

**FEATURE DOCUMENT**  
**CODE 108-TYPE TEST LINE FEATURE**  
**2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS**

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## **INTRODUCTION**

### **1. GENERAL INFORMATION**

#### **SCOPE**

**1.01** This feature document describes the code 108-type test line (108TL) feature when utilized with the No. 1 or No. 1A Electronic Switching System (ESS).

#### **REASONS FOR REISSUE**

**1.02** The reasons for reissuing this section are listed below. Since this reissue is a general revision, no revision arrows have been used to denote significant changes.

- (1) Reformat contents from 23-part to 18-part format
- (2) Add coverage for HILO 4-wire switching feature
- (3) Add coverage for toll common channel interoffice signaling (CCIS) feature.

#### **FEATURE AVAILABILITY**

**1.03** The 108TL feature is available in all issues of CTX-7 and later generic programs for No. 1 ESS, and 1AE1 and later generic programs for No. 1A ESS. The capability of accessing 108-type test lines without DN translations (via call type 3) is available in Issue 8 of CTX-7 and 1E3 for No. 1 ESS, and in 1AE1 for No. 1A ESS. For ESS offices equipped with the HILO 4-wire switching feature, the 108TL feature is available with 1E4 and later generic programs for No. 1 ESS, and 1AE4 and later generic programs for No. 1A ESS. For ESS offices equipped with the toll CCIS feature, the 108TL feature is available with 1E5 and later generic programs for No. 1 ESS, and 1AE5 and later generic programs for No. 1A ESS.

**1.04** The 108TL feature software is contained in generic program base for 2-wire applications. HILO 4-wire and toll CCIS 108TL feature software is available in the HL4W and CCISTM feature packages, respectively.

### **2. DEFINITION/BACKGROUND**

#### **DEFINITION**

**2.01** The code 108-type test line (108TL) feature provides far-end loop-around termination for in-service testing of echo suppressors and is to be used with the 58-type echo suppressor measuring system (ESMS).

#### **BACKGROUND**

**2.02** Echo suppressors may be required on certain regional center-to-regional center trunks, and should be used on interregional high-usage intertoll trunks, interregional toll connecting trunks, and end office toll trunks which have echo path delays exceeding specifications.

#### **DESCRIPTION**

### **3. USER OPERATION**

#### **CUSTOMER**

**3.01** Not applicable.

#### **TELEPHONE COMPANY**

**3.02** The functional arrangement of the 108TL feature is shown in Fig. 1. No maintenance personnel actions [except routine equipment maintenance of 108-type test line(s)] are required in a No. 1 or No. 1A ESS office containing the 108TL feature (terminating end).

**3.03** The user perspective of the way the 108TL feature is activated is presented from the maintenance personnel point of view at the originating (or near) end. The operation of the 108TL feature by near-end maintenance personnel is shown in Fig. 2. Refer to the applicable Equipment Test List and Method of Operation BSP documentation for more detailed information.

**3.04** On non-CCIS trunk test calls, certain conditions cause the ESS to return failure signals to the near end. A 60-ipm signal is returned if the 108-type test line is busy, that is, both test port 0 and test port 1. If no calibration tone is received upon initial connection, maintenance personnel have actually reached test port 1 because test port 0 is already busy by another office. A 120-ipm signal is returned if the switching network is congested,

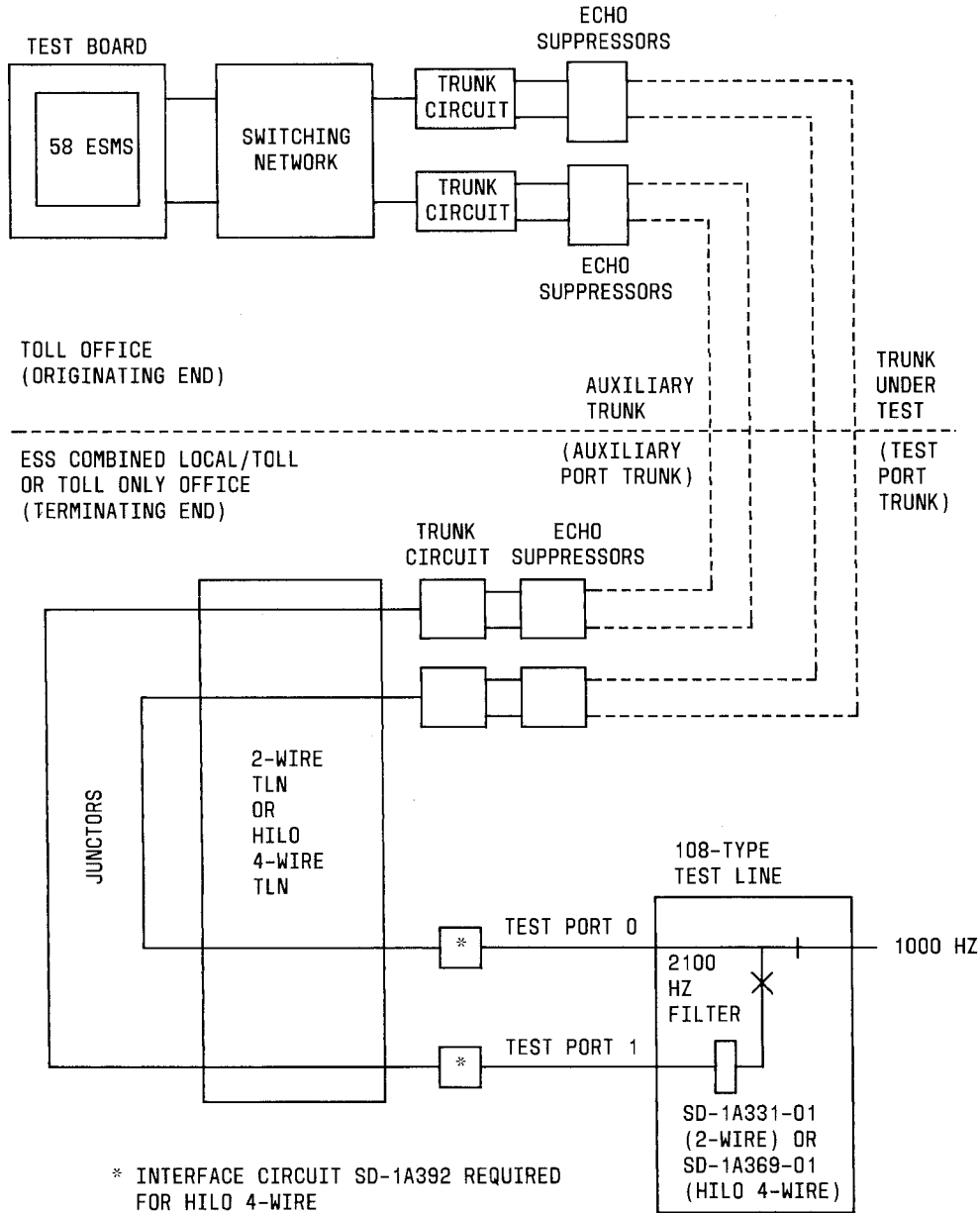
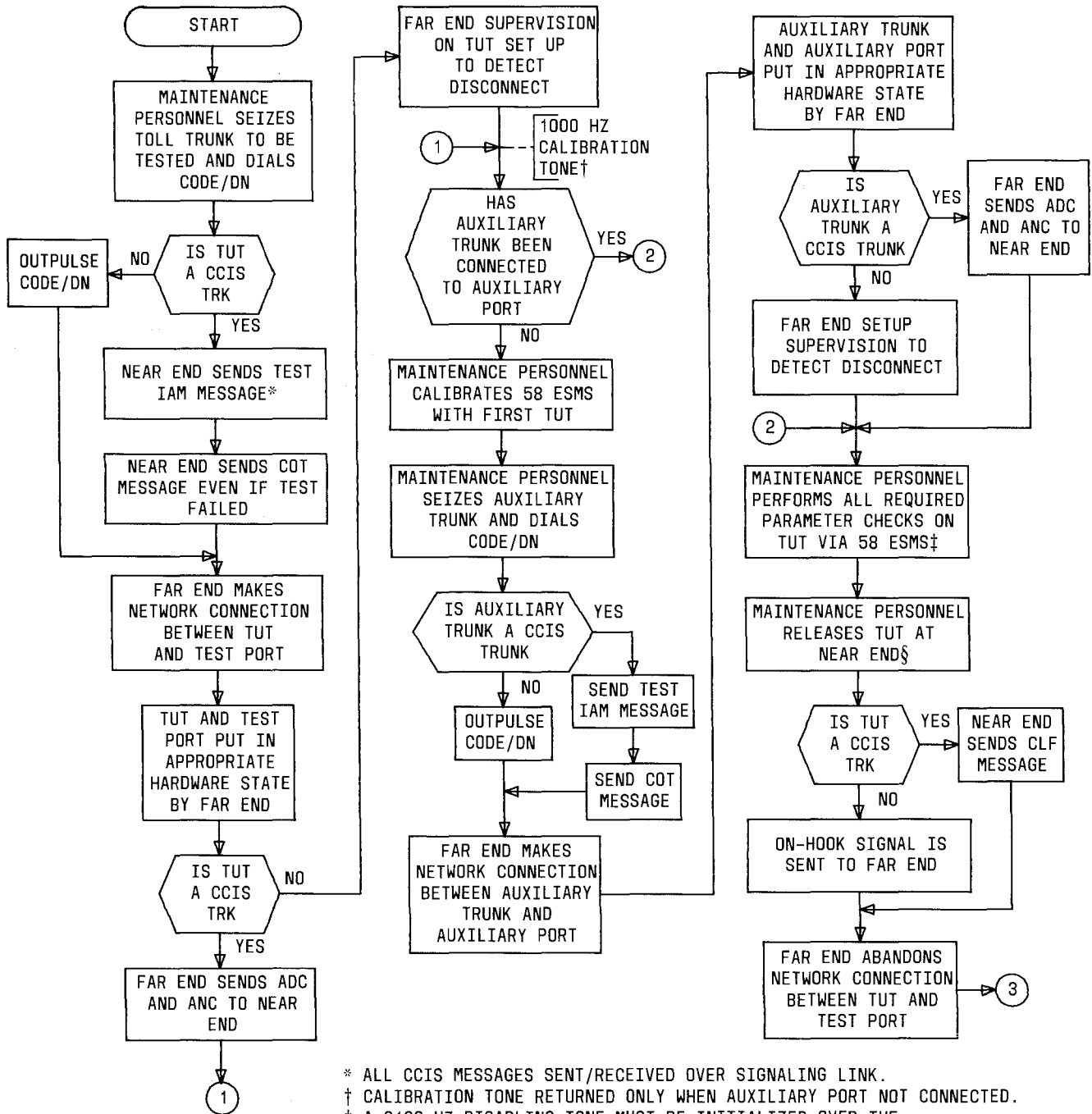


