

FEATURE DOCUMENT
TOLL RESTRICTION AND
TOLL DIVERSION
NO. 3 ELECTRONIC SWITCHING SYSTEM

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NOTICE

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INTRODUCTION

1. GENERAL INFORMATION

1.01 This section describes the Toll Restriction and Toll Diversion features for the No. 3 Electronic Switching System (ESS). These features are available with all issues of the No. 3 ESS generic programs.

1.02 When this section is reissued, the reasons for reissue will be included in this paragraph.

1.03 Toll restriction is a software feature which requires no hardware. Normally, toll diversion is provided only for lines from a PBX which is capable of detecting battery reversal and rerouting the call.

2. DEFINITION

TOLL RESTRICTION

2.01 Toll restriction is generally defined as the action of preventing stations from making calls to toll or any other restricted points. The calling line is usually directed to a recorded announcement or given reorder tone when a restricted call is dialed.

2.02 The No. 3 ESS toll restriction feature is implemented by Operating Telephone Company (OTC) inputs to the 3-digit translation. This feature applies to all lines and trunks when they use the 3-digit translator. When a call is originated from a No. 3 ESS line, the program determines from a route index identity, obtained from the 3-digit screening tables, where the call is to be routed. This route index may route the call to the dialed destination or to a recorded announcement or reorder tone when "restriction" is required.

2.03 This feature provides a general restriction capability, even though the official name is "toll" restriction.

TOLL DIVERSION

2.04 The No. 3 ESS toll diversion feature is normally used by PBX lines. If toll diversion applies to a call that is placed from a PBX line, No. 3 ESS reverses battery on the line to the PBX. If the PBX determines that the call should not be allowed, the PBX trunk circuit indicates

on-hook to the No. 3 ESS. The No. 3 ESS then disconnects the call, and the PBX is responsible for directing the calling station to a recorded announcement, an attendant, or reorder tone.

2.05 If the PBX determines that the call should not be diverted, the on-hook indication is not provided back to the No. 3 ESS upon detection of the battery reversal. The No. 3 ESS then allows the call to complete normally.

2.06 In the No. 3 ESS, toll diversion can only be implemented for lines which are equipped with devices (normally PBXs) which are capable of detecting the battery reversal and rerouting the call.

DESCRIPTION

3. USER OPERATION

TOLL RESTRICTION

3.01 The No. 3 ESS toll restriction feature allows customers to restrict stations from making calls to toll or any other restricted destinations. The feature is implemented by the OTC at the request of the customer. A customer with this feature is usually a business customer; however, any No. 3 ESS line or trunk may be restricted.

3.02 The toll restriction feature is implemented by OTC inputs to the 3-digit translations and the line subtranslator. Based on the calling line and the called directory number, the route index derived is used to route restricted calls to a recorded announcement or to reorder tone, as desired. Nonrestricted calls are routed to their dialed destination.

3.03 Toll restriction is a general type of restriction and any combination of calling party and dialed destination may be restricted.

TOLL DIVERSION

3.04 The toll diversion feature allows customers to determine what type of calls will be completed when the calls are originated from their lines. A customer with this feature is usually a business customer with PBX service, but the feature may be implemented for other types of lines provided these lines have devices for detecting

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battery reversal and rerouting the call to an announcement, an attendant, or to reorder.

3.05 The toll diversion is implemented by the use of a toll diversion indicator (bit) in the 3-digit screening tables.

3.06 Toll diversion is a general type of restriction and any combination of calling party and dialed destination may be restricted.

4. SYSTEM OPERATION

4.01 The No. 3 ESS Toll Restriction and Toll Diversion features are very closely related. They differ only in their end result. Although the official names for these features are "toll" restriction and "toll" diversion, either feature can divert any call that is to be denied, even local calls.

4.02 The No. 3 ESS generic program uses the 3-digit translator in conjunction with the line subtranslator to accomplish both toll restriction and toll diversion. For most calls processed by the No. 3 ESS, the 3-digit translator is used to determine how to route and charge a call. The 3-digit translation includes the local and foreign area translators, the code index expansions, and the screening tables.

4.03 There are two inputs for every call processed through the 3-digit translator. These inputs are the calling party's screening class and the called directory number.

