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NO. 1
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TRANSVERTER TEST

CHANGES

B. Changes in Apparatus

B.01 Added

CATA - Lamp, M1, Option PF

TRP - Lamp, M1, Option PF

D. Description of Changes

D.01 Option NQ is added which enables the selection of a particular auxiliary sender on this test call.

D.02 Figure 1 is changed to show the addition of two lamps, CATA and TRP. The SGLO Lamp is changed to SGPO lamp.

F. Changes in Description of Operations

F.01 In Appendix 6B, under 35. STUCK SENDER TRUNK IDENTIFICATION CONTROL OF SELECT AND HOLD MAGNETS ON THE SENDER TEST FRAME, add the following to 35.03:

CATA	Cancel ATA
TRP	Sender or Trunk Involved in a Trace has been matched by TRAP Circuit

F.02 In Appendix 10B, under B.01, lines 11 and 12, change option NB to NJ and Option NA to NI.

F.03 In Appendix 10B under D.01 change sentence to read:

Option NJ is added to improve the 7 maximum and 7 minimum pulsing speed tests.

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CHANGES

B. Changes in Apparatus

B.01 Added

AR Relay, U835, Option PR

SOF Relay, U937, Option PR

SOF1 Relay, Y293, Option PR

SOF2 Relay, U452, Option PR

SK2-7 Key, 2AP, Option PV

SOF Key, 2TB, Option PR

POS/PNS Key, 2DH, Fig. AS

MFGT Relay, U, Option PX

BK(-0115) Diode, 446K, Option PZ

BK(-0103) Diode, 446K Option PZ

NE Resistor, 18BK, Option NB

(RMV NE Resistor, 18HW, Option NA)

TTRD Relay, U286, Option NB

STP Resistor, 18FL, Option ND

TO Jack, 289AM, Fig. 25

(RMV to Jack, 289B - New Frame Only)

W01 Jack, 289AM, Fig. 27

(RMV W01 Jack, 289B - New Frames Only)

RS1 Resistor, KS-20289,L6C, Fig. F

(RMV RS1 Resistor, 140A - New Frames Only)

Added (Cont)

RS4 Resistor, KS-20289,L6C, Fig. F

(RMV RS4 Resistor, 141A - New Frames Only)

GTO Resistor, KS-20289,L6C, Fig. 49

(RMV GTO Resistor, 147A - New Frames Only)

SRG Resistor, KS-20289,L6C, Fig. F

(RMV SRG Resistor, 141A - New Frames Only)

D. Description of Changes

D.01 Options PR and PV added for a new MF outpulsing alternate route test. Figure AS is added to provide means to skip old senders as well as to skip new senders. Option PT is added to provide permanent signal tests with prefix digits "1" or "11" calls. Option PX is added to provide a sender GT relay critical operate and release test on a MF outpulsing dial-tone first test. Option PZ is added to improve the dial-tone first false trunk closure test so it will block properly with a test failure. Option NB is added to improve the 7 maximum and 7 minimum pulsing speed tests. Option NB is added which enables TT senders to be tested for rotary dial even though all RD senders in the same subgroup are busy. Option ND is added to make a more stringent test of the STP relay in the sender. This will insure that this relay will function satisfactorily with RP even on long loops. Option NE is added to provide a false trunk closure test with an MF coin failure announcement test on dial-tone first senders. Option NG is added to improve the directory assistance charging straightforward, service observed, LAMA test calls. Option NH is added to improve the eleventh and twelfth button TT test calls. With new senders on automatic sequential advance the senders are being left off-normal.

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F. Changes in Description of Operation

F.01 In SECTION -0141, add the following:

27. ALTERNATE ROUTE TEST USING MF OUTPULSING

27.01 This circuit is brought into use by the operation of the SOF locking key. The SOF1 relay operated causes this circuit to make the alternate route test. The SOF1 relay is operated in different ways. It is operated if the SOF2 relay operates. A make-contact (9-10T) of the SOF2 operates the SOF relay directly. The SOF2 is operated by the CA key when the test frame is control advanced. The SOF2 relay operating the SOF1 relay insures that an alternate route test will occur on the first call rather than the second. The SOF1 relay is also operated when the test is started on the first sender through SOF key operated, the SOF diode, and a break contact of the start relay to ground of the ST relay (-0103). The SOF1 relay is also operated through the SOF key, SOF1 diode, make contact of AV relay (-0141), make contact of start pulse check relay - STK (-0141), and a break contact of the CK2 relay (MF rec). This SOF1 relay operation happens at the end of a complete MF call received and thus prepares the circuit for an alternate route test on the call to the next sender. The SOF1 relay when operated locks and is released when an alternate route test is being made (SOF or AR operated). The SOF1 released requires that a complete MF call be received on the next call.

27.02 The SOF relay will operate when the SOF1 relay has previously operated and the MFK set reaches position 10 which is the thousands digit position. At this point when the SOF operates, the fundamental from the sender is reversed. This causes the sender to immediately stop outpulsing, then to request another marker to set up an alternate route for another complete outpulsed call. This causes the AR lead from the second marker to be grounded to sheet -0133 to 4T AR1 relay, then through the SOF relay make, then 2-3T OF1 (-0133) break contact which prevents the AR relay from operating on the up-check pulse from the marker. When the up-check pulse is gone, the prolonged ground on the AR lead then operates the AR relay. The AR relay operated releases the C relay (-0141) and the SOF relay. The C relay (-0141) releasing causes the MFK set to reset in preparation of receiving the next complete call. By the time the selection has reset and preset to the first digit to be received the sender has not yet outpulsed the second call. With the SOF1 relay being normal, the complete call is received. At the end of this call the last pulse to be received (the start pulse) reoperates the SOF1 relay through the STK relay. The next call is then set up for an alternate route test.

27.03 This test will work on skip-two calls. It will also work with skip two on the first call (alternate route) and 7-digit MF outpulses on the second call providing PV option is furnished and the SK2-7 key is operated. A make contact (3-4T) of the SOF1 relay causes the MFK sel on the alternate route call to be preset to the skip two position and on the regular call to be preset to the 7-digit call position of the MFK sel.

F.02 In SECTION -0102, add the following:

34. PASSING THE SENDER PER SD-25012-01 USING THE PNS/POS KEY IN THE POS POSITION (FIG. AS)

34.01 When the test frame connects ground to the STD lead this ground is also extended to the POS relay through a front contact of key POS (Section -0162). The POS relay is slow-operate to allow time for the operation of the NS, NSA relays to allow the test frame to distinguish new and old senders. With the PNS key and NSA relay normal, (old sender attached) an operate path is closed to operate relay PSD. The operate ground originates from a front contact of POS relay and then through back contact of PNS key and then to the PSD relay as described above. The circuit will function as described in 27.

F.03 In SECTION -0121, add the following at the end of 14.01:

With PT option, a "1" or "11" will be dialed first and then the A, B, and C digits will not be dialed because of relay PS. With PS option, the prefix digits are not dialed first.

F.04 In SECTION -0165, add 11.02 and 11.03 as follows:

11.02 For the MF outpulsing GT relay release test, operate keys MFGT, CON, and GTN and select a coin class MF call. After marker release and sender registration complete, EP (-0139) operates which in turn operates the GTA relay. Relay GTA places ground to the ring lead and relay GTK to the tip lead to detect the sender relay GT. When the sender relay SCT operates, it places relay GT on the tip. This allows relays GT and GTK to operate in series which in turn operates relay GTB. Relay GTB operates MFCB and places a release resistance of 10,000 ohms in the operate path of relay GT which should cause it to release. This release of relay GT indicates a coin failure and the call should be routed to coin failure announcement (see 7.02). With this being a coin failure test, A2, A4, and A5 leads are grounded by the sender and the test will advance with the operation of the COK relay.

11.03 For the MF outpulsing GT relay operate test, operate MFGT, CON, and GTO and select a coin class MF call. After marker release and sender registration complete, the test circuit advances as indicated in 11.02 to the operation of relay GTB and MFCB. The sender GT relay open circuit releases. Relay GTA releases and places a stringent operate resistance path to re-operate the GT relay. If the GT relay operates, the call will complete normally. If the GT relay does not operate, the sender will attempt to route the call to coin failure announcement. However, the test circuit will block with no MF outpulsing from the sender, and also will light lamp GTK indicating a sender relay GT operate test failure.

