

NO. 5 CROSSBAR
TROUBLE REFERENCE GUIDE - PART 2
OFFICE TEST FRAME
BIN LISTINGS----- A

1. GENERAL

1.01 This section is one of a series of sections comprising the information necessary to guide the central office maintenance force to an understanding of the nature of troubles reported by either trouble indicator display records or ATA exception reports.

1.02 Whenever this section is reissued, the reason for reissue will be covered in this paragraph. This issue does not affect Equipment Test Lists.

1.03 Refer to Section 218-404-500 for an explanation of a typical bin listing, along with a complete listing of all bins, and the Trouble Reference Guide part number in which they appear.

1.04 The method of trouble duplication using the office test frame is provided in Part 11, 218-404-510.

NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

AIS

LAMP INFORMATION

Lamp - BN/RI
No Lamp - AIS

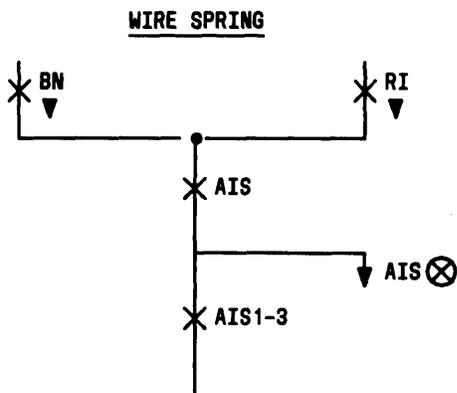
DESCRIPTION OF CIRCUIT OPERATION

The marker is handling a call that is to be routed to intercept. AIS with LLP and AIS with dedicated senders is essentially the same up to the operation of the (AIS) relay.

DESCRIPTION OF FAILURE

Presence of the (BN) or (RI) lamps indicates that the call is to be routed to intercept. (AIS) not lighted indicates that the (AIS) or (AIC) relay did not operate.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

Automatic Intercept Service Class Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-26002-01 FS-153 SC-122,168 CD-26002-01 Para - 39

AIS

AMA-2TR

LAMP INFORMATION

Lamp - 2TR
No Lamp - (Does not apply)

DESCRIPTION OF CIRCUIT OPERATION

(Does not apply)

DESCRIPTION OF FAILURE

A second trial failure occurred.

NORMAL SEQUENCE OF OPERATION

(Does not apply)

TROUBLE DUPLICATION INFORMATION

(None)

REFERENCE DOCUMENTS

None

AMA-2TR

AMA--A'-F'

LAMP INFORMATION

Lamp - Not Available

No Lamp - A' -/B' -/C' -/D' -/E' -/F' -

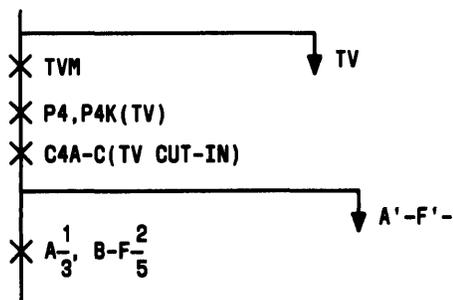
DESCRIPTION OF CIRCUIT OPERATION

(A' -) through (F' -) information is being transferred from the transverter to the recorder.

DESCRIPTION OF FAILURE

(A' -/B' -/C' -/D' -/E' -/F' -) not lighted means that for any given digit, no information was received. (This is not a two-out-of-five failure.)

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-8 SC-1 CD-25872-01 Para - 1.14

AMA--A'-F'

AMA-ANA, DNK

LAMP INFORMATION

Lamp -CK1
No Lamp-DNK

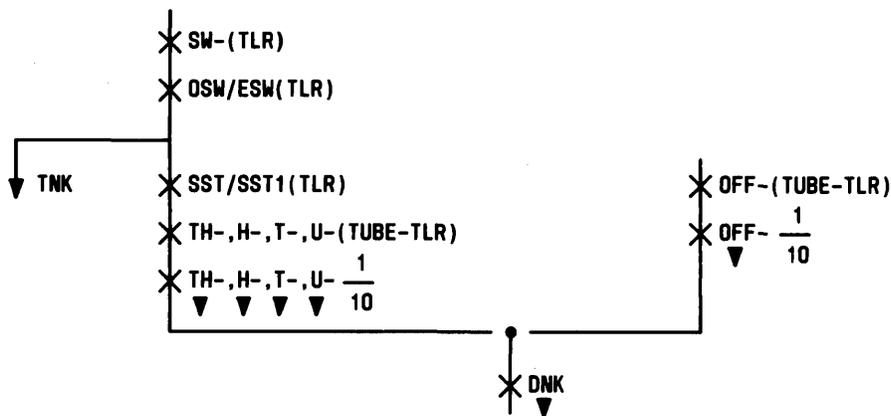
DESCRIPTION OF CIRCUIT OPERATION

The transverter is checking for a correct recording of the directory number on an automatic number announcement test.

DESCRIPTION OF FAILURE

Presence of the CK1 lamp indicates that the transverter is satisfied with some of the input information. (DNK) not lighted indicates that the (DNK) relay failed to operate or failed to detect locking ground on an automatic number announcement test.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-4	SC-3	CD-25591-01	Para - 5.14
SD-26161-01	FS-7	SC-1	CD-26161-01	Para - 1.04

AMA-ANA-DNK

AMA--CI1

LAMP INFORMATION

Lamp - CI2
 No Lamp - CI1

DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of passing information to the recorder so it can be perforated on the tape.

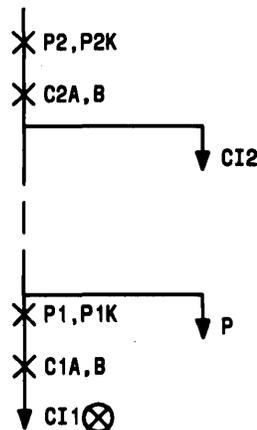
If the associated (P1) relay operates and locks, the cut-in relays operate as indicated by the (CI1) lamp.

DESCRIPTION OF FAILURE

Presence of the (CI2) lamp indicates that all entries except the last have been made.

(CI1) not lighted indicates failure of the last group of cut-in relays to operate properly.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01

FS-18

SC-3

CD-25591-01

Para - 10.01

AMA--CI1

AMA--CI2

LAMP INFORMATION

Lamp - P
No Lamp - CI2

DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of passing information to the recorder so it can be perforated on the tape.

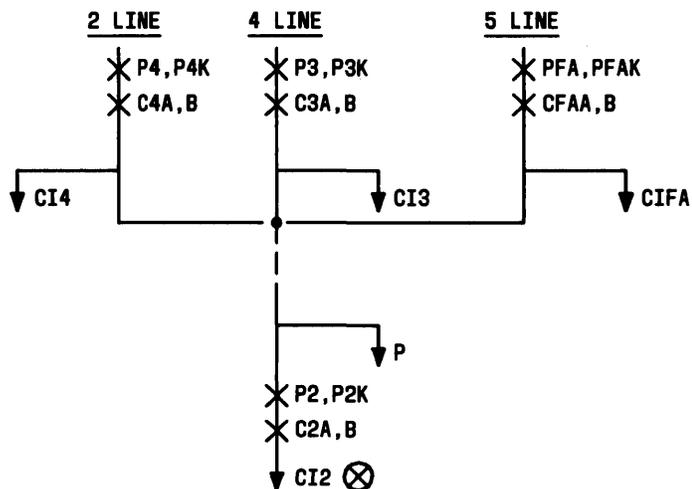
If the associated (P2) relay operates and locks, the cut-in relays operate as indicated by the (CI2) lamp.

DESCRIPTION OF FAILURE

Presence of the (P) lamp indicates that the recorder is ready for the next entry.

(CI2) not lighted indicates failure of this group of cut-in relays to operate properly.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-18 SC-3 CD-25591-01 Para - 10.01

AMA--CI2

AMA--CI2/CI4

LAMP INFORMATION

Lamp - P
 No Lamp - CI1, CI2, CIFA, CI3, CI4

DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of passing information to the recorder so it can be perforated on the tape.

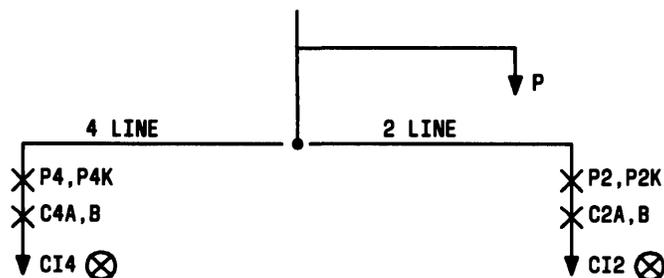
When the cut-in relays operate for a given line entry, it is indicated by the presence of an associated (CI-) lamp.

DESCRIPTION OF FAILURE

Presence of the (P) lamp indicates that the recorder is ready for the first line entry.

Transverter cannot determine if it is to start a four or two line entry.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-18 SC-3 CD-25591-01 Para - 10.01

AMA--CI3

LAMP INFORMATION

Lamp - CI4, P
No Lamp - CI3

DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of passing information to the recorder so it can be perforated on the tape.

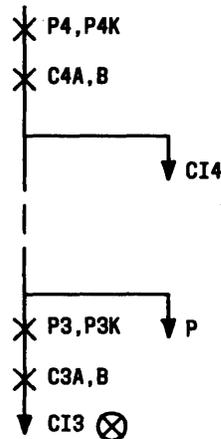
If the associated (P3) relay operates and locks, the cut-in relays operate as indicated by the (CI3) lamp.

DESCRIPTION OF FAILURE

Presence of the (P) lamp indicates that the recorder is ready for the next entry.

(CI3) not lighted indicates failure of this group of cut-in relays to operate properly.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01

FS-18

SC-3

CD-25591-01

Para - 10.01, 10.04

AMA--CI3

AMA--CIFA/CI2

LAMP INFORMATION

Lamp - P, CI3, CI4
 No Lamp - CI2, CIFA

DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of passing information to the recorder so it can be perforated on the tape.

When the cut-in relays operate for a given line entry, it is indicated by the presence of an associated (CI-) lamp.

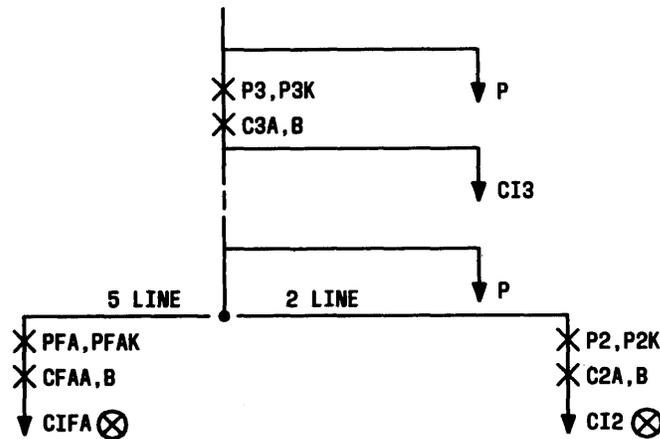
DESCRIPTION OF FAILURE

Presence of the (P) lamp indicates that the recorder is ready for the third line entry.

(CI2, CIFA) not lighted indicates that the transverter cannot determine if it is making a five or four line entry.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-18 SC-3 CD-25591-01 Para - 10.01

AMA--CII.T/U

LAMP INFORMATION

Lamp - (Not available)
 No Lamp - T & U or T/U

DESCRIPTION OF CIRCUIT OPERATION

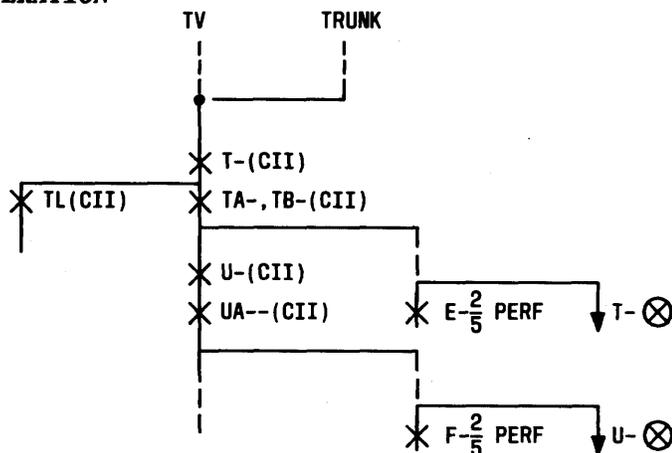
The call identity indexer circuit (CII) is utilized to identify the trunk handling a call, when a recorder is called upon to record the initial entry, time of answer, or time of disconnect. The (CII) serves 100 trunks maximum, which are divided into groups of ten. Each group of ten trunks is associated with a specific (T-) tens relay, which is operated via the associated trunk "DJ" lead when an identification is requested. The (T-) relay operated, switches the associated ten "DJ" leads to the ten (U-) units relays, causing the (U-) relay associated with the grounded "DJ" lead to operate. The tens and units information is converted from one-out-of-ten form to two-out-of-five form and passed to the recorder to operate the (E-) and (F-) perforators respectively.