4.04 The screening class is obtained from the calling party's originating translation. The screening class is entered into the translation by one of the following OTC inputs:

- (a) The line class code if the calling party is a line
- (b) The trunk group data if the calling party is connected to the No. 3 ESS by a trunk.

4.05 The direct route index is originally obtained from the code index expansion based on the dialed directory number, but this route index may be overridden if a different route index is obtained from the screening tables.

4.06 The No. 3 ESS generic program decodes the route index and routes the call as

indicated. The call may be routed to a line, trunk, recorded announcement, reorder, test circuit, etc. The provision of routing the call to a tone or an announcement is generally called "toll restriction."

TOLL RESTRICTION

4.07 The No. 3 ESS toll restriction feature is completely accomplished by OTC inputs to the 3-digit translation. If a particular dialed code from a station with a particular screening class should be restricted, the OTC personnel should enter a route index to accomplish the restriction. The call can be routed to an announcement, reorder, etc.

4.08 There is no bit or indicator in the 3-digit translator to indicate toll restriction. The override route index, which is obtained from the screening tables, provides the OTC personnel an easy way to accomplish toll restriction. Since most 3-digit codes are permitted from most screening classes, the direct route index from the code index translator, routes the call to completion. The call may be routed to a line, an outgoing trunk, an announcement, a tone, a test circuit, etc. If a call from a particular screening class should not be completed as indicated by the direct route index, the override route index then routes the call somewhere else to provide the restriction. Figure 1 provides a flowchart for the toll restriction feature.

TOLL DIVERSION

4.09 When a call is originated from a No. 3 ESS line, the program determines from the 3-digit translation screening tables if the calling line has the toll diversion feature.

4.10 If toll diversion applies to the call, then the call information is saved in the transient call record (TCR) for later use.

4.11 After all the dialed digits are received, the program determines if toll diversion applies to the call. This is done by consulting the toll diversion bit which was stored in the TCR. If toll diversion applies to the call, the customer dial pulse receiver (CDPR) reverses battery on the line from the No. 3 ESS to the PBX. Reverse battery is maintained for 100 milliseconds (nominal). The battery reversal is a signal to the PBX, so that it may determine if the call should be allowed.

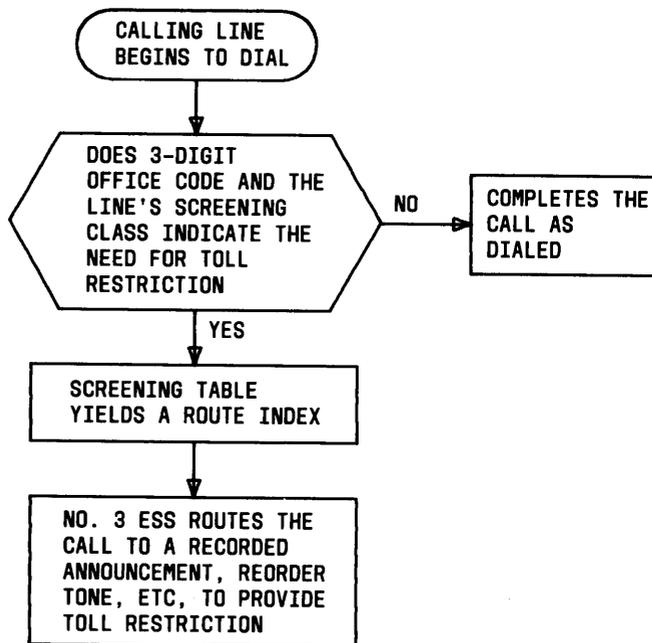


Fig. 1—Toll Restriction Flowchart

4.12 If the PBX determines that the call should be diverted within the PBX, the PBX trunk circuit indicates on-hook to the No. 3 ESS within 400 ms after the battery reversal. When the CDPR detects the on-hook, the No. 3 ESS program disconnects the call. The PBX may then take one of the following actions:

- (a) Connect the calling line to a recorded announcement
- (b) Connect the calling line to an attendant
- (c) Connect the calling line to reorder tone.

The PBX actions to implement toll diversion are independent of No. 3 ESS actions.