F.05 In SECTION -0165, add the following at the end of 7.04:

Relay BK (-0115) operates relay BK (-0103) through BK diode (-0115) and a make contact of FTC key (-0165).

F.06 In SECTION -0131, add 8.02 as follows:

8.02 With option NB furnished it is possible to test TT and/or DTF subscriber sender for rotary dial even though the rotary senders are busy. The TTRDT key must be operated. This connects the winding of the TTRD relay to the TTGBO lead to the subscriber sender link frame. This lead will have battery on it when all TT or DTF senders in the subgroup are busy. If they become busy the TTRD relay operates which then connects the GB relay (-0131) to the GBR lead which has battery applied on it when all rotary senders are busy in the subgroup. With this situation the battery on the GB- lead passing through a make contact of the TTRD relay then operates the GB relay (-0131) The test frame is then blocked in the busy test. This compares with the test frame being blocked in the busy test with only the RD senders busy while testing the TT senders for RD. This previous way is restored when the TTRDT key is normal. When testing TT senders with TT calls, the TTRDT key must be normal.

F.07 In SECTION -0165, 7.03, change title to:

PCI OR MF CALLS (COIN FAILURE)

F.08 In SECTION -0165 change title to:

DIRECT PCI OR MF

F.09 In SECTION -0165, at end of 7.04, add:

With MF outpulsing, a make contact of the G, C, and DP relays (-0115) are shorted out with make contacts of the MFCA relay so that the false trunk closure test is still functional even though the -0115 PCI section is normal.

F.10 In Appendix 8B, add 11.02:

11.02 On DAC straightforward service observed LAMA service observed calls, the transverter does not ground the LO lead as on regular service observing calls. A transfer contact on the DAC-STF key wired into the LO matching circuit (-0135) will enable the testing of this test call.

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D. Description of Changes

D.1 On sheet 0135, Fig. 42, wiring is added to the DAC-STF key.

D.2 On sheet 0133, Fig. 18, wiring is added to the DAC TV-TRL key, and the DAC TRL key designation is changed to AMA CK. Also, the ADV1 lead is removed from the OF3 relay.

D.3 On sheet 0141, Fig. 25, wiring is added to the STK relay. The designation of ST-ODN key is changed to STF-ODN key.

D.4 On sheet 0105, Fig. 3, wiring is added to the A5, B5, and C5 keys.

D.5 On sheet 0139C, Fig. 39, the 555 key is added with option PJ.

D.6 On sheet 0106, Fig. 33, the designation of DAC-INF key is changed to DAC 411 key.

F. Changes in CD Sections

Appendix 8B

F.1 Change the following key designations in B.01 as follows:

DAC-TRL Key to AMA CK Key

DAC-INF Key to DAC 411 Key

DAC-ST Key to DAC STF Key

ST-ODN Key to STF ODN Key

F.2 In 24.02, remove the last four lines: "Ground is then connected. . . ."

F.3 Change 11.01 to read:

11.01 The 2L and LO relays have special requirements placed on them to increase relay tension. This will prevent them from operating on up-check pulses coming from the transverter.

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CHANGES

B. Changes in Apparatus

B.01 Added

Directory Assistance Charging

DAC-ODN Relay U591, Option PH

L Relay U108, Option PM

OF3 Relay U660, Option PM

DAC TV-TRL/TRL Key 2YL, Option PM

ST-ODN Key 2TB, Option PK

DAC-ODN Key, 2AP Option PH

DAC-INF Key 2AP, Option PL

DAC-ST Key 2AP, Option PM

DATRL Lamp M1, Option PM

DAO Lamp M1, Option PH

5L Diode 446K, Option PM

2L Diode 446K, Option PM

TP Diode 446K, Option PM

LO Diode 446K, Option PM

C Diode 446K, Option PM

OF Diode 446K, Option PM

B.02 Changed

Directory Assistance Charging

From	To
INFK Relay U158, Option PN	U258, Option PM

B.03 Added - 209FF

Relay Replacement

From	To
CHK Relay 209FF, Option PO	316G, Option PP
FND Relay 209FF, Option PO	316G, Option PP
RVP Relay 209FF, Option PO	316G, Option PP
RVP1 Relay 209FF, Option PO	316G, Option PP
INT Relay 209FF, Option PO	316G, Option PP
INT1 Relay 209FF, Option PO	316G, Option PP
CTG Relay 209FF, Option PO	316G, Option PP
PLS Relay 209FF, Option PO	316G, Option PP
BJ (Fig. 5) Resistor 18AP, Option PO	18BM, Option PP
BH (Fig. 5) Resistor 19MG, Option PO	18DU, Option PP
BJ (Fig. 4) Resistor 18FR, Option PO	19SN, Option PP
BH (Fig. 4) Resistor 19RB, Option PO	18AP, Option PP
P (Fig. 4) Resistor 18DS, Option PO	18GH, Option PP

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From (Cont)	To
P1 (Fig. 4) Resistor 63CR, Option PO	19HD, Option PP
BF (Fig. 4) Resistor 18DS, Option PO	18KY, Option PP
BK (Fig. 4) Resistor 18BM, Option PO	18AP, Option PP
BO (Fig. 4) Resistor 19RB, Option PO	18AP, Option PP
BP (Fig. 4) Resistor 19HU, Option PO	18LA and 19PK, Option PP
BR (Fig. 4) Resistor 18AP, Option PO	18LA, Option PP

D. Description of Changes

D.01 Options PH, PK, PL, and PM are added for directory assistance charging. Option PN is provided when DAC tests are not provided. Option PG (tests for 1-NPA-411) is made Mfr Disc. Option PH is for DAC ODN calls. Option PK is for DAC straightforward ODN calls. Option PL is for DAC 411 calls both routed MF or straightforward. Option PM is for DAC straightforward transverter local record calls.

D.02 Figures 20, 23, 25, 33, 36, 39, 42, and 43 are changed to show the addition of the apparatus shown in B.01 (Directory Assistance Charging).

D.03 Circuit Notes 112 (-0104); 113 (-0107D); 102, 103 (-0136); 102, 103 (-0140); 102, 103 (-0142); 127 (-0153); 102, 104 (-0156); 153 (-0162) are updated to relfect the above changes. Circuit Notes 133 (-0107D) and 115 (-0140) added.

D.04 Figures 4 and 5 are changed to show the change of apparatus shown in B.02, (209FF relay replacement for reduced maintenance).

F. Changes in Description of Operation

F.01 In SECTION - 0133, add the following:

24. DIRECTORY ASSISTANCE CHARGING AUTOMATIC TROUBLE RELEASE TEST WITH MESSAGE BILLING INDEX 16

24.01 This test should be made to a particular transverter with that transverter and the TBL indicator made busy.

24.02 The AMA (-0135), DAC-TV TRL, and the class 17 (-0103) keys are used with a code that causes the marker to operate the sender relays for index 16. The DAC-TV TRL key opens the RL release lead to the transverter causing it to block and give a trouble release. This key also closes through the operate path to the OF3 relay winding and to the OF lead to the marker. A break contact of the A1 relay is also in this path to open the operate path to the OF3 realy when this lead is grounded on up-check from the marker. The OF3 is operated and locks with ground on the OF lead. Ground is then connected through the DAC TV-TRL key, then through 1-2B OF3 to ground the ADV lead to sheet -0103 which advances the frame to the next sender test.

25. DIRECTORY ASSISTANCE CHARGING TRANSVERTER TROUBLE RELEASE (MBI16) BLOCKING OF TEST

25.01 When making a DAC LAMA test call, if the DAC relay in the sender were to fail to operate, the transverter would come back with a trouble release (TRL), which would cause the sender to still release and the test call would pass. However, when the DAC-TRL key is operated, the OF3 relay is operated from the OF lead from the marker the same as 9.02. However, instead of advancing the frame, this circuit will stick the frame with a ground through the DAC TV-TRL key normal, the DAC TRL key operated, then through 4-5B OF3 relay to the sleeve lead through the connector circuit (-0103).