DESCRIPTION OF FAILURE

The AMA-CII T/U display indicates either the trunk identification tens or units or both the tens and units information was not passed from the call identity indexer to the AMA recorder circuit. This could result from trouble in a transverter, sender, trunk, call identity indexer or recorder.

The call may complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01	FS-8	SC-1	CD-25872-02	Para - 1.19
SD-25621-01	FS-1&2	SC-1	CD-25621-01	Para - 1.01-1.06

AMA--CII.T/U

AMA--CK1

LAMP INFORMATION

Lamp - TV
 No Lamp - CK1

DESCRIPTION OF CIRCUIT OPERATION

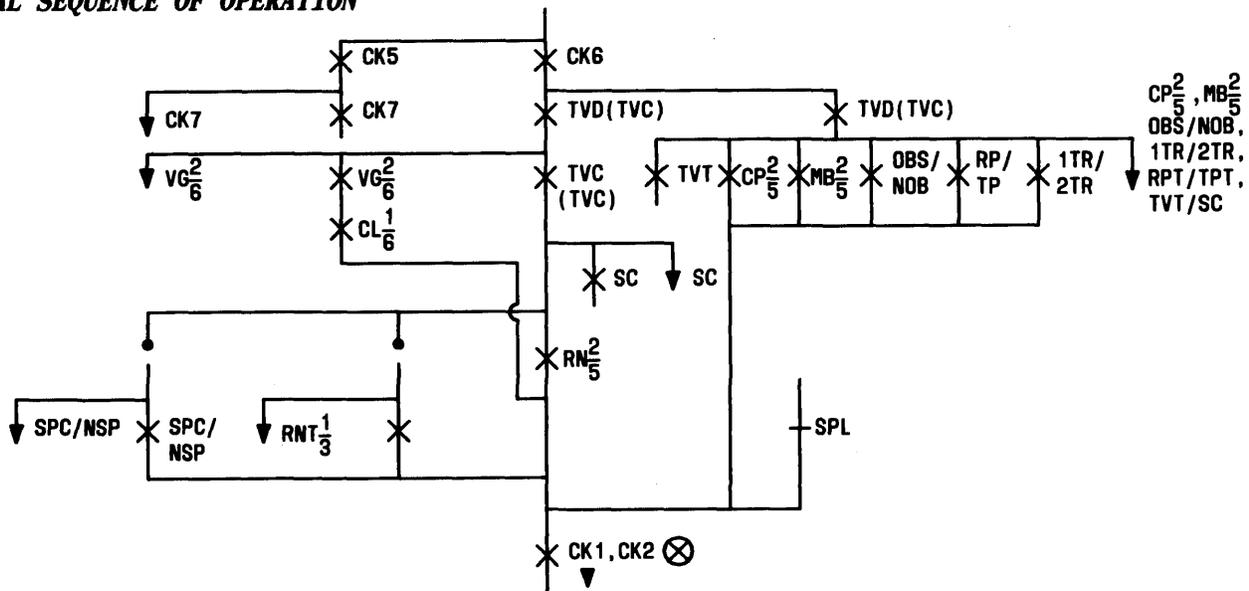
On regular AMA calls in the transverter, relays (CK1) and (CK2) check information passed from the sender to the transverter.

DESCRIPTION OF FAILURE

Relay (CK7) operated indicates a satisfactory down check. With the information from the sender registered in the proper patterns in the transverter, relays (CK1) and (CK2) should have operated, but did not.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-2,3 SC-1 CD-25591-01 Para - 2.01, 3

AMA-CLF**LAMP INFORMATION**

Lamp - CLF
 No Lamp - (does not apply)

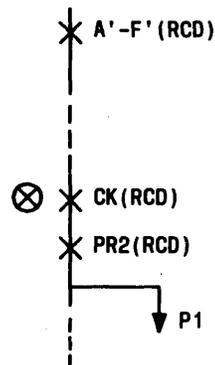
DESCRIPTION OF CIRCUIT OPERATION

The billing data transmitter performs checks on its various control leads to the AMA recorder. If these control leads do not function properly, the BDT will stop the progress of the recorder at the point of operation of its (CK) relay.

DESCRIPTION OF FAILURE

The BDT has detected a trouble on its control leads to the AMA recorder. As a result, it has prevented the recorder's (CK) relay from operating to force a trouble record.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01	FS-9	SC-10,11	CD-25872-01	Para - 1.15, 1.16
SD-94850-01	FS-1, 2	SC-1	CD-94850-01	Para - 4.10

AMA-CLF

AMA--DNK

LAMP INFORMATION

Lamp - CK1-TH-,H-,T-,U-,OFF- (1/10)
 No Lamp - DNK

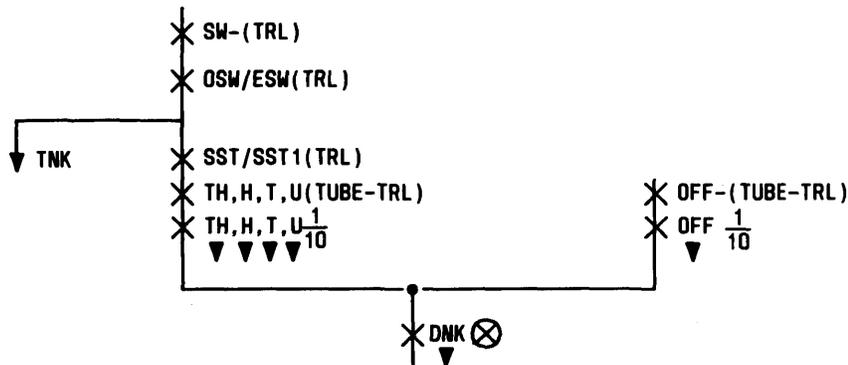
DESCRIPTION OF CIRCUIT OPERATION

The transverter is checking for a correct recording of the directory number. When one out of ten of the following relays operate (TH-, HN-, T-, U-), the (DNK) relay operates to indicate a valid registration.

DESCRIPTION OF FAILURE

Presence of the CK1 lamp indicates that the transverter is satisfied with some of the input information. (DNK) not lighted indicates that the (DNK) relay failed to operate or failed to detect locking ground.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-4	SC-3	CD-25591-01	Para - 5.14
SD-26161-01	FS-7	SC-1	CD-26161-01	Para - 1.04

AMA--DNK

AMA-EA-EF**LAMP INFORMATION**

Lamp - A' -, B' -, C' -, D' -, E' -, F' -
 No Lamp - EA-/EB-/EC-/ED-/EE-/EF-

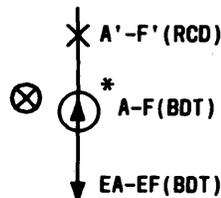
DESCRIPTION OF CIRCUIT OPERATION

After the recorder receives the (A' -) through (F' -) information, it forwards it to the billing data transmitter (BDT). The BDT then transmits this information to the No. 1 automatic message accounting recording center (AMARC) for billing purposes.

DESCRIPTION OF FAILURE

(EA' -/EB' -/EC' -/ED' -/EE' -/EF' -) not lighted indicates that for any given digit, no information was received by the BDT. (This is not a two-out-of-five failure.)

May complete on second trial.

NORMAL SEQUENCE OF OPERATION

* THIS DENOTES THE OPERATION
 OF A SCAN POINT

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01	FS-8	SC-1	CD-25872-01	Para - 1.14
SD-94850-01	FS-2	SC-1	CD-94850	Para - 2

AMA-EA-EF

AMA--FLS, A'-F'

LAMP INFORMATION

Lamp - PAK, P, A'-F'
 No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

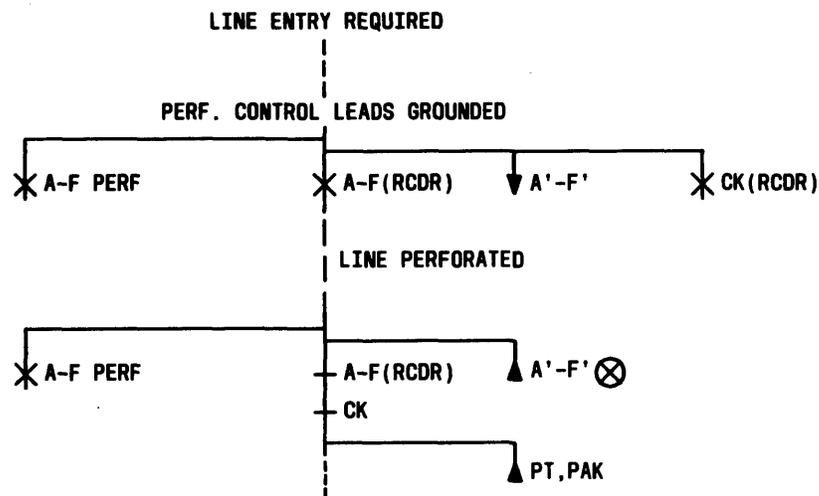
When the recorder is called upon to perforate a line entry, ground is closed to 11 of the 28 perforator magnet leads, designated A0 to F7. These grounded leads operate corresponding check relays in series with the perforator magnets and the recorder (CK) relay checks for the release of all the operated perforator magnets, before advancing the paper in preparation for perforating the next line entry.

DESCRIPTION OF FAILURE

The AMA recorder completed a line entry perforation and detected a perforation check relay release failure, which prevented the release of the recorder (CK) check relay. Failure of relay (CK) to release indicates one or more of the perforator magnets remained energized falsely, as indicated by the presence of one or more A' to F' lamps.

The call may not complete.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-8 SC-1 CD-25872-01 Para - 1.14-1.16

AMA--FLS, A'-F'

AMA--FLS.CII.T/U

LAMP INFORMATION

Lamp - RD, T/U or T&U
No Lamp - RL

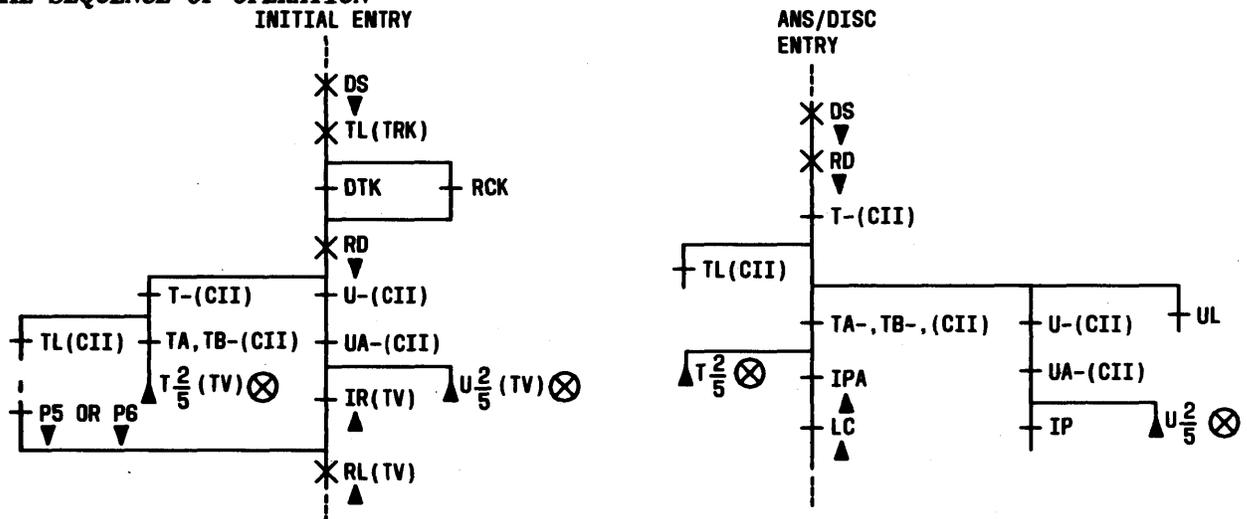
DESCRIPTION OF CIRCUIT OPERATION

The call identity indexer circuit (CII) is utilized to identify the trunk handling a call, when the AMA recorder is called upon to record the initial entry, time of answer or time of disconnect. When the recorder has completed its functions, it operates a recorder disconnect (RD) relay, which in turn opens leads "TL1," "BT" and "GU" to release the (CII) circuit (T-) and (U-) relays.

DESCRIPTION OF FAILURE

The (T-) and/or (U-) lighted after (RD) operates indicates a failure of the (CII) tens and/or units (trunk number) relays to release under (RD) relay control. Check for shorted contacts on 1 and 3T (RD) in the recorder, false ground on the "GU" or "TL1" leads to the (CII) circuit or trouble in the (CII) circuit.

