INTELLIGENT SIMPLEX PERIPHERAL INTERFACE
IMPLEMENTATION PROCEDURES
(1AE9 AND LATER GENERIC PROGRAMS)
1A *ESS*™ SWITCH

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1. GENERAL

This practice provides procedures for implementing the ISPI (intelligent simplex peripheral interface) feature for the 1A *ESS* switch. Included are translator descriptions and RC (recent change) implementation procedures. Also included are procedures for controller and trunk maintenance/diagnostics. The ISPI feature is initially available in the 1AE9 generic program.

This practice is reissued to:

- Revise ISPI feature implementation flowchart (Fig. 9) to show the correct stage at which "trunk testing" should be done in the procedure. This change is also reflected in the procedure itself.
- Update information for adding new or modifying existing custom announcements (Part 9)
- Make minor corrections as required.

Items and fields shown in translator layouts and keywords shown in RC and verify messages are not necessarily included in the list of abbreviations and acronyms. These items and keywords are defined in legends included in translator layout figures or tables associated with the RC and verify message.

Refer to AT&T Practice 231-318-316 for additional general information on RC message formats, interpretation of message flowcharts, and RC roll-back and roll-forward procedures.

Refer to the information accompanying the message flowcharts for definitions of keywords used in RC messages.

1.1 Additional References

Refer to the following practices for related information.

- AT&T Practice 231-368-001 — *System Recovery and System Operations — (File Store Offices)* or 231-368-011 — *System Operations and Recovery — APS Office*
- AT&T Practice 231-390-235 — *Local Area Signaling Services — General Description* (Features Description)
- AT&T Practice 231-318-340 — *Local Area Signaling Services (LASS) — Recent Change Implementation Procedures*
- AT&T Practice 231-390-170 — *Message Service Feature Document*
- AT&T Practice 231-318-364 — *Recent Change Formats and Implementation — Description and Procedures — Message Desk Service*
- AT&T Practice 231-390-391 — *Remote Access Service Feature Document, 1A ESS Switch*
- AT&T Practice 231-390-389 — *Remote Access Call Forwarding Feature Description*
- AT&T Practice 231-390-239 — *Automatic Recall — Local Area Signaling Services* (Automatic Callback Feature Description)
- AT&T Practice 231-390-523 — *Total Separation Selective Call Forwarding Feature Local Area Signaling Services, 1A ESS Switch*

- AT&T Practice 231-318-334 — *CAMA, CCIS, CFTRK, POINTC, SCGA, TG, TGBVT, TGMEM, TKCNVT, TKCONV, TMBCGA, and TRK — Trunk Translation Recent Change Formats*
- AT&T Practice 231-318-336 — *ARS, CCOL, CHRGX, DIGTRN, DITABS, DNHT, IDDD, IWSA, NOCNOG, NOGRAC, RATPAT, RI, RLST, TDXD, and TNDA — Rate and Route Recent Change Formats*
- AT&T Practice 231-318-355 — *CTXCB, CTXDI, CTXEXR, CXDICH, DITABS, Centrex — CO/ESSX-1 Recent Change Formats*
- AT&T Practice 231-318-331 — *ANIDL, BISI, CFG, CLAM, CPD, JUNCT, LRE, MSN, NMTGC, PLM, PUC, PUCMB, RCHAN, ROTL, RSP, RSSCB, and SIMFAC — Recent Change Formats*
- AT&T Practice 231-318-325 — *ACT, CFV, DNRNGE, LINE, MLHG, MOVE, MPTY, SCLIST, SEL, TWOPTY, VEND — Line Recent Change Formats*
- AT&T TOP 231-371-001 — *Traffic and Plant Measurements*
- AT&T Practice 231-300-015 — *Plant Measurements*
- AT&T Practice 231-318-320 — *Procedures for Adding or Deleting Hard Tables, Data Tables, Subtranslators, Auxiliary Blocks, and Unit Type Translators*
- AT&T Practice 231-318-319 — *RC:GENT, PSBLK, PSWD, and SUBTRAN*
- AT&T Practice 231-318-317 — *Recent Change Message Program Listings, System Acknowledgments, RC18, RC16, RC29, and RC Failure Output Messages Description*
- Translation Guide TG-1A — *1 ESS Switch 2-Wire* (Provides documentation of translators and associated forms)
- PA-6A002 — *1A ESS System Translation Output Configuration Arranged for 2-Wire Operation* [Provides information relating the translation memory (translators) and forms]
- IM-6A001 and OM-6A001 — *1A ESS Input Messages* (Generic Input and Output messages description)
- PK-6A1374 — *ISPIC (ISPI controller) Maintenance Guide*
- PK-1A045 — *Trunk and Service Circuit Maintenance Guide*

1.2 Flowchart Symbols

The following symbols are used in RC message flowcharts.

○ **OPTION Symbol:** The OPTION symbol indicates that all flowlines leaving the symbol are optional. None, one, some, or all such flowlines may be selected.

⊗ **EXCLUSIVE OR Symbol:** The EXCLUSIVE OR symbol indicates that one of two or more flowlines leaving the symbol must be selected.

⦶ **NONEXCLUSIVE OR Symbol:** The NONEXCLUSIVE OR symbol indicates that one or more of the flowlines leaving the symbol must be selected (no less than one, but more than one may be selected).

● **AND Symbol:** The AND symbol indicates that all flowlines leaving the symbol must be used.

% **Repeatable Segment:** The repeatable segment symbol indicates that the keyword unit or the specific group of keyword units within the segment bracket can be repeated in the

RC message without re-entering previous keyword units. Each segment is terminated by the percent sign.

In change message flowcharts, keywords without a variable shown are Y(ES)/N(O) keywords. When a Y(ES)/N(O) feature is added, enter the keyword; when a Y(ES)/N(O) feature is removed, enter the keyword followed by NO or N.

When using a change message flowchart, refer to the associated new message flowchart for valid combinations of keywords.

2. GLOSSARY OF ABBREVIATIONS AND ACRONYMS

Listed below are abbreviations and/or acronyms used in this practice:

AC	Automatic Callback
ACI	Application Circuit Interface
ACP	Application Circuit Processor
AML	Automatic Maintenance Limits
APT	Automatic Progression Testing
ASC	Announcement Service Circuit
ATI	Announcement Trunk Interface
bps	Bits Per Second
CATP	Conditional All Test Pass
COT	Customer Originated Trace
CPD	Central Pulse Distributor
CPI	Circuit Program Index
CRC	Cyclic Redundancy Check
CTTU	Central Trunk Test Unit
DTI	Data Transmitter Interface
EPSM	Expanded Programmable Speech Memory
EQL	Equipment Location
FDDL	Full Duplex Data Link
FSK	Frequency Shift Keying
H&W	High and Wet
ICBM	Intelligent Simplex Peripheral Interface Common Buffer Memory
ICLID	Individual Calling Line Identification
I/O	Input/Output
IOP	Input/Output Processor
ISPI	Intelligent Simplex Peripheral Interface
ISPIC	Intelligent Simplex Peripheral Interface Controller
ISPICM	Intelligent Simplex Peripheral Interface Controller Maintenance
ISU	Individual Calling Line Identification Service Unit
LASS	Local Area Signaling Services
MSS	Message Service System
MSN	Master Scanner Number
MTTP	Manual Trunk Test Panel

NOTR	Number of Trunk Members
NTPI	Non-Trunk Program Index
OOS	Out of Service
PMC	Power Monitor and Control
PSM	Programmable Speech Memory
PTW	Primary Translation Word
RACF	Remote Access Call Forwarding
RAS	Remote Access Service
RC	Recent Change
RC/DTI	Ringing Circuit for Individual Lines/Data Transmitter Interface
REX	Routine Exercise
RI	Route Index
RTTU	Remote Trunk Test Unit
SLE	Screen List Editing
SSM	Synthesized Speech Memory
STTP	Supplementary Trunk Test Panel
TCC	Trunk Class Code
TG	Trunk Group
TGN	Trunk Group Number
TI	Trunk Interface
TLN	Trunk Link Network
TLTP	Trunk and Line Test Panel
TML	Trunk Maintenance List
TNN	Trunk Network Number
TNN-PEN	Trunk Network Number to Peripheral Equipment Number
TNN-TGN	Trunk Network Number to Trunk Group Number
TOP	Task Oriented Practice
TPI	Trunk Program Index
TSSCF	Total Separation of Selected Call Forwarding
TTN	Test Table Number
TU	Trunk Usage
VDI	Voice-band Digital Interface
VMWI	Visual Message Waiting Indication

3. ISPI FEATURE DESCRIPTION

The ISPI feature is the generic software interface needed to provide the 1A *ESS* switch with the ability to communicate with new simplex micro-processor controllers. This communication link is provided via normal TIs (trunk interfaces) and over dedicated I/O (input/output) channels (refer to 4.3). The typical hardware configuration used for ISPI is shown in Fig. 1.

The controllers currently available are the ASC (announcement service circuit) and the ISU (ICLID service unit). Functionally, these controllers are quite different; however, they require the same common hardware and software interface.

ISPI allows, newly featured, call processing software and maintenance software to interact with the new controllers. Those functions that ISPI can perform are listed below:

(1) Play announcement message or message segment to customer (ASC)

(2) Collect specified number of digits (ASC)

(3) Transmit digit information to customer (ISU)

(4) Perform timing functions (ASC)

(5) Diagnose specified controller and/or service circuit

(6) Perform required fault recovery and maintenance actions on controllers and service circuits.

The ISPI feature is required to support all call processing features that utilize the ASC and/or the ISU.

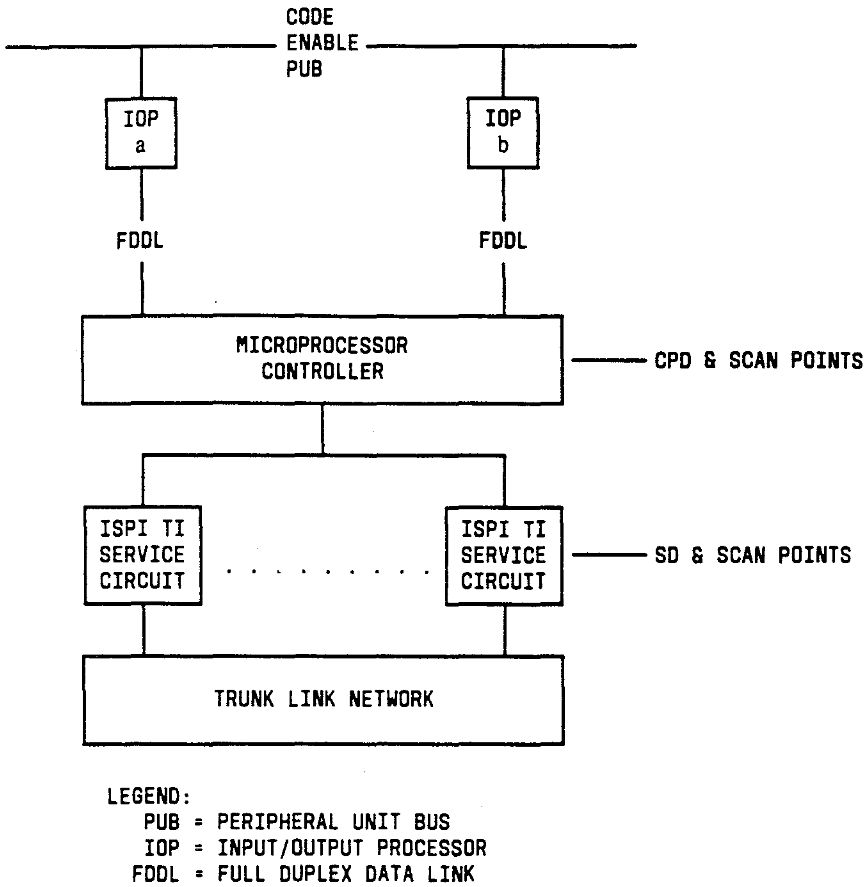


Fig. 1 — Typical ISPI Hardware Configuration

4. HARDWARE USED WITH ISPI FEATURE

The ASC and ISU are mounted on the specialized trunk and service circuit frame (J6A007A-1). No more than three units (3 ASCs, 3 ISUs, or any combination) can be mounted on the frame. If the third unit is mounted on the frame, an additional filter (J1A053AA-1) is required.