25.02 When a DAC straightforward call is made with the DAC-TRL key normal, the call will still be blocked if the sender DAC relay fails to operate. Ground through DAC-TRL key normal, DAC-ST key operated, INFK relay (-0135) normal (this relay will remain normal if the transverter is not seized on the DAC call), and then grounds the sleeve lead which sticks the test.

F.02 In SECTION -0135 add the following:

10. DIRECTORY ASSISTANCE CHARGING AUTOMATIC TROUBLE RELEASE TEST AND TRANSVERTER TROUBLE RELEASE BLOCKING OF TEST (MBI16)

10.01 See SECTION -0133, 24. and 25.

11. DIRECTORY ASSISTANCE CHARGING AC SELECTOR IMPROVEMENTS

11.01 The L relay, 2L, TP, 5L, and LO diodes added to prevent the 2L, TP, 5L, and LO relays from locking falsely on up-check pulses from the transverter. The L relay is operated in position 9 of the AC selector. The L relay then locks up to the C relay operated. The above relays cannot lock up until the L relay has operated.

F.03 In SECTION -0141, add the following:

25. DIRECTORY ASSISTANCE CHARGING - INFORMATION CODE 411 ODN TEST CALL (PH OPTION)

25.01 This test is made in the same manner as the test of Outpulsing of the Directory Number in LAMA Offices, 20., with the exception of the operation of the DAC-ODN relay, which is operated by the DAC-ODN key, ODN relay (-0154), and the INF relay (-0139), all operated. The DAC-ODN relay will supply stepping grounds to the MFK selector for the TH, H, T, and U digits for DAC straightforward calls. The straight forward ODN (ST-ODN) key is not operated and 411 must be received in the A, B, and C digits, because the ST-ODN key opens up the A, B, and C stepping grounds with the key released. The ODN number is then received and checked after the U digit is stepped by. The DAO (DAC-ODN) lamp is lit for this test.

26. DIRECTORY ASSISTANCE CHARGING - STRAIGHTFORWARD ODN TEST CALL (PH AND PK OPTIONS

26.01 This test is the same as the DAC Information Code 411 ODN test call, 25., except that the ST ODN key is operated which will complete the stepping grounds through to the MFK selector stepping circuit for the A, B, and C digits. The ODN number is then received and checked after the U digit is stepped by.

F.04 Add "Mfr Disc.," immediately following "1-NPA-411" in the following sections:

(a) Change second sentence of 21.10 (a) in SECTION -0133.

(b) Change first sentence of 29.01 in SECTION -0139.

(c) Change first sentence of 29.02 in SECTION -0139.

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B. Changes in Apparatus

B.1 Removed

*# - 2WT Key, Fig. AT

B.2 Added

*# - 2DH Key, Fig. AT

F. Changes in Description of Operation

F.1 In SECTION -0143, 15.02 add the following after the first sentence:

The *# key is operated to apply either the eleventh or twelfth pushbutton tone and also will remove the ground on the CK1 lead to prevent a lock up condition in the marker and OST frame.

F.2 In Section -0143, 15.02 change the second sentence to read:

The CT key must be normal . . .

F.3 In SECTION -0143, 15.03 add the following after the last sentence:

The fail new sender (FNS) lamp lights when the test fails.

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CHANGES

B. Changes in Apparatus

B.1 Added

RLS/CANC SS Key - 2NM - Option PF

SGRLS/SSAR Key - 2JP - Option PF

DF Lamp - M1 - Option PF

PRF Lamp - M1 - Option PF

TO Lamp - M1 - Option PF

SS Lamp - M1 - Option PF

MTR Lamp - M1 - Option PF

SGPO Lamp - M1 - Option PF

TFB Lamp - M1 - Option PF

EC Diode - 446K - Option PF

D. Description of Changes

D.1 Option PF is added for stuck sender trunk identification. Option PE is provided when stuck sender trunk identification is not provided.

D.2 Figures 1, 2, and 17 are changed to show the addition of the apparatus shown in B.1.

D.3 Circuit Note 124 (-0104), 109 (-0132), and 153 (-0162) are updated to reflect above changes. Engineering Note 114 (-0132) is added.

D.4 On ES-558991, sheets 1, 5, 6, 7, and 32 are raised to Issue 11 to cover stuck sender trunk identification.

F. Changes in Description of Operations

F.1 In SECTION -0102 add the following;

34. STUCK SENDER TRUNK IDENTIFICATION SEIZURE OF THE SENDER TEST FRAME BY THE SENDER TEST CONTROL CIRCUIT

34.01 When the stuck sender test control circuit attempts to seize the sender test frame, any sender test in progress is allowed to complete. If a repeat two test is in progress, the second test along with the first test is allowed to finish. At the end of the test when it is desired to seize the sender test frame, a ground is applied from the OST to operate the B and B1 relays in the STCC. This ground originates at the operate ground side of the CA relay which operates in advancing to a new sender in both sequential advancing and repeat 2 advancing. (see ES-558991 Issue 11, sheet 7, Fig. 7 - see both detachment and sequence chart along with sequence chart in Fig. 10). When the STCC releases the OST the next sender is tested.

(a) The ground to operate the B and B1 relays in the STCC during a repeat test is obtained from a make-contact of the CA1 relay to ground. When this relay and the REP relay is operated in the sender test connector control circuit a path is completed for the ground from the CA1 relay to operate the B and B1 relays in the STCC.

(b) The B and B1 relays operating in the STCC causes the sender test frame to be seized in the following manner: The AV relay is held operated by make-contact three of the B relay in the STCC and the operate and locking grounds to the select and hold magnets are opened up by break contacts of B and B1 relays in the STCC.

35. STUCK SENDER TRUNK IDENTIFICATION CONTROL OF SELECT AND HOLD MAGNETS ON THE SENDER TEST FRAME

35.01 When the B and B1 relays are operated in the STCC, break-contacts of these relays open up all operate and lock paths to the select and hold magnets in the sender test frame crossbar switch. The following contacts in the STCC perform the following functions:

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STCC Leads	Contact	Function
1,2	1B(B)RLY	Opens operate path to select magnet W-Z walking circuit.
C1,C2	4B(B)RL4	Opens C relay (-0131) to remove busy test in connector to stuck sender.
AV	3M(B) and 12M(A3A)RLYS	Holds AV relay operated so test frame will not advance.
HML01,2	9B(B)RLY	Opens lock path for odd hold magnets.
0HM1,2	10B(B)RLY	Opens hold magnet 0 and 0A operate path.
HMLE1,2	11B(B)RLY	Opens lock path for even hold magnets.
ESML1,2	1B(B1)RLY	Opens lock path for even select magnets lock path.
0SML1,2	2B(B1)RLY	Opens lock path for odd select magnets lock path.
3,4	7B(B1)RLY	Opens operate path to hold magnet W-Z walking circuit.
SML1,2	8B(B1)RLY	Opens operate path to odd hold magnets.
BKL,BKLA	9B(B1)RLY	Opens lock path for BK relay.
RN,SML1	11B(AA) and 11B (RLS3A) RLYs	Prevents two hold magnets from operating at same time with idle test frame.
MGB1,2	4B(AA)RLY	Prevents busying out a whole subgroup of senders while STCC is attached.

35.02 The above B and B1 relay contacts can be located on ES-558991 detachment as shown in the following table:

Contact	Lead Desig	Location In ES-558991, Issue 11
1B(B)RLY	1,2	ES-558991, sheet 6, coord. E1
4B(B)RLY	C1,C2	ES-558991, sheet 6, coord. F4
3M(B) and 12M(A3A)RLYs*	AV	ES-558991, sheet 6, coord. B4
9B(B)RLY*	HML01,HML02	ES-558991, sheet 6, coord. C5
10B(B)RLY	0HM1,0HM2	ES-558991, sheet 6, coord. A4
11B(B)RLY*	HMLE1,HMLE2	ES-558991, sheet 6, coord. B4
1B(B1)RLY	ESML1,ESML2	ES-558991, sheet 6, coord. E0
2B(B1)RLY	0SML1,0SML2	ES-558991, sheet 6, coord. F1
7B(B1)RLY	3,4	ES-558991, sheet 6, coord. B1
8B(B1)RLY*	SML1,SML2	ES-558991, sheet 6, coord. E2
9B(B1)RLY	BKL and BKLA	ES-558991, sheet 5, coord. C6
11B(AA) and 11B(RLS3A)RLYs*	RN,SML1	ES-558991, sheet 6, coord. E2
4B(AA)RLY	MGB1,MGB2	ES-558991, sheet 32, coord. G0

*Contact also shown on ES-558991, Issue 11, sheet 7.

