Remove ground connection from DP Selector (-111). Restore key GTO.	Relay GTA releases.
	149	C(O)(-133)		Relay CKG(-133) operates.
	150	CNF(O)		Relay CKG(-133) releases and reoperates.
	151		Operate and release relay CK4(-133).	Relay CKG(-133) releases and reoperates.

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS

Step 199 (Cont.):

Operate Key OB-	Set Switch OGA-	X = Buzz, - = No Buzz
2		-
	2	X
3		-
	3	X
4		-
	4	X
5		-
	5	X
6		-
	6	X
7		-
	7	X
8		-
	8	X
9		-
	9	X

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION
QF	200	SBB(O), SBD(N)	Repeat Step 199 using key OG and switch OBA instead of key OB and switch OGA.
QF	201		Remove blocking tools from relays SBB and SBD. Disconnect ITE-4137A from relays OB and OG(-108).
QF	202	OB,OG(N)(-108) SBD(N)	Insulate contacts 1 and 2T, relay BO(-108) and 2 and 3T, relay TFO(-108). Connect an ITE-4442, Volt-Ohmmeter, adjusted to the RX1000 scale, to 3B, relay OG(-108) and 1T, relay BO(-108).

Operate Key OFF CR	Block Operated Relay	Release Relay	Set Switch CRA	Volt-Ohmmeter Reading + 1%
0				infinity
	SBC			open
			0	infinity
300		SBC		300
	SBB			open
			300	300
			600	600
		SBB		300
600				600
700				700
	SBB			600
			700	700
			900	900
		SBB		700
900				900
1000				1000
	SBA SBB			900
			1000	1000
			1300	1300
1300		SBA SBB		
1600				1600
	SBA			1300
			1600	1600
		SBA		

OPT	STEP	BLOCK RELAY (O) Operated (N) Normal	ACTION	RESULTS
QF	203		Remove blocking tools from relays OB, OG (-108) and SBD. Remove insulators from relays BO and TFO (-108). Disconnect Volt-Ohmmeter from relays OG and BO(-108).	
	204		Restore all electrically operated relays to normal. Remove all test equipment.	
	205		Make a visual inspection for connections which may have been inadvertently broken during wiring or test operations.	

3.4 Verification Tests

3.41 To verify that existing features of the Test Circuit, affected by this modification, are still operational, routine tests of a Subscriber Sender, SD-25012-01, should be performed as follows:

A. HANDBOOK 61, SECTION 162.1

(a) Routine 2720A, Paragraphs 3.201, 3.202 and 3.203.
(b) Routine 2720B, Paragraphs 3.31 and 3.32.

(c) Routine 2720D, Paragraphs 3.51 and 3.52.

B. HANDBOOK 61, SECTION 169

(a) 10 Digit - No Skip, Paragraph 12.2.
(b) 10 Digit - Skip 3, Paragraph 12.3.
(c) 10 Digit - Recycle, Paragraph 12.4.

Manager, Crossbar Product Engineering
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