4.1 Announcement Service Circuit

The ASC (SD-6A003-01) is a micro-processor controlled multi-circuit unit which controls up to eight (8) application circuits (ATIs). The common hardware in this unit consists of a micro-processor controller, a communications interface, power control circuitry, and announcement memory.

The ASC assembly (J6A007EA-1) is shown in Fig. 2. This unit is equipped with the following apparatus.

- Up to four speech memory boards positioned from left to right on the unit in EQLs (equipment locations) 008, 016, 024, and 032, respectively. They are described as follows:
  - — **(Required)** One standard announcement SSM (synthesized speech memory) board (TM433) — This board is ***always*** positioned in EQL 008.
  - — (Optional) Up to three custom announcement boards (refer to Part 9) positioned in EQL 016, 024, and/or 032 — These can be any combination of the TM432 SSM boards, the TM690 PSM (programmable speech memory) boards, and/or the TM744 EPSM (expanded PSM) boards.

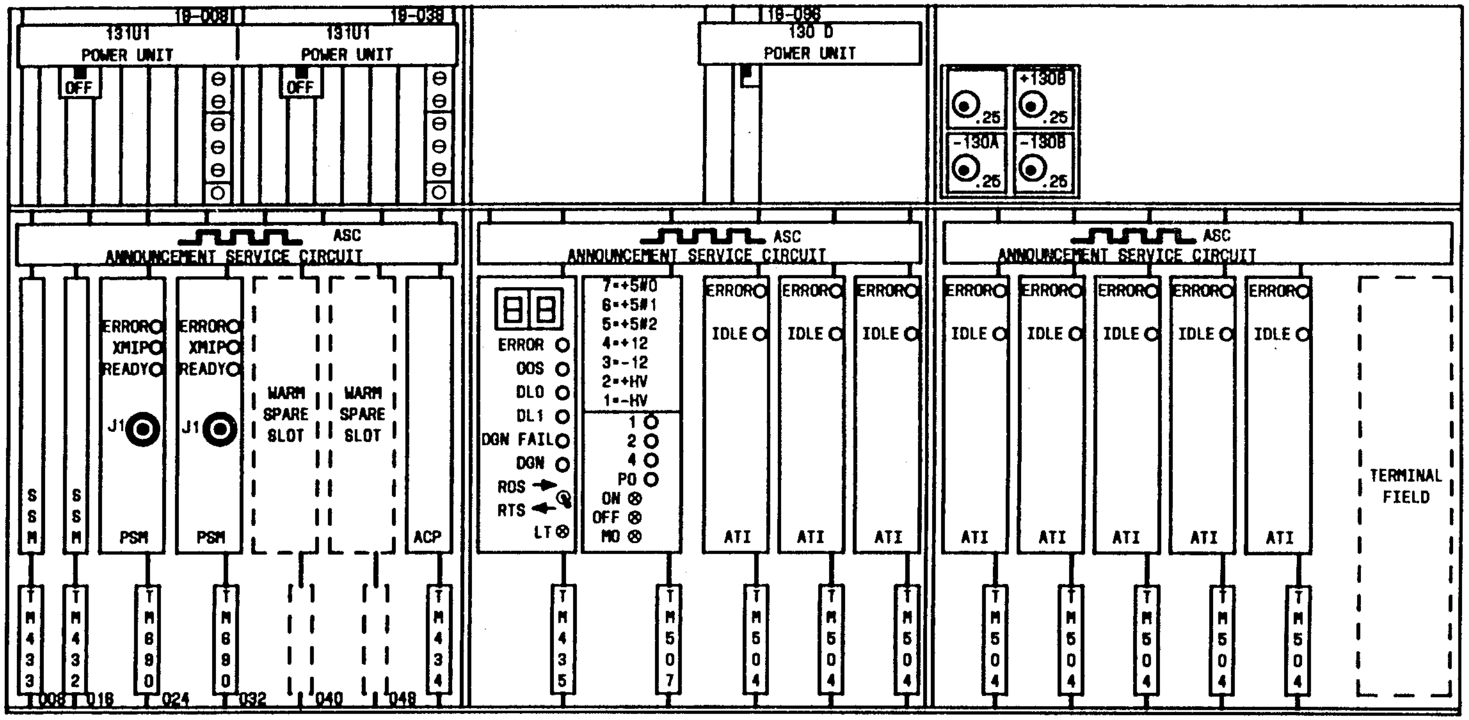
  In contrast to their position on the unit, the speech memory boards are searched from right to left for announcement messages.
- Two processor circuit boards — The ACP (application circuit processor) board (TM434) and the ACI (application circuit interface) board (TM435)
- One PMC (power monitor and control) circuit board (TM507)
- Up to eight ATI (announcement trunk interface) circuit boards (TM504) positioned left to right in slots 0 through 7
- A test position with terminal fields for office cabling.
- Power converters and fuse blocks are mounted on the power unit. This unit is located on top of the ASC assembly and comes equipped with three power supplies (two 5 volt and one ± 12 volt).

The ASC provides synthesized voice, immediate start, and concatenated announcements. These announcements can be interrupted via customer responses (dual tone or dial pulse inputs). All announcement services are provided to software clients over ISPI TI service circuits. The TI associated with the ASC is the ATI (announcement trunk interface) circuit.

4.1.1 Announcement Trunk Interface

The ATI circuit board (TM504) provides the 2-wire interface for the ASC to the TLN (trunk link network). All announcements are transmitted over the 2-wire interface to the customer.

The ATI circuit board contains a voice-signal processor that is used for speech generation. It also contains a voice coder/decoder, a hybrid line-feed detector, network interface hardware, dual tone receiver, and a dial-pulse receiver.



LEGEND:
- ○ = LAMP (LED)
- ■ = SLIDE SWITCH
- ⊖ = TEST JACK
- = TOGGLE SWITCH
- ⊗ = PUSHBUTTON SWITCH
- ● = FACEPLATE JACK

Fig. 2 — ASC Assembly (J6A007EA-1)

4.2 ICLID Service Unit

The ISU (SD-6A009-01) is a micro-processor controlled multi-circuit unit which controls up to eight application circuits [8-ringing circuit and DTI (data transmitter interface) combinations]. The common hardware in this unit consists of a micro-processor controller, a communications interface, and power control circuitry.

The ISU assembly (J6A007EB-1) is shown in Fig. 3. This unit is equipped with the following apparatus.

- A power unit on which two power converters (one 5 volt and one ±12 volt) are mounted
- Two processor circuit boards — One ACP board (TM434) and one ACI board (TM435)
- Up to eight RC/DTI [ringing circuit for individual lines (SD-1A621-01) and data transmitter interface circuit board (TM541)] combinations positioned left to right in slots 0 through 7 (upper shelf) and slots 8 through 15 (lower shelf)
- A test position, with terminal fields, for office cabling
- One PMC circuit board (TM507).

The ISU enables the called party to identify the calling party prior to answering the call. The directory number of the calling party is transmitted to the customer premises equipment during the first ringing phase of the call. This service is provided via another ISPI TI service circuit. This TI circuit is composed of two components, RC/DTI (ringing circuit and data transmitter interface circuit).

4.2.1 Ringing Circuit/Data Transmitter Interface

Calling line identification data is transmitted to the customer over the switching network via the RC/DTI trunk interface.

The ringing circuit (SD-1A621-01) provides all the standard functions required to ring a single party line. It also provides the 2-wire interface to the customer's line appearance for the DTI circuit.

During the first quiet interval of the ringing cycle, the DTI circuit (TM541) transmits the calling line display data to the customer premises equipment. The data is transmitted using FSK (frequency shift keying) signals at a rate of 1200 bps.

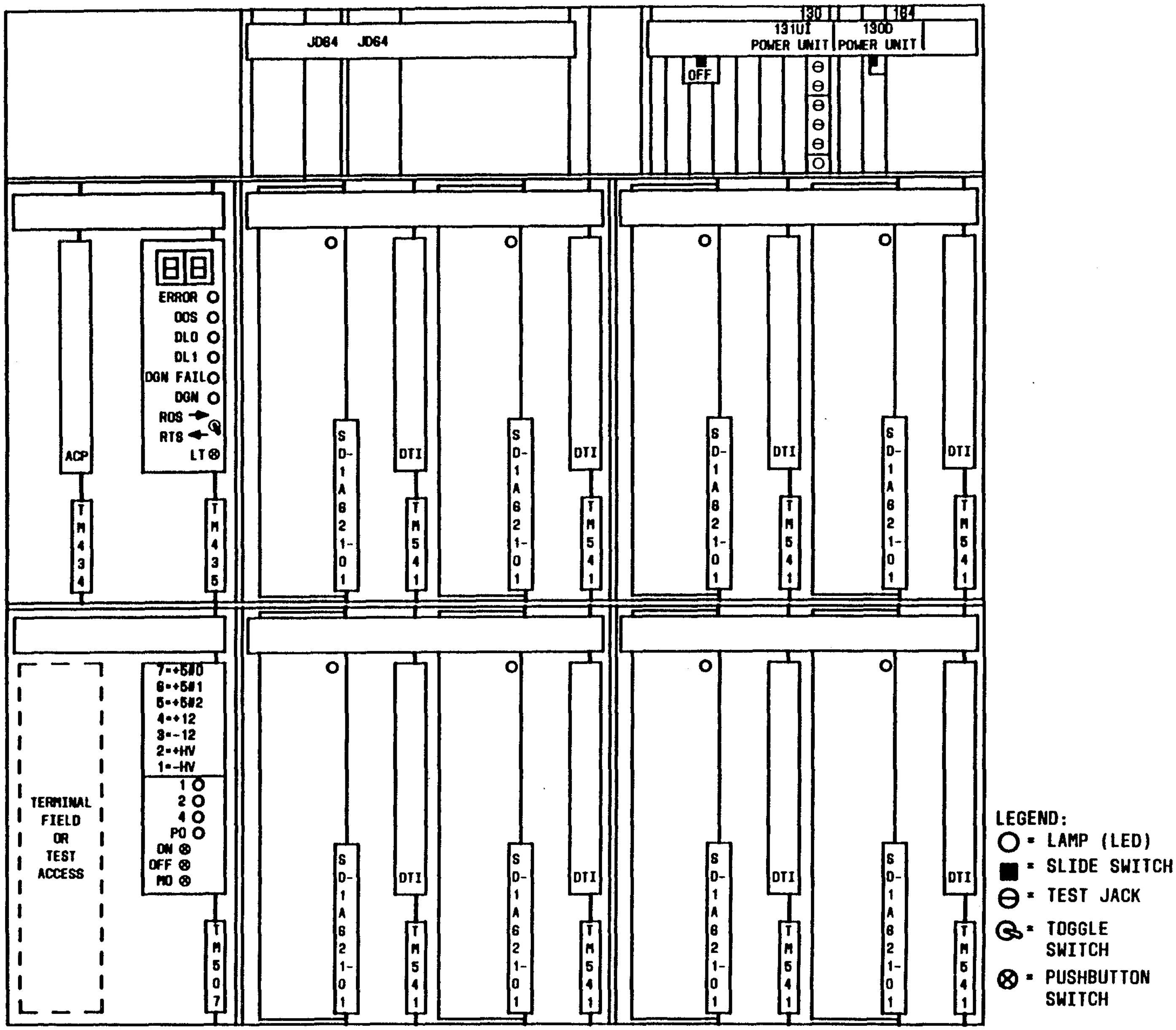


Fig. 3 — ISU Assembly (J6A007EB-1)

4.2.2 ICLID Test Circuit (CPS JD64)

The ICLID test circuit, CPS JD64, is used to verify FSK signals that are sent over the specified ICLID TI. The associated diagnostic will test all hardware components of the DTI circuit board.

Two (2) ICLID test circuits are required per office. These test circuits are to be mounted on the ISU frame (J6A007A-1). If the office is equipped with more than one ISU, the test circuits should be mounted on different ISU frames.

4.3 Input/Output Processor (IOP) Data Links

ISPICs communicate with the 1A processor over IOP data links. These data links are asynchronous, full duplex, 1200 bps channels. Two I/O channels are required for each controller. A maximum of 72 channels can be assigned for ISPI. These I/O channels are driven by FG19 circuits. The two data links must be from separate IOPs, which may or may not reside in the same IOP frame. One data link is designated as the active communication channel while the other serves as a back-up.

The IOP lead from the ISPIC to the IOP frame must be less than 200 feet long. If not, an additional 1200 baud data set is required at each ISPIC.