4.13 If the CDPR does not receive on-hook from the PBX line within the 400 ms after the battery reversal, then the call is completed, as dialed, by the No. 3 ESS program. Figure 2 provides a flowchart for the toll diversion feature.

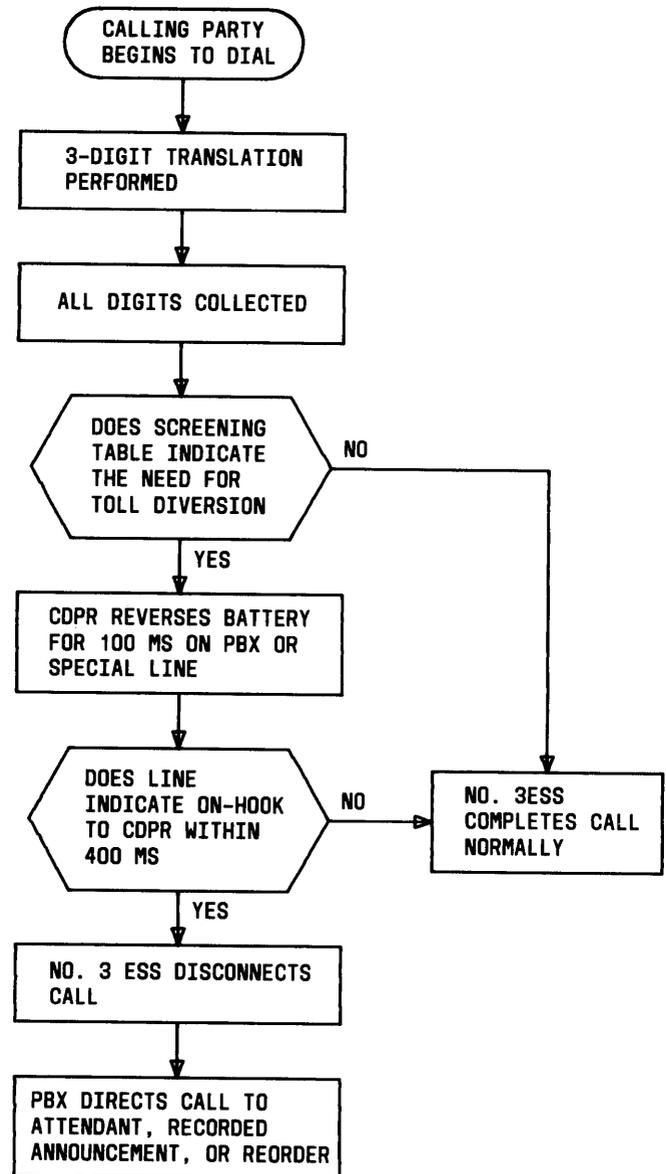


Fig. 2—Toll Diversion Flowchart

CHARACTERISTICS

5. FEATURE ASSIGNMENT

TOLL RESTRICTION

5.01 The No. 3 ESS toll restriction feature may be assigned to any line or trunk. Wide area telecommunication service (WATS) is an example of toll restriction, where the customer is restricted from certain bands. Refer to Section

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233-190-142 for further description of the WATS feature.

TOLL DIVERSION

5.02 The No. 3 ESS toll diversion feature is normally assigned to PBX lines, but it can be implemented for other lines which are equipped with detection devices and which are capable of rerouting the call.

6. LIMITATIONS

6.01 The toll diversion feature can be implemented only for lines having devices capable of detecting the battery reversals and rerouting the appropriate calls. These tasks are usually performed by PBX equipment.

6.02 The PBX must reroute the diverted calls to a recorded announcement, an attendant, or reorder tone.

7. INTERACTIONS

7.01 The toll restriction and toll diversion features operate independently of other No. 3 ESS features.

8. RESTRICTION CAPABILITY

8.01 Calls from lines or trunks may be restricted or diverted as previously described.

INCORPORATION INTO SYSTEM

9. INSTALLATION/ADDITION/DELETION

9.01 The toll restriction and toll diversion features are provided with all issues of the generic programs for the No. 3 ESS. These features may be added or deleted simply through the rearrangement of the screening tables.