Call may complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25621-01	FS-1&2	SC-1	CD-25621-01	Para - 4.01
SD-25872-01	FS-4	SC-1	SD-25872-01	Para - 1.20

AMA--FLS.CII.T/U

AMA--FLS.DTN

LAMP INFORMATION

Lamp - P1, DTN
 No Lamp -

DESCRIPTION OF CIRCUIT OPERATION

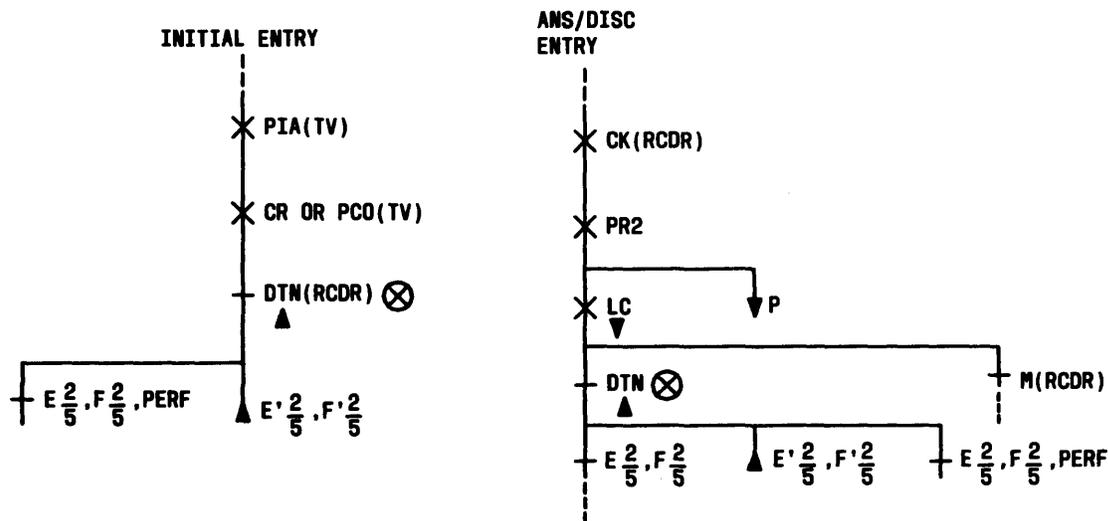
The AMA recorder circuit (DTN) relay is operated on an initial entry, time of answer or time of disconnect entry (after the trunk serving the call has been identified) when the recorder is ready to perforate. Relay (DTN) operated prepares a path for operating the E and F perforator magnets to record the trunk number. After the entry is perforated, the transverter or recorder (LC) relay releases the (DTN) relay to release the (E) and (F) perforator magnets.

DESCRIPTION OF FAILURE

The (DTN) relay failed to release following the perforation of the last line of an initial entry or an answer or disconnect entry. This may result from a transverter or AMA recorder trouble.

The call may complete.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-13	SC-3	CD-25591-01	Para - 12
SD-25872-01	FS-4	SC-1, 2&3	CD-25872-01	Para - 1.20, 3.02

AMA--FLS. IPA**LAMP INFORMATION**

Lamp - REC, RD, IPA
 No Lamp - T-, U-

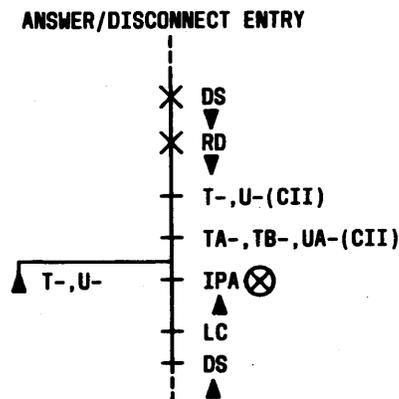
DESCRIPTION OF CIRCUIT OPERATION

When a call is answered, and again when it is disconnected, the call identity index is transmitted to the recorder to identify the trunk serving the call. The trunk serving the call seizes the call identity indexer (CII) circuit, which in turn accesses the recorder by operating the recorder (IP) and (IPA) relays. The recorder functions to perforate an entry index, the time of answer or disconnect and the call identity index number. Upon perforation completion, the recorder signals the CII circuit to release. The CII circuit releases the AMA recorder (IP) and (IPA) relays followed by all the remaining operated recorder relays, to restore the recorder to normal.

DESCRIPTION OF FAILURE

An answer or disconnect entry has been perforated and the AMA recorder signaled the CII circuit to disconnect as indicated by the presence of the (RD) lamp. The (T-) and (U-) not lighted indicates the CII circuit released the trunk identity index tens and units information; however, the recorder (IPA) relay failed to release thereby preventing normal recorder release. Check for trouble in recorder or call identity indexer circuit.

Call in progress should complete.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-2 SC-2,3 CD-25872-01, Para - 2.02 & 3.05

AMA--FLS. IPA

AMA--FLS.P

LAMP INFORMATION

Lamp - TV, A'-F', P, CI1
 No Lamp - Pl, RD

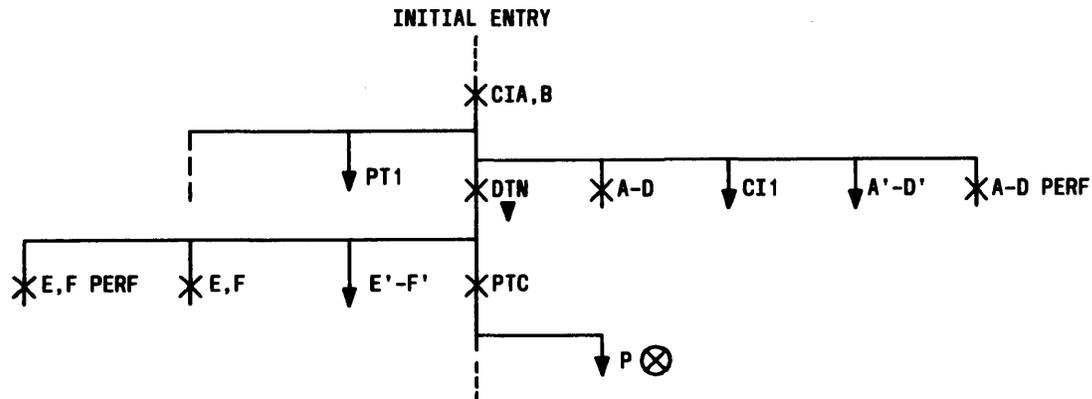
DESCRIPTION OF CIRCUIT OPERATION

The AMA recorder grounds the "P" lead to operate the transverter line perforation control and perforator cut-in relays. The perforator cut-through relays energize the perforator magnets and operate the recorder (PTC) perforator timing control relay to start the perforator timing interval which allows sufficient time for the perforator magnets to operate. The recorder (PTC) relay operated removes ground from the "P" lead to prepare the transverter for advancing the perforation control circuit to next line to be perforated.

DESCRIPTION OF FAILURE

The (CI1) lighted indicates the recorder is in the process of perforating the last line of an initial entry. The (A'-F') lamps indicate the transverter cut-through relays operated; however, the presence of the (P) lamp indicates the recorder perforator timing control circuit was not actuated. Check for trouble in the transverter "PT1" or "DTN" lead or in the recorder (DTN) or (PTC) relay operate path.

The call will probably not complete.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-11 SC-3 CD-25591-01 Para - 11.01

AMA--FLS.P

AMA--FLS.P1

LAMP INFORMATION

Lamp - TV/REC, P1
 No Lamp -A'-F', PT, PAK

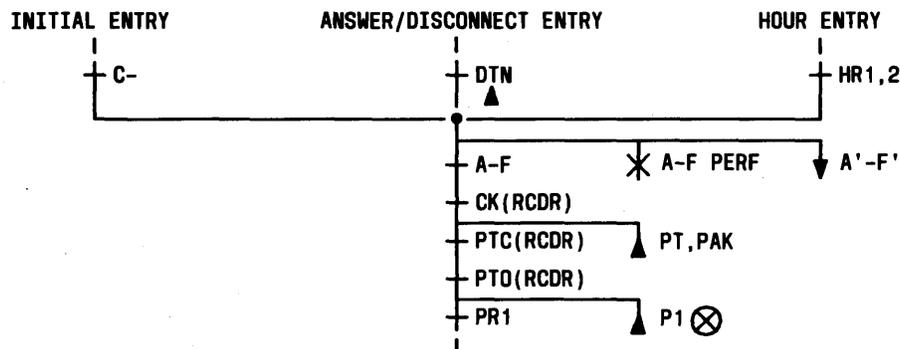
DESCRIPTION OF CIRCUIT OPERATION

When any AMA line entry is perforated, a perforator timing interval is started which allows sufficient time for the perforator magnets to operate. At the end of this timing interval (indicated by PTO relay operation), the recorder checks that one relay operated for the A digit and exactly two relays operated for each of the other five digits. The "P1" lead is grounded as a signal that a valid perforation was completed and the perforator magnets may be released. The recorder checks that all the perforator magnets released, advances the paper and resets the perforation control timer in preparation for perforating the next entry line. Ground is removed from the "P1" lead as a signal that the perforator timing control timer has been reset.

DESCRIPTION OF FAILURE

The (P1) lighted indicates a valid line entry (initial, answer, etc.) was perforated and checked satisfactorily. The (A'-F'), (PT) and (PAK) not lighted indicates the perforator magnets and associated check relays were released; however, the perforator timing circuit was not reset as evidenced by existence of the (P1) lamp in the absence of the (PT) and (PAK) lamps. Check recorder (PTC) and (PTO) circuitry for trouble condition.

Call making an initial entry will probably fail to complete.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-11	SC-3	CD-25591-01	Para - 11.01
SD-25872-01	FS-7	SC-1,2,3,4	CD-25872-01	Para - 1.16

AMA--FLS.P1

AMA--FLS.PT

LAMP INFORMATION

Lamp - PT
 No Lamp A' -, B' -, C' -, D' -, E' -, F' -

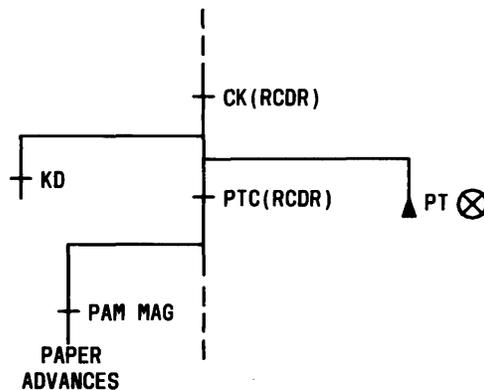
DESCRIPTION OF CIRCUIT OPERATION

After the perforator magnets operate, the recorder (CK) relay provides a check of the (A0) to (F7) perforator series check relays. Relay (CK) releases only if all check relays return to normal. Absence of ground on the "PT" lead indicates the transverter cut-in relays have released as desired and/or all perforator magnets have released thereby indicating the paper may be advanced for the next perforation line.

DESCRIPTION OF FAILURE

The perforator magnet check relays have released; however, ground exists on the "PT" lead which prevents the release of the (PTC) relay. This prevents the normal paper advance and perforator control timing recycle.

The call may complete second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-11	SC-3	CD-25591-01	Para - 11.01
SD-25872-01	FS-9	SC-1,2,3	CD-25872-01	Para - 1.16

AMA--FLS.PT

AMA--FLS.RD

LAMP INFORMATION

Lamp - RD, IC
No Lamp -

DESCRIPTION OF CIRCUIT OPERATION

The AMA recorder (RD) relay operation on initial entries indicates the talking charge relay operated in the trunk and the recorder is now signaled to release the call identity indexer. Relay (RD) also functions when the recorder is initially seized (initial entry) by the transverter, to release any previously operated tens or units relays in the call identity indexer. The (RD) relay is operated under (DS) relay control, after the completion of a timing entry, to release the call identity indexer tens and units relays which operated to identify the trunk handling the call.

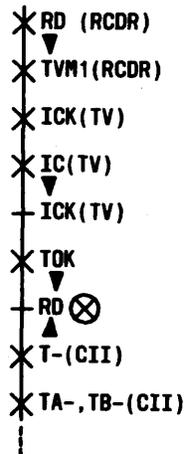
DESCRIPTION OF FAILURE

The recorder (RD) relay functioned on an initial or timing entry (to release the call identity indexer tens and units relays) but it failed to release when its function was completed. Check for shorts, crosses, or false ground in (TC-) relay multiple associated with the "RD" or "RDL" leads or trouble in the AMA recorder.

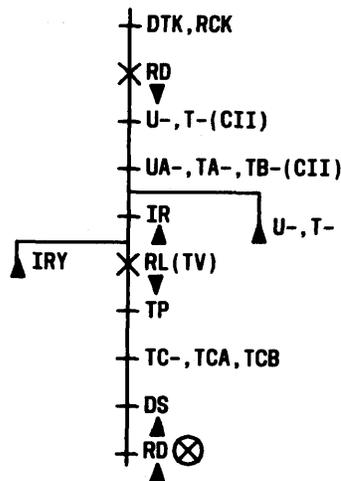
Call will probably not complete.