Refer to AT&T TOP 231-361-010 for IOP growth procedures. Also refer to AT&T Practice 231-302-305 for implementation, removal, and restoral of IOP channels.

5. TRANSLATOR DESCRIPTIONS

5.1 TNN-PEN (Trunk Network Number to Peripheral Equipment Number) Translator

A new TNN-PEN auxiliary block structure (Fig. 4) is required to define characteristics of TI service circuits associated with ISPICs.

The CPIs (circuit program index) for the service circuits associated with ISPICs are:

- ATI circuit is assigned CPI 225
- Ringing circuit (SD-1A621-01) is assigned CPI 226
- ICLID test circuit (CPS JD64) is assigned CPI 230.

The allowed signal distributor circuits for the service circuits associated with CPIs 225, 226, and 230 are SD-1A338-02 and SSD-1A402-01.

In addition, a new five-word "variable part" for CPIs 225 and 226 is also included in the new TNN-PEN auxiliary block (Fig. 4). The fifth word (word 8) contains the address of the TNN-PEN supplementary auxiliary block (Fig. 5).

5.2 Master Scanner Number (MSN) Translator

The MSN translator is unchanged. However, it requires a Type-4 PTW (primary translation word) for each controller. It also requires a Type-2 PTW for ISPI service circuit to TLN interface.

The TPI (trunk program index) values are as follows. The fast master scan point is assigned TPI 0 and the supervisory master scan points assigned TPI 1.

5.3 TCC (Trunk Class Code) Expansion Table Translator

The TCC expansion table translator contains the CPI value for ISPI service circuits. This value is stored in bits 7-0 of word 4. Other bits that are set to one and their meaning are listed below.

- Word 1, bits 1-0 — Miscellaneous
- Word 3, bit 3 — Denotes ISPI TG (trunk group) for CPI 225 and 226 only.

All other bits are set to zero.

TRUNK NETWORK NUMBER TO PERIPHERAL EQUIPMENT NUMBER AUXILIARY BLOCK

	23	18	15	13	0
WORD 0	0	WRDN	QUANT	CPDN	
WORD 1	0	QUANT = 2	MTDN		
WORD 2	0	QUANT	0 0	MSN (SUP)	
WORD 3	0	QUANT	0 0	MSN (DIRECTED)	
	VARIABLE PART (SEE BELOW)				

TNN-PEN AUXILIARY BLOCK
VARIABLE PART WORDS FOR CIRCUIT PROGRAM INDEX (CPI) 225 AND 226

		22 20		0
WORD 4	0	VPI =0	0	
WORD 5	0	QUANT	0 0	MSN (FAST)
WORD 6	0			
WORD 7	0			
WORD 8	0 0 0 0	ADDRESS OF SUPPLEMENTARY AUX BLOCK		

LEGEND:

WORD 0 WRDN = NUMBER OF WORDS IN THE AUXILIARY BLOCK:
= 9 FOR CPI 225 AND 226
= 4 FOR CPI 230.
QUANT = QUANTITY OF CENTRAL PULSE DISTRIBUTOR POINTS ASSOCIATED WITH THE TRUNK NETWORK NUMBER:
= 1 FOR CPI 230 (OTHERWISE 0):
CPDN = CENTRAL PULSE DISTRIBUTOR NUMBER FOR CPI 230 ONLY.

WORD 1 QUANT = QUANTITY OF SIGNAL DISTRIBUTOR POINTS:
= 2 FOR CPI 225, 226, AND 230
MTDN = MISCELLANEOUS TRUNK DISTRIBUTOR NUMBER.

WORD 2 QUANT = QUANTITY OF SUPERVISORY MASTER SCAN POINTS:
= 1 FOR CPI 225 (OTHERWISE 0)
MSN = MASTER SCANNER NUMBER.

WORD 3 QUANT = QUANTITY OF DIRECTED MASTER SCAN POINTS:
= 2 FOR CPI 226
= 8 FOR CPI 230
= 0 FOR CPI 225
MSN = MASTER SCANNER NUMBER.

WORD 5 QUANT = QUANTITY OF FAST MASTER SCAN POINTS:
= 1 FOR CPI 226 (OTHERWISE 0)
MSN = MASTER SCANNER NUMBER

WORD 8 = ADDRESS OF THE SUPPLEMENTARY AUXILIARY BLOCK WHICH CONTAINS MORE INFORMATION ABOUT THE TNN.

Fig. 4 — TNN-PEN Auxiliary Block

TNN-PEN SUPPLEMENTARY AUXILIARY BLOCK

23 22 18 17 16 15 14 13 12 11 6 5 4 3 2 1 0

WORD 0	0	WRDN	R Q P O N M L K J I H G F E D C B A	
OPT A - WORD 1				
OPT C - WORD 1	← 0 →		TOC4	TOC5
OPT C - WORD 2	0 0 0 0	CSLOT	UT=27	MEMNO

19 13 6

LEGEND:

WORD 0 WRDN = NUMBER OF WORDS IN THE AUXILIARY BLOCK.

A,B,...R = OPTION BITS. AN OPTION BIT SET INDICATES THAT THE CORRESPONDING OPTION WORD(S) ARE BUILT IN THE AUX BLOCK. OPTION BIT C (BIT 2 = 1) INDICATES THAT THE ISPI OPTION WORDS ARE BUILT. OPTION BIT A IS BEING RESERVED FOR FUTURE USE. IN THE FUTURE, IF ADDITIONAL OPTION WORDS ARE NEEDED (MORE WORDS THAN OPTION BITS A-R CAN INDICATE), OPTION BIT A WILL INDICATE THAT AN OPTIONAL WORD CONTAINING ADDITIONAL OPTION BITS EXIST (OPT A - WORD 1).

OPT A - WORD 1 = OPTIONAL WORD CONTAINING ADDITIONAL OPTION BITS. THIS WORD WILL BE BUILT IF OPTIONS A-R ARE USED AND MORE OPTION BITS ARE NEEDED.

OPT C - WORD 1 TOC4 = TRUNK ORDER CODE DIGIT 4. SIX BIT RECENT CHANGE CODE.

TOC5 = TRUNK ORDER CODE DIGIT 5. SIX BIT RECENT CHANGE CODE.

OPT C - WORD 2 CSLOT = CIRCUIT SLOT. SLOT NUMBER WHERE CIRCUIT IS PHYSICALLY MOUNTED.

UT = UNIT TYPE = 27 (ISPI).

MEMNO = UNIT TYPE MEMBER NUMBER.

Fig. 5 — TNN-PEN Supplementary Auxiliary Block

5.4 ISPI Unit-Type Translators (Fig. 6)

5.4.1 Unit Type 27

ISPI requires a new unit-type 27 auxiliary block (Fig. 7) to define CPD (central pulse distributor) points, scan points, and IOP channel data for each controller. This layout also identifies ISPI service circuits in terms of TNNs (trunk network number) and corresponding slot numbers.

Listed below are restrictions for the unit-type-27 layout.

- Since the RC/DTI circuit uses two TNN slots per circuit, the TNN positions corresponding to the DTI slots must always be zeros
- RC/DTI circuit pairs must be mounted on the same shelf.

The size of the unit-type-27 auxiliary block is dependent on the number of shelves occupied by the controller; therefore, the size is determined as follows.

Number of Shelves	Number of Words
1	15
2	23

5.4.2 Unit Type 22

ISPI also requires a unit-type-22 PTW (Fig. 8) to identify the ISPI feature as a valid feature for each associated I/O channel. The software channel number is used as the unit-type member number input to this unit-type translator.

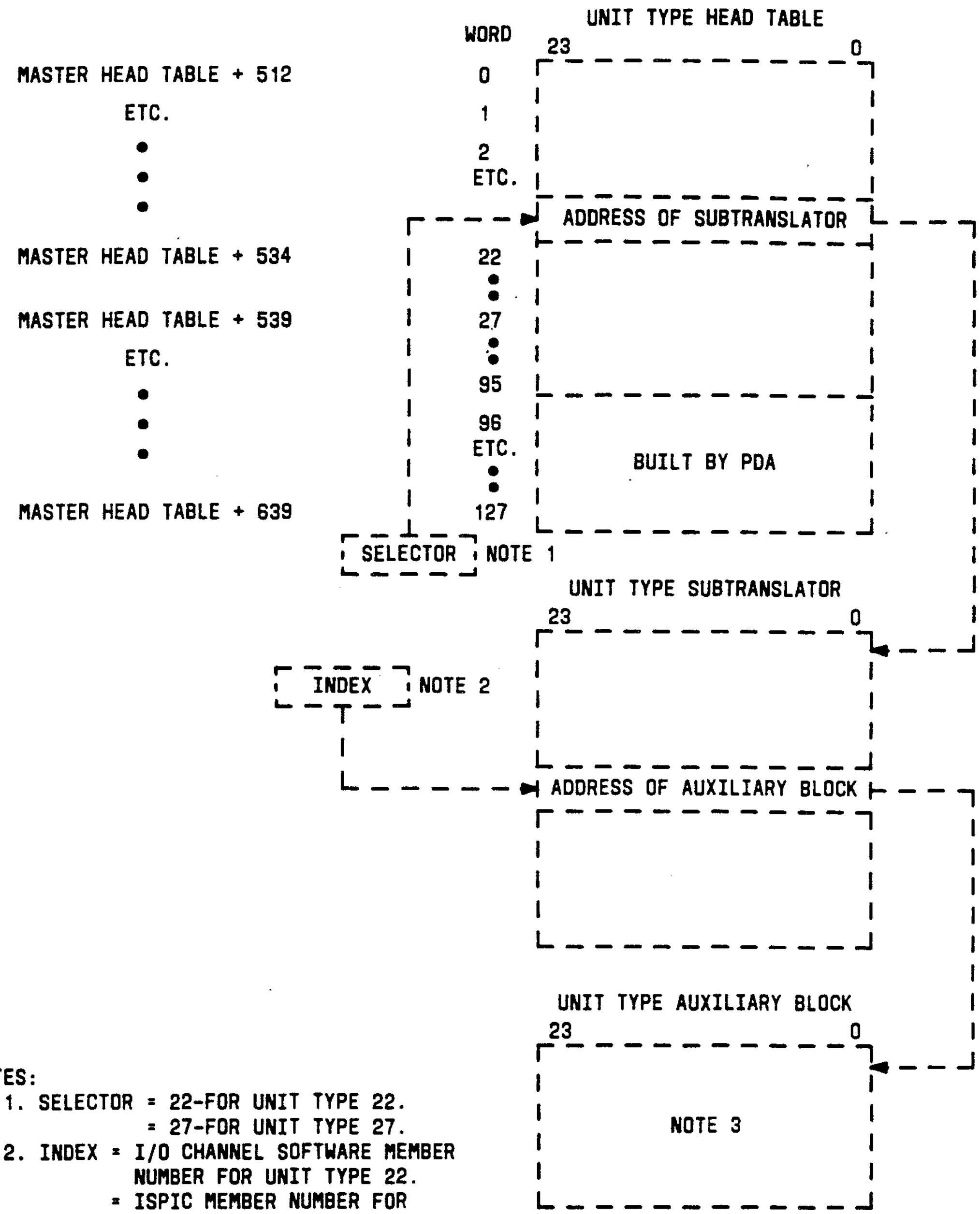
5.5 TNN-TGN (Trunk Network Number to Trunk Group Number) Translator

The TNN-TGN translator requires a Type-2A PTW containing the TCC (trunk class code) (bits 18-10) and TGN (trunk group number) (bits 9-0). These translations are required for ATIs, ringing circuits, and ICLID test circuits.

5.6 TGN Translator

The TGN translator requires a Type-1B PTW containing a TTN (test table number) (bits 20-18) of 0, TU (trunk usage) (bits 11-10) of 3 (miscellaneous), and number of trunk members in TG (NOTR) (bits 9-0). These translations are also required for ATIs, ringing circuits, and ICLID test circuits.

> *Note:* The NOTR field (bits 9-0) is equal to 2 for ICLID test circuits.



NOTES:

1. SELECTOR = 22-FOR UNIT TYPE 22.
   = 27-FOR UNIT TYPE 27.
2. INDEX = I/O CHANNEL SOFTWARE MEMBER NUMBER FOR UNIT TYPE 22.
   = ISPIC MEMBER NUMBER FOR UNIT TYPE 27.
3. NO AUXILIARY BLOCK IS REQUIRED FOR THE UNIT TYPE 22 TRANSLATOR.
4. REFER TO PA-6A002, SECTION 512, FOR DETAILS.