10. HARDWARE REQUIREMENTS

10.01 The toll restriction is a software feature and therefore requires no special hardware.

10.02 Lines with the toll diversion feature must have devices capable of detecting the battery reversal and rerouting calls which should be diverted.

11. SOFTWARE REQUIREMENTS

11.01 All the necessary software for the toll diversion and toll restriction features are provided as a part of the No. 3 ESS generic programs. Since restricted or diverted calls are processed identically to any other normal call, no additional translations are required.

12. DATA ASSIGNMENTS AND RECORDS

12.01 The software assignments for the toll diversion and toll restriction features may be made through the use of recent change messages or, in the case of the initial installation, the office data administration (ODA) run. The software translation layout for these features is shown in Figure 3.

12.02 If the ODA run is used to incorporate these features, the following forms must be completed and submitted to the Western Electric Regional Data Center for processing. Refer to Translation Guide TG-3 for details concerning the completion of these forms.

- **ESS 3301-1 Rate and Route Table**—Used to construct the screening tables and to define the screening classes required to provide toll restriction. The toll diversion indicator is also activated by this form.

- **ESS 3304-1 Code Index Table**—Used to define the screening table and direct route index associated with a particular 3-digit code which should be restricted or diverted.

- **ESS 3306-1 Line Class Code Table**—Used to associate a toll restriction or toll diversion screening class with a line class code for lines whose calls should be restricted or diverted.

12.03 The following recent change messages may be used to incorporate the toll restriction and toll diversion features.

- **RC:CDI**—Used to associate a direct route index (keyword RTI) and screening table number (keyword SCRTBL) with a 3-digit code which should be restricted or diverted.