NORMAL SEQUENCE OF OPERATION

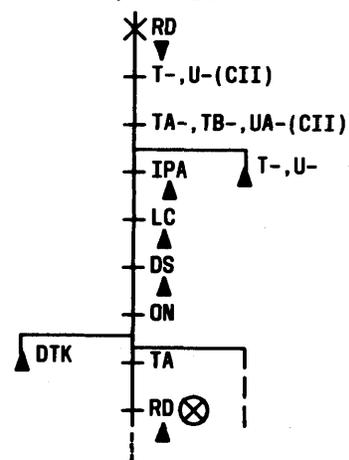
INITIAL ENTRY



INITIAL ENTRY (LAST LINE)



ANS/DISC ENTRY



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-3 SC-1,2,3,4 CD-25872-01 Para - 1.07, 1.10

AMA - GARBAGE

LAMP INFORMATION

Lamp - Does not apply
No Lamp - (Does not apply)

DESCRIPTION OF CIRCUIT OPERATION

(Does not apply)

DESCRIPTION OF FAILURE

The trouble record does not make sense.

NORMAL SEQUENCE OF OPERATION

(Does not apply)

TROUBLE DUPLICATION INFORMATION

(None)

REFERENCE DOCUMENTS

(None)

AMA - GARBAGE

AMA--IC

LAMP INFORMATION

Lamp - RD
No Lamp - IC

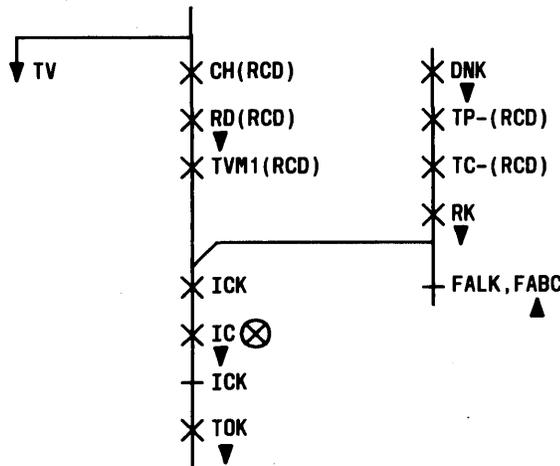
DESCRIPTION OF CIRCUIT OPERATION

The transverter is testing the call identity indexer (T-) relays for the presence of false battery or ground. 226 ohm battery is applied to the (TIC) lead which is returned thru the (CII) on the (ICK) lead operating the (ICK) relay. The (ICK) relay operates the (IC) relay.

DESCRIPTION OF FAILURE

Presence of the (RD) lamp indicates that the transverter is testing the (ICK) lead. (IC) not lighted indicates the continuity test of the (ICK) lead through the recorder, call identity indexer, and trunk is not satisfied.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-13 SC-3,15 CD-25591-01 Para - 12.01,12.06

AMA--IC

AMA--IPA

LAMP INFORMATION

Lamp -REC, T-, U-
 No Lamp - IPA

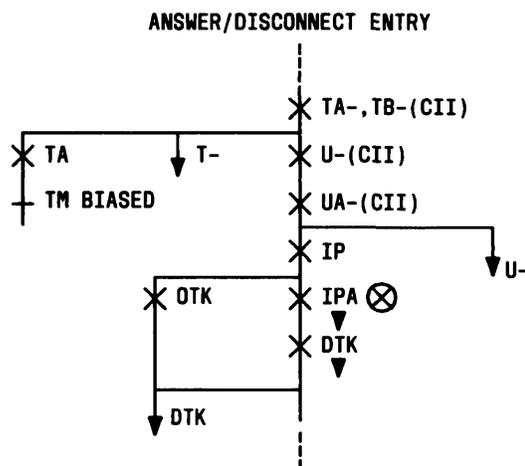
DESCRIPTION OF CIRCUIT OPERATION

When the called customer answers or the calling customer disconnects after completing a call, a time entry is initiated by the trunk serving the call. When the trunk is ready for identification, it calls upon the call identity indexer to furnish the two-digit number that identifies the trunk serving the call. When this trunk identification number is ready to be passed to the recorder, the indexer applies battery to the recorder "IR" lead to operate the (IP) preference relay in the recorder preference chain. When preference is gained to the recorder, the recorder (IP) relay operates and the recorder functions to perforate an index number, the time in minutes, and the trunk identity index on the AMA tape.

DESCRIPTION OF FAILURE

The call identity indexer circuit attempted to seize the recorder as indicated by the presence of the tens and units lamps; however, the (IPA) not lighted indicates the recorder preference relays failed to function properly, check for trouble in the recorder preference chain circuitry.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-2 SC-2,3 CD-25872-01 Para - 2.02

AMA--IPA

AMA--MB

LAMP INFORMATION

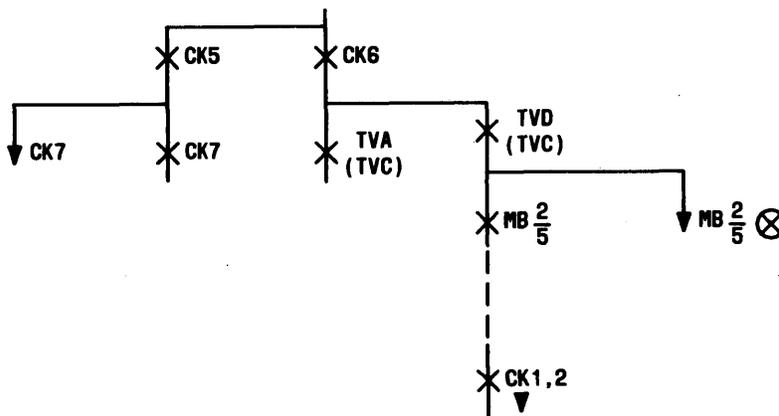
Lamp - TV
 No Lamp - CK1, MB

DESCRIPTION OF CIRCUIT OPERATION

Relays (CK1) and (CK2) operate if the correct number of relays are operated from information passed from the sender to the transverter.

DESCRIPTION OF FAILURE

Relay (CK7) operated indicates a satisfactory down check. Relays (CK1) and (CK2) failed to operate because no (MB-) message billing relays operated.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-3,4 SC-1 CD-25591-01 Para - 2.01

AMA--MB

AMA---M.LN.NO.-SPL

LAMP INFORMATION

Lamp - at least two lamps lighted in any one designation
 No Lamp - OFF-, not lighted in one-out-of-five or TH-, HN-, T-, U- not lighted in one-out-of-ten format.

DESCRIPTION OF CIRCUIT OPERATION

The ANI transverter is converting the line link location into the directory number. The electron tube is fired by a current pulse thru the associated diamond ring. When the tube turns on, the associated relay operates indicating the directory number.

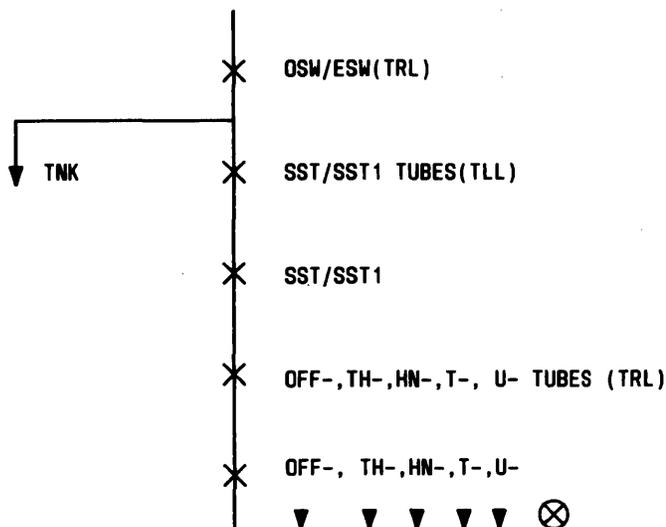
DESCRIPTION OF FAILURE

If the (OFF-, TH-, HN-, T-, U-) relays do not operate in a one-out-of-ten or one-out-of-five format, the transverter blocks and an AMA-M.LN.NO.-SPL trouble is registered.

Probably will not complete on second trial.

Note: All automatic number announcement tests that access the transverter in an ANI mode will be placed in this bin, if a directory number translation failure occurs.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-7	SC-2	CD-25591-01	Para - 5.12, 5.13
SD-26161-01	FS-3	SC-1	CD-26161-01	Para - 1.10, 1.11

AMA-MISS.LN.LOC

LAMP INFORMATION

Lamp - TV, CK1
 No Lamp - FU-, VG-, SW-, VF-

DESCRIPTION OF CIRCUIT OPERATION

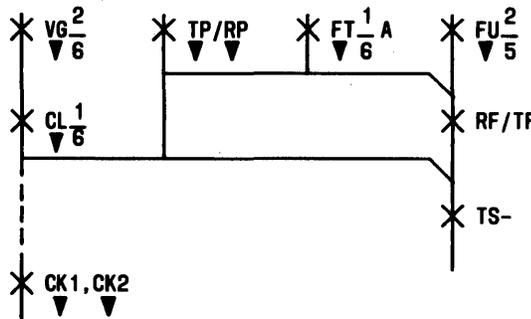
The transverter uses the originating line location to choose a translator and get a calling directory number.

DESCRIPTION OF FAILURE

None of the originating line location was received and therefore a translator could not be chosen to get a calling directory number. The vertical group information was originally received, but then the information was lost.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-3,6 SC-2 CD-25591-01 Para - 2.01,5.01,5.02

AMA--MISS.LN.LOC

AMA--MISS.LN.NO

LAMP INFORMATION

Lamp - DNK
 No Lamp - OFF-, TH-, HN-, T-, U-

DESCRIPTION OF CIRCUIT OPERATION

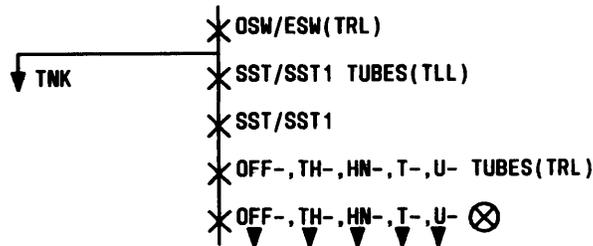
The transverter is converting the line link location into the directory number. The electron tube is fired by a current pulse thru the associated diamond ring. When the tube turns on, the associated relay operates indicating the directory number.

DESCRIPTION OF FAILURE

If the (OFF-, TH-, HN-, T-, U-) relays do not operate, the transverter blocks and an AMA-MISS.LN.NO trouble is registered.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-7 SC-2 CD-25591-01 Para - 5.12, 5.13

AMA-MT-BSP**LAMP INFORMATION**

Lamp - BSP
 No Lamp - (Does not apply)

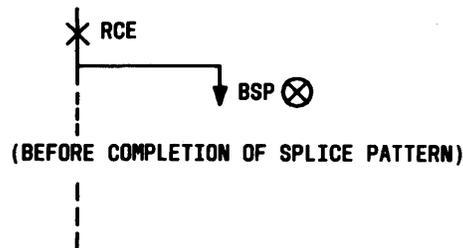
DESCRIPTION OF CIRCUIT OPERATION

The recorder is punching an end of tape pattern. For example, this pattern is punched at 3:00 a.m. or when a transfer of recorders is made.

DESCRIPTION OF FAILURE

(BSP) lighted indicates that the master timer timed-out while perforating before completion of splice pattern entry on an end-of-tape pattern.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

See Section 218-772-501

REFERENCE DOCUMENTS

SD-25633-01 FS-23,15 SC-4 CD-25633-01 Para - 11.08

AMA-MT-BSP

AMA-MT-HR

LAMP INFORMATION

Lamp - HR
No Lamp

DESCRIPTION OF CIRCUIT OPERATION

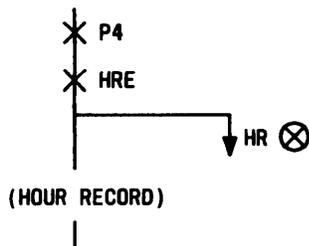
The recorder is punching an end of tape pattern. For example, this pattern is punched at 3:00 a.m. or when a transfer of recorders is made.

DESCRIPTION OF FAILURE

(HR) lighted indicates that the master timer timed-out while perforating the hour entry on an end-of-tape pattern.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

See Section 218-772-501

REFERENCE DOCUMENTS

SD-25633-01 FS-23,3 SC-4 CD-25633-01 Para - 11.08

AMA-MT-SP**LAMP INFORMATION**

Lamp - SP
 No Lamp -

DESCRIPTION OF CIRCUIT OPERATION

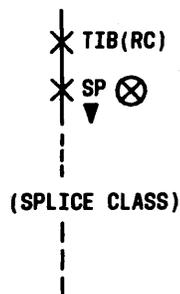
The recorder is punching an end of tape pattern. For example, this pattern is punched at 3:00 a.m. or when a transfer of recorders is made.