Fig. 1—Functional Arrangement of the 108TL Feature

no incoming trunk test registers are available, or if a peripheral order buffer failure occurs.

**3.05** On toll CCIS trunk test calls, certain conditions cause the ESS to return failure messages to the near end. If the 108-type test line is busy (both ports 0 and 1), a national trunk congestion message is returned. If no calibration tone is

received upon initial connection, the test line is to be considered busy, and the clear forward message must be returned to the far end. A national switching congestion message is returned if the network is blocked, no incoming trunk test registers are available, or a peripheral order buffer failure occurs. If an invalid number is dialed, a vacant national number message is returned.



\* ALL CCIS MESSAGES SENT/RECEIVED OVER SIGNALING LINK.  
 † CALIBRATION TONE RETURNED ONLY WHEN AUXILIARY PORT NOT CONNECTED.  
 ‡ A 2100 HZ DISABLING TONE MUST BE INITIALIZED OVER THE AUXILIARY TRUNK PRIOR TO TESTING BY MAINTENANCE PERSONNEL.  
 § ASSUMES ALL TESTS PASS. OTHERWISE LEAVE TRUNK OUT OF SERVICE AND FOLLOW NORMAL MAINTENANCE PROCEDURES.

Fig. 2—User Operation of the 108TL Feature (Sheet 1)

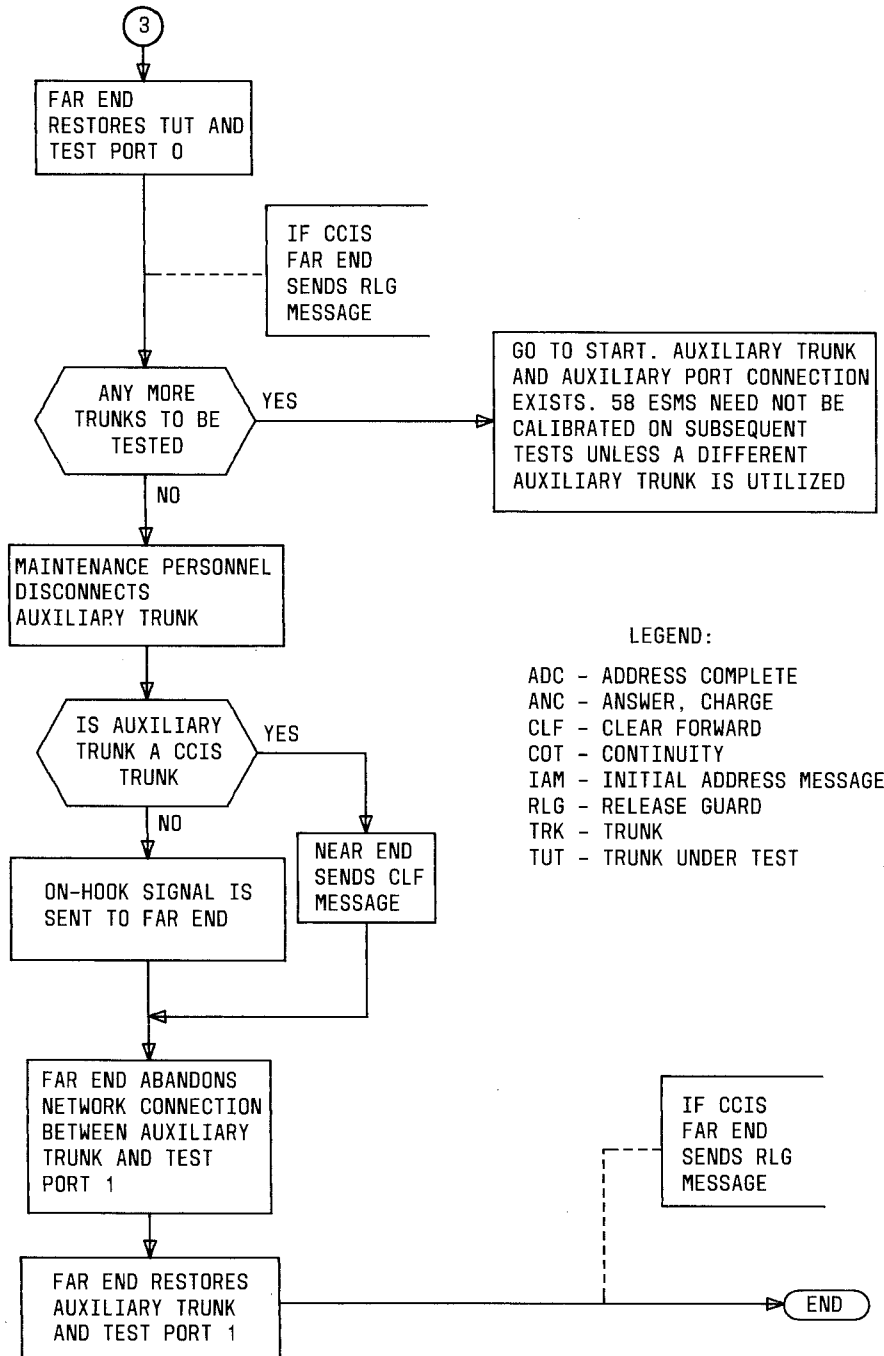


Fig. 2—User Operation of the 108TL Feature (Sheet 2)

#### 4. SYSTEM OPERATION

##### HARDWARE

4.01 Hardware associated with the 108TL feature is shown in Table A. The function of a

2-wire test line is to provide a 108-type test termination for certain incoming 2-wire toll trunks. The function of a HILO 4-wire test line is to provide a 108-type test termination for certain incoming HILO 4-wire toll trunks. More technical information may be found in the appropriate Circuit Description

and Equipment Design Requirements BSP documentation for No. 1/1A ESS.