35.03 The functions of keys and lamps required for stuck sender trunk identification are as follows:

Key or Lamp	Function
RLS Key	Will release the sender test connector control circuit.
CANC SS Key	Will disable the sender test connector control circuit and prevents SSTI from seizing the OST.
SSAR	Will release the alarm relays in the STCC.
SGRLS	Will release all operated LG- relays in the STCC.
PRF Lamp	Indicates a peripheral failure has occurred.
TO Lamp	Indicates an overall timeout of 120 seconds has occurred.
SS Lamp	Indicates the STC has seized the OST to a stuck sender.
MTR Lamp	Indicates a trunk could not be found with an associated stuck sender and that a manual trace is required.
SGPO Lamp	Indicates that identification to one or more subgroups of senders has been locked out and the subgroup is primed out.
TFB Lamp	The incoming trunk test frame is busy.

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CHANGES

A. Changed and Added Functions

A.1 Provision is made to automatically progress through eleventh and twelfth TOUCH-TONE© button tests on the SD-27810-01 wire spring senders.

B. Changes in Apparatus

B.1 Added

A2A4 - AG20 Relay, Fig. 24, PB Option

*# ATNS - 2JB Key, Fig. AT

*# FNS - [illegible] Lamp, Fig. 24, PB Option

D. Description of Changes

D.1 Options PA, PB, PC, and PD are added. Option PA is provided when the eleventh or twelfth button sender test is not provided. Option PB provides for automatic eleventh or twelfth TOUCH-TONE button sender tests. Option PC provides for making these tests on subscriber senders arranged for prefix digits 0, 1, and 11X codes with recycle. Option PD provides for making these tests on subscriber senders not equipped with prefix digits 0, 1, and 11X codes with recycle.

D.2 Figures 18, 24, 45, 35, and AT are changed to show the addition of the A2A4 relay, *# FNS lamp, and *# ANTS key.

D.3 Circuit Notes 102, 103(-0140); 102(-0141); 111, 127(-0153) are updated to reflect above changes.

F. Changes in Description of Operation

F.1 In SECTION -0143 add the following after 14.01:

15. "TOUCH-TONE" BUTTON SENDER TEST

15.01 General - The auxiliary sender dial pulse circuit (-0139) is used for the dialing of the digits. Either 7- or 10-digit TOUCH-TONE calls arranged for MF outpulsing may be dialed into the sender with one of the digits changed to an eleventh or twelfth TOUCH-TONE signal. This is accomplished by operating the *# key to the desired tone and setting the TT *# switch to the digit slot in which it is desired to insert the eleventh or twelfth tone. Flat spring senders will provide the proper test response as soon as an eleventh or twelfth tone is keyed into a digit position, but cannot be tested automatically (see 15.04). With wire spring senders automatic test operation is provided, but the complete call must be dialed into the sender even though an eleventh or twelfth tone signal is dialed early in the sequence (see 15.02).

15.02 Wire Spring Senders, SD-27810-01 - The *# ATNS key (eleventh or twelfth tones - automatic test new senders) must be operated along with the class key 17 operated to perform this test on wire spring senders. The CTR keys must be normal and TT key must be operated. The CTR keys must be pulled out on the sender make-busy frame. The test consists of the insertion of either the eleventh or twelfth TOUCH-TONE signals into one of the digits of the call. Upon receipt of the eleventh or twelfth tone, the sender will operate the PD relay, call in the marker by grounding the A2 and A4 leads to the marker which then grounds the A2 and A4 leads to the test frame. This causes the A2 and A4 relay to operate in the test frame, respectively, which, in turn, operates the A2A4 relay which resets the test frame in preparation for testing the next sender.

15.03 A missing X_1 and X_2 to PD cross-connection in the wire spring sender cannot be detected by an eleventh or twelfth button tone in the first or (if prefix check and recycle - Fig. 35 is not provided) in the second or third digit. Under the above conditions the insertion of an eleventh or twelfth tone in the first digit will result in a long time-out or, if in the second or third digit, in a mutilated digit, without going to stuck sender. The sender will eventually release

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(unless the CTR key is pulled out) and the test will proceed to the next sender.

15.04 Eleventh and Twelfth Tone Tests on SD-25012-01 Sender - The call is set up the same way as with wire spring senders except the *# ATNS key is not operated. When the eleventh or twelfth tone is dialed into the sender, overflow tone is returned over the tip and ring by the sender which should then be verified by listening in the earphone on the test frame. The CA key should then be operated to advance the test frame to the next sender. The PNS key should be operated so that new senders will be bypassed.

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CHANGES

D. Description of Changes

D.1 A wiring strap is added to the AC resistor in Fig. 17 to change the effective resistance from 860 to 215 ohms in order to increase the operating current supplied to the ON1 relay of the sender under test and provide a greater operate current margin.

D.2 A make-contact of the OSA relay in Fig. AP was added to the secondary winding release path of the SP relay to reduce the release time of the SP relay and prevent a second transmission of the TOUCH-TONE® digit selected for a given station digit position.

D.3 The IST1 relay contact arrangement is changed to make manufacturing and circuit drawings compatible.

F. Changes in CD Section

F.1 In Section -0131, 10.01(e) change "830-ohm ground" to "215-ohm ground".

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TRANSVERTER TEST

CHANGES

B. Changes in Apparatus

B.1 Added

Relay PD*, PD# Type 293C, Fig. AT
Key Unit *-# Type 2WT, Fig. AT
Rotary Switch TT*# Type KS-14618,L-39,
Fig. AT

D. Description of Changes

D.1 Figure AT added to provide eleventh and twelfth button TOUCH-TONE® signals for originating sender test.

D.2 Note 113, SD Sheet -0132 is changed for clarification.

D.3 Option notation Sheet 0139C, Fig. T and Fig. U is changed to eliminate duplication of options.

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TRANSVERTER TEST

CHANGES

D. Description of Changes

D.1 Figure AP changed to improve "TOUCH-TONE®" oscillator tuning.

D.2 Wiring changed on SH -0166 to eliminate false ground during PCI tandem coin failure test calls.

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CHANGES

B. Changes in Apparatus

B.1	Removed	Replaced By
	A2 Resistor 146A 2000 Ohms	A2 Resistor 146A 4020 Ohms
	B2 Resistor 146A 2000 Ohms	B2 Resistor 146A 4020 Ohms
	C2 Resistor 146A 2000 Ohms	C2 Resistor 146A 4020 Ohms
	A3 Resistor 146A 4020 Ohms	A3 Resistor 146A 2000 Ohms
	B3 Resistor 146A 4020 Ohms	B3 Resistor 146A 2000 Ohms
	C3 Resistor 146A 4020 Ohms	C3 Resistor 146A 2000 Ohms

D. Description of Changes

D.1 Correction of resistor values - Note 202, SD sheet -0147.

D.2 Correction of duplication in connections - Fig. 2N, sheet -0104.

D.3 For description of operation, see CD Issue 25D.

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CHANGES

B. Changes in Apparatus

B.1 Added

Relay PD*, PD# Type 293C, Fig. AT
Key Unit *-# Type 2WT, Fig. AT
Rotary Switch TT*# Type KS-1461B,L-39, Fig. AT

D. Description of Changes

D.1 Figure AT added to provide eleventh and twelfth button TOUCH-TONE® signals for originating sender test.

D.2 Note 113, SD Sheet -0132 is changed for clarification.

D.3 Option notation Sheet 0139C, Fig. T and Fig. U is changed to eliminate duplication of options.