DESCRIPTION OF FAILURE

(ASP) not lighted indicates that the master timer did not advance to the point where the after completion of splice pattern entry is made.

(SP) lighted indicates that the master timer timed-out while perforating the splice class entry on an end-of-tape pattern.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

See Section 218-772-501

REFERENCE DOCUMENTS

SD-25633-01 FS-23,16 SC-5 CD-25633-01 Para - 11.08

AMA-MT-SP

AMA--MUT.A'-F'

LAMP INFORMATION

Lamp - A' -, B' -, C' -, D' -, E' -, F' -

No Lamp - A' -(1/3) or (3/3), B' -, C' -, D' -, E' -, F' -(2/5)

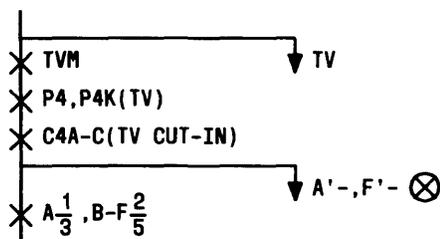
DESCRIPTION OF CIRCUIT OPERATION

The digit information that is received by the recorder is checked for validity. The (A' -) digit should be recorded in one-out-of-three without (OTO) and in three-out-of-three with (OTO) and the rest of the digits should be recorded in two-out-of-five.

DESCRIPTION OF FAILURE

Verification is first made that at least some of the information is present as indicated by at least some of the (A' -) thru (F' -) lamps being present. (A' -) thru (F' -) not in their proper format results in an AMA-MUT.A'-F' type failure.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872

FS-8

SC-1

CD-25872-01

Para - 1.14

AMA--MUT.A'-F'

AMA-MUT-CII.T/U

LAMP INFORMATION

Lamp - (Not available)
 No Lamp - CIIT-, CIU- (in the correct format)

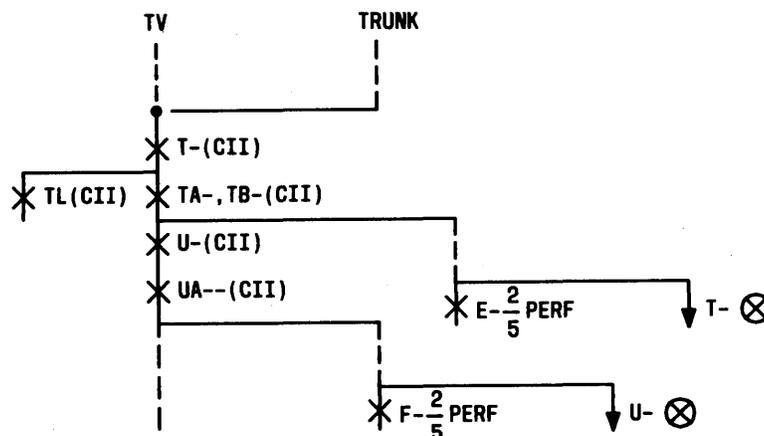
DESCRIPTION OF CIRCUIT OPERATION

The call identity indexer circuit (CII) is utilized to identify the trunk handling a call, when a recorder is called upon to record the initial entry, time of answer or time of disconnect. The (CII) serves 100 trunks maximum, which are divided into groups of ten. Each group of ten trunks is associated with a specific (T-) tens relay, which is operated via the associated trunk "DJ" lead when an identification is requested. The (T-) relay operated switches the associated ten "DJ" leads to the ten (U-) unit relays, causing the (U-) relay associated with the grounded "DJ" lead to operate. The tens and units information is converted from one-out-of-ten form to two-out-of-five form and passed to the recorder to operate the (E-) and (F-) perforators respectively.

DESCRIPTION OF FAILURE

AMA-MUT-CII.T/U printout indicates either the trunk identification tens or units or both the tens and units information was not passed from the call identity indexer to the AMA recorder circuit in the correct format. This could result from trouble in a transverter, sender, trunk, call identity indexer or recorder.

The call may complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01	FS-8	SC-1	CD-25872-01	Para - 1.19
SD-25621-01	FS-1&2	SC-1	CD-25621-01	Para - 1.01-1.06

AMA-MUT-CII.T/U

AMA--MUT.DIG

LAMP INFORMATION

Lamp - A- thru --- (at least one lamp in each digit)

No Lamp - A- thru --- (at least one designation not in two-out-of-five format)

DESCRIPTION OF CIRCUIT OPERATION

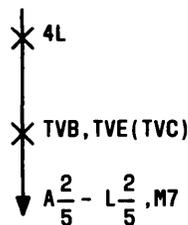
Information stored in the sender is being transferred to the transverter or recorder. All digits must be in two-out-of-five format, except the last digit which must have a lone seven lighted.

DESCRIPTION OF FAILURE

One or more of the digits were not received in the transverter or recorder on a two-out-of-five basis, or a single seven lamp was not present on the last digit.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-12	SC-1	CD-25591-01	Para - 3.04
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AMA-MUT.EA-EF

LAMP INFORMATION

Lamp - EA-, EB-, EC-, ED-, EE-, EF-(at least one lamp lighted in each designation)
 No Lamp - EB-,EC-, ED-, EE-, EF-(at least one designation not in two-out-of-five format)

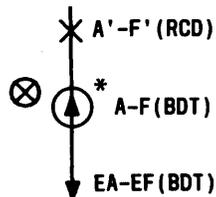
DESCRIPTION OF CIRCUIT OPERATION

The digit information that is received by the billing data transmitter (BDT) is checked for validity.

DESCRIPTION OF FAILURE

Verification is first made that at least some of the information is present, as indicated by at least some of the (EA-) thru (EF-) lamps being present. (EA-) thru (EF-) not in their proper format results in an AMA-MUT.EA-EF type failure.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION

* THIS DENOTES THE OPERATION OF A SCAN POINT.

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01	FS-8	SC-1	CD-25872-01	Para - 1.14
SD-94850-01	FS-2	SC-1	CD-94850-01	Para - 2

AMA-MUT.EA-EF

AMA --- MUT. LINE. NO

LAMP INFORMATION

Lamp -(at least two lamps lighted in one designation)
 No Lamp - OFF-(not lighted in one-out-of-five or TH-, HN-, T-, U-not lighted in one-out-of-ten format)

DESCRIPTION OF CIRCUIT OPERATION

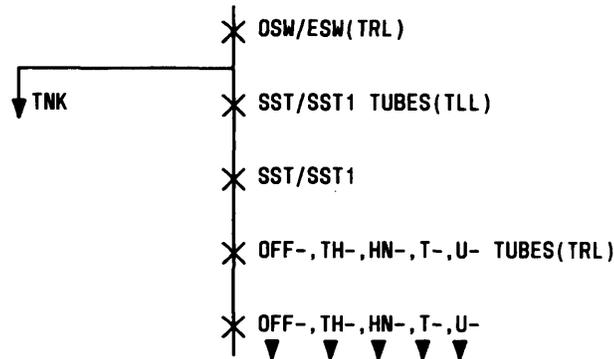
The transverter is converting the line link location into the directory number. The electron tube is fired by a current pulse thru the associated diamond ring. When the tube turns on, the associated relay operates indicating the directory number.

DESCRIPTION OF FAILURE

If the (OFF-, TH-, HN-, T-, U-) relays do not operate in a one-out-of-ten or one-out-of-five format, the transverter blocks and an AMA-MUT.LINE.NO trouble is registered.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-7 SC-2 CD-25591-01 Para - 5.12, 5.13

AMA--MUT.LN.LOC

LAMP INFORMATION

Lamp - TV,CK1, VG, FU, SW, VF

No Lamp - FU2/5, SW2/5, VF1/5, VG2/6 (not in proper pattern)

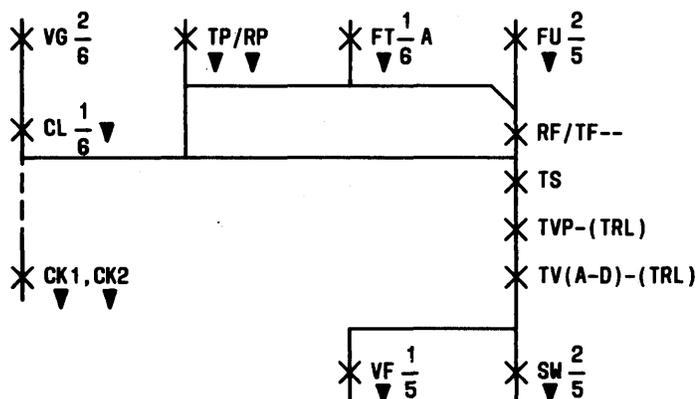
DESCRIPTION OF CIRCUIT OPERATION

The transverter uses the originating line location to choose a translator and get a calling directory number.

DESCRIPTION OF FAILURE

The originating line location, although present, was not in the proper pattern and therefore, a translator was either not seized or could not derive a directory number.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01

FS-3,6

SC-2

CD-25591-01

Para - 2.01,5.01,5.02

AMA--MUT.LN.LOC

AMA - - MUT.MB

LAMP INFORMATION

LAMP - TV, MB-(at least one lamp lighted in MB designation)
 No Lamp - CK1, MB (not in 2-out-of-5 format)

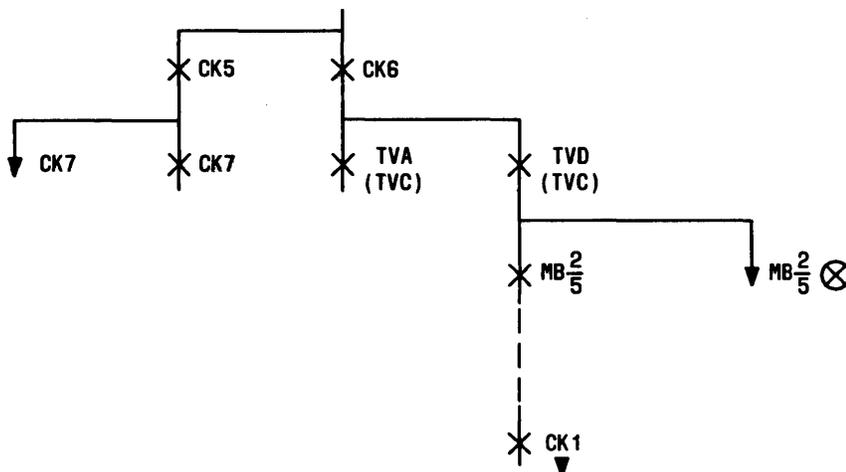
DESCRIPTION OF CIRCUIT OPERATION

Relays (CK1) and (CK2) operate if the correct number of relays are operated from information passed from the sender to the transverter.

DESCRIPTION OF FAILURE

Relays (CK1) and (CK2) failed to operate because the message billing (MB) relays did not operate in a 2-out-of-5 pattern.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-3,4 SC-1 CD-25591-01 Para - 2.01

AMA--MUT.RN

LAMP INFORMATION

Lamp - TV, RN-(at least one lamp lighted in RN designation)
 No Lamp - CK1, RN-(not in two-out-of-five format)

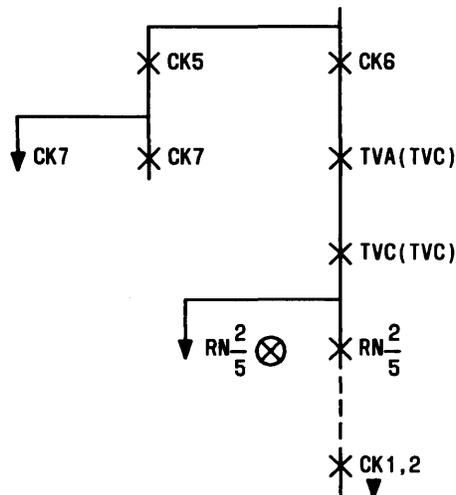
DESCRIPTION OF CIRCUIT OPERATION

Relays (CK1) and (CK2) operate if the correct number of relays are operated from information passed from the sender to the transverter.