## OFFICE DATA STRUCTURES

### A. Translations

**4.02** The 108TL feature uses the local/toll 3/6-digit translator to process an incoming 108-type test call. The code 108 can use a call type 3 translation [108 to route index (RI)], or a call type 28 translation (108 to DN translator). A DN translator (DN to RI) is also used for 7-digit test call processing. Call type 3 is the most efficient of the three methods. The result of all methods is to identify the applicable RI and to identify the incoming call as a test call. This is accomplished via the call indicator word for call type 3 shown in Fig. 3 where the RI is 178 and test (TST) item set to 1. RI 178 is only assigned to the 108TL feature. If the DN translator is used, a type 4 entry word

contains this information. The program index item is set to 1 to indicate a test call. Refer to Fig. 4.

**4.03** For the 108TL feature for testing 2-wire toll trunks, RI 178 points the trunk under test (TUT) to the trunk group number (TGN) of test port 0 in its route index expansion table (Fig. 5). RI 179 is also assigned to the 108TL feature, and is used to point the auxiliary trunk to the TGN of test port 1. This also is accomplished in its route index expansion table. If the TGN for test port 0 is busy (as expected), the call is alternate routed to the TGN of test port 1. Both trunk groups contain only one trunk connected to a 2-wire 108-type test line.

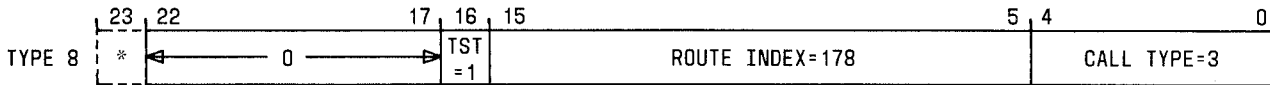
**4.04** For the 108TL feature for testing HILO 4-wire toll trunks, RI 178 will be correlated to pseudo route index (PRI) 010 in the PRI table. PRI 010 will contain a nonfixed RI which points to the TGN of test port 0 in its route index

TABLE A

108TL FEATURE HARDWARE DATA

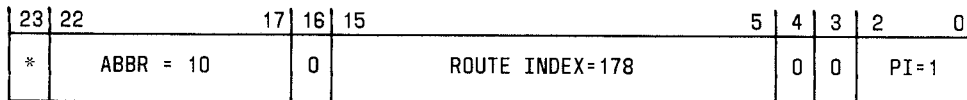
ITEM	2-WIRE TEST LINE	HILO 4-WIRE TEST LINE*
Name	Electronic Switching System No. 1, Arranged for 2-Wire Features, Echo Suppressor Test Termination Circuit (108-Type)	Electronic Switching System Common, Arranged for 2-Wire Features, Echo Suppressor Test Termination Circuit (for HILO 4-Wire Switching)
SD Number	SD-1A331	SD-1A389
J Number	J1A033JR	J1A033MF
Frame	Miscellaneous Trunk Frame (MTF)	MTF
Mounting Space	2 inches	2 inches
Cable Length Limit	1190 Feet	1190 Feet
Number of Circuits per unit	1	1

\* A HILO interface circuit is an integral part of HILO 4-wire trunk circuits for the HILO 4-wire switching feature, but is presented here for information purposes: SD-1A392; J1A090BH-1; Trunk Order Code 14200; HILO MTF or HILO universal trunk frame; plug-in; two circuits per unit.



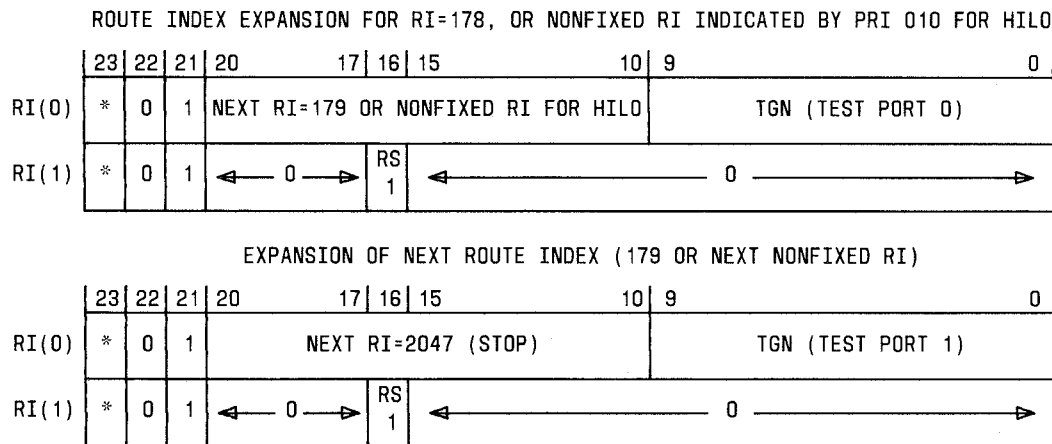
\* BIT 23 DOES NOT EXIST IN THE TRANSLATION WORD FOR NO. 1 ESS. IT IS EQUAL TO 0 IN THE NO. 1A ESS. TST - TEST CALL

Fig. 3—Rate and Route Pattern Table Translator—Call Identification Word for Call Type 3



\* BIT 23 DOES NOT EXIST IN THE TRANSLATION WORD FOR NO. 1 ESS. IT IS EQUAL TO 0 IN THE NO. 1A ESS. PI - PROGRAM INDEX TEST CALL = 001  
 ABBR - ABBREVIATED TERMINATING CODE  
 PI - PROGRAM INDEX

Fig. 4—DN Translator—DN Subtranslator-Type 4 Entry (Trunk)



\* BIT 23 DOES NOT EXIST IN THE TRANSLATION WORD FOR NO. 1 ESS. IT IS EQUAL TO 0 IN THE NO. 1A ESS.

PRI - PSUEDO ROUTE INDEX  
 RI - ROUTE INDEX  
 RS - RETURN SUPERVISION  
 TGN - TRUNK GROUP NUMBER

Fig. 5—Route Index Expansion Table Translator

expansion table (Fig. 5). Another nonfixed RI will be assigned in the route index expansion table to alternate route to the TGN of test port 1 for the auxiliary trunk connection.

4.05 The trunk class code expansion table of the 108TL feature must provide trunk usage 3

and circuit program index (CPI) 110 for 2-wire 108-type test lines, or CPI 139 for HILO 4-wire 108-type test lines. See Fig. 6.

4.06 The trunk network number to peripheral equipment number (TNN-to-PEN) auxiliary block contains the information shown in Fig. 7.