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CHANGES

B. Changes in Apparatus

B.01 Added

CATA - Lamp, M1, Option PF

TRP - Lamp, M1, Option PF

D. Description of Changes

D.01 Option NQ is added which enables the selection of a particular auxiliary sender on this test call.

D.02 Figure 1 is changed to show the addition of two lamps, CATA and TRP. The SGLO Lamp is changed to SGPO lamp.

F. Changes in Description of Operations

F.01 In Appendix 6B, under 35. STUCK SENDER TRUNK IDENTIFICATION CONTROL OF SELECT AND HOLD MAGNETS ON THE SENDER TEST FRAME, add the following to 35.03:

CATA	Cancel ATA
TRP	Sender or Trunk Involved in a Trace has been matched by TRAP Circuit

F.02 In Appendix 10B, under B.01, lines 11 and 12, change option NB to NJ and Option NA to NI.

F.03 In Appendix 10B under D.01 change sentence to read:

Option NJ is added to improve the 7 maximum and 7 minimum pulsing speed tests.

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TRANSVERTER TEST

CHANGES

B. Changes in Apparatus

B.01 Added

AR Relay, U835, Option PR

SOF Relay, U937, Option PR

SOF1 Relay, Y293, Option PR

SOF2 Relay, U452, Option PR

SK2-7 Key, 2AP, Option PV

SOF Key, 2TB, Option PR

POS/PNS Key, 2DH, Fig. AS

MFGT Relay, U, Option PX

BK(-0115) Diode, 446K, Option PZ

BK(-0103) Diode, 446K Option PZ

NE Resistor, 18BK, Option NB

(RMV NE Resistor, 18HW, Option NA)

TTRD Relay, U286, Option NB

STP Resistor, 18FL, Option ND

TO Jack, 289AM, Fig. 25

(RMV to Jack, 289B - New Frame Only)

W01 Jack, 289AM, Fig. 27

(RMV W01 Jack, 289B - New Frames Only)

RS1 Resistor, KS-20289,L6C, Fig. F

(RMV RS1 Resistor, 140A - New Frames Only)

Added (Cont)

RS4 Resistor, KS-20289,L6C, Fig. F

(RMV RS4 Resistor, 141A - New Frames Only)

GTO Resistor, KS-20289,L6C, Fig. 49

(RMV GTO Resistor, 147A - New Frames Only)

SRG Resistor, KS-20289,L6C, Fig. F

(RMV SRG Resistor, 141A - New Frames Only)

D. Description of Changes

D.01 Options PR and PV added for a new MF outpulsing alternate route test. Figure AS is added to provide means to skip old senders as well as to skip new senders. Option PT is added to provide permanent signal tests with prefix digits "1" or "11" calls. Option PX is added to provide a sender GT relay critical operate and release test on a MF outpulsing dial-tone first test. Option PZ is added to improve the dial-tone first false trunk closure test so it will block properly with a test failure. Option NB is added to improve the 7 maximum and 7 minimum pulsing speed tests. Option NB is added which enables TT senders to be tested for rotary dial even though all RD senders in the same subgroup are busy. Option ND is added to make a more stringent test of the STP relay in the sender. This will insure that this relay will function satisfactorily with RP even on long loops. Option NE is added to provide a false trunk closure test with an MF coin failure announcement test on dial-tone first senders. Option NG is added to improve the directory assistance charging straightforward, service observed, LAMA test calls. Option NH is added to improve the eleventh and twelfth button TT test calls. With new senders on automatic sequential advance the senders are being left off-normal.

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F. Changes in Description of Operation

F.01 In SECTION -0141, add the following:

27. ALTERNATE ROUTE TEST USING MF OUTPULSING

27.01 This circuit is brought into use by the operation of the SOF locking key. The SOF1 relay operated causes this circuit to make the alternate route test. The SOF1 relay is operated in different ways. It is operated if the SOF2 relay operates. A make-contact (9-10T) of the SOF2 operates the SOF relay directly. The SOF2 is operated by the CA key when the test frame is control advanced. The SOF2 relay operating the SOF1 relay insures that an alternate route test will occur on the first call rather than the second. The SOF1 relay is also operated when the test is started on the first sender through SOF key operated, the SOF diode, and a break contact of the start relay to ground of the ST relay (-0103). The SOF1 relay is also operated through the SOF key, SOF1 diode, make contact of AV relay (-0141), make contact of start pulse check relay - STK (-0141), and a break contact of the CK2 relay (MF rec). This SOF1 relay operation happens at the end of a complete MF call received and thus prepares the circuit for an alternate route test on the call to the next sender. The SOF1 relay when operated locks and is released when an alternate route test is being made (SOF or AR operated). The SOF1 released requires that a complete MF call be received on the next call.

27.02 The SOF relay will operate when the SOF1 relay has previously operated and the MFK set reaches position 10 which is the thousands digit position. At this point when the SOF operates, the fundamental from the sender is reversed. This causes the sender to immediately stop outpulsing, then to request another marker to set up an alternate route for another complete outpulsed call. This causes the AR lead from the second marker to be grounded to sheet -0133 to 4T AR1 relay, then through the SOF ~~relay~~ key make, then 2-3T OF1 (-0133) break contact which prevents the AR relay from operating on the up-check pulse from the marker. When the up-check pulse is gone, the prolonged ground on the AR lead then operates the AR relay. The AR relay operated releases the C relay (-0141) and the SOF relay. The C relay (-0141) releasing causes the MFK set to reset in preparation of receiving the next complete call. By the time the selection has reset and preset to the first digit to be received the sender has not yet outpulsed the second call. With the SOF1 relay being normal, the complete call is received. At the end of this call the last pulse to be received (the start pulse) reoperates the SOF1 relay through the STK relay. The next call is then set up for an alternate route test.

27.03 This test will work on skip-two calls. It will also work with skip two on the first call (alternate route) and 7-digit MF outpulses on the second call providing PV option is furnished and the SK2-7 key is operated. A make contact (3-4T) of the SOF1 relay causes the MFK sel on the alternate route call to be preset to the skip two position and on the regular call to be preset to the 7-digit call position of the MFK sel.

F.02 In SECTION -0102, add the following:

34. PASSING THE SENDER PER SD-25012-01 USING THE PNS/POS KEY IN THE POS POSITION (FIG. AS)

34.01 When the test frame connects ground to the STD lead this ground is also extended to the POS relay through a front contact of key POS (Section -0162). The POS relay is slow-operate to allow time for the operation of the NS, NSA relays to allow the test frame to distinguish new and old senders. With the PNS key and NSA relay normal, (old sender attached) an operate path is closed to operate relay PSD. The operate ground originates from a front contact of POS relay and then through back contact of PNS key and then to the PSD relay as described above. The circuit will function as described in 27.

F.03 In SECTION -0121, add the following at the end of 14.01:

With PT option, a "1" or "11" will be dialed first and then the A, B, and C digits will not be dialed because of relay PS. With PS option, the prefix digits are not dialed first.

F.04 In SECTION -0165, add 11.02 and 11.03 as follows:

11.02 For the MF outpulsing GT relay release test, operate keys MFGT, CON, and GTN and select a coin class MF call. After marker release and sender registration complete, EP (-0139) operates which in turn operates the GTA relay. Relay GTA places ground to the ring lead and relay GTK to the tip lead to detect the sender relay GT. When the sender relay SCT operates, it places relay GT on the tip. This allows relays GT and GTK to operate in series which in turn operates relay GTB. Relay GTB operates MFCB and places a release resistance of 10,000 ohms in the operate path of relay GT which should cause it to release. This release of relay GT indicates a coin failure and the call should be routed to coin failure announcement (see 7.02). With this being a coin failure test, A2, A4, and A5 leads are grounded by the sender and the test will advance with the operation of the COK relay.

11.03 For the MF outpulsing GT relay operate test, operate MFGT, CON, and GTO and select a coin class MF call. After marker release and sender registration complete, the test circuit advances as indicated in 11.02 to the operation of relay GTB and MFCB. The sender GT relay open circuit releases. Relay GTA releases and places a stringent operate resistance path to re-operate the GT relay. If the GT relay operates, the call will complete normally. If the GT relay does not operate, the sender will attempt to route the call to coin failure announcement. However, the test circuit will block with no MF outpulsing from the sender, and also will light lamp GTK indicating a sender relay GT operate test failure.