DESCRIPTION OF FAILURE

Relays (CK1) and (CK2) failed to operate because the recorder number (RN-) relays were not operated in a 2-out-of-5 pattern.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-3,4 SC-1 CD-25591-01 Para - 2.01

AMA--MUT.RN

AMA--MUT.RPT,TPT

LAMP INFORMATION

Lamp - TV, RPT, TPT
 No Lamp - CK1

DESCRIPTION OF CIRCUIT OPERATION

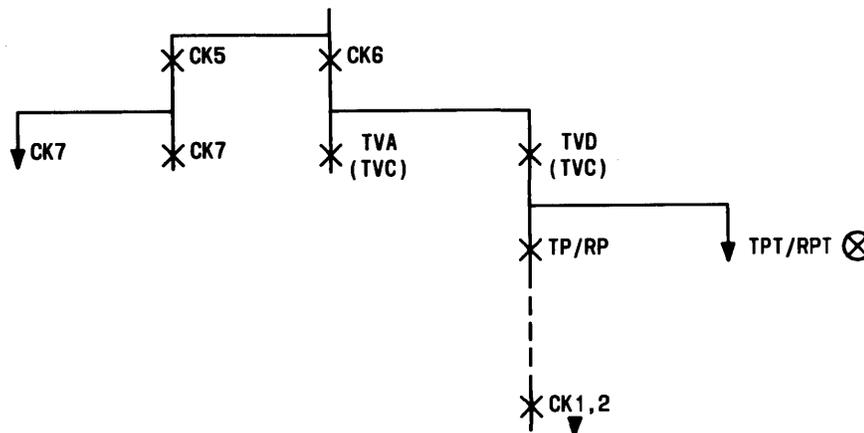
Relays (CK1 and CK2) operate if the correct number of relays are operated from information passed from the sender to the transverter.

DESCRIPTION OF FAILURE

Relays (CK1) and (CK2) failed to operate because both relays (RP) and (TP) operated.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-3,4 SC-1 CD-25591-01 Para - 2.01

AMA - - MUT . RST

LAMP INFORMATION

Lamp - TV, CK1, RST-(at least two lamps lighted in RST designation)
 No Lamp - RST-(not in one-out-of-X format)

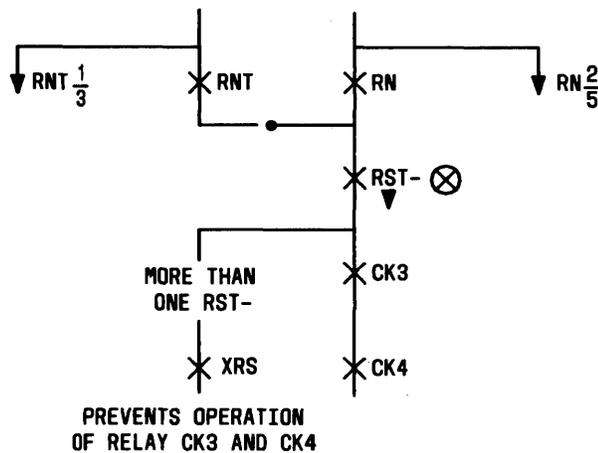
DESCRIPTION OF CIRCUIT OPERATION

On a LAMA call, the transverter checks that one recorder start (RST-) relay operates. If one (RST-) relay operates, relay CK3 operates and operates relay CK4.

DESCRIPTION OF FAILURE

Relays (CK1) and (CK2) checked the input information from the sender as being correct. More than one (RST-) relay operated prevents the operation of relay CK4.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Part 11 - 218-404-510

REFERENCE DOCUMENTS

SD-25591-01

FS-10

SC-3,12

CD-25591-01

Para - 10.02

AMA - - MUT . RST

AMA-MUT-TLR

LAMP INFORMATION

Lamp - CK1, TLR-(at least two lamps lighted in TLR- designation)
No Lamp - TLR-(not in one-out-of-X format)

DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of seizing the translator. When the connector multicontact relays operate, the translator seized should be identified by the (TLR) indication.

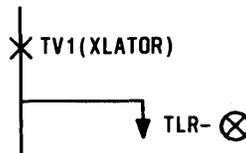
DESCRIPTION OF FAILURE

Presence of the CK1 lamp indicates that the transverter has been seized.

(TLR) lighted in the wrong format indicates that the translator was seized but could not be identified.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25754-01 FS-Fig. 3 SC-(None) CD-25754-01 Para - 6.2

AMA--P

LAMP INFORMATION

Lamp - Not available
 No Lamp - P, A', B', C', D', E', F'

DESCRIPTION OF CIRCUIT OPERATION

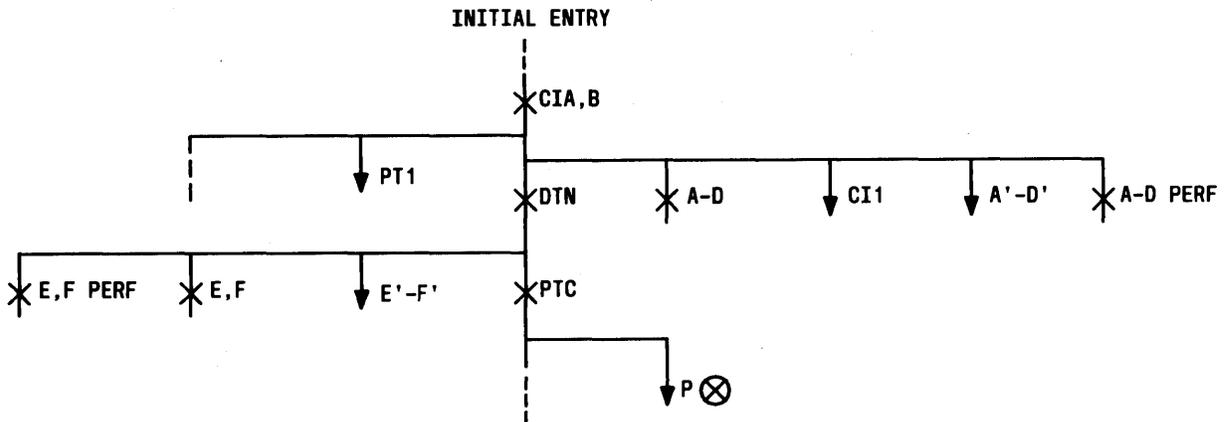
The AMA recorder grounds the "P" lead to operate the transverter line perforation control and perforator cut-in relays. The perforator cut-through relays energize the perforator magnets and operate the recorder (PTC) perforator timing control relay to start the perforator timing interval which allows sufficient time for the perforator magnets to operate. The recorder (PTC) relay operated removes ground from the "P" lead to prepare the transverter for advancing the perforation control circuit to next line to be perforated.

DESCRIPTION OF FAILURE

Absence of the (A'-F') lamps indicate the transverter cut-through relays did not operate. Absence of the (P) lamp indicates that the transverter did not detect a ground from the recorder on the "P" lead.

The call will probably not complete.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-11 SC-3 CD-25591-01 Para - 11.01

AMA-P1

LAMP INFORMATION

Lamp-PAK
No Lamp-P1

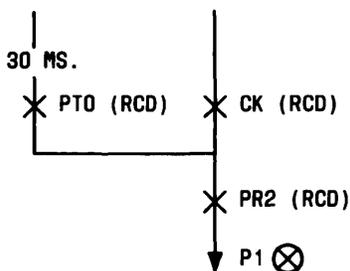
DESCRIPTION OF CIRCUIT OPERATION

The recorder is in the process of perforating the tape and indicates its success by the operation of the (P1) relay.

DESCRIPTION OF FAILURE

Presence of the (PAK) lamp indicates that the recorder started to perforate the tape.
(P1) not lighted indicates that the recorder failed to successfully perforate the current line on the tape.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-11	SC-3	CD-25591-01	Para - 11.
SD-25872-01	FS-7	SC-1,2,3	CD-25872-01	Para - 1.,2.

AMA-P1

AMA -- PAK

LAMP INFORMATION

Lamp - PT
 No Lamp - PAK

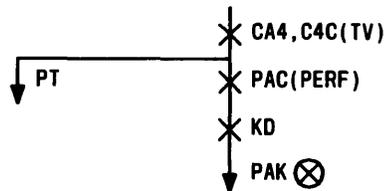
DESCRIPTION OF CIRCUIT OPERATION

The recorder is checking that the perforation was made and that the paper advanced.
 With the (Z) and (KD) relays both operated or released, operate ground for the (PTC) relay should be extended to give the (PAK) lamp.

DESCRIPTION OF FAILURE

Presence of the (PT/PT1) lamp indicates that the transverter cut in relays have operated.
 (PAK) not lighted indicates a paper advance check failure.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-9 SC-1 CD-25872-01 Para - 1.15, 1.16

AMA -- PAK

AMA--PART.LN.LOC

LAMP INFORMATION

Lamp-TV, CK1, FU, SW, VF, VG
 No Lamp - Any one of (FT, FU, SW, VF)

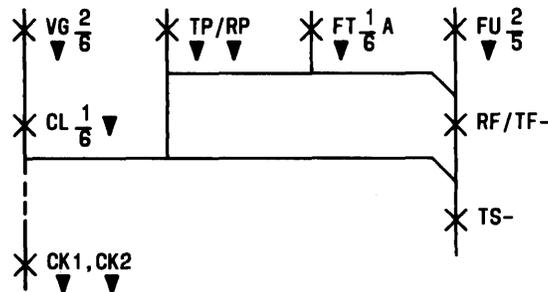
DESCRIPTION OF CIRCUIT OPERATION

The transverter uses the originating line location to choose a translator and get a calling directory number.

DESCRIPTION OF FAILURE

The originating line location, although partially present, was not complete. At least one of FT, FU, SW OR VF information was missing resulting in an incomplete line location. The transverter could either not choose a translator or receive a calling directory number.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-3,6 SC-2 CD-25591-01 Para - 2.01,5.01,5.02

AMA--PART.LN.NO**LAMP INFORMATION**

Lamp - OFF-, TH-, HN-, T-, U-

No Lamp - in any one of OFF-, TH-, HN-, T-, U-

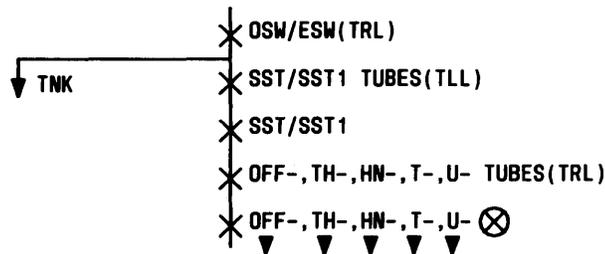
DESCRIPTION OF CIRCUIT OPERATION

The transverter is converting the line link location into the directory number. The electron tube is fired by a current pulse thru the associated diamond ring. When the tube turns on, the associated relay operates indicating the directory number.

DESCRIPTION OF FAILURE

If one of the (OFF-, TH-, HN-, T-, U-) relays do not operate, the transverter blocks and an AMA-PART.LN.NO trouble is registered.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01

FS-7

SC-2

CD-25591-01

Para - 5.12, 5.13

AMA--PART.LN.NO

AMA--PT

LAMP INFORMATION

Lamp - (Not available)
 No Lamp - PT

DESCRIPTION OF CIRCUIT OPERATION

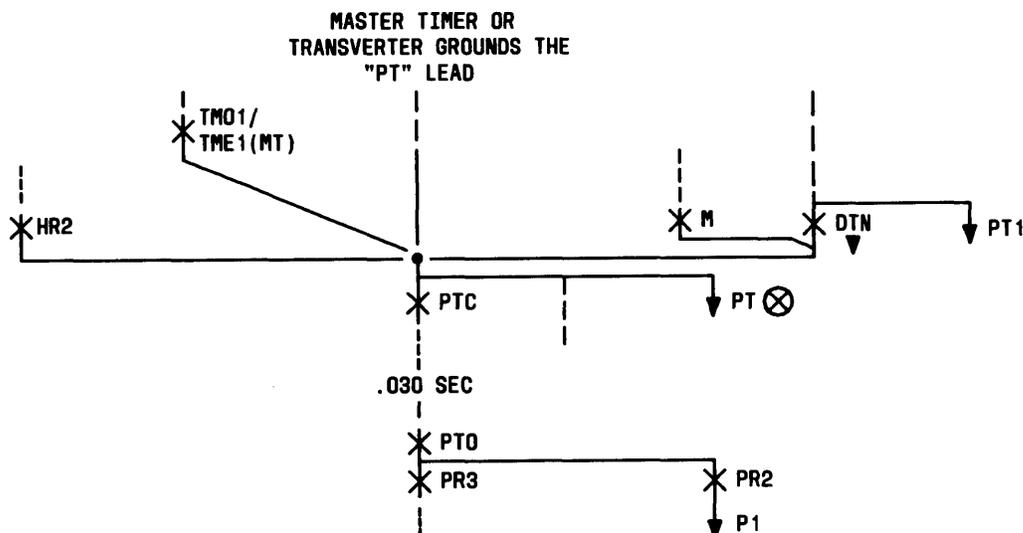
When the recorder is called upon to make initial, time, trouble entries, etc, sufficient time must be provided to perforate the AMA tape before the tape is advanced. An approximate thirty millisecond timing interval is provided in the recorder that allows sufficient time for the perforator magnets to operate. This timing interval is started by the operation of the AMA recorder (PTC) perforator timing control relay and ends when the recorder (PTO) perforator timing operate relay operates.