	23	22						8	7			2	1	0
WORD 1	*													TU=3
WORD 4	*													CPI=110(139 HILO)

CPI - CIRCUIT PROGRAM INDEX  
TU - TRUNK USAGE

\* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS  
IT IS EQUAL TO 0 IN THE NO. 1A ESS

Fig. 6—Trunk Class Code Expansion Table Translator

TEST PORT 0

	23	22		18	17	16	15	14	13					0
WORD 0	*	WRDN=4		QUANT=0	CENTRAL PULSE DISTRIBUTOR NUMBER = 0									
WORD 1	*	QUANT=2 (1 FOR HILO)	MISCELLANEOUS TRUNK DISTRIBUTOR NUMBER											
WORD 2	*	QUANT=1		SUPERVISORY-MSN (SCO)										
WORD 3	*	QUANT=0		DIRECTED-MSN=0										

TEST PORT 1

	23	22		18	17	16	15	14	13					0
WORD 0	*	WRDN=4		QUANT=0	CENTRAL PULSE DISTRIBUTOR NUMBER = 0									
WORD 1	*	QUANT=2 (1 FOR HILO)	MISCELLANEOUS TRUNK DISTRIBUTOR NUMBER											
WORD 2	*	QUANT=1		SUPERVISORY-MSN (SC1)										
WORD 3	*	QUANT=0		DIRECTED-MSN=0										

\* BIT 23 DOES NOT EXIST IN TRANSLATION WORDS FOR NO. 1 ESS  
IT IS EQUAL TO 0 IN THE NO. 1A ESS  
QUANT - QUANTITY  
WRDN - NUMBER OF WORDS IN AUXILIARY BLOCK

Fig. 7—TNN-to-PEN Auxiliary Blocks

4.07 The master scanner translator (Fig. 8) provides the trunk network number (TNN) and trunk program index 9.

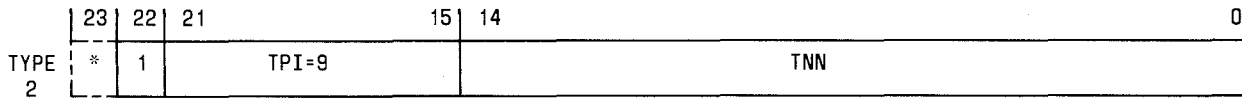
**B. Parameters/Call Store**

4.08 Incoming trunk test registers (ITTRs) are required for processing certain trunk test calls. Refer to Fig. 9 for the layout of the registers for the 108TL feature.

**FEATURE OPERATION**

**A. 2-Wire Trunk Testing (Non-CCIS Trunks)**

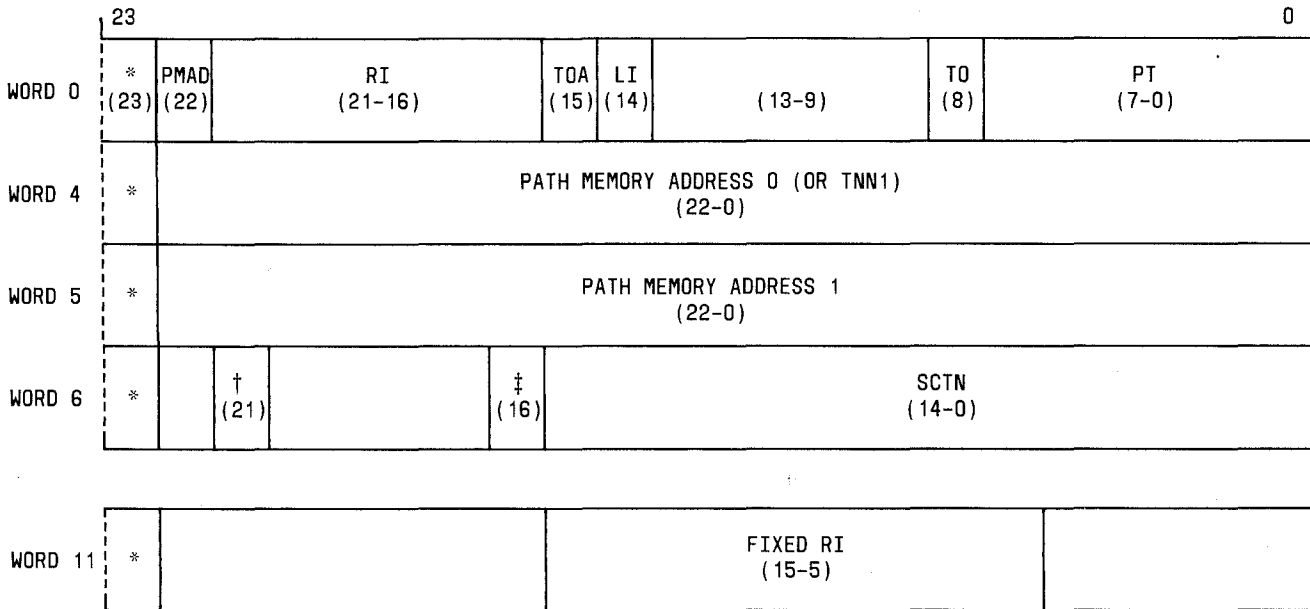
4.09 The 108TL feature in the No. 1/1A ESS is designed to receive dialed code 108 or any assignable 7-digit DN, and to test 2-wire trunks in the tandem state only. Test point level is not relevant. The first dialing is for the connection of the TUT to test port 0 of the 2-wire 108-type



\* BIT 23 DOES NOT EXIST IN THE TRANSLATION WORD FOR NO. 1 ESS. IT IS EQUAL TO 0 IN THE NO. 1A ESS.

TPI - TRUNK PROGRAM INDEX  
TNN - TRUNK NETWORK NUMBER

**Fig. 8—Master Scanner Translator**



\* BIT 23 DOES NOT EXIST IN THE TRANSLATION WORD FOR NO. 1 ESS IT IS EQUAL TO 0 IN THE NO. 1A ESS.

WORD 0 (STATE WORD)

PT - PROGRAM TAG  
TO - REGISTER TIMEOUT FLAG  
PMFI - PATH MEMORY FORMAT INDICATOR  
LI - LINK WORD INDICATOR  
TOA - TIMEOUT ANNEX  
RI - REGISTER IDENTIFIER  
PMAD - PATH MEMORY ANNEX DISPLAY