F.05 In SECTION -0165, add the following at the end of 7.04:

Relay BK (-0115) operates relay BK (-0103) through BK diode (-0115) and a make contact of FTC key (-0165).

F.06 In SECTION -0131, add 8.02 as follows:

8.02 With option NB furnished it is possible to test TT and/or DTF subscriber sender for rotary dial even though the rotary senders are busy. The TTRDT key must be operated. This connects the winding of the TTRD relay to the TTGBO lead to the subscriber sender link frame. This lead will have battery on it when all TT or DTF senders in the subgroup are busy. If they become busy the TTRD relay operates which then connects the GB relay (-0131) to the GBR lead which has battery applied on it when all rotary senders are busy in the subgroup. With this situation the battery on the GB- lead passing through a make contact of the TTRD relay then operates the GB relay (-0131) The test frame is then blocked in the busy test. This compares with the test frame being blocked in the busy test with only the RD senders busy while testing the TT senders for RD. This previous way is restored when the TTRDT key is normal. When testing TT senders with TT calls, the TTRDT key must be normal.

F.07 In SECTION -0165, 7.03, change title to:

PCI OR MF CALLS (COIN FAILURE)

F.08 In SECTION -0165 change title to:

DIRECT PCI OR MF

F.09 In SECTION -0165, at end of 7.04, add:

With MF outpulsing, a make contact of the G, C, and DP relays (-0115) are shorted out with make contacts of the MFCA relay so that the false trunk closure test is still functional even though the -0115 PCI section is normal.

F.10 In Appendix 8B, add 11.02:

11.02 On DAC straightforward service observed LAMA service observed calls, the transverter does not ground the LO lead as on regular service observing calls. A transfer contact on the DAC-STF key wired into the LO matching circuit (-0135) will enable the testing of this test call.

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CHANGES

D. Description of Changes

D.1 On sheet 0135, Fig. 42, wiring is added to the DAC-STF key.

D.2 On sheet 0133, Fig. 18, wiring is added to the DAC TV-TRL key, and the DAC TRL key designation is changed to AMA CK. Also, the ADV1 lead is removed from the OF3 relay.

D.3 On sheet 0141, Fig. 25, wiring is added to the STK relay. The designation of ST-ODN key is changed to STF-ODN key.

D.4 On sheet 0105, Fig. 3, wiring is added to the A5, B5, and C5 keys.

D.5 On sheet 0139C, Fig. 39, the 555 key is added with option PJ.

D.6 On sheet 0106, Fig. 33, the designation of DAC-INF key is changed to DAC 411 key.

F. Changes in CD Sections

Appendix 8B

F.1 Change the following key designations in B.01 as follows:

DAC-TRL Key to AMA CK Key

DAC-INF Key to DAC 411 Key

DAC-ST Key to DAC STF Key

ST-ODN Key to STF ODN Key

F.2 In 24.02, remove the last four lines: "Ground is then connected. . . ."

F.3 Change 11.01 to read:

11.01 The 2L and LO relays have special requirements placed on them to increase relay tension. This will prevent them from operating on up-check pulses coming from the transverter.

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CHANGES

B. Changes in Apparatus

B.01 Added

Directory Assistance Charging

DAC-ODN Relay U591, Option PH

L Relay U108, Option PM

OF3 Relay U660, Option PM

DAC TV-TRL/TRL Key 2YL, Option PM

ST-ODN Key 2TB, Option PK

DAC-ODN Key, 2AP Option PH

DAC-INF Key 2AP, Option PL

DAC-ST Key 2AP, Option PM

DATRL Lamp M1, Option PM

DAO Lamp M1, Option PH

5L Diode 446K, Option PM

2L Diode 446K, Option PM

TP Diode 446K, Option PM

LO Diode 446K, Option PM

C Diode 446K, Option PM

OF Diode 446K, Option PM

B.02 Changed

Directory Assistance Charging

From	To
INFK Relay U158, Option PN	U258, Option PM

B.03 Added - 209FF

Relay Replacement

From	To
CHK Relay 209FF, Option PO	316G, Option PP
FND Relay 209FF, Option PO	316G, Option PP
RVP Relay 209FF, Option PO	316G, Option PP
RVP1 Relay 209FF, Option PO	316G, Option PP
INT Relay 209FF, Option PO	316G, Option PP
INT1 Relay 209FF, Option PO	316G, Option PP
CTG Relay 209FF, Option PO	316G, Option PP
PLS Relay 209FF, Option PO	316G, Option PP
BJ (Fig. 5) Resistor 18AP, Option PO	18BM, Option PP
BH (Fig. 5) Resistor 19MG, Option PO	18DU, Option PP
BJ (Fig. 4) Resistor 18FR, Option PO	19SN, Option PP
BH (Fig. 4) Resistor 19RB, Option PO	18AP, Option PP
P (Fig. 4) Resistor 18DS, Option PO	18GH, Option PP

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From (Cont)	To
P1 (Fig. 4) Resistor 63CR, Option PO	19HD, Option PP
BF (Fig. 4) Resistor 18DS, Option PO	18KY, Option PP
BK (Fig. 4) Resistor 18BM, Option PO	18AP, Option PP
BO (Fig. 4) Resistor 19RB, Option PO	18AP, Option PP
BP (Fig. 4) Resistor 19HU, Option PO	18LA and 19PK, Option PP
BR (Fig. 4) Resistor 18AP, Option PO	18LA, Option PP

D. Description of Changes

D.01 Options PH, PK, PL, and PM are added for directory assistance charging. Option PN is provided when DAC tests are not provided. Option PG (tests for 1-NPA-411) is made Mfr Disc. Option PH is for DAC ODN calls. Option PK is for DAC straightforward ODN calls. Option PL is for DAC 411 calls both routed MF or straightforward. Option PM is for DAC straightforward transverter local record calls.

D.02 Figures 20, 23, 25, 33, 36, 39, 42, and 43 are changed to show the addition of the apparatus shown in B.01 (Directory Assistance Charging).

D.03 Circuit Notes 112 (-0104); 113 (-0107D); 102, 103 (-0136); 102, 103 (-0140); 102, 103 (-0142); 127 (-0153); 102, 104 (-0156); 153 (-0162) are updated to relfect the above changes. Circuit Notes 133 (-0107D) and 115 (-0140) added.

D.04 Figures 4 and 5 are changed to show the change of apparatus shown in B.02, (209FF relay replacement for reduced maintenance).

F. Changes in Description of Operation

F.01 In SECTION - 0133, add the following:

24. DIRECTORY ASSISTANCE CHARGING AUTOMATIC TROUBLE RELEASE TEST WITH MESSAGE BILLING INDEX 16

24.01 This test should be made to a particular transverter with that transverter and the TBL indicator made busy.

24.02 The AMA (-0135), DAC-TV TRL, and the class 17 (-0103) keys are used with a code that causes the marker to operate the sender relays for index 16. The DAC-TV TRL key opens the RL release lead to the transverter causing it to block and give a trouble release. This key also closes through the operate path to the OF3 relay winding and to the OF lead to the marker. A break contact of the A1 relay is also in this path to open the operate path to the OF3 realy when this lead is grounded on up-check from the marker. The OF3 is operated and locks with ground on the OF lead. Ground is then connected through the DAC TV-TRL key, then through 1-2B OF3 to ground the ADV lead to sheet -0103 which advances the frame to the next sender test.

25. DIRECTORY ASSISTANCE CHARGING TRANSVERTER TROUBLE RELEASE (MBI16) BLOCKING OF TEST

25.01 When making a DAC LAMA test call, if the DAC relay in the sender were to fail to operate, the transverter would come back with a trouble release (TRL), which would cause the sender to still release and the test call would pass. However, when the DAC-TRL key is operated, the OF3 relay is operated from the OF lead from the marker the same as 9.02. However, instead of advancing the frame, this circuit will stick the frame with a ground through the DAC TV-TRL key normal, the DAC TRL key operated, then through 4-5B OF3 relay to the sleeve lead through the connector circuit (-0103).