Fig. 6 — Flow Diagram for ISPI Unit Type Translators

UNIT TYPE 27 AUXILIARY BLOCK WORDS

Bits: 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0

WORD 0	0	WRDN	QUANT = 3	CPDN
WORD 1	0	QUANT = 2	0 0	MSN
WORD 2	0	QUANT = 1	0 0	MSN
WORD 3	0	QUANT = 2	0 0	MSN
WORD 4	0		BCHAN	PCHAN
WORD 5	0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		CONT
WORD 6	0	ALL ZEROS		
WORD 7	0	← 0 →	TNN (SLOT 0)	
• • •		• • •		
•	0		TNN (LAST SLOT)	
REMAINING WORDS	ALL ZEROS			
	• • •	• • •		

LEGEND:

WORD 0 WRDN = NUMBER OF WORDS IN AUXILIARY BLOCK.
QUANT = QUANTITY OF CENTRAL PULSE DISTRIBUTOR BIPOLAR POINTS.
CPDN = CENTRAL PULSE DISTRIBUTOR NUMBER.

WORD 1 QUANT = QUANTITY OF SUPERVISORY MASTER SCAN POINTS.
MSN = MASTER SCANNER NUMBER (MUST BE ASSIGNED WITH NTPI = 27).

WORD 2 QUANT = QUANTITY OF DIRECTED MASTER SCAN POINTS.
MSN = MASTER SCANNER NUMBER.

WORD 3 QUANT = QUANTITY OF SUPERVISORY SCAN POINTS USED AS FUSE SCAN POINTS
MSN = MASTER SCANNER NUMBER (MUST BE ASSIGNED WITH NTPI = 27 AND UNIT TYPE = 21).

WORD 4 BCHAN = BACKUP IOP SOFTWARE CHANNEL NUMBER (CHANNEL B OR DL1). PROVIDES BACKUP CHANNEL FOR THE PRIMARY IOP SOFTWARE CHANNEL NUMBER.
PCHAN = PRIMARY IOP SOFTWARE CHANNEL NUMBER (CHANNEL A OR DLO).

WORD 5 CONT = CONTROLLER TYPE:
= 0 FOR ASC.
= 1 FOR ISU.

WORD 7 TNN = TRUNK NETWORK NUMBER FOR SERVICE CIRCUITS. WORD 7 CORRESPONDS TO TNN POSITION SLOT 0. THE FOLLOWING WORDS CORRESPOND TO REMAINING TNN POSITIONS BY SLOT NUMBER.

REMAINING WORDS = AFTER THE LAST TNN SLOT NUMBER, THE REMAINING WORDS ARE ALL ZEROS.

Fig. 7 — Unit Type 27 Auxiliary Block

UNIT TYPE 22 PTW

23	22 18	17 9	8 0
1	0 ⟷ 0	FEATURE = 6	CUSTOMER ID

LEGEND:
FEATURE = FEATURE ASSOCIATED WITH IOP CHANNEL (6 DENOTES ISPI)
CUSTOMER ID = FEATURE CUSTOMER IDENTIFICATION NUMBER: THE ISPIC MEMBER NUMBER OF THE UNIT TYPE 27 AUX BLOCK ASSOCIATED WITH THIS I/O SOFTWARE CHANNEL.

Fig. 8 — Unit Type 22 PTW

6. ISPI FEATURE IMPLEMENTATION

ISPI requires a 9SISPI set card which consists of two feature packages: set cards 9F220 (ISPI) and 9F102 (DIAL). Other set cards that are required depend on the type controller(s) being supported by the ISPI feature; these cards are listed below.

- ISPIAC — This card specifies the number of ASC controllers in the office
- ISPIIC — This card specifies the number of ISU controllers in the office.

The ISPI feature implementation (Fig. 9) also involves the following translations: unit type, trunk, routing, and traffic/plant measurements.

6.1 Establish Unit Type Translations

Use the following procedures to add unit-type-27 translations, then repeat for unit-type 22.

6.1.1 Establish Unit-Type Subtranslator

Determine if unit-type subtranslator exists. At the terminal, enter:

DUMP:CSS,ADR aaaaaaa!

aaaaaaa = Starting address of head table for the unit-type subtranslator:
= 7721033 for unit-type 27
= 7721026 for unit-type 22.

System response is the **DUMP:CSS** output message containing an 8-digit octal number representing the subtranslator address. Record this address for later use. Note that if this number is all zeros, the subtranslator does not exist.

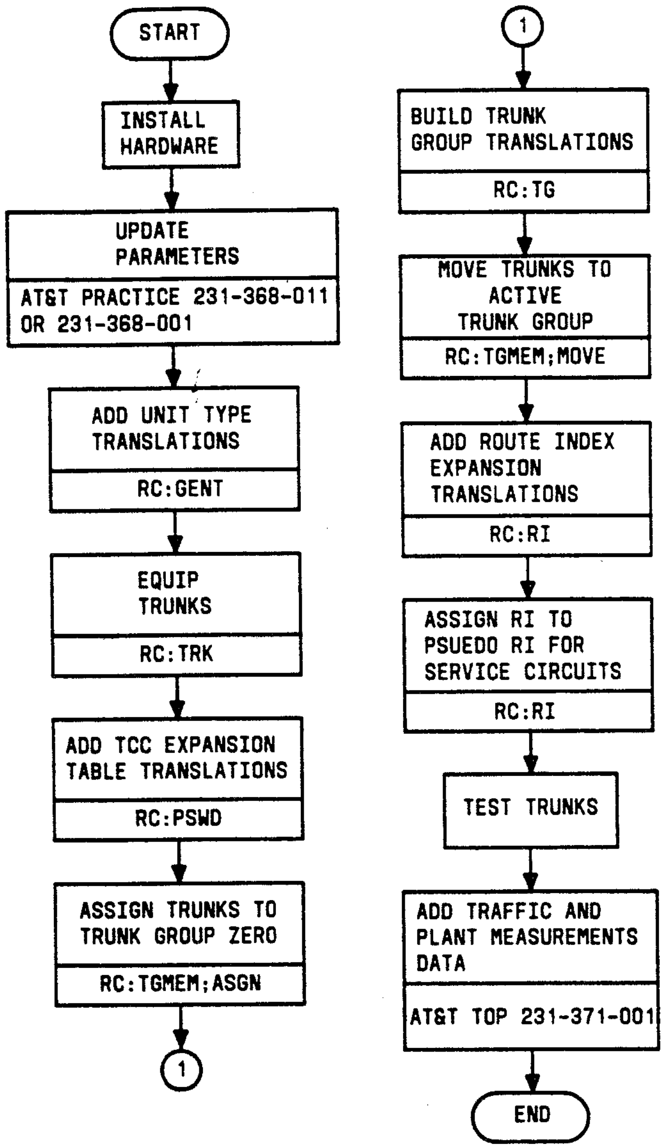


Fig. 9 — ISPI Feature Implementation

6.1.2 Seize and Initialize a New Unit-Type Subtranslator

If the subtranslator does not exist, proceed as follows to build a new unit-type subtranslator.

> *Note:* The decimal length of the unit-type subtranslator should be as follows: 64 words for unit-type 27; 96 words for unit-type 22.

At the terminal:

(1) Check link list for available space by entering:

VFY-SPACE-29 b 32 1.

b = 0 (LUCS)
  = 1 (HUCS).

(2) Use the **TR13** output message to determine if the memory block exists with an octal length equal to or greater than the desired octal length (see Note above). If so, record the size of the available memory block(s) for later use.

(3) Construct RC message per Table A.

(4) Enter RC message as constructed in Step (3).

TABLE A

RC:SUBTRAN KEYWORDS

RC MESSAGE	REMARKS
RC:SUBTRAN:	Message heading
DATA 0	Octal data to be written into each word of seized memory block
LNG b~~ddd~~a, ~~cc~~ccc	b = H (HUCS) or L (LUCS) ~~ddd~~a = Decimal length of memory block to be seized; = 64 (for unit type 27 subtranslator) = 96 (for unit type 22 subtranslator) ~~cc~~ccc = AUX (Auxiliary blocks, LUCS blocks) = OTHER (Other translation blocks or tables — HUCS or LUCS)

(5) From the **RC18 INFO** output message, record the octal address of the subtranslator block seized for later use.

(6) Verify that the memory block has been seized by repeating Step (1). The **TR13** output message should show the size of the available memory block reduced by the size of the seized memory block.

(7) Enter:

DUMP:CSS,ADR aaaaaaa!

aaaaaaa = Starting address of head table for the unit type subtranslator:
= 7721033 for unit-type 27
= 7721026 for unit-type 22.

System response is the **DUMP:CSS** output message containing an 8-digit octal number representing the subtranslator address. This address (present contents) should be all zeros.

Caution: Extreme caution must be exercised in using the RC:PSWD message to avoid errors resulting in incorrect translations.

(8) Construct a RC message per Table B to link unit-type subtranslator to unit-type head table.

(9) Enter RC message as constructed in Step (8) and observe the **RC18 ACPT** response.

(10) Verify that unit-type subtranslator is linked to unit-type head table by entering:

DUMP:CSS,ADR aaaaaaa!

aaaaaaa = Starting address of head table for the unit-type subtranslator:
= 7721033 for unit-type 27
= 7721026 for unit-type 22.

System response is the **DUMP:CSS** output message containing an 8-digit octal number representing the subtranslator address. This address (contents) should equal the new unit type subtranslator address entered in Step (9). If not, correct the **RC:PSWD** message and repeat from Step (9).

TABLE B

RC:PSWD KEYWORDS
LINKING SUBTRANSLATOR TO UNIT TYPE HEAD TABLE

RC MESSAGE	REMARKS
RC:PSWD:	Message heading
ADD ccccccc	ccccccc = Unit type head table address associated with subtranslator being linked (Recorded in Step 7)
OLDDAT p̸p̸p̸p̸p̸p̸p̸p	p̸p̸p̸p̸p̸p̸p̸p = Present octal contents of head table address (Recorded in Step 7)
DAT b̸b̸b̸b̸b̸b̸b̸b	b̸b̸b̸b̸b̸b̸b̸b = Octal starting address of subtranslator block seized (Recorded in Step 5)

(11) Enter:

DUMP:CSS,ADR aaaaaaa!

aaaaaaa = Unit type lengths table address associated with unit type subtranslator:
= 7721233 for unit-type 27
= 7721226 for unit-type 22.

System response is the **DUMP:CSS** output message containing an 8-digit octal number representing the subtranslator length. The decimal length of the unit-type subtranslator should be as follows: 64 words for unit-type 27; 96 words for unit- type 22.

(12) Construct a RC message per Table C to enter unit-type subtranslator length in the unit-type lengths table.

(13) Enter RC message as constructed in Step (12) and observe the **RC18 ACPT** response.

TABLE C RC:PSWD KEYWORDS ENTERING SUBTRANSLATOR LENGTH IN LENGTHS TABLE	
RC MESSAGE	**REMARKS**
RC:PSWD:	Message heading
ADD ccccccc	ccccccc = Unit type length table address associated with subtranslator
OLDDAT pppppppp	pppppppp = Present octal contents in unit type lengths table
DAT bbbbbbbb	bbbbbbbb = Octal length of seized unit type subtranslator to be entered in head table

(14) Verify length in unit type lengths table by entering:

DUMP:CSS,ADR aaaaaaa;DEC!

aaaaaaa = Address containing unit-type subtranslator length:
= 7721233 for unit-type 27
= 7721226 for unit-type 22.

From the **DUMP:CSS** output message, verify that the length found is equal to the expected length of the new subtranslator. If not, correct the **RC:PSWD** message and repeat from Step (13).

6.1.3 Build or Change Unit-Type Auxiliary Block

If auxiliary block does not exist, determine the number of blocks available by entering:

VFY-SPACE-29 1 cc 0.

cc = Size of auxiliary block (refer to third paragraph in 5.4).

Using the **TR13** output message, verify that the memory block of size "cc" exists.

Use the following steps to seize and initialize an unit-type auxiliary block, link it to an unit-type subtranslator, and update the auxiliary block words. Refer to AT&T Practice 231-318-319 for further explanation of the **RC:GENT** message.

> ***Caution: Extreme caution must be exercised in using the RC:GENT message to avoid errors resulting in incorrect translations.***

At the terminal:

(1) Construct a RC message per Table D and Fig. 10.

(2) Enter RC message as constructed in Step (1) and observe the **RC18 ACPT** response.