DESCRIPTION OF FAILURE

The (PT) not lighted indicates the perforator timing control circuit was not activated. Check for failure of the transverter or master timer to ground the "PT" lead or trouble in the AMA recorder perforation check circuit.

Calls may complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-11	SC-3	CD-25591-01	Para - 11.01
SD-25872-01	FS-9	SC-1-3,5-15	CD-25872-01	Para - 1.15

AMA--PT

AMA -- RCD. TBL - RLS

LAMP INFORMATION

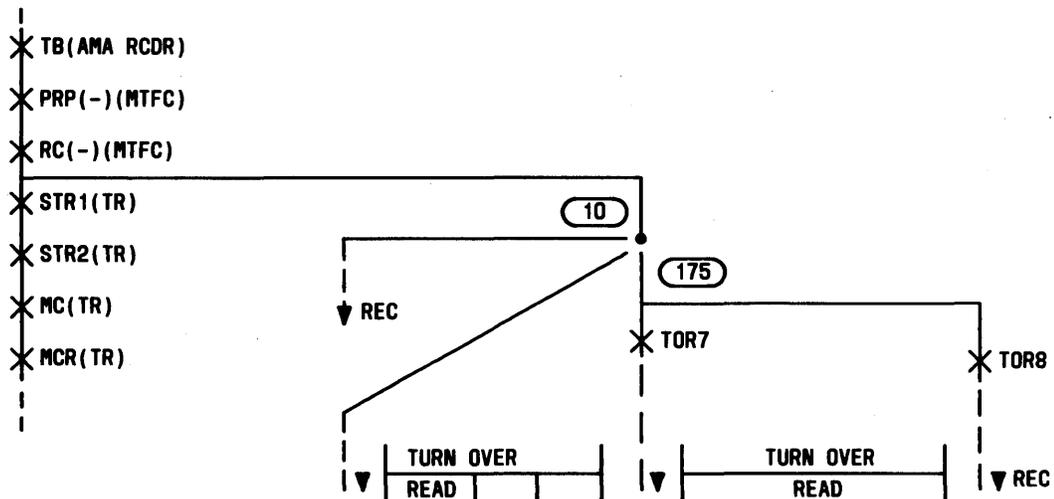
Lamp - REC.
No Lamp - DNK, CK1, T, U

DESCRIPTION OF CIRCUIT OPERATION

The recorder can seize the trouble recorder connector circuit, when the recorder is not attached to a transverter, by connecting battery potential to the associated recorder start lead ("TRST"/"TIS"/"EPR"/"RP") under (TB) relay control. This battery potential causes a recorder preference relay to operate in the associated connector, to bid for a trouble recorder.

DESCRIPTION OF FAILURE

The (REC) lighted indicates an AMA recorder requested the trouble record. The lamps listed above as "no lamp," indicate the recorder was not functioning with a transverter or a call identity indexer circuit when the record was requested. Check for falsely grounded call identity indexer "AG" lead, trouble in the AMA recorder trouble timing circuit, or trouble in the recorder preference relays.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-17 SC-none CD-25872-01 Para - 22.03

AMA -- RCD. TBL - RLS

AMA--RD

LAMP INFORMATION

Lamp - not available
No Lamp - RD

DESCRIPTION OF CIRCUIT OPERATION

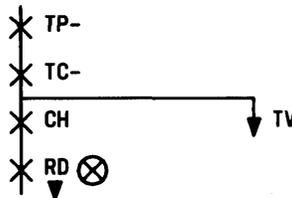
The recorder is checking that the talking charge relay had functioned in the trunk. Relay (CH) operates relay (RD) which locks over the (RDL) lead to the transverter.

DESCRIPTION OF FAILURE

(RD) not lighted indicates that the recorder cannot verify that the talking charge relay operates in the trunk on initial entry or proper relay shunted down on timing entry.

May complete on second trial on initial entries.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-3 SC-1 CD-25872-01 Para-1.07, 1.20

AMA--RL(ANI)

LAMP INFORMATION

Lamp - (DNK-25591) (DNK-26161)
 No Lamp - RL

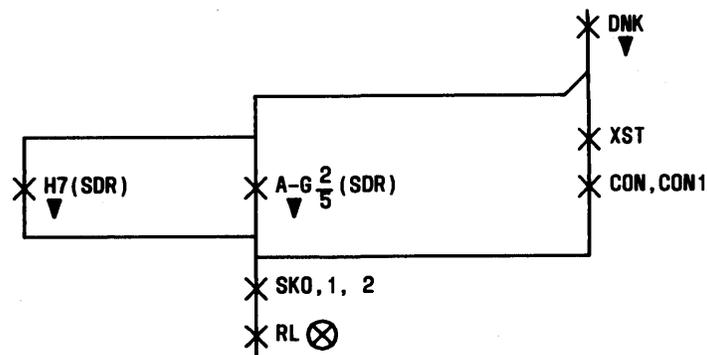
DESCRIPTION OF CIRCUIT OPERATION

ANI use of the transverter simply converts the calling line link location to a directory number and returns it to the sender for outpulsing.

DESCRIPTION OF FAILURE

The line link information was received by the transverter and the directory number was returned to sender. However, a normal transverter release signal did not occur.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-14	SC-11	CD-25591-01	Para. 14.11
SD-26161-01	FS-7	SC-1	CD-26161-01	Para. 1.30

AMA--RL(ANI)

AMA--RN

LAMP INFORMATION

Lamp - CK1
No Lamp - RN

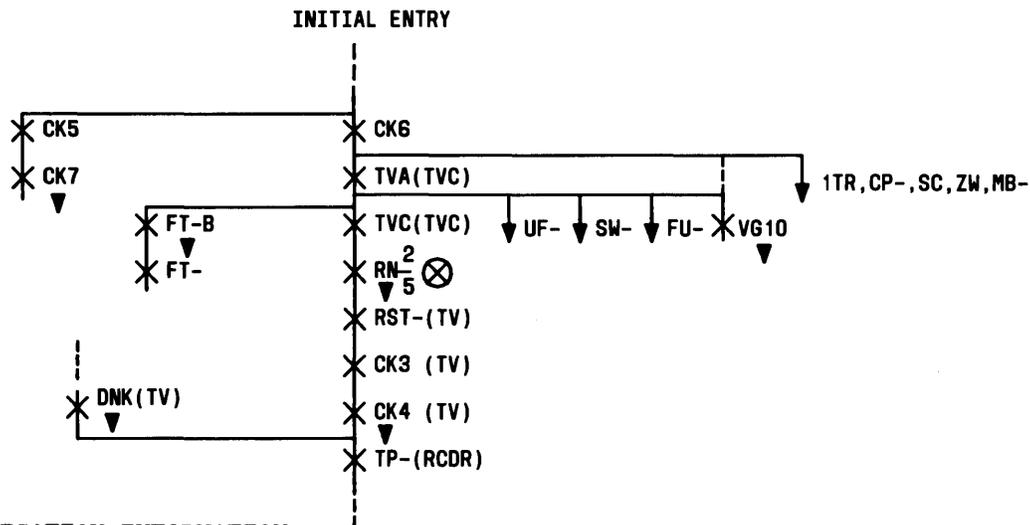
DESCRIPTION OF CIRCUIT OPERATION

When the marker functions to establish a connection requiring an AMA record, it selects an idle trunk circuit and determines from a trunk link cross-connection the recorder number assigned to the selected trunk. The marker takes the 1-out-of-10 recorder number information received from the trunk link frame, converts it to 2-out-of-5 form, checks it and passes it to the associated sender. The sender passes the recorder number to the transverter to indicate which recorder (max 30) to seize when perforating the initial entry.

DESCRIPTION OF FAILURE

The transverter was seized by a sender to perforate an initial entry on the AMA tape; however, the recorder number was not passed by the sender to the transverter, thereby resulting in a transverter time-out. Check the "RN-" and "RNT-" leads to the transverter connector for opens, the AMA trunk transfer circuit if provided, the transverter connector (TVA) & (SA) relay multiples and the sender for trouble conditions.

Call may not complete.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-2 SC-3 CD-25591-01 Para - 2.01

AMA--RN

AMA--RPT/TPT

LAMP INFORMATION

Lamp - TV

No Lamp - CK1, TPT, RPT

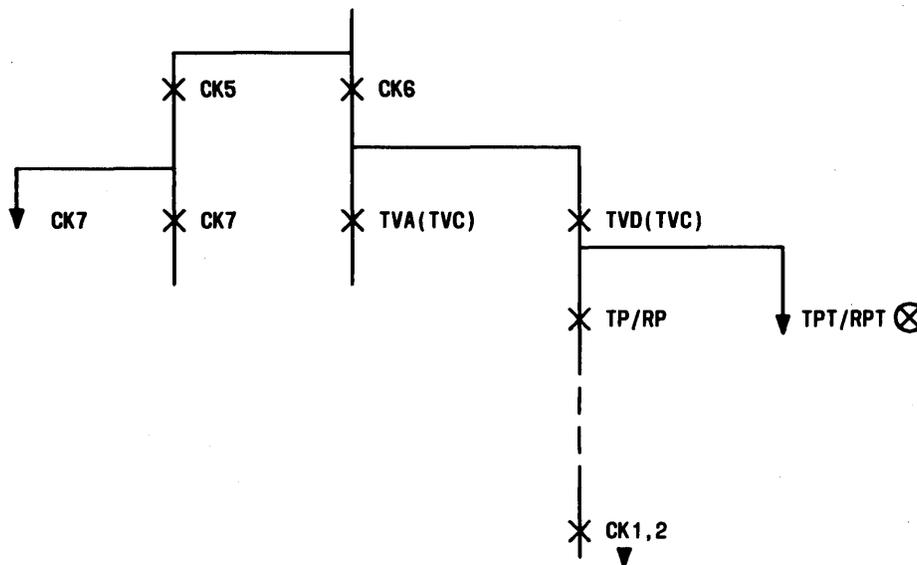
DESCRIPTION OF CIRCUIT OPERATION

Relays (CK1 and CK2) operate if the correct number of relays are operated from information passed from the sender to the transverter.

DESCRIPTION OF FAILURE

Relays (CK1 and CK2) failed to operate because neither relay (RP) or (TP) operated.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01

FS-3,4

SC-1

CD-25591-01

Para - 2.01

AMA--RPT/TPT

AMA--RST

LAMP INFORMATION

Lamp - TV, CK1, RN
 No Lamp - RST

DESCRIPTION OF CIRCUIT OPERATION

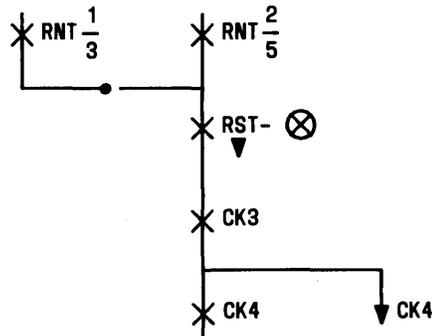
On a LAMA call, the transverter checks that one recorder start (RST-) relay operates.

DESCRIPTION OF FAILURE

Relays (CK1) and (CK2) checked the input information from the sender as being correct. Lamp RST not being present indicates a failure to operate a (RST-) recorder start relay.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-10 SC-3 CD-25591-01 Para - 10.02

AMA--TLR**LAMP INFORMATION**

Lamp - CK1
 No Lamp - TLR

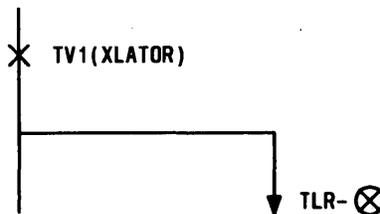
DESCRIPTION OF CIRCUIT OPERATION

The transverter is in the process of seizing the translator. When the connector multicontact relays operate, the translator seized should be identified by the (TLR) indication.

DESCRIPTION OF FAILURE

Presence of the CK1 indicates that the transverter has been seized. (TLR) not lighted indicates that the translator was not seized or not identified.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25754-01 FS-Fig. 3 SC-(None) CD-25754-01 Para - 6.2

AMA--TLR

AMA - TLR . BUSY

LAMP INFORMATION

Lamp-TM1
No Lamp-TLR

DESCRIPTION OF CIRCUIT OPERATION

The transverter is trying to seize the translator but the translator is busy in service. The transverter will wait for up to 2 seconds for the translator to become idle.

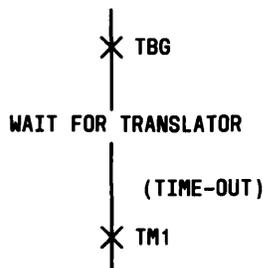
DESCRIPTION OF FAILURE

(TM1) lighted indicates that the transverter timed out while waiting for a translator to become idle.

(TLR) not lighted indicates that a translator was never seized.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-15 SC-2 CD-25591-01 Para - 5.