WORD 6

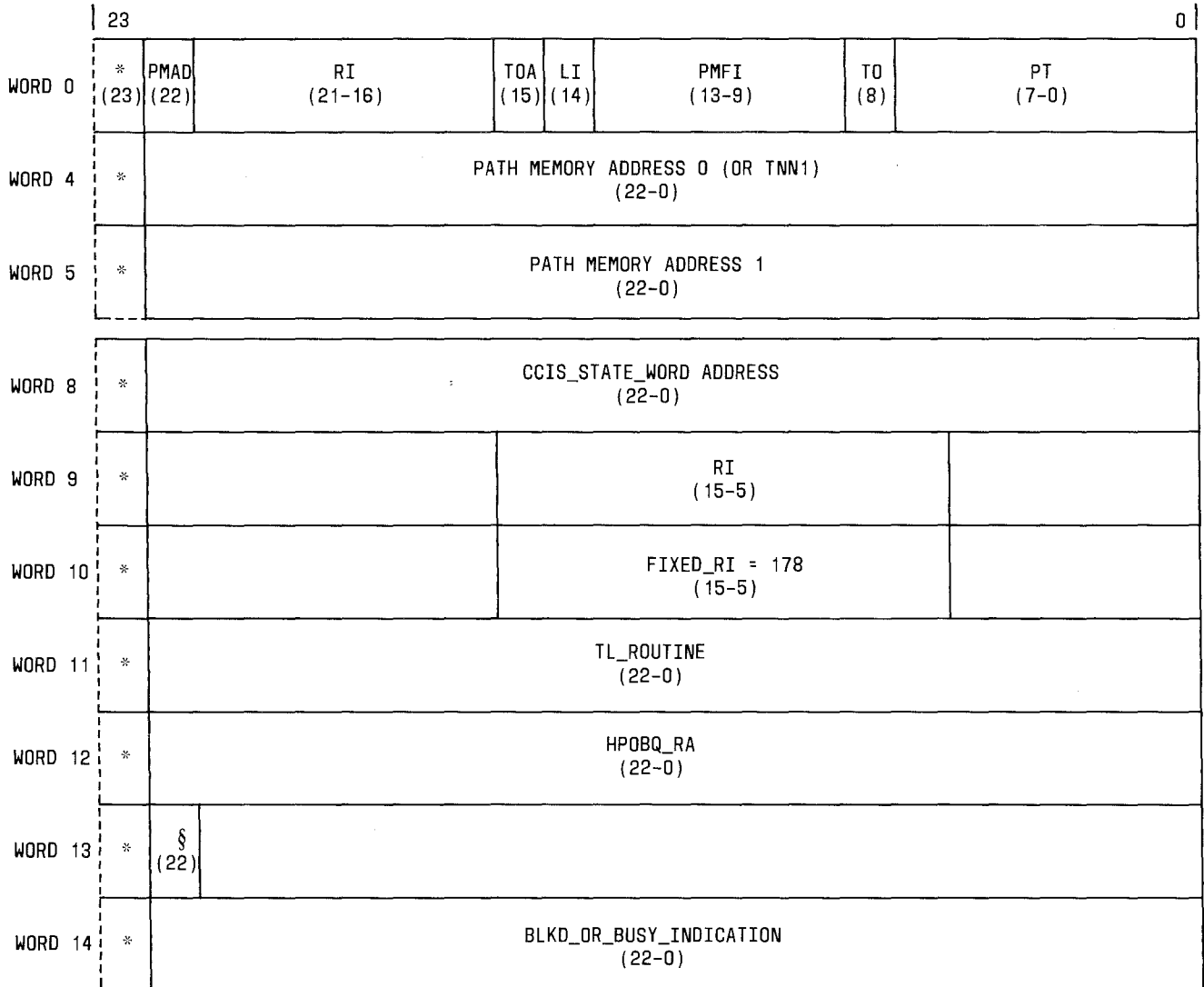
SCTN - TNN OF TEST LINE  
‡ - 108TL = 1  
† - HILO 4-WIRE ICT =1; 2-WIRE ICT=0

A. NON-CCIS TRUNKS

**Fig. 9—Layout of Incoming Trunk Test Register (Sheet 1)**

test line; the second dialing is for the connection of the auxiliary trunk to test port 1. Once the connection to test port 1 is established and maintained, any subsequent dialing over another TUT will be reconnected to test port 0 again.

4.10 Normal call processing using call types 3, 28, or the DN translator will analyze and receive digits from an incoming 108-type test call. The DN subtranslator type 4 entry or call indicator word for call type 3 identifies the call as a test



WORD 0  
REFER TO PART A

WORD 9  
RI - NONFIXED ROUTE INDEX USED TO COMPLETE CONNECTION TO TEST LINE (HILO 4-WIRE)

WORD 10  
FIXED\_RI - FIXED RI OF TEST LINE

WORD 11  
TL\_ROUTINE - ADDRESS OF APPROPRIATE TEST LINE ROUTINE

WORD 12  
HPOBQ\_RA - RETURN ADDRESS FOR HUNT A POB ROUTINE

WORD 13  
§ - ICT TOLL CCIS HILO 4-WIRE TRUNK =1; ICT TOLL CCIS 2-WIRE =0

WORD 14  
BLKD\_OR\_BUSY\_INDICATION - INDICATES WHETHER CIN (CHANGE IN NETWORK ENCOUNTERED BLOCKED OR BUSY CONDITION)

B. TOLL CCIS TRUNKS

Fig. 9—Layout of Incoming Trunk Test Register (Sheet 2)

call and associates RI 178 with it. The associated incoming register is released, and an idle ITTR seized. Alternate routing to RI 179 for test port 1 via the route index expansion table is then allowed, and a correlation between RI 178 and its (test port 0) trunk group is made. This trunk group

contains only one trunk assigned to test port 0 of the 2-wire 108-type test line.

4.11 The system then abandons the applicable receiver connection and connects the TUT to the only applicable TNN. Refer to Fig. 1. The

TUT and test port 0 are put in the appropriate hardware state. Following this, supervision for disconnect is set up on the TUT via scanning and the master scanner translator. A 1000-Hz calibration tone is returned for the near end to calibrate its 58 ESMS. The tone will remain on this TUT until disconnect or connection of the auxiliary trunk to test port 1.

**4.12** The second dialing over the auxiliary trunk is processed in a similar manner as above except that it is alternate routed to RI 179 (recall that test port 0 is still busy) for connection to test port 1 trunk group. At this time, calibration tone is removed from test port 0. Following application of a 2100-Hz disabling tone over the auxiliary trunk for disabling echo suppressors, maintenance personnel are ready to perform the seven required parameter checks on the TUT via the 58 ESMS.

**4.13** After TUT disconnect by the near end, the ESS effects the following actions: idle the trunk and test port 0 hardware; abandon network connections; restore trunk and test port software, and release the applicable ITTR. Other trunks (to the ESS office) may be tested by simply redialing, connection to test port 0, and performing the parameter checks. No recalibration is necessary until a different auxiliary trunk is employed. Upon disconnect by the near end of the auxiliary trunk, the ESS also effects the above actions for test port 1.

**4.14** Certain conditions cause the ESS to return failure signals to the near end. A 60-ipm signal is returned if the 108-type test line is busy, that is, both test port 0 and 1. (If no calibration tone is received upon initial connection, this means that the maintenance personnel have actually reached test port 1 instead of test port 0 because test port 0 is already busy by another office.) A 120-ipm signal is returned if the TLN is congested, no ITTRs are available, or if a peripheral order buffer fails.

**B. HILO 4-Wire Trunk Testing (Non-CCIS Intertoll Trunks Only)**

**4.15** The operation of the 108TL feature in a No. 1/1A ESS equipped with the HILO 4-wire switching feature is very similar to the 2-wire trunk testing described above. However,

certain exceptions must be noted. These exceptions are the following:

- (a) HILO 4-wire trunks are tested in the talk state.
- (b) RI 178 correlates to PRI 010 which contains a nonfixed RI for test port 0 trunk group.
- (c) RI 179 does not exist for test port 1 trunk group. Instead the route index expansion of the nonfixed RI in the PRI table will contain another nonfixed RI for the test port 1 trunk group.
- (d) Supervision for disconnect will be set up by scanning the 108-type test line test ports.
- (e) Certain translation word data will be different.

**C. Toll CCIS Trunk Testing (Intertoll Trunks Only)**

**4.16** In this operation description of the 108TL feature for a No. 1/1A ESS equipped with the toll CCIS switching feature, it should be remembered that the ESS may switch 2-wire and/or HILO 4-wire trunks, depending on how it is equipped, and that all interactive communications between offices is done over signaling links instead of toll trunks.

**4.17** After the near-end maintenance personnel dials the appropriate digits, a test initial address message (IAM) is formatted and sent over the signaling link. The ESS then verifies the digits. If invalid, a vacant national number message is returned; if valid a continuity check circuit is connected to the TUT. A continuity (COT) test is automatically performed by the near-end switcher. Regardless of the COT results, the near end sends a COT message and the far end proceeds with the 108-type test call. The check circuit is abandoned, the incoming register released, and an idle ITTR seized. [If none available, ESS sends the national switching congestion (NSC) message. The near end must send the clear forward (CLF) message. The ESS then sends the release guard (RLG) message and the test call is terminated.]