(3) Verify contents of auxiliary block by entering:

DUMP:CSS,ADR aaaaaaa,L bbb!

aaaaaaa = Octal starting address of auxiliary block

bbb = Decimal length of auxiliary block.

Using the **DUMP:CSS** output message, verify that the contents of each word agree with the data entered in the RC message.

Repeat this procedure from the beginning of paragraph 6.1.3. to build remaining auxiliary blocks.

TABLE D

RC:GENT KEYWORDS

RC MESSAGE	REMARKS
RC:GENT:	Message heading (Use RC:GENT;CHG: for change message)
UT a̸a	a̸a = 27 for unit-type 27 = 22 for unit-type 22
X b̸b̸b̸b	b̸b̸b̸b = Decimal index into unit-type head table
XX c̸c̸c̸c	c̸c̸c̸c = Unit-type subtranslator member number (decimal) for unit-type 27 = I/O channel number for unit-type 22
SZ s̸s̸s̸s	s̸s̸s̸s = Decimal size of auxiliary block
W d̸d̸d̸d	d̸d̸d̸d = Word number in auxiliary block. The WRDN field in word 0, bits 22 through 18, is set automatically.
DD a̸a̸a̸a̸a̸a̸a	a̸a̸a̸a̸a̸a̸a = Decimal data (Right adjusted in word). The range of the data is 23 bits
OD b̸b̸b̸b̸b̸b̸b̸b	b̸b̸b̸b̸b̸b̸b̸b = Octal data (Right adjusted in word) The range of data is 23 bits
DI (c̸c̸c̸c̸c̸c̸c, d̸d-e̸e)	c̸c̸c̸c̸c̸c̸c = Decimal value (data) d̸d-e̸e = Decimal bit range value is stored in. For a single bit position, dd and ee will be the same number
OI (f̸f̸f̸f̸f̸f̸f̸f, g̸g-h̸h)	f̸f̸f̸f̸f̸f̸f̸f = Octal value (data) g̸g-h̸h = Decimal bit range value is stored in. For a single bit position, gg and hh are the same number
TNN eeeeee	eeeeee = Trunk network number (Bits 14 through 0)
MSN (f̸f, gggggg)	f̸f = Quantity or word number (decimal) gggggg = Master scanner number
CPD (a̸a, bcdef)	a̸a = Quantity (Bits 17 through 14) in decimal bcdef = CPD bipolar point is bits 13 through 0 (Where b = pair, c = half, d = group, e = row, f = column)

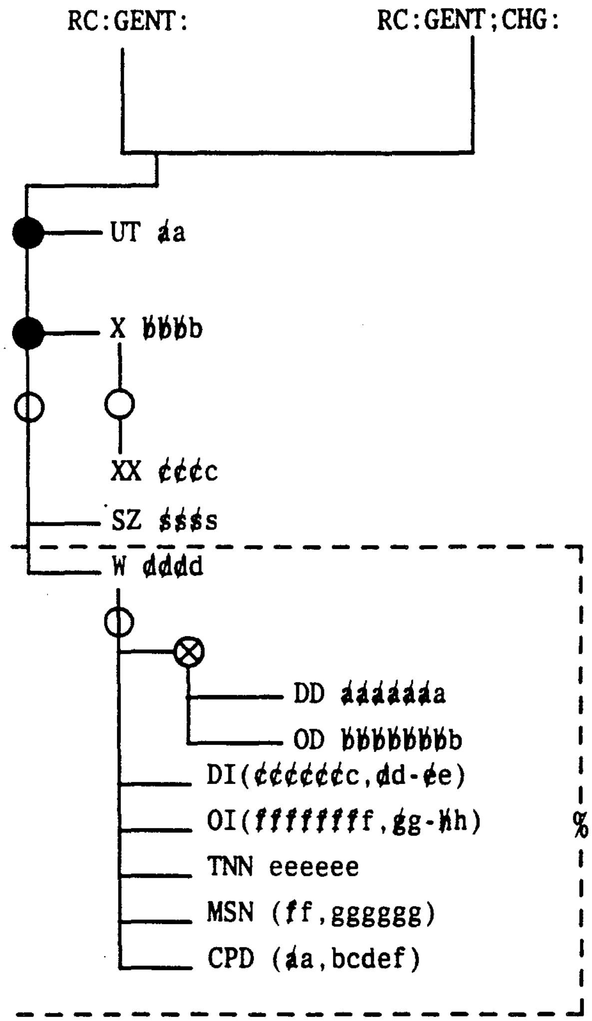


Fig. 10 — RC:GENT Message Flowchart

6.2 Establish New Service Circuit Trunk Group

6.2.1 Verify Trunk Group

See Fig. 11. Verify that TG is not established by entering:

VFY-TKGN-14 aaa.

aaa = TG number (Form ESS 1229A2, columns 35-37).

Observe the **TR10** output message (Fig. 12) indicating that TG is not established.

6.2.2 Verify TNN Correctly Equipped

Verify that each TNN is correctly equipped as follows.

(1) At the terminal, enter:

VF:TNNSVY:S bbcdef,XPND!

bb = TLN (00 through 15)

c = Trunk switch frame or circuit (0 through 7)

d = Grid (0 through 3)

e = Switch (0 through 7)

f = Level (0 through 7).

(2) Verify 1-port or 2-port miscellaneous equipment as follows.

(a) Compare Form ESS 1229 with the **TR14** output message data.

(b) Determine whether the **TR12** output message data is correct.

If the **TR14** or **TR12** data is incorrect, TNN(s) is not correctly equipped.

6.2.3 Verify TNN Assignment

Verify that each TNN is unassigned or assigned to TG 0. Proceed as follows.

(1) Using the **TR14** output message, determine if the TNN assignment (assigned or unassigned) is correct. If not, refer the problem to network administration personnel.

(2) Proceed only if the TNN assignment is correct.

6.2.4 Verify ISPI TNN Physical Assignment

For each ISPIC with assigned TNN slots (unit type 27 translations), verify that the physical slots are equipped (plugged in, etc.) as well:

At the terminal:

(1) Enter:

VFY-UNTY-15 027 bbbb.

bbbb = ISPIC member number (0000 through 0063).

(2) Using the **TR13** output message, determine if the assigned slots actually agree with the physical equipage on the ISPIC.

6.2.5 Busy TNNs

Make each TNN maintenance busy. If all trunks in the entire TG are to be made busy, perform Steps (1) and (3); if not, perform Steps (2) and (3) at MTCE terminal.

(1) To busy all trunks in the entire TG, enter:

TRK-GROUP-MB 00 aaaa.

aaaa = Trunk group.

Note: Trunks in TG 0 should not be made busy with the **TRK-GROUP-MB** message.

(2) For each trunk to be made busy, enter:

T-TNN-MB 00 nnnnnn.

nnnnnn = TNN.

(3) If the **TRK-GROUP-MB** message was input, observe the **TN15** and **TN05** output messages for each TNN not put on the out-of-service list. If the **T-TNN-MB** message was input, observe the **TN06** or **TN05** output message for each TNN made busy.

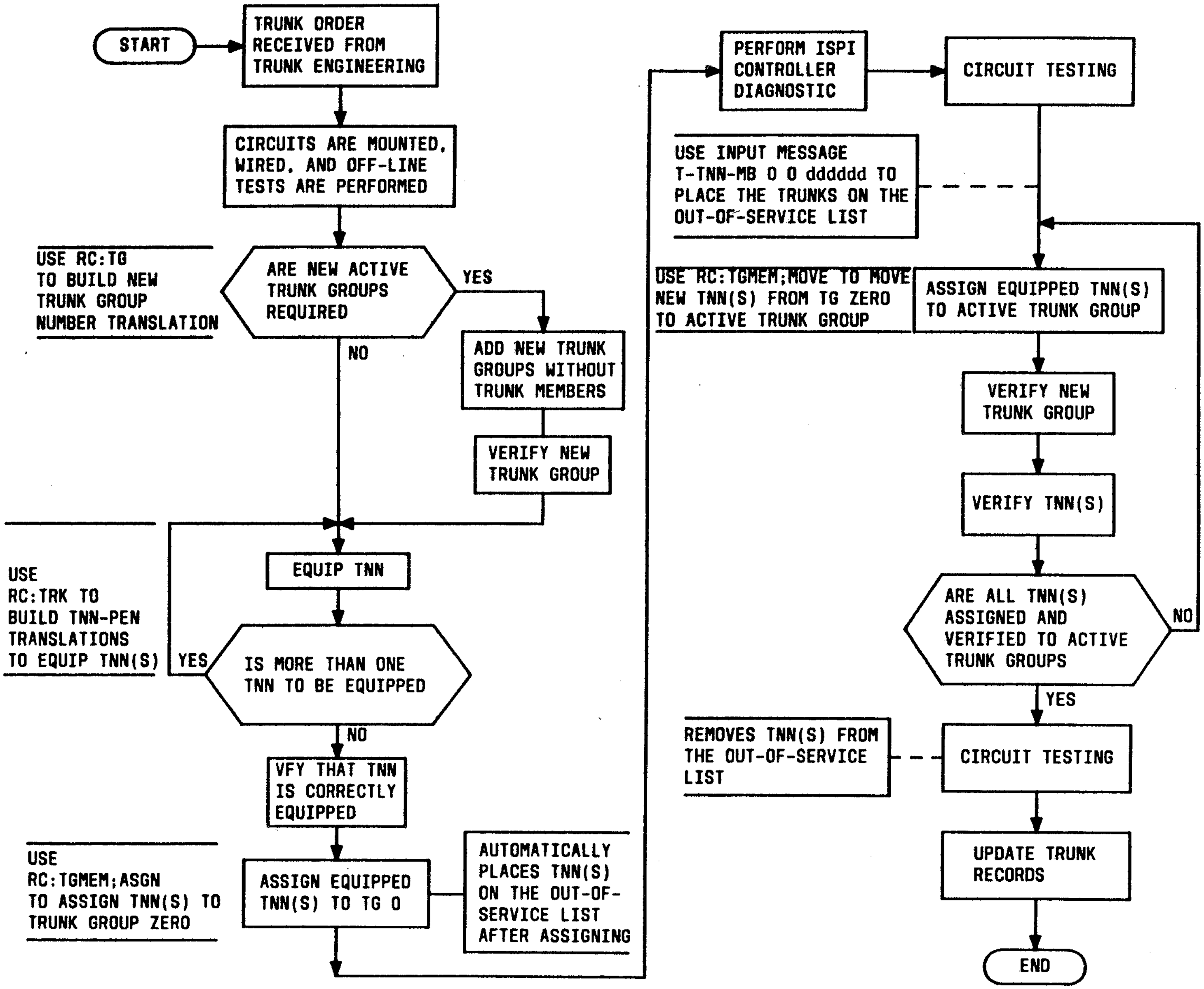


Fig. 11 — General Flowchart to Add a Trunk Circuit

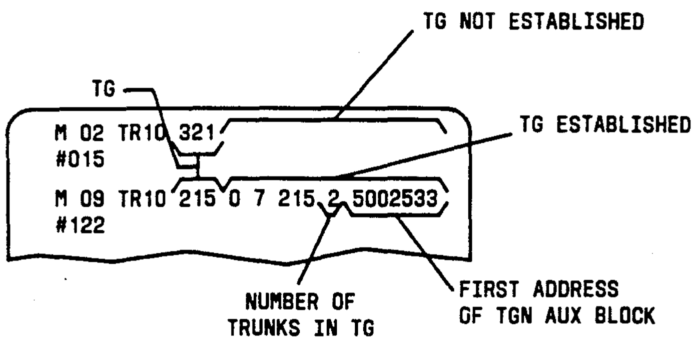


Fig. 12 — Example of TR10 Messages

6.2.6 Equip TNNs

Properly equip each unequipped TNN as follows.

At the terminal:

(1) Construct a RC message per Table E and Fig. 13 for a 1-port miscellaneous trunk.

(2) Enter RC message as constructed in Step (1) and observe the **RC18 5 0 ACPT** response.

If necessary, properly equip each TNN that is incorrectly equipped. Proceed as follows.

(1) If the TNN is to be changed, verify that the new TNN is unassigned by entering the following message and observing the **TR14** output message.

VFY-TNN-11 bbbbbb.

bbbbbb = New TNN.

(2) For a 1-port miscellaneous trunk, construct a RC message per Table E and Fig. 14.

(3) Enter RC message as constructed in Step (2) and observe the **RC18 5 0 ACPT** output response.