25.02 When a DAC straightforward call is made with the DAC-TRL key normal, the call will still be blocked if the sender DAC relay fails to operate. Ground through DAC-TRL key normal, DAC-ST key operated, INFK relay (-0135) normal (this relay will remain normal if the transverter is not seized on the DAC call), and then grounds the sleeve lead which sticks the test.

F.02 In SECTION -0135 add the following:

10. DIRECTORY ASSISTANCE CHARGING AUTOMATIC TROUBLE RELEASE TEST AND TRANSVERTER TROUBLE RELEASE BLOCKING OF TEST (MBI16)

10.01 See SECTION -0133, 24. and 25.

11. DIRECTORY ASSISTANCE CHARGING AC SELECTOR IMPROVEMENTS

11.01 The L relay, 2L, TP, 5L, and LO diodes added to prevent the 2L, TP, 5L, and LO relays from locking falsely on up-check pulses from the transverter. The L relay is operated in position 9 of the AC selector. The L relay then locks up to the C relay operated. The above relays cannot lock up until the L relay has operated.

F.03 In SECTION -0141, add the following:

25. DIRECTORY ASSISTANCE CHARGING - INFORMATION CODE 411 ODN TEST CALL (PH OPTION)

25.01 This test is made in the same manner as the test of Outpulsing of the Directory Number in LAMA Offices, 20., with the exception of the operation of the DAC-ODN relay, which is operated by the DAC-ODN key, ODN relay (-0154), and the INF relay (-0139), all operated. The DAC-ODN relay will supply stepping grounds to the MFK selector for the TH, H, T, and U digits for DAC straightforward calls. The straight forward ODN (ST-ODN) key is not operated and 411 must be received in the A, B, and C digits, because the ST-ODN key opens up the A, B, and C stepping grounds with the key released. The ODN number is then received and checked after the U digit is stepped by. The DAO (DAC-ODN) lamp is lit for this test.

26. DIRECTORY ASSISTANCE CHARGING - STRAIGHTFORWARD ODN TEST CALL (PH AND PK OPTIONS

26.01 This test is the same as the DAC Information Code 411 ODN test call, 25., except that the ST ODN key is operated which will complete the stepping grounds through to the MFK selector stepping circuit for the A, B, and C digits. The ODN number is then received and checked after the U digit is stepped by.

F.04 Add "Mfr Disc.," immediately following "1-NPA-411" in the following sections:

(a) Change second sentence of 21.10 (a) in SECTION -0133.

(b) Change first sentence of 29.01 in SECTION -0139.

(c) Change first sentence of 29.02 in SECTION -0139.

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CHANGES

B. Changes in Apparatus

B.1 Removed

*# - 2WT Key, Fig. AT

B.2 Added

*# - 2DH Key, Fig. AT

F. Changes in Description of Operation

F.1 In SECTION -0143, 15.02 add the following after the first sentence:

The *# key is operated to apply either the eleventh or twelfth pushbutton tone and also will remove the ground on the CK1 lead to prevent a lock up condition in the marker and OST frame.

F.2 In Section -0143, 15.02 change the second sentence to read:

The CT key must be normal . . .

F.3 In SECTION -0143, 15.03 add the following after the last sentence:

The fail new sender (FNS) lamp lights when the test fails.

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CHANGES

B. Changes in Apparatus

B.1 Added

RLS/CANC SS Key - 2NM - Option PF

SGRLS/SSAR Key - 2JP - Option PF

DF Lamp - M1 - Option PF

PRF Lamp - M1 - Option PF

TO Lamp - M1 - Option PF

SS Lamp - M1 - Option PF

MTR Lamp - M1 - Option PF

SGPO Lamp - M1 - Option PF

TFB Lamp - M1 - Option PF

EC Diode - 446K - Option PF

D. Description of Changes

D.1 Option PF is added for stuck sender trunk identification. Option PE is provided when stuck sender trunk identification is not provided.

D.2 Figures 1, 2, and 17 are changed to show the addition of the apparatus shown in B.1.

D.3 Circuit Note 124 (-0104), 109 (-0132), and 153 (-0162) are updated to reflect above changes. Engineering Note 114 (-0132) is added.

D.4 On ES-558991, sheets 1, 5, 6, 7, and 32 are raised to Issue 11 to cover stuck sender trunk identification.

F. Changes in Description of Operations

F.1 In SECTION -0102 add the following;

34. STUCK SENDER TRUNK IDENTIFICATION SEIZURE OF THE SENDER TEST FRAME BY THE SENDER TEST CONTROL CIRCUIT

34.01 When the stuck sender test control circuit attempts to seize the sender test frame, any sender test in progress is allowed to complete. If a repeat two test is in progress, the second test along with the first test is allowed to finish. At the end of the test when it is desired to seize the sender test frame, a ground is applied from the OST to operate the B and B1 relays in the STCC. This ground originates at the operate ground side of the CA relay which operates in advancing to a new sender in both sequential advancing and repeat 2 advancing. (see ES-558991 Issue 11, sheet 7, Fig. 7 - see both detachment and sequence chart along with sequence chart in Fig. 10). When the STCC releases the OST the next sender is tested.

(a) The ground to operate the B and B1 relays in the STCC during a repeat test is obtained from a make-contact of the CA1 relay to ground. When this relay and the REP relay is operated in the sender test connector control circuit a path is completed for the ground from the CA1 relay to operate the B and B1 relays in the STCC.

(b) The B and B1 relays operating in the STCC causes the sender test frame to be seized in the following manner: The AV relay is held operated by make-contact three of the B relay in the STCC and the operate and locking grounds to the select and hold magnets are opened up by break contacts of B and B1 relays in the STCC.

35. STUCK SENDER TRUNK IDENTIFICATION CONTROL OF SELECT AND HOLD MAGNETS ON THE SENDER TEST FRAME

35.01 When the B and B1 relays are operated in the STCC, break-contacts of these relays open up all operate and lock paths to the select and hold magnets in the sender test frame crossbar switch. The following contacts in the STCC perform the following functions:

STCC Leads	Contact	Function
1,2	1B(B)RLY	Opens operate path to select magnet W-Z walking circuit.
C1,C2	4B(B)RL4	Opens C relay (-0131) to remove busy test in connector to stuck sender.
AV	3M(B) and 12M(A3A)RLYS	Holds AV relay operated so test frame will not advance.
HML01,2	9B(B)RLY	Opens lock path for odd hold magnets.
0HM1,2	10B(B)RLY	Opens hold magnet 0 and 0A operate path.
HMLE1,2	11B(B)RLY	Opens lock path for even hold magnets.
ESML1,2	1B(B1)RLY	Opens lock path for even select magnets lock path.
0SML1,2	2B(B1)RLY	Opens lock path for odd select magnets lock path.
3,4	7B(B1)RLY	Opens operate path to hold magnet W-Z walking circuit.
SML1,2	8B(B1)RLY	Opens operate path to odd hold magnets.
BKL,BKLA	9B(B1)RLY	Opens lock path for BK relay.
RN,SML1	11B(AA) and 11B (RLS3A) RLYs	Prevents two hold magnets from operating at same time with idle test frame.
MGB1,2	4B(AA)RLY	Prevents busying out a whole subgroup of senders while STCC is attached.

35.02 The above B and B1 relay contacts can be located on ES-558991 detachment as shown in the following table:

Contact	Lead Desig	Location In ES-558991, Issue 11
1B(B)RLY	1,2	ES-558991, sheet 6, coord. E1
4B(B)RLY	C1,C2	ES-558991, sheet 6, coord. F4
3M(B) and 12M(A3A)RLYs*	AV	ES-558991, sheet 6, coord. B4
9B(B)RLY*	HML01,HML02	ES-558991, sheet 6, coord. C5
10B(B)RLY	0HM1,0HM2	ES-558991, sheet 6, coord. A4
11B(B)RLY*	HMLE1,HMLE2	ES-558991, sheet 6, coord. B4
1B(B1)RLY	ESML1,ESML2	ES-558991, sheet 6, coord. E0
2B(B1)RLY	0SML1,0SML2	ES-558991, sheet 6, coord. F1
7B(B1)RLY	3,4	ES-558991, sheet 6, coord. B1
8B(B1)RLY*	SML1,SML2	ES-558991, sheet 6, coord. E2
9B(B1)RLY	BKL and BKLA	ES-558991, sheet 5, coord. C6
11B(AA) and 11B(RLS3A)RLYs*	RN,SML1	ES-558991, sheet 6, coord. E2
4B(AA)RLY	MGB1,MGB2	ES-558991, sheet 32, coord. G0

*Contact also shown on ES-558991, Issue 11, sheet 7.