**4.18** From the digits 108 in the test IAM, the ESS determines RI 178 for the test port 0 trunk group. If HILO 4-wire, it correlates PRI 010 to obtain a nonfixed RI from the PRI table for the test port 0 trunk group. The TUT is then

connected to the only TNN of the applicable test port 0 trunk group, the trunks are put into the appropriate hardware state, and an address complete, charge (ADC) and an answer, charge (ANC) message is returned. Toll CCIS trunks are tested in different test states than non-CCIS trunks. Toll CCIS 2-wire trunks are tested in tandem-talk-on-hook-with-transformer-or-2-dB-pack (TANONX) state. Toll CCIS HILO 4-wire trunks are tested in the continuity-check-state-on-hook-toward-trunk-HILO-4-wire (CNTN4) state. The 1000-Hz calibration tone is returned and remains until a CLF message is received or until connection of the auxiliary trunk to test port 1.

**4.19** A second test IAM is formatted and sent over the auxiliary trunk, and is likewise processed by the ESS. When the system finds test port 0 TNN traffic busy, it alternate routes to RI 179 or nonfixed RI indicated in the applicable route index expansion table for connection to the test port 1 trunk group. The 108-type test line removes calibration tone from test port 0, maintenance personnel apply the 2100-Hz disabling tone, and then perform the 108-type parameter checks on the TUT via the 58 ESMS.

**4.20** Upon test completion, the maintenance personnel releases the TUT which causes a CLF message to be sent to the far end. The ESS effects the following actions: idle the trunk and test port 0 hardware; abandon network connections; restore trunk and test port software; release the applicable ITTR; and return a RLG message. Other trunks may be tested by seizing another TUT, dialing, and repeating the above TUT procedure. No recalibration is necessary until a different auxiliary trunk is employed. Upon receipt of a CLF message for the auxiliary trunk, the ESS will also effect the above disconnect actions for test port 1.

**4.21** Certain network conditions cause various ESS failure messages to be returned. If the test line (both ports 0 and 1) is busy, a national trunk congestion message is returned. (If no calibration tone is received upon initial connection, the test line is to be considered busy. The trunk should be idled immediately by sending the CLF message.) A NSC message is returned if the network is blocked, no ITTRs are available, or a peripheral order buffer failure occurs.

## CHARACTERISTICS

### 5. FEATURE ASSIGNMENT

**5.01** The 108TL feature is to be provided on a toll office basis where incoming toll trunks equipped with echo suppressors terminate.

### 6. LIMITATIONS

#### OPERATIONAL

**6.01** A 108-type test line is capable of being used by only one 58-type ESMS location at a time. Once the test and auxiliary ports are seized, the system gives all other attempts from different 58-type ESMS locations a busy trunk indication. Two 108-type test lines in an office (i.e., one 2-wire and one HILO 4-wire test line) may be operated simultaneously by the 108TL feature.

**6.02** If two offices try to access a 108-type test line at the same time only one office receives calibration tone. The office not receiving calibration tone should abandon the seizure and retry at a later time.

#### ASSIGNMENT

**6.03** One 108-type test line is needed per toll office where applicable, except in toll offices where both 2-wire and HILO 4-wire incoming toll trunks equipped with echo suppressors exist. In these situations the 108TL feature consists of two 108-type test lines, one 2-wire type and one HILO 4-wire type.

**6.04** Every 108-type test line must be assigned two trunk groups, one for test port 0 and one for the test port 1. These trunk groups must not contain any other type of circuit.

**6.05** The code 108 or any available 7-digit DN may be assigned the 108TL feature for dial access.

### 7. INTERACTIONS

**7.01** Not applicable.

### 8. RESTRICTION CAPABILITY

**8.01** Not applicable.

**INCORPORATION INTO SYSTEM****9. INSTALLATION/ADDITION/DELETION**

**9.01** Figure 10 illustrates the procedure to add the 108TL feature, providing the appropriate generic program exists in the office. Refer to paragraph 1.03.

**10. HARDWARE REQUIREMENTS****COST FACTORS**

**10.01** Hardware usage costs for the 108TL feature are shown in Table B.

**DETERMINATION OF QUANTITIES**

**10.02** Hardware associated with the 108TL feature is shown in Table A. One 2-wire 108-type test line is required per toll office for testing incoming 2-wire toll trunks with echo suppressors, if any. One HILO 4-wire 108-type test line is required per toll office for testing incoming HILO 4-wire toll trunks with echo suppressors, if any.

**11. SOFTWARE REQUIREMENTS****COST FACTORS****A. Memory—No. 1 ESS****Fixed**

**11.01** The following memory is required whether or not the 108TL feature is used in a toll office.

- **Generic Program (program store):**  
Refer to Table C.

- **Translations (program store):**

- (a) 1 word for PRI 010 (all offices equipped with 1E4 and later generic programs).

- (b) 4 words for RI expansion table for RI 178 and RI 179.

**Conditional**

**11.02** The following memory is required per test line when the 108TL feature is activated in a toll office.

- **Generic Program (program store):**  
Refer to Table C.

- **Translations (program store):**

- (a) 4 words for trunk class code expansion table

- (b) 1 word for DN subtranslator entry, if applicable

- (c) 1 word for each applicable type call identification word in the rate and route pattern auxiliary block

- (d) 2 words for master scanner translator

- (e) 8 words for TNN-to-PEN auxiliary block (4 words per port)

- (f) 4 words for RI expansion table for HILO 4-wire trunk testing capability.

- **Call Store**

- (a) The 108TL feature requires two ITTRs, each ITTR using 18 CS words for a total of 36 CS words per 108-type test line. Set card NITT defines the total number of ITTRs required by an office. A minimum of four ITTRs is required for all types of test lines in an office.

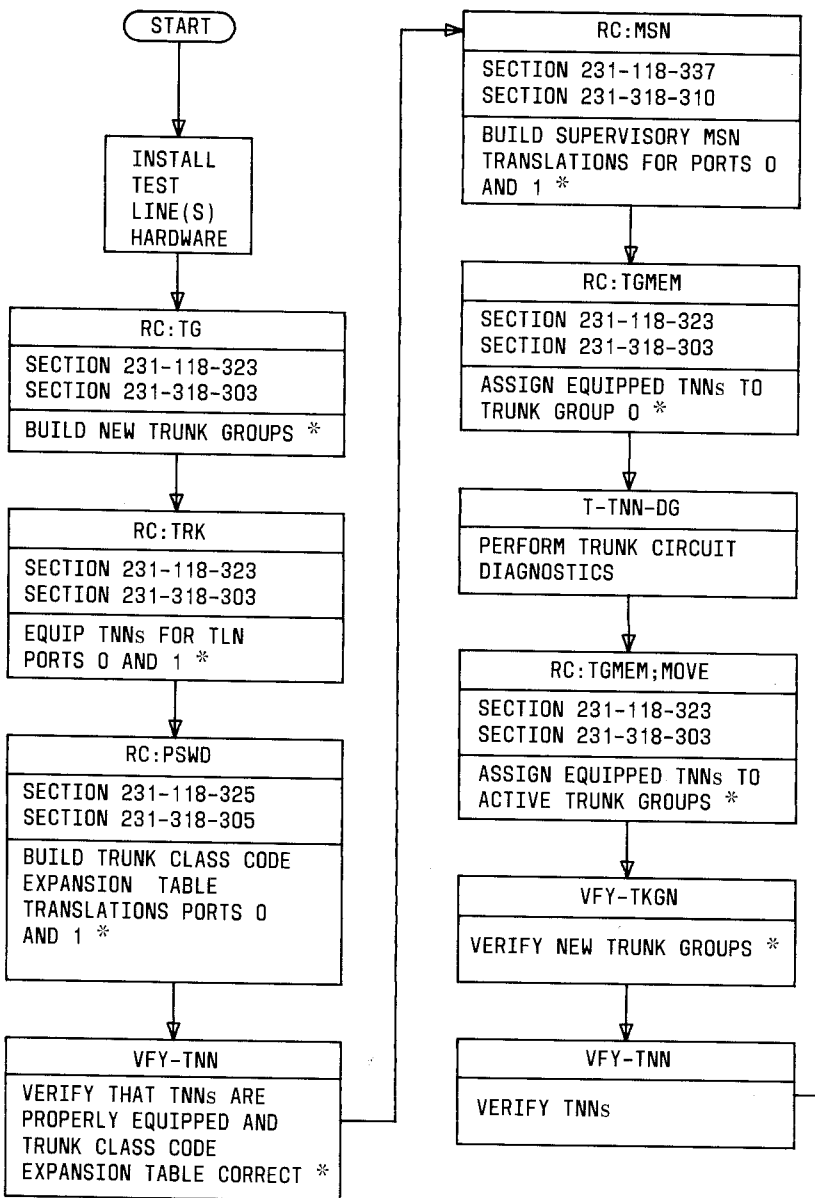
- (b) Peripheral order buffers are required to perform connection between the incoming toll trunks and 108-type test line. They are also used to place the trunk under test, auxiliary trunk, and the test line in the appropriate state during set up. These additions alone should not require any additional peripheral order buffers to be engineered for an office.