TABLE E RC:TRK KEYWORDS				
RC MESSAGE	**FORM ESS**	**COLUMN**	**REMARKS**	
RC:TRK:	—	—	Message heading (Use RC:TRK;CHG on change message)	
TNN ttttt	1229A2	29-34	ttttt = TNN (trunk network number)	
CPD (ii,eeeee)	1229A2	45-46	ii = Quantity of bipolar CPD points: = 1 for CPI 230 (otherwise 0)	CPD (central pulse distributor)
		44, 47-50	eeeee = First bipolar CPD point	
SDN (jj,Mccddd)	1229A1	28-29	jj = Quantity of SD points: = 2 for CPI 225, 226 and 230	SD (signal distributor)
		25	M = SD type	
		26-27 and 30-32	ccddd = First SD point	
STMS (kk,dddddd,1)	1229A1	35-36	kk = Quantity of master scanner points: = 1 for CPI 225 only	Supervisory scan point data
		33-34 and 37-40	dddddd = Scan point number	
		—	1 = TPI for master scanner point	
DMS (kk,dddddd, 0,...,0)	1229A1	43-44	kk = Quantity of master scanner points: = 2 for CPI 226 = 8 for CPI 230. These scan points must be consecutive and assigned to same row	Directed scan point data
		41-42 and 45-48	dddddd = Scan point number	
		—	0,...,0 = TPI values for directed scan points	

TABLE E (Contd)

RC:TRK KEYWORDS

RC MESSAGE	FORM ESS	COLUMN	REMARKS	
VMS (1,dddddd,0)	1229A1	51-52 or 59-60	1 = Quantity of scan points for CPI 226 only	Fast/common scan point data
		49-50 and 53-56 or 57-58 and 61-64	dddddd = Scan point number	
		—	0 = TPI for fast scan point	
ATD (jj,Mccddd)	1229A1	76-77	jj = Quantity of SD points	Additional trunk distributor point
		73	M = SD type	
		78-80 74-75	ccddd = First SD point	
TOC4 n	1204	28	n = Trunk order code digit 4: = 0-9 or A-Z	Refer to AT&T Practice 231-318-317 for 6-bit RC code
TOC5 n	1204	29	n = Trunk order code digit 5: = 0-9 or A-Z	
MEMN nn	1229A2	53-55	nn = Member number for unit type 27: = 0-63	ISPI member number
CSLOT nn	1229A2	26-27	nn = Slot number for TNN in unit type 27 auxiliary block: = 0-15	
XTNN bbbbbb	1229A2	29-34	bbbbbb = TNN to replace TNN tttttt	1-port keyword (Change message only)

RC:TRK:
TNN tttttt

- CPD (~~i~~i,eeeee)
- SDN (~~j~~j,bccddd)
- STMS (~~k~~k,dddddd,~~mm~~m,.....,~~nn~~n)
- DMS (~~k~~k,dddddd,0....,0)
- VMS (~~k~~k,dddddd,0....,0)
- ATD (~~j~~j,bccddd)
- TOC4 n
- TOC5 n
- MEMN ~~n~~n
- CSLOT ~~n~~n

NOTE:
1. As result of this message, the TNN will be entered in the unit type 27 auxiliary block.

Fig. 13 — Equipping a 1-Port Miscellaneous Trunk

RC:TRK;CHG:
TNN tttttt

- CPD (~~i~~i,eeeee)
- SDN (~~j~~j,bccddd)
- STMS (~~k~~k,dddddd,~~mm~~m,.....,~~nn~~n)
- DMS (~~k~~k,dddddd,0....,0)
- VMS (~~k~~k,dddddd,0....,0)
- ATD (~~j~~j,bccddd)
- XTNN bbbbbb
- TOC4 n
- TOC5 n
- MEMN ~~n~~n
- CSLOT ~~n~~n

Fig. 14 — Changing a 1-Port Miscellaneous Trunk

(4) Verify that each TNN is now correctly equipped as follows.

(a) Enter:

VF:TNNSVY:S bbcdef,XPND!

bb = TLN (00 through 15)

c = Trunk switch frame or circuit (0 through 7)

d = Grid (0 through 3)

e = Switch (0 through 7)

f = Level (0 through 7).

(b) Verify 1-port or 2-port miscellaneous equipment as follows.

1. Compare Form ESS 1229A2 with the **TR14** output message data.
2. Determine whether the **TR12** output message data is correct.

If **TR14** or **TR12** data is incorrect, TNN(s) is not correctly equipped.

If necessary, use the following RC message to unequip trunk(s).

RC:TRK;OUT:
TNN aaaaaa!

aaaaaa = TNN.

Note: As a result of this message, the TNN is removed from the unit-type 27 auxiliary block.

6.2.7 Add TCC Data

If TCC (Form ESS 1204) is to be added for a TG, perform the following steps. At the terminal:

(1) If new TCC is to be added, check the length of the TCC expansion table as follows.

(a) Enter:

DUMP:CSS,ADR 7720411;DEC!

(b) Using the **DUMP:CSS** output message, determine the length of the TCC expansion table.

(c) Using Form ESS 1204A, determine the highest TCC number.

(d) Multiply the highest TCC by 4.

(e) Add 4 to the results of Substep (d) to determine the required length of the table to add the new TCC data.

(f) Determine whether the required table length is less than the active table length [Substep (b)]. If so, the active table length is sufficient. If not, the active table length is insufficient to add the new TCC data.

If the active table length is insufficient to add the new TCC data, move the TCC expansion table to increase the table length. Refer to AT&T TOP 231-367-020 for the procedure, then return to Step (2).

(2) Add the TCC to the TCC expansion table as follows:

(a) Obtain the TCC from Form ESS 1204.

(b) Multiply the TCC by 4 (results = iiii). Retain the results iiii for use in Substep (e).

(c) Using Form ESS 1204, identify the translation words for which data is to be changed (Translation Words 1, 2, 3, and 4).

(d) Determine the new data by converting the binary word in the INPUT row to octal for each translation word being changed (results = dddddddd). Save results for use in Substeps (h) and (i).

(e) Determine the address and old data of translation words being added or changed by entering the following message:

DUMP:CSS,INDIR 1,ADR 7720011,INC iiii,L4!

iiii = Results obtained in Substep (b).

Note: If the new TCC is being added, the old data of translation words may be all zeros.

(f) Using the **DUMP:CSS** output message, determine the address of the TCC translation words (Fig. 15) (results = bbbbbbb). Retain the results for use in Substeps (h) and (i).

(g) Using the **DUMP:CSS** output message, also determine the old data (contents) contained in the TCC translation words (Fig. 15) (results = cccccccc). Save results for use in Substeps (h) and (i).

(h) Construct RC message per Table F and Fig. 16. Check for accuracy.

Caution: Extreme caution must be exercised in using the* RC:PSWD *message to avoid errors resulting in bad translations data.

(i) Enter RC message as constructed in Substep (h) and observe the **RC18 1 0 ACPT** response.

(3) Verify the TCC expansion table data as follows.

(a) Enter:

VF:DATA:
FROM 7720011
NWDS 1
DUMP!

(b) Using the **TR100** output message, obtain the starting address of the TCC expansion table for use in Substep (c).

(c) Enter:

VF:DATA:
FROM aaaaaaa
NWDS 4
DUMP!

aaaaaaa = Starting address of TCC expansion table + (TCC x 4 converted to octal).

(d) Compare the four TCC translation words in the **TR100** output message with each word on Form ESS 1204.

(e) Using the procedures in Steps 2(h) and 2(i), correct each TCC translation word in error.

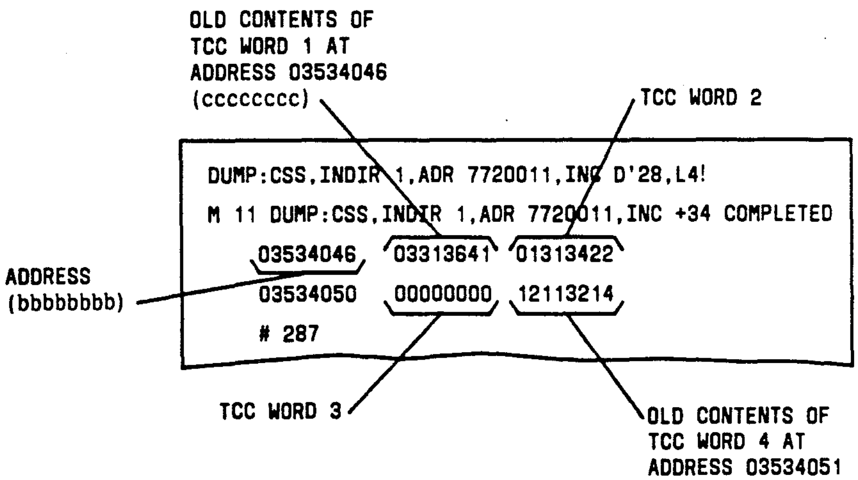


Fig. 15 — Example of DUMP of TCC Translation Words

TABLE F

RC:PSWD KEYWORDS
ADDING/CHANGING TCC DATA

RC MESSAGE	REMARKS
RC:PSWD:	Message heading
ADD bbbbbbb	bbbbbbb = Address of memory to be changed
OLDDAT cccccccc	cccccccc = Old data determined from DUMP:CSS output message
DAT dddddddd %	dddddddd = Octal form of binary number found in form and converted to octal

% Repeatable segment. If more than one word is to be changed and addresses for each word are consecutive, all word changes can be entered in same message by repeating; otherwise, must be entered one word at a time.

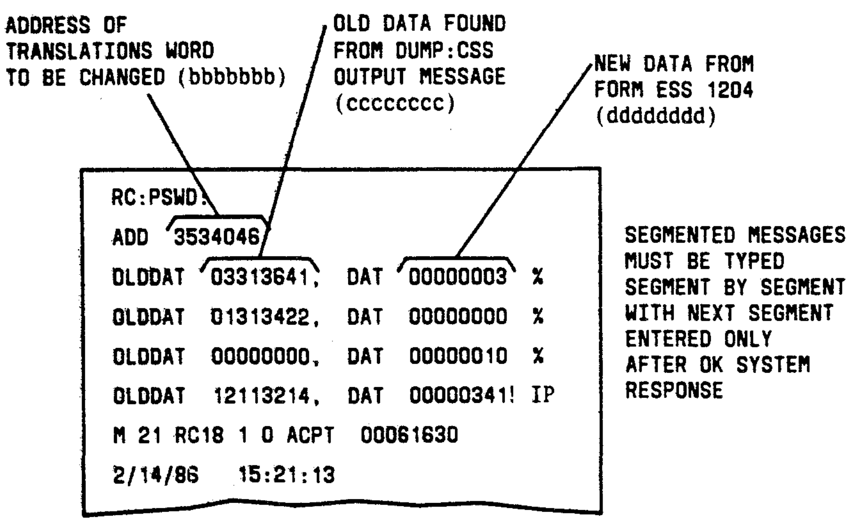


Fig. 16 — Example of RC:PSWD Message for Multiple Changes

6.2.8 Assign Trunks to TG Zero

If some trunks are not assigned to TG 0, assign as follows.

At the terminal:

(1) Construct RC message per Table G and Fig. 17 to assign TNNs to TG 0.

> *Note:* More than one segment of a segmented message may be typed with DATASPEED® 40 teletypewriter in FORM ENTER mode and then entered, segment by segment, in regular mode.

(2) Enter RC message as constructed in Step (1) and observe the **RC18 9 0 ACPT** response.

TABLE G

RC:TGMEM;ASGN KEYWORDS

RC MESSAGE	FORM ESS	COLUMN	REMARKS
RC:TGMEM;ASGN:	—	—	Message heading
TCC ~~nn~~m %	1229A2	41-43	TCC (trunk class code)
MEM (0,tttttt)	1229A2	34-39	tttttt = TNN. All TNNs assigned to TG 0 have member number = 0 regardless of Form ESS 1229
% Repeatable segment. More than one can be entered in same message.			

```
RC:TGMEM;ASGN:
TCC 61
MEM(0, 012321)!
```

EXAMPLE OF RC MESSAGE TO ASSIGN ONE TNN TO TG 0

```
RC:TGMEM;ASGN:
TCC 61
MEM(0, 01 23 21)%
TCC 61
MEM(0, 01 02 52)%
TCC 64
MEM(0, 11 13 41)!
```

EXAMPLE OF RC MESSAGE ASSIGNING MORE THAN ONE TNN TO TG 0

Fig. 17 — Example of Assigning Trunks to TG 0

(3) Verify that each TNN is assigned to TG 0 with the correct TCC by entering:

VF:TNNSVY:S bbcdef,XPND!

bb = TLN (00 through 15)

c = Trunk switch frame or circuit (0 through 7)

d = Grid (0 through 3)

e = Switch (0 through 7)

f = Level (0 through 7).