35.03 The functions of keys and lamps required for stuck sender trunk identification are as follows:

Key or Lamp	Function
RLS Key	Will release the sender test connector control circuit.
CANC SS Key	Will disable the sender test connector control circuit and prevents SSTI from seizing the OST.
SSAR	Will release the alarm relays in the STCC.
SGRLS	Will release all operated LG- relays in the STCC.
PRF Lamp	Indicates a peripheral failure has occurred.
TO Lamp	Indicates an overall timeout of 120 seconds has occurred.
SS Lamp	Indicates the STC has seized the OST to a stuck sender.
MTR Lamp	Indicates a trunk could not be found with an associated stuck sender and that a manual trace is required.
SGPO Lamp	Indicates that identification to one or more subgroups of senders has been locked out and the subgroup is primed out.
TFB Lamp	The incoming trunk test frame is busy.

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DEPT 5245-GFC

WE DEPT 25830-AFW-GWC-JC

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CROSSBAR SYSTEMS
NO. 1
ORIGINATING AND AUXILIARY SENDER TEST
TRANSVERTER TEST

CHANGES

A. Changed and Added Functions

A.1 Provision is made to automatically progress through eleventh and twelfth TOUCH-TONE© button tests on the SD-27810-01 wire spring senders.

B. Changes in Apparatus

B.1 Added

A2A4 - AG20 Relay, Fig. 24, PB Option

*# ATNS - 2JB Key, Fig. AT

*# FNS - [illegible] Lamp, Fig. 24, PB Option

D. Description of Changes

D.1 Options PA, PB, PC, and PD are added. Option PA is provided when the eleventh or twelfth button sender test is not provided. Option PB provides for automatic eleventh or twelfth TOUCH-TONE button sender tests. Option PC provides for making these tests on subscriber senders arranged for prefix digits 0, 1, and 11X codes with recycle. Option PD provides for making these tests on subscriber senders not equipped with prefix digits 0, 1, and 11X codes with recycle.

D.2 Figures 18, 24, 45, 35, and AT are changed to show the addition of the A2A4 relay, *# FNS lamp, and *# ANTS key.

D.3 Circuit Notes 102, 103(-0140); 102(-0141); 111, 127(-0153) are updated to reflect above changes.

F. Changes in Description of Operation

F.1 In SECTION -0143 add the following after 14.01:

15. "TOUCH-TONE" BUTTON SENDER TEST

15.01 General - The auxiliary sender dial pulse circuit (-0139) is used for the dialing of the digits. Either 7- or 10-digit TOUCH-TONE calls arranged for MF outpulsing may be dialed into the sender with one of the digits changed to an eleventh or twelfth TOUCH-TONE signal. This is accomplished by operating the *# key to the desired tone and setting the TT *# switch to the digit slot in which it is desired to insert the eleventh or twelfth tone. Flat spring senders will provide the proper test response as soon as an eleventh or twelfth tone is keyed into a digit position, but cannot be tested automatically (see 15.04). With wire spring senders automatic test operation is provided, but the complete call must be dialed into the sender even though an eleventh or twelfth tone signal is dialed early in the sequence (see 15.02).

15.02 Wire Spring Senders, SD-27810-01 - The *# ATNS key (eleventh or twelfth tones - automatic test new senders) must be operated along with the class key 17 operated to perform this test on wire spring senders. The CTR keys must be normal and TT key must be operated. The CTR keys must be pulled out on the sender make-busy frame. The test consists of the insertion of either the eleventh or twelfth TOUCH-TONE signals into one of the digits of the call. Upon receipt of the eleventh or twelfth tone, the sender will operate the PD relay, call in the marker by grounding the A2 and A4 leads to the marker which then grounds the A2 and A4 leads to the test frame. This causes the A2 and A4 relay to operate in the test frame, respectively, which, in turn, operates the A2A4 relay which resets the test frame in preparation for testing the next sender.

15.03 A missing X_1 and X_2 to PD cross-connection in the wire spring sender cannot be detected by an eleventh or twelfth button tone in the first or (if prefix check and recycle - Fig. 35 is not provided) in the second or third digit. Under the above conditions the insertion of an eleventh or twelfth tone in the first digit will result in a long time-out or, if in the second or third digit, in a mutilated digit, without going to stuck sender. The sender will eventually release

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(unless the CTR key is pulled out) and the test will proceed to the next sender.

15.04 Eleventh and Twelfth Tone Tests on SD-25012-01 Sender - The call is set up the same way as with wire spring senders except the *# ATNS key is not operated. When the eleventh or twelfth tone is dialed into the sender, overflow tone is returned over the tip and ring by the sender which should then be verified by listening in the earphone on the test frame. The CA key should then be operated to advance the test frame to the next sender. The PNS key should be operated so that new senders will be bypassed.

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WE DEPT 367-AFW-EER-MH

CROSSBAR SYSTEMS
NO. 1
ORIGINATING AND AUXILIARY SENDER TEST
TRANSVERTER TEST

CHANGES

D. Description of Changes

D.1 A wiring strap is added to the AC resistor in Fig. 17 to change the effective resistance from 860 to 215 ohms in order to increase the operating current supplied to the ON1 relay of the sender under test and provide a greater operate current margin.

D.2 A make-contact of the OSA relay in Fig. AP was added to the secondary winding release path of the SP relay to reduce the release time of the SP relay and prevent a second transmission of the TOUCH-TONE® digit selected for a given station digit position.

D.3 The IST1 relay contact arrangement is changed to make manufacturing and circuit drawings compatible.

F. Changes in CD Section

F.1 In Section -0131, 10.01(e) change "830-ohm ground" to "215-ohm ground".

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NO. 1
ORIGINATING AND AUXILIARY SENDER TEST
TRANSVERTER TEST

CHANGES

B. Changes in Apparatus

B.1 Added

Relay PD*, PD# Type 293C, Fig. AT
Key Unit *-# Type 2WT, Fig. AT
Rotary Switch TT*# Type KS-1461B,L-39, Fig. AT

D. Description of Changes

D.1 Figure AT added to provide eleventh and twelfth button TOUCH-TONE® signals for originating sender test.

D.2 Note 113, SD Sheet -0132 is changed for clarification.

D.3 Option notation Sheet 0139C, Fig. T and Fig. U is changed to eliminate duplication of options.

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TRANSVERTER TEST

CHANGES

D. Description of Changes

D.1 Figure AP changed to improve "TOUCH-TONE®" oscillator tuning.

D.2 Wiring changed on SH -0166 to eliminate false ground during PCI tandem coin failure test calls.

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TRANSVERTER TEST

CHANGES

B. Changes in Apparatus

B.1	Removed	Replaced By
	A2 Resistor 146A 2000 Ohms	A2 Resistor 146A 4020 Ohms
	B2 Resistor 146A 2000 Ohms	B2 Resistor 146A 4020 Ohms
	C2 Resistor 146A 2000 Ohms	C2 Resistor 146A 4020 Ohms
	A3 Resistor 146A 4020 Ohms	A3 Resistor 146A 2000 Ohms
	B3 Resistor 146A 4020 Ohms	B3 Resistor 146A 2000 Ohms
	C3 Resistor 146A 4020 Ohms	C3 Resistor 146A 2000 Ohms

D. Description of Changes

D.1 Correction of resistor values - Note 202, SD sheet -0147.

D.2 Correction of duplication in connections - Fig. 2N, sheet -0104.

D.3 For description of operation, see CD Issue 25D.

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