**Variable**

**11.03** Not applicable.

**B. Memory—No. 1A ESS****Fixed**

**11.04** The following memory is required whether or not the 108TL feature is used in a toll office.



\* ONE PER TEST LINE, IE ONE FOR 2-WIRE AND ONE FOR HILO 4-WIRE APPLICATIONS

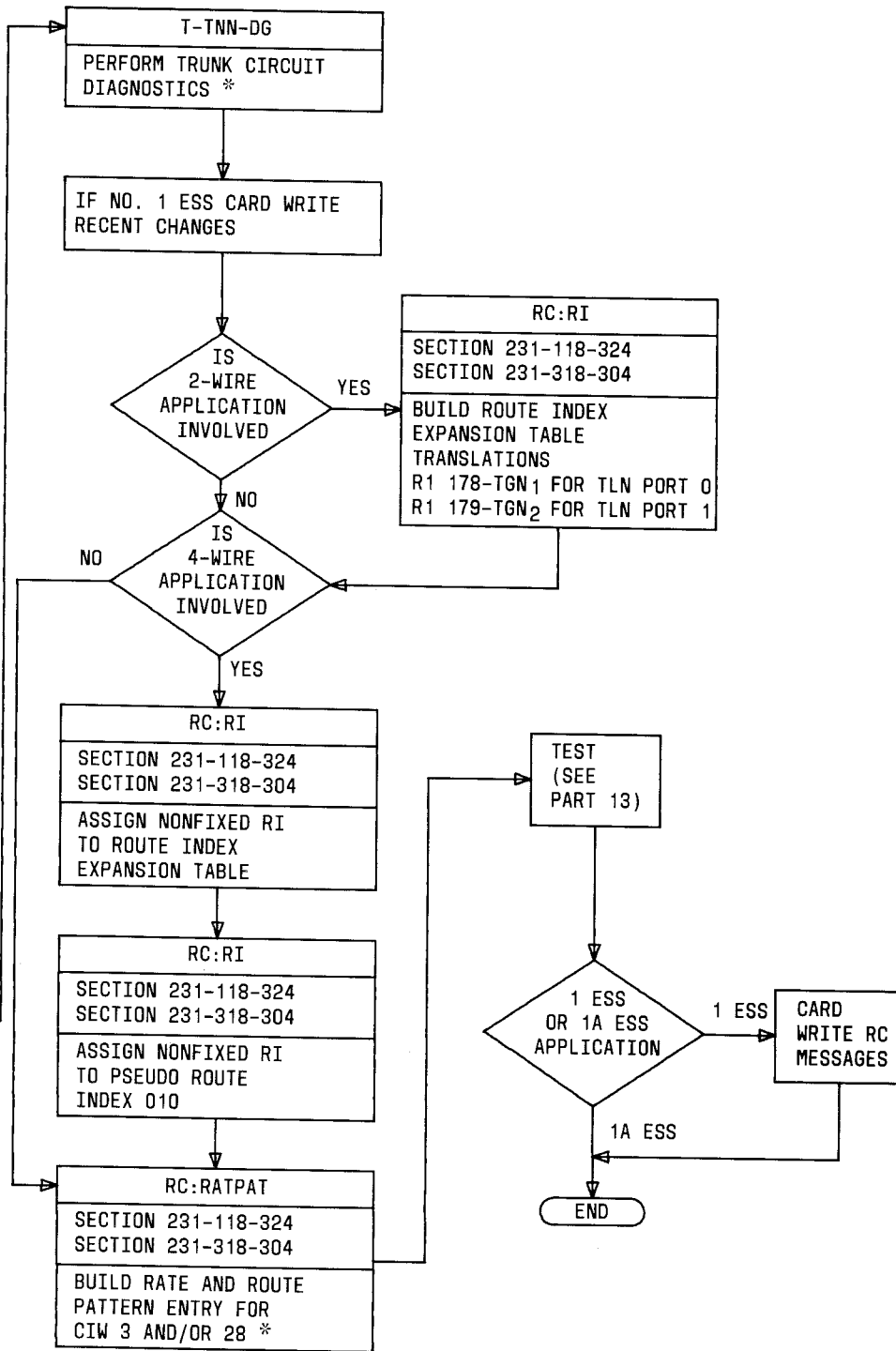


Fig. 10—Procedure for Adding the 108TL Feature



TABLE B

## 108TL FEATURE HARDWARE USAGE COSTS

HARDWARE USAGE	SD-1A331	SD-1A389
	2-WIRE QUANTITIES	HILO 4-WIRE QUANTITIES
Signal Distributor Points	4	2
Master Scan Points	2	2
Network Appearances	2*	2†
Required Trunk Groups	2	2
Trunk Order Code	11000	13900

\* Transmission Reference Network

† Via HILO Interface Circuit, Trunk Order Code 14200

TABLE C

## NO. 1 ESS GENERIC PROGRAM WORDS (108TL)

GENERIC PROGRAM	FIXED	CONDITIONAL		TOTAL
	2-WIRE (BASE)	HILO 4-WIRE (HL4W)*	TOLL CCIS (CCISTM)*	
Prior to 1E4	40	—	—	40
Effective with 1E4	40	35	—	75
Effective with 1E5	40	35	40	115

\* Optionally loaded feature package.

• **Generic Program (program store, file store):** Refer to Table D.

• **Translation (program store):**

- (a) 1 word for PRI 010 (all offices)
- (b) 4 words for RI expansion table for RI 178 and RI 179.

**Conditional**

**11.05** The following memory is required per test line when the 108TL feature is activated in a toll office.

• **Generic Program (program store, file store):** Refer to Table D.

• **Translation (unduplicated call store and file store):**

- (a) 4 words for trunk class code expansion table
- (b) 2 words for master scanner translator
- (c) 1 word for DN subtranslator entry, if applicable

TABLE D

## NO. 1A ESS GENERIC PROGRAM WORDS (108TL)

GENERIC PROGRAM	FIXED	CONDITIONAL		
	2-WIRE (BASE)	HILO 4-WIRE (HL4W)*	TOLL CCIS (CCISTM)*	TOTAL
Prior to 1AE4	50	—	—	50
Effective with 1AE4	50	45	—	95
Effective with 1AE5	50	45	50	145

\* Optionally loaded feature package.