The **TR14** output message contains the requested data.

6.2.9 Build Trunk Group

Establish TG as follows.

Note: Both ICLID test circuits must be assigned to the same TG.

At the terminal:

(1) Construct RC message per Table H and Fig. 18.

(2) Enter RC message as constructed in Step (1) and observe the **RC18 2 0 ACPT** response.

(3) Verify the TG data in memory by entering:

VFY-TKGN-14 aaa.

aaa = TG number.

Observe the **TR10** output message (Fig. 12) indicating that TG is established.

(4) Compare the **TR10** output message from Step (3) with the data obtained from forms in Table H.

(5) Is there incorrect data in memory?

If so, recheck the RC message input data. If the incorrect data resulted from the RC message input, correct the RC message and start over from Step (1).

TABLE H

RC:TG KEYWORDS

RC MESSAGE	FORM ESS	COLUMN	REMARKS	
RC:TG:	—	—	Message heading	Columns on ESS forms associated with optional keywords will not contain data if option is omitted. Data in columns 69-80, Form ESS 1216, contain variable information depending on type number in columns 65-66.
TG aaa	1229A2	35-37	TGN (trunk group number)	
TYP c	—	—	Trunk Group Type: c = 2 if 2-way trunk, otherwise 1	
SIZE ddd	1229A2	38-40	ddd = Total number of trunks in TG (keyword used only for 2-way trunks, or if BVT (busy verification of trunks) or DLG (data link group) keywords are specified.	
TCC bbb	1229A2	41-43	Trunk Class Code	
COL gggg	1208	51-54	Chart Class Column	
ATT hhh	1504	28-30	Automatic Trunk Test Table. For service circuit TG, hhh = 4.	
ITD	1216	35	TG inhibit system diagnostics indicator (check in column for ITD)	
REVH	1216	37	Reverse Hunt. Start hunt for idle trunk at bottom of list (2-way group only)	
GLRM	1216	38	Glare Master. If glare, other trunk yields (2-way TG only)	
INSEP aa	1216	43-44	Incoming separation of revenue class. All incoming or 2-way TGs except common control switching arrangement	
TRL e	1216	34	Transmission Reference Level	
CRFT d	1216	33	Administration responsibility for TG. d = 0 or no entry = TELCO d = 1 = AT&T	
RAMN aa	1216	69-70	Recorded Announcement Member Number	

<table>
<tr><th colspan="5">TABLE H (Contd)
RC:TG KEYWORDS</th></tr>
<tr><th>RC MESSAGE</th><th>FORM ESS</th><th>COLUMN</th><th colspan="2">REMARKS</th></tr>
<tr><td>RRRI nnnn</td><td>1216</td><td>69-72</td><td>Reroute Route Index. Type 18 (Form ESS 1216, columns 65-66).</td><td rowspan="10">Columns on ESS forms associated with optional keywords will not contain data if option is omitted.

Data in columns 69-80, Form ESS 1216, contain variable information depending on type number in columns 65-66.</td></tr>
<tr><td>TTY aaa</td><td>1216</td><td>31-32</td><td>TG maintenance channel. Channel 13 used as default.</td></tr>
<tr><td>TTP cc</td><td>1216</td><td>28-30</td><td>Trunk Test Position (TG test panel member number).</td></tr>
<tr><td>TXT a</td><td>1216</td><td>41-42</td><td>a = Transmission Type.</td></tr>
<tr><td>PRECUT</td><td>1216</td><td>40</td><td>Precut bridging during cutover.</td></tr>
<tr><td>NPA ddd</td><td>1216</td><td>78-80</td><td>Number Plan Area (keyword NPA entered only if 18 appears in columns 65-66).</td></tr>
<tr><td>CNTRLT n</td><td>1216</td><td>76</td><td>n = 0 for cancel-to control type
= 1 for skip routing control type.</td></tr>
<tr><td>RSPCAT p</td><td>1216</td><td>78</td><td>p = Response Category.</td></tr>
<tr><td>RACH bb</td><td>1216</td><td>73-74</td><td>Recorded Announcement Channel number (keyword RACH only if 03 appears in columns 65-66).</td></tr>
<tr><td>IRI iiii</td><td>1216</td><td>70-73</td><td>Intercept Route Index. Nonoutpulsing route index to recorded announcement frame for overflow.</td></tr>
</table>

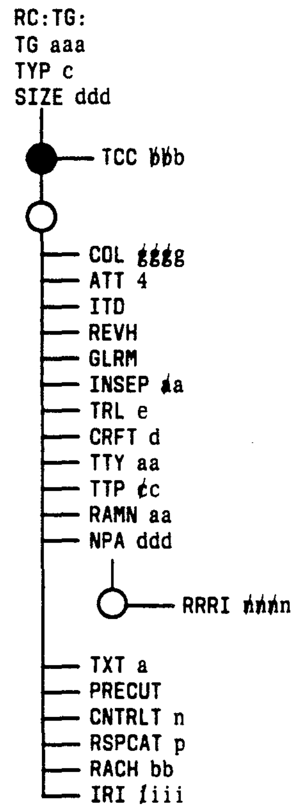


Fig. 18 — RC:TG Message Flowchart

(6) Compare the verification data in the **TR10** output message with the **TR14** output message. Ensure that the TCCs are the same. If not, check the forms for accuracy.

(7) Are there TCC(s) to be changed?

If so, unassign the TNNs that have incorrect TCC(s) per Step (8); then reassign the TNN(s) using the correct TCC(s) per Table G and Fig. 17 (refer to 6.2.8).

(8) Unassign the TNN(s) per Table I. Then verify that each TNN is unassigned by entering:

VF:TNNSVY:S bbcdef,XPND!

bb = TLN (00 through 15)

c = Trunk switch frame or circuit (0 through 7)

d = Grid (0 through 3)

e = Switch (0 through 7)

f = Level (0 through 7).

The **TR14** output message should contain the requested data.

TABLE I

RC:TGMEM;UNASSIGN KEYWORDS

RC MESSAGE	FORM ESS	COLUMN	REMARKS
RC:TGMEM;UNASGN:		—	Message heading
MEM(a̸a̸a,tttttt)%	1229A2	38-40	a̸a̸a = Trunk member number*
	1229A2	29-34	tttttt = TNN

% More than one member from same TG can be unassigned in one message.

* aaa must equal zero if no data in columns 38-40. (No trunk member list exists in TG auxiliary block).

6.2.10 Verify Trunk Circuit at Frame

At the equipment location, verify that the correct trunk circuit is installed by checking the schematic drawing number.

Connect trunk distributing frame jumpers for all TNNs.

6.2.11 Move Trunk Members to Active TG

Move TNN(s) from TG 0 to active TG as follows.

At the terminal:

(1) Construct RC message per Table J.

(2) Enter RC message as constructed in Step (1).

TABLE J

RC:TGMEM;MOVE KEYWORDS

RC MESSAGE	FORM ESS	COLUMN	REMARKS
RC:TGMEM;MOVE:	—	—	Message heading
TOTG r̸r̸r	1229A2	35-37	r̸r̸r = TG number to which trunk members are being moved
MEM (0,tttttt)%	1229A2	38-40	0 = TG member number
	1229A2	29-34	tttttt = TNN

Verify each TNN moved to active TG as follows.

(1) Verify each TNN by entering:

VF:TNNSVY:S bbcdef,XPND!

bb = TLN (00 through 15)

c = Trunk switch frame or circuit (0 through 7)

d = Grid (0 through 3)

e = Switch (0 through 7)

f = Level (0 through 7).

(2) Compare the **TR14** output message with the data on Form ESS 1229. If the **TR14** data is wrong, unassign TNN [refer to 6.2.9(8)] and repeat from Step (1).

(3) Verify the TG data by entering:

VFY-TKGN-14 aaa.

aaa = TG number.

(4) Compare the **TR10** output message data (Fig. 12) with the data obtained from forms.

(5) Does the **TR10** output message contain an auxiliary block address?

If so, proceed as follows.

(a) Enter:

DUMP:CSS,ADR ccccccc,INC -1,L2;BIN!

ccccccc = Auxiliary block address.

(b) Using the **DUMP:CSS** output message, determine whether bits 22-18 of the first word of the auxiliary block are all zeros. If so, convert bits 9-0 of the word before auxiliary block to decimal; subtract 1 from the decimal number to determine the length of the auxiliary block. If bits 22-18 are not all zeros, convert bits 22-18 to decimal to determine the length of the auxiliary block; if this number is greater than 3, continue on to next step.

(c) Enter:

DUMP:CSS,ADR ccccccc,L bbbb;BIN!

ccccccc = Auxiliary block address
bbbb = Length of auxiliary block.

(d) Using the **DUMP:CSS** output message, convert the binary TNNs listed in the auxiliary block to decimal.

Note: List of TNNs begins at word 3 (fourth word of **DUMP:CSS** output).

(e) Verify that the TNNs listed in the auxiliary block agree with those moved to **the** active TG (Form ESS 1229A2).

6.2.12 Verify Trunk Members

At the MTCE terminal, verify member list as follows.

(1) Enter:

TRK-GROUP-LT 0 0 nnnn.

nnnn = TG number.

(2) Verify that the TNNs listed in the **TN15** output message agree with those moved in TG.

6.2.13 Assign RI (Route Index)

At the terminal, assign the RI as follows.

(1) Construct RC message per Table K and Fig. 19.

(2) Enter RC message as constructed in Step (1) and observe the **RC18 3 0 ACPT** response.

6.2.14 Assign RI to Pseudo Route Index

At the terminal, assign RI to pseudo RI for service circuit TG. Proceed as follows.

(1) Construct the RC message below:

RC:RI:
PRI bbb
RI cccc!

bbb = Pseudo RI (Form ESS 1303C, columns 52-54):
= 169 for new ringing circuit (SD-1A621-01)
= 176 for ATI circuit
= 183 for ICLID test circuits
cccc = RI (Form ESS 1303C, columns 20-23).

(2) Enter RC message as constructed in Step (1) and observe the **RC18 3 0 ACPT** response.

(3) Using the MTCE terminal, idle all trunks by entering the following message for each TNN.

T-TNN-MI 00 tttttt.

tttttt = TNN.

Observe the **TN06 tttttt dddd ACT** response (where tttttt = TNN, and dddd = TG number).

(4) Update office records.

Test all trunk members by performing trunk diagnostic tests (refer to Part 8).

TABLE K

RC:RI KEYWORDS

RC MESSAGE	FORM ESS 1303C COLUMNS	REMARKS
RC:RI:	—	Message heading
RI cccc	20-23	cccc = Route index
TG bbb	25-27	bbb = Trunk group number
NRI aaaa	45-48	aaaa = Next route index. For SD-1A621-01, the NRI is a special ringing circuit (SD-1A188). = 2047 when columns = STOP
TCC ggg	—	Trunk class code. Used only if trunk group contains no members. Form ESS 1229A2, columns 41-43
FIXED	20-23	Fixed route index. Required when RI is 199 or less
CST ff	39	ff = LO (Low tone, steady)/HI (high tone, steady)/DL (double burst, low tone)/DH (double burst, high tone) class of service
CRC h	40	h = Coin return code
OPT ii	43-44	ii = Options
TATO u	55	u = 0 (column = 1)/1 (column = 3)/2 (column = 5)/3 (column = 7) for tone and announcement time-out period. Do not use when column = 0
SFMUT	56	Single frequency mutilation flag when column marked

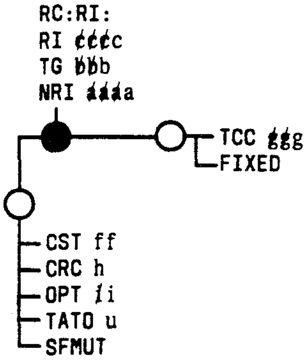


Fig. 19 — RC:RI Message Flowchart

6.3 Assign Traffic and Plant Measurements

Assign traffic and plant measurements and destination codes per AT&T TOP 231-371-001 and AT&T Practice 231-300-015.