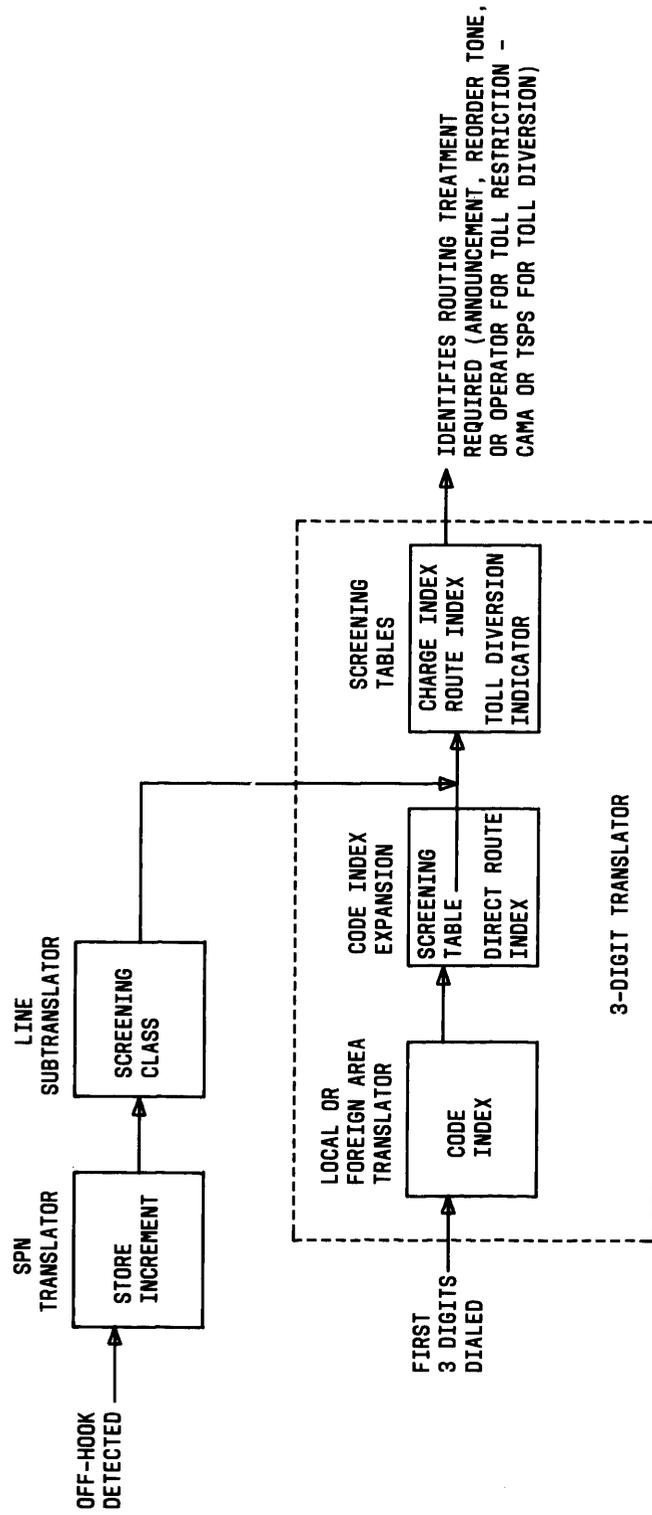


Fig. 3—Translation Layout for Toll Restriction and Toll Diversion

- **RC:LCC**—Used to associate a screening class (keyword SCR) with a line class code for toll restriction or toll diversion purposes.
- **RC:LINE**—Used to associate a line class code (keyword LCC) with a line which may eventually point to a screening table which indicates that toll restriction or toll diversion is required.
- **RC:MLHG**—Used to associate a line class code (keyword LCC) with an entire multiline hunt group. This LCC may eventually point to a screening table which indicates that toll restriction or toll diversion is required.
- **RC:MPTY**—Used to assign line class codes to multiparty lines for purposes of toll restriction and toll diversion.
- **RC:MTL**—Used to assign line class codes (keyword LCC) for individual members of multiline hunt groups for purposes of toll diversion or toll restriction.
- **RC:RTI**—Used to associate a route index with a particular toll restriction treatment (announcement, attendant, reorder tone, etc).
- **RC:SCR**—Used to construct the screening tables for toll diversion and toll restriction applications. The keyword SCR is used to associate the screening table with the appropriate screening classes. The RTI keyword associates the screening table with the appropriate routing treatment (announcement, attendant, or reorder for toll restriction or CAMA or TSPS for toll diversion). Keyword TD is used with this message to provide the toll diversion feature.
- **RC:TWOPTY**—Used with keyword LCC to assign line class codes for two-party lines for purposes of toll diversion or toll restrictions.

Refer to IM-3H300 for further details concerning the use of these messages.

13. TESTING

- 13.01 The toll restriction and toll diversion features can be tested by making the appropriate test calls from the lines subscribing to these features.

14. OTHER PLANNING TOPICS

- 14.01 No special planning is required for these features.

ADMINISTRATION

15. MEASUREMENTS

- 15.01 Not applicable.

16. CHARGING

- 16.01 Calls which are restricted or diverted to announcements, attendants, or reorder are not charged. Calls which are not diverted by the PBX equipment are charged in the usual manner.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

- 17.01 The following list identifies terms used in this document which may be unfamiliar to the reader.

- **Customer Dial Pulse Receiver (CDPR)**—A circuit that provides dial tone to the customer and detects the dialed digits.
- **Office Data Administration (ODA) Run**—Mechanism by which translation information may be assembled or changed for a No. 3 ESS. Information from the ESS input forms is entered into the regional ODA computer, assembled, then sent back to the No. 3 ESS.
- **OTC**—Operating Telephone Company.
- **Reorder Tone**—An audible signal (interrupted tone) sent back to the calling party to indicate that the call cannot be completed. Reorder tone indicates that equipment between the calling and called parties is busy. The tone is usually interrupted at a rate of 120-IPM and is sometimes called fast busy.
- **Transient Call Record (TCR)**—A 16-word block of temporary store assigned to monitor calls in a transient state.

18. REFERENCES

18.01 The following documents may be referred to for supplementary information concerning operations related to the toll restriction and toll diversion features.

- Section 233-190-142—Outward Wide Area Telecommunication Service (OUTWATS)
- IM-3H300—Input Message Manual

- PA-3H300—No. 3 ESS Layout Specification
- TG-3—Translation Guide
- PR-3H155—Digit Interpretation Progress Marks Program (DNTRP)
- PR-3H181—Three Digit Translation Program (XSL3DG)