AMA - TLR . BUSY

AMA-TLR-TRAP**LAMP INFORMATION**

Lamp -OFF-, TH-, H-, T-,U-
No Lamp - DNK

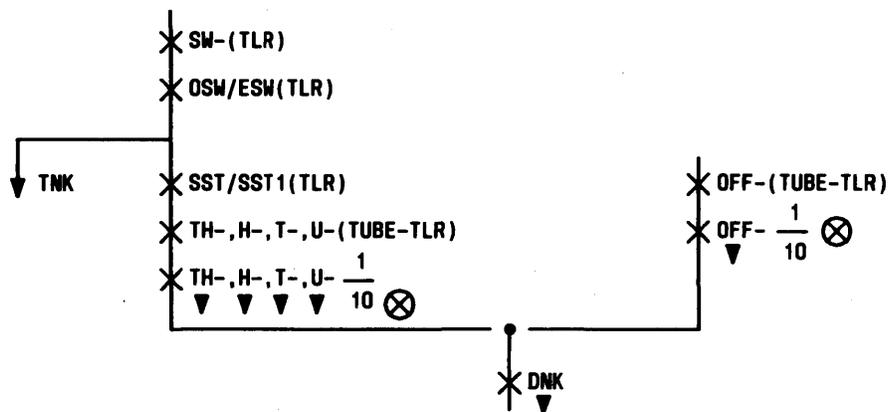
DESCRIPTION OF CIRCUIT OPERATION

The directory number of a line is set up to trap in the transverter and force a trouble record on all calls billed to that number. The record is made to identify AMA translator cross-connection errors.

DESCRIPTION OF FAILURE

The failure indicates that the originating customer's AMA calls are being incorrectly billed to another customer's directory number.

Will not complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IOA or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01	FS-7	SC-2	CD-25591-01	Para - 6.
SD-26161-01	FS-3	SC-1	CD-26161-01	Para - 2.07 - 2.19

AMA-TLR-TRAP

AMA-TRANSV.RLS

LAMP INFORMATION

Lamp-TV
No Lamp-CK1

DESCRIPTION OF CIRCUIT OPERATION

Normally when the transverter is seized, the transverter is not released until the completion of the call or until a trouble occurs and a trouble record is taken.

DESCRIPTION OF FAILURE

Presence of the (TV) lamp indicates that the transverter has been seized. CK1 not lighted indicates that the transverter was released before it made any progress into the call.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION

(none)

TROUBLE DUPLICATION INFORMATION

IOA or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

None

AMA-TRANSV.RLS

AMA--TRS

LAMP INFORMATION

Lamp - TV, TRS
 No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

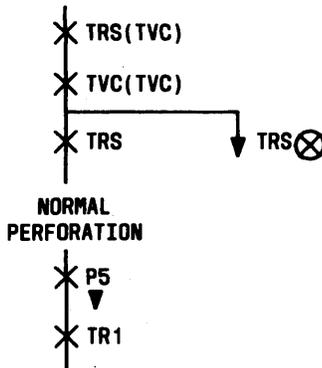
The transverter connector attempts to seize an idle preferred transverter. If the transverter is not seized in approximately one second, the start lead for that transverter is opened and a start lead closed for a lesser preferred transverter. When the lesser preferred transverter is seized, a TRS signal is given to cause a trouble record and regular release when the entry is completed.

DESCRIPTION OF FAILURE

The transverter connector caused the (TRS) relay to be operated in the transverter to indicate that a trouble condition prevented the seizure of a more preferred transverter. A TRS trouble record is never taken by the transverter that cannot be seized, but may be taken by any other transverter.

No second trial is necessary.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-14 SC-10 CD-25591-01 Para - 13.09

AMA--X

LAMP INFORMATION

Lamp - X
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

If the transverter is equipped for ANI-LAMA operation, the (XS) relay provides a check of the 2-out-of-5 numerical digits sent from the transverter to the sender. If more than two out of the five leads (associated with each A through G digits) are grounded, the (XS) cross sender relay operates in the transverter. Relay (XS) operates the (XSA) relay, which locks operated and causes a trouble record to be taken followed by a trouble release.

DESCRIPTION OF FAILURE

The transverter has detected a trouble while checking the office code or numerical digits being sent from the transverter to the sender while functioning to serve an ANI call.

NORMAL SEQUENCE OF OPERATION

(Does not apply.)

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-15 SC-12 CD-25591-01 Para - 14.09-14.10

AMA--X

AMA--XET

LAMP INFORMATION

Lamp - XET
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

The (XET) relay makes a standing ground test on various relays in the translator.

DESCRIPTION OF FAILURE

The transverter detected a false ground on, or a cross between, two or more equipment terminals in the translator.

May complete on second trial.

NORMAL SEQUENCE OF OPERATION

(Does not apply.)

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

SD-25591-01 FS-6 SC-12 CD-25591-01 Para - 5.23

AMA--XET

AMA--XP1

LAMP INFORMATION

Lamp - XP1
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

The AMA recorder (XP) relay provides a standing test of the AMA recorder preference chain for a cross or open condition on the contacts of the (IP), (HP), (TP-) and (MTP) relays. If an open or cross is detected, the (XP) relay operates causing a trouble record to be taken and the office major alarm to sound.

DESCRIPTION OF FAILURE

The (XP1) lighted indicates a cross or open was detected on the recorder preference chain by the recorder (XP) relay.

NORMAL SEQUENCE OF OPERATION

(Does not apply.)

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-14 SC-22 CD-25872-01 Para - 6.01

AMA--XRL

LAMP INFORMATION

Lamp - TV, X, XRL
 No Lamp - (Does not apply.)

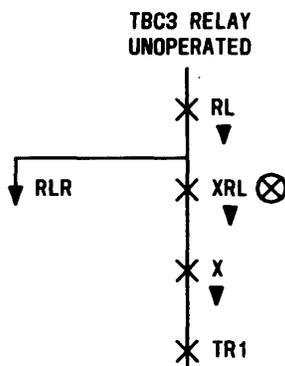
DESCRIPTION OF CIRCUIT OPERATION

The (XRL) relay monitors the RL and TR leads for false grounds when the transverter is idle. Also, if make contacts of relays (RTR, TAL, TM3 or TEC) are shorted, (XRL) will operate.

DESCRIPTION OF FAILURE

Operation of relay (XRL) indicates that the RL or TR leads are falsely grounded, or that contacts of relay (RTR, TAL, TM3 or TEC) are shorted.

Detected with circuit idle.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

Momentarily operate relay (RL).

REFERENCE DOCUMENTS

SD-25591-01 FS-14

AMA--XRL

AMA--XT1

LAMP INFORMATION

Lamp - REC, XT1
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

The AMA recorder (XT) relay provides a standing test on the call identity indexer (CII) circuit "XTN," "TK" or "BT" leads to indicate a trouble condition if an open or ground exists in the chain contacts of the (CII) circuit (T-) relays.

DESCRIPTION OF FAILURE

The (XT1) lamp indicates the recorder (XT) relay detected an open or ground condition in the (CII) tens (T-) relay contact chain.

NORMAL SEQUENCE OF OPERATION

(Does not apply.)

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-14 SC-22 CD-25872-01 Para - 6.33

AMA--XTC**LAMP INFORMATION**

Lamp - REC, XTC
No Lamp - XTL

DESCRIPTION OF CIRCUIT OPERATION

The recorder and recorder connector circuit (XTC) relay provides a standing test on the associated call identity indexer (CII) circuit "TC-" leads, via the "XTC1" lead, to detect false crosses or grounds in the (CII) circuit (TL-) relay multiple. Relay (XTC) also monitors the "XTC" lead, to the (CII), which is grounded if more than one (TL-) relay operates. False ground on the master timing circuit "TCO" lead will also operate the (XTC) relay. Under the above conditions, the (XTC) relay operated indicating a trouble condition was detected that requires a charge guard entry on the AMA tape and a trouble record to be punched.

DESCRIPTION OF FAILURE

The (XTC) lighted without the (XTL) lamp indicates that two or more (TL-) relays operated in the call identity indexer. Check for shorts or crosses on 3&4T (T-) relays in the associated call identity indexer circuit.

Call may complete on second trial.

NORMAL SEQUENCE OF OPERATION

(Does not apply.)

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-14 SC-14&15 CD-25872-01 Para - 15&16

AMA--XTC

AMA--XTL

LAMP INFORMATION

Lamp - REC, XTL
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

The recorder and recorder connector circuit (XTC) relay provides a standing test on the associated CII circuit "TC-" leads (via the "XTC1" lead) to detect false crosses or grounds in the CII circuit (TL-) relay contact multiple.

DESCRIPTION OF FAILURE

The XTL lighted indicates the AMA recorder detected a cross between two "TC-" leads associated with the same (TL-) relay in the call identity indexer.

Call may complete on second trial.

NORMAL SEQUENCE OF OPERATION

(Does not apply.)

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-14 SC-14&15 CD-25872-01 Para - 15&16

AMA--XU1**LAMP INFORMATION**

Lamp - REC, XU1
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

The AMA recorder (XU1) relay provides a standing test of the "XU" and "BU" leads to the call identity indexer circuit, to detect an open or a false ground in the lead to the chain contacts of the (U-) relays in the call identity indexer.

DESCRIPTION OF FAILURE

The AMA recorder has detected an open circuit condition in either the "XU" or "BU" leads to the call identity indexer (CII) or a false ground in the chain contacts of the (CII) circuit (U-) relay contacts.

NORMAL SEQUENCE OF OPERATION

Does not apply.

TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25872-01 FS-14 SC-22 CD-25872-01 Para - 6.33

AMA--XU1

AMA--XVF

LAMP INFORMATION

Lamp - TV, XVF
No Lamp - (Does not apply.)

DESCRIPTION OF CIRCUIT OPERATION

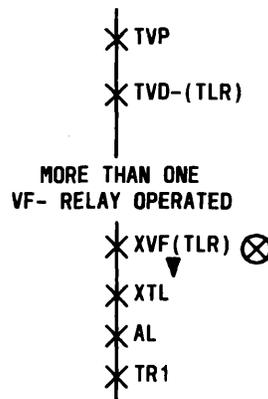
The transverter is signaled by the translator if more than one (VF-) relay operates.

DESCRIPTION OF FAILURE

The translator detected more than one (VF-) relay operated. Lead XVF is then grounded to operate XTL and cause a trouble record.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION



TROUBLE DUPLICATION INFORMATION

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-6 SC-12 CD-25591-01 Para - 5.24

AMA - -XVG**LAMP INFORMATION**

Lamp - TV, XVG
 No Lamp - (Does not apply.)

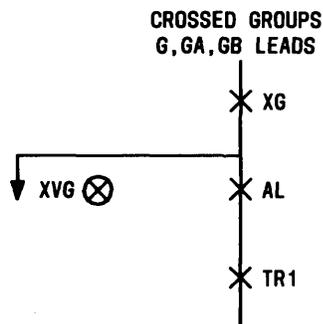
DESCRIPTION OF CIRCUIT OPERATION

The transverter is signaled if more than one group relay operates in the translator.

DESCRIPTION OF FAILURE

More than one group relay in the translator operated causing relay (XG) to operate in the transverter to initiate a trouble record.

Probably will not complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

IAO or OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-25591-01 FS-6 SC-12 CD-25591-01 Para - 5.22

AMA - -XVG

AVK1

LAMP INFORMATION

Lamp - SLK2
 No Lamp - AVK1

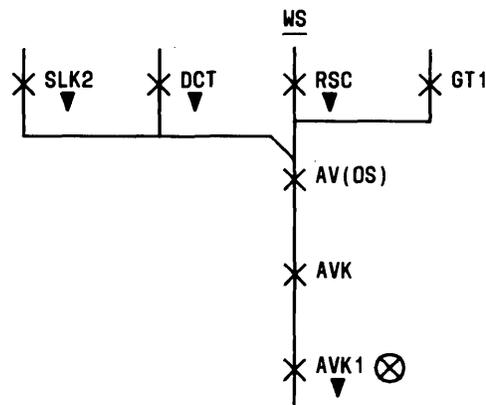
DESCRIPTION OF CIRCUIT OPERATION

(AVK1) lamp indicates that the marker is satisfied with all crosspoint tests and informed the sender that it should proceed with the call. The (AV) relay in the sender operates in series with the (AVK) relay which in turn operates the (AVK1) relay.

DESCRIPTION OF FAILURE

The (SLK2) lamp present indicates that the crosspoints from the sender to the trunk have locked operated (OSL). (AVK1) not lighted indicates that marker did not verify sender advance (operation of the (AV) relay in the sender).

May complete on second trial.

NORMAL SEQUENCE OF OPERATION**TROUBLE DUPLICATION INFORMATION**

OGT Test - See Section 218-404-510 - Part 11

REFERENCE DOCUMENTS

SD-26002-01 FS-61 SC-112 CD-26002-01 Para - 10.8

AVK1