(d) 1 word for each applicable type call identification word in the rate and route pattern auxiliary block

(e) 8 words for TNN-to-PEN each peripheral equipment auxiliary block (4 words per port)

(f) 4 words for RI expansion table for HILO 4-wire trunk testing capability.

• **Call Store:**

(a) The 108TL feature requires two ITTRs, each ITTR using 18 CS words for a total of 36 CS words per 108-type test line. Set card NITT defines the total number of ITTRs required by an office. A minimum of four ITTRs is required for all types of test lines in an office.

(b) Peripheral order buffers are required to perform connection between the incoming toll trunks and 108-type test line. They are also used to place the trunk under test, auxiliary trunk, and the test line in the appropriate state during set up. These additions alone should not require any additional peripheral order buffers to be engineered for an office.

**Variable**

11.06 Not applicable.

**DETERMINATION OF QUANTITIES**

11.07 Refer to COST FACTORS above.

**PROCESSOR TIME**

11.08 Each connection to the 108-type test line requires approximately 3500 processor cycles for No. 1 ESS, and approximately 7000 processor cycles for No. 1A ESS. The cycle time for No. 1 ESS is 5.5  $\mu$ sec. The cycle time for No. 1A ESS is 0.7  $\mu$ sec.

**FEATURE DEFINING SET CARDS**

11.09 Not applicable.

**12. DATA ASSIGNMENTS AND RECORDS**

**TRANSLATION FORMS**

12.01 ESS translation forms, found in reference C(1) in Part 18 requiring completion are as follows:

(a) ESS 1101—Directory Number Record: This form assigns program index for directory numbers employing a route index for completion.

(b) ESS 1201—Miscellaneous Trunk Frame Record: This form relates the equipment location on a frame basis with the trunk network number (TNN), the trunk group, the trunk number, the trunk class code, and CPD points. This form also contains records of signal distributor points

and supervisory, direct, fast, and common scan points associated with the trunk group.

- (c) ESS 1202—Trunk Group Record: This form is used to furnish TNN to trunk group and trunk number translations for all trunks.
- (d) ESS 1203—Trunk Network Number Record: This form relates the TNN to the trunk group and trunk frame location.
- (e) ESS 1204—Trunk Class Code Data: Specifies data for trunk class code expansion tables.
- (f) ESS 1220—Universal Trunk Frame (HILO) Record: Relates the HILO universal trunk equipment locations on a frame basis to the corresponding trunk network appearances and the HILO universal trunks assigned to these equipment locations.
- (g) ESS 1303 A/B/C Trunk and Service Circuit Route Index Record: This form assigns route index, next route index, and return supervision to trunk groups containing test lines.
- (h) ESS 1303D—Pseudo Route Index Record: Specifies data for pseudo route indexes for HILO 4-wire 108TL feature.
- (i) ESS 1305—Rate and Route Pattern Record: This form enables simulated dialing of 7-digit directory numbers after receiving a 108-type test code via call type 28 in call identification word or provides a route index to complete the call for special use of call type 3.
- (j) ESS 1311—Toll Three/Six-Digit Translations: This form establishes routings for incoming 3- and 6-digit toll codes via rate and route pattern number pointing to a call identification word (1305).

#### RECENT CHANGES

12.02 Not applicable.

#### 13. TESTING

13.01 Verification that the 108TL feature has been properly installed and assigned can be accomplished by the following input/output messages (abbreviated from the appropriate input/output message manual referenced in Part 18B).

System responses should be checked against the applicable ESS translation form data.

- (a) For No. 1 ESS T-READ input message is used to verify trunk class code expansion table entries. System response should be a TW02 output message. For No. 1A ESS use DUMP:CSS, ADR— to verify the call indicator words. The system response is DUMP:CSS output message.
- (b) Type in on maintenance TTY the VFY-EXP input message to verify the route index (or pseudo route index). Refer to output message TR05 for system responses.
- (c) Type in on maintenance TTY the VFY-MSN input message to verify the master scanner number. Refer to output message TR12 for system responses.
- (d) Type in on maintenance TTY the VFY-TKGN input message to verify trunk group numbers. Refer to output message TR10 for system responses.
- (e) Type in on maintenance TTY the VFY-TNN input message to verify a trunk network number translation. Refer to output message TR14 for system responses.

13.02 Incoming 108-type test calls should be made over various trunk groups to verify proper operation of the 108TL feature.

13.03 The 108-type test line circuits are diagnosed routinely and on-demand by an ESS. Routine testing is done through automatic progression testing. Demand testing is accomplished from an ESS test position or teletypewriter. Refer to reference A(20) in Part 18.

#### 14. OTHER PLANNING TOPICS

14.01 Refer to the applicable SD drawing for the particulars concerning nominal power requirements.

### ADMINISTRATION

#### 15. MEASUREMENTS

15.01 None.

16. CHARGING

16.01 Not applicable.

**SUPPLEMENTARY INFORMATION**

17. GLOSSARY

Echo Suppressor A voice-operated switching device that reduces echo by introducing loss in the return transmission path of a 4-wire trunk.

18. REFERENCES

18.01 The following documentation contains information pertaining to or affected by the 108TL feature.

**A. Bell System Practices**

- (1) Section 103-105-110—58-Type Echo Suppressor Measuring System (J68658) Description
- (2) Section 103-105-310—58-Type Echo Suppressor Measuring System (J68658) Operations
- (3) Section 103-105-510—58-Type Echo Suppressor Measuring System, J68658, Near-End Equipment, Tests and Adjustments
- (4) Section 231-061-210—Service Circuits, Network Design—No. 1 Electronic Switching System
- (5) Section 231-061-220—Trunk and Miscellaneous Circuits, Network Design—No. 1 Electronic Switching System
- (6) Section 231-061-450—Program Stores, Network Design—No. 1 Electronic Switching System
- (7) Section 231-061-460—Call Stores, Network Design—No. 1 Electronic Switching System
- (8) Section 231-062-210—Service Circuits, Network Design—No. 1A Electronic Switching System
- (9) Section 231-062-220—Trunks and Miscellaneous Circuits, Network Design—No. 1A Electronic Switching System

- (10) Section 231-062-460—Processor Community Engineering, Program Stores, Network Design—No. 1A Electronic Switching System
- (11) Section 231-062-465—Processor Community Engineering, Duplicated Call Store, Network Design—No. 1A Electronic Switching System (when published)
- (12) Section 231-062-470—Processor Community Engineering, Unduplicated Call Store, Network Design—No. 1A Electronic Switching System
- (13) Section 231-062-475—Processor Community Engineering, File Stores, Network Design—No. 1A Electronic Switching System
- (14) Section 231-090-366—Feature Document—HILO 4-Wire Switching Feature, 2-Wire No. 1 and No. 1A Electronic Switching Systems
- (15) Section 231-090-416—Feature Document—Toll Common Channel Interoffice Signaling Feature, 2-Wire No. 1 and No. 1A Electronic Switching System
- (16) Section 231-118-323—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM (CTX-6 through 1E5 Generic Programs), 2-Wire No. 1 Electronic Switching System
- (17) Section 231-118-324—Rate and Route Translation Recent Change Procedures for NOCNOG, DNHT, NOGRAC, RATPAT, DIGTRN, TOLDIG, CCOL, RI, CHRGX, DITABS, TNDM, IDDD, and TDXD (CTX-6 through 1E5 Generic Programs), 2-Wire No. 1 Electronic Switching System
- (18) Section 231-118-325—RC Procedures for PSWD, GENT, PSBLK, SUBTRAN (CTX-6 through 1E5 Generic Programs), 2-Wire No. 1 Electronic Switching System
- (19) Section 231-118-337—RC Procedures for ANIDL, CAMA, CFG, CPD, MSN, NMTGC, PLM, ROTL, SIMFAC, and TMGCGA (CTX-6 through 1E5 Generic Programs), 2-Wire No. 1 Electronic Switching System