7. ISPICM (ISPI CONTROLLER MAINTENANCE)/DIAGNOSTICS

Both automatic and manual diagnostics are available for testing ISPIC's hardware. The results of these tests can be used by maintenance personnel to maintain the performance standards of the circuits.

For active ISPICs, the "heartbeat" test runs continuously in the background if the firmware issue of the ISPIC(s) is as follows: for the ASC — MC6A002-A1, Issue 4 and later; and/or for the ISU — MC6A004-A1, Issue 5 and later. The "heartbeat" test provides a sanity check on the I/O channels. All functional operations of the data links are verified. If a channel is being communicated over, the data link LED (**DL0/DL1**) on the ISPIC is on (or otherwise blink). If such indication is not visible, then there is no communication over the I/O channel. As a result, fault recovery actions can occur in an effort to recover the channel and/or re-establish communication with an ISPIC. To restore an I/O channel, refer to AT&T Practice 231-302-305.

The firmware in the ISPICs can reject requests from ISPI clients (LASS, MSS, etc.) for various reasons. The reason(s) for the rejection are printed in the **ISPI ERROR** output message.

Automatic diagnostic requests can originate from the following stimulus:

- Controller power-up
- Controller fuse replacement
- Detection of IOP FDDL (full duplex data link) fault
- Detection of ISPIC hardware fault
- REX (routine exercise)
- ISPI trunk maintenance error analysis.

> *Caution: When an ISPIC is diagnosed or removed from service, the state of the ISPIC is changed to OOS (out of service), and its associated TIs are changed to H&W (high and wet). Calls that are in progress are not lost; however, no new calls are allowed.*

If an automatic controller diagnostic passes, the controller is restored to active service. Whenever an ISPIC is restored to service, its associated TIs are returned to their previous state.

If an automatic controller diagnostic fails, the controller remains OOS and the TIs H&W. In addition, a status message (**ISPI CONT STATUS**) prints, and a major alarm sounds. All OOS ISPICs are identified in the hourly **MA03** output message.

7.1 ISPICM Input Messages

Manual controller maintenance actions are requested at the I/O terminal. Refer to IM-6A001 for details of the "**ISPI-C-**" input message.

7.2 ISPICM Output Messages

Existing output messages, **DR01, DR02,** and **DR04**, report the diagnostic results for ISPICs. Other controller maintenance results are reported by "**ISPI**" output messages. These messages are explained in OM-6A001 and in PR-6A1377. For ISPIC diagnostic raw data analysis, refer to PK-6A1374.

7.3 Replace ISPIC Firmware Circuit Board

To replace an ISPIC firmware circuit board, proceed as follows:

(1) Enter **ISPI-C-STA ALL 0000.**

(2) Verify the ISPI TNN physical assignments; refer to 6.2.4 for procedure.

(3) Toggle the ACI (TM435 board) **ROS/RTS** switch to **ROS** (request OOS).

Response: **OOS** LED flashes (on ACI board)

(4) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady on).

Caution: If at any time it is desired to power down an OOS ASC unit after the installation of TM690 PSM/TM744 EPSM board(s), first lower the locking tab(s) which shuts off the internal circuitry of the TM690 PSM/TM744 EPSM board(s). This ensures the integrity of the data that is loaded into the board(s).

(5) Depress the **OFF** button on the PMC board (TM507).

(6) Remove the old firmware circuit board.

(7) Plug in the new firmware circuit board.

(8) Depress the **ON** button on the PMC board.

(9) Toggle the ACI **ROS/RTS** switch to **RTS** (return to service).

Response: **OOS** LED flashes

(10) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady off).

(11) Perform trunk diagnostics (using **T-TNN-DG** or from TLTP) on one of the ISPI TNNs listed in the **TR13** output message (from Step 2 above) if the ISPIC has assigned/equipped TNNs. Refer to 8.2.1 for trunk diagnostic procedures.

End of Procedure

8. ISPI TRUNK MAINTENANCE/DIAGNOSTICS

Trunk maintenance/diagnostics consist of the following functions:

(a) Removing and restoring ISPI TIs from/to service

(b) Running diagnostic tests on suspected faulty trunk circuits

(c) Routine testing of all trunk circuits via APT (automatic progression testing)

(d) Verifying (manually) the trunk circuits from the trunk test positions.

Whenever a call processing call that involves an ISPIC fails, the associated TNN is placed on the TML. All such trunks are identified in the **ISPI ERROR** output message.

8.1 Removing and Restoring ISPI TIs

When an ISPIC is taken out of service, the associated ISPI TIs are placed H&W (high and wet). These trunks will remain H&W until the controller is returned to service. Afterwards, the trunks are restored to their previous states.

8.1.1 Determine Status of ISPI TIs

To determine the status of ISPI TIs, perform Step (a) or Step (b).

(a) For a single trunk, enter the following message and observe the **TN07** output response.

T-TNN-RS 0 0 tttttt.

tttttt = TNN.

(b) For a trunk group, enter the following message and observe **TN15** output response.

TRK-GROUP-LT 0 0 dddd.

dddd = Trunk group number.

8.1.2 Removing ISPI TIs from Service

ISPI TI circuits can be physically removed from service without powering down the associated ISPIC. This may be accomplished by performing Step (a) or Step (b).

(a) From the trunk test panel, access the TNN, operate the **MAKE BUSY** key (or equivalent), and then release the **TRUNK** key (or equivalent). For details, refer to the appropriate AT&T practice listed in the next to the last paragraph in 8.2.1.

(b) At the MTCE terminal, enter the following message and observe the **TN06** or **TN05** output response.

T-TNN-LO 0 0 aaaaaa.

aaaaaa = TNN.

If ISPI TI circuits are physically removed from the ISPIC, they must be logically unassigned in translations as well. If not unassigned in translations, the ISPIC diagnostic will be CATP until the logical and physical trunk assignments match. This may be accomplished by performing Step (c) or Step (d).

(c) Zero the unit-type-27 auxiliary block word associated with the TNN (slot). Remember the TNN for when it is later physically equipped.

(d) Use the following RC message to unequip trunk(s).

RC:TRK;OUT:
TNN aaaaaa!

aaaaaa = TNN.

Note: As result of this message, the TNN is removed from the unit-type-27 auxiliary block.

8.1.3 Restoring Trunks to Service

Trunks may be restored to service by performing Step (a) or Step (b).

(a) If testing at the trunk test panel, release all necessary test keys, and operate the **RMV BUSY/REMOVE BUSY** key (or equivalent) for each trunk. For details, refer to the appropriate AT&T practice listed in the next to the last paragraph in 8.2.1.

(b) If testing at the MTCE terminal, enter the following message for each TNN, and observe the **TN06** or **TN05** output response.

T-TNN-MA 0 0 aaaaaa.

aaaaaa = TNN.

8.2 Diagnostic Tests

8.2.1 Existing Operational Trunk Tests

Several existing operational trunk test procedures can be used to test certain functions of the ISPI TI or ICLID test circuit from the trunk test panels (or via input messages). The functions that can be tested are given below.

Note 1: The trunk diagnostic fails if the ISPIC has not been pumped via the ISPIC diagnostic since the trunk assignment and physical equipage.

The **2-digit diagnostic test codes** are as follows.

(a) The following test codes may be used to test a single trunk or TG (see Note 2):

- 00 — Normal diagnostic for specified trunk (without raw data)
- 20 — Repeat normal diagnostic 32 times on specified trunk (without raw data)
- 40 — Normal diagnostic with raw data
- 60 — Repeat normal diagnostic 32 times with raw data.

Note 2: If a TG diagnostic is requested, all failing trunks, up to the AML, are taken out of service.

(b) The test codes listed below are used only for TGs (see Note 2):

- 06 — Normal diagnostic for specified trunk (without raw data). All failing trunks are removed from service
- 26 — Repeat normal diagnostic 32 times on specified trunk (without raw data). All failing trunks are removed from service
- 46 — Normal diagnostic with raw data. All failing trunks are removed from service
- 66 — Repeat normal diagnostic 32 times with raw data. All failing trunks are removed from service.

The following test code is used ONLY for a single trunk: 0 — (**Abort repeat test** on trunk).

Existing **4-digit diagnostic test codes** can be used to operate or release signal distributor points associated with the trunk under test. The same is true for central pulse distributor points.

The above tests may be requested by performing Step (1) or Step (2).

(1) If testing at the trunk test panel, operate **test** key, dial 6-digit TNN or 3-digit TG number, then dial *cc and # where "cc" is the test code (above). For details, refer to the appropriate AT&T practice listed in the next to the last paragraph in 8.2.1.

(2) If testing at the MTCE terminal, enter one of the following:

Note 3: In order to perform trunk diagnostics via input messages, the controller(s) must be in the active state.

(a) **T-TNN-aa 0 0 tttttt.**

(b) **TRK-GROUP-aa 0 0 dddd.**

(c) **TRK-LIST-fff.**

aa = DG — Diagnose trunk (without a raw data printout)
= DR — Diagnose trunk and print diagnostic raw data if a failure occurs (Not used in **TRK-GROUP** message). Refer to PK-1A045.
tttttt = TNN
dddd = TG number
fff = SOS — Diagnose all service circuits on the out-of-service list.

In response to the above input, the system response should be the **TN05, TN15, TN10, TN01,** or **TL01** output message. Refer to OM-6A001 for interpretation of response.

For details on the above test panel procedures, refer to AT&T TOP 231-050-009 (TLTP), 231-050-008 (STTP), 231-050-007 (MTTP), or AT&T Practice 190-104-302 and AT&T Document OPA-1P036-01, Section 2 (CTTU/RTTU).

Diagnostics can also be run at scheduled time intervals (APT). If a trunk circuit fails the diagnostic, the circuit is immediately retested. A second failure results in the circuit being removed from service — provided that the AML for the TG is not exceeded. The AML for ISPI TGs can be as large as 25 percent of the trunks in a small TG or as small as 12 percent for a large TG.

8.2.2 Diagnostics for Announcement(s)

The following (five-digit) test codes request that a specific announcement phrase or sequence of announcement phrases be played over the ISPI TI associated with an ASC. These tests provide manual verification of the contents as well as the quality of the recorded announcement phrases. The procedure for requesting the announcement phrase(s) is as follows.

(a) At the trunk test panel, dial 6-digit TNN, then dial *nmmmm and #.

where n = 2 — Request repetition of the announcement phrase specified by "mmmm"

= 3 — Request a sequence of announcement phrases starting at "mmmm"

mmmm = Announcement phrase number to be played (0 through 9999).

For details on the above test panel procedures, refer to AT&T TOP 231-050-009 (TLTP), 231-050-008 (STTP), 231-050-007 (MTTP), or AT&T Practice 190-104-302 and AT&T Document OPA-1P036-01, Section 2 (CTTU/RTTU).

(b) Repeat procedure for other trunks to be tested.

8.3 Analyze Diagnostic Results for ISPI TIs

Refer to PK-1A045 for raw data analysis.

9. CUSTOM ANNOUNCEMENTS FOR THE ASC

All custom announcements were originally supplied on a unique-micro-coded TM432 SSM board, a customized circuit pack. This method is currently available only to those offices with assigned custom announcement micro-codes, and only for those custom announcements previously defined. Such customized announcements are provided at an additional expense. Contact your AT&T account representative for details.

All new, and any modified, custom announcements can only be supplied via the methods described below.

9.1 Adding New or Modifying Existing Custom Announcements

Customized announcements are provided by loading such data from either an audio cassette tape or from a PROM card into a PSM (programmable speech memory) board on the ASC. To accomplish this, the ASC must be equipped with the TM690 PSM and/or the TM744 EPSM (expanded PSM) board(s). These generic boards are used for storing custom announcement data. Customized data supplied on cassette tape are loaded into the TM690 PSM board; in contrast, data supplied on a PROM card are loaded into the TM744 EPSM board. After the PSM board is plugged into the ASC unit, it may be programmed (or loaded) from the tape(s) or the PROM card containing the desired digitally recorded speech segments as described in 9.2.1 or 9.2.2, respectively.

Your office must identify and supply information for each announcement segment to be changed. The custom announcements are recorded and placed on either cassette tape(s) or a PROM card by AT&T in a digital format with embedded protocol used by the PSM board(s) to control the data transfer. The digitized announcement data also contains segment identifiers which are accessible by the generic program.

The service listing and hardware specifications for this feature are defined in the ED6A038-11 drawing. For further ordering information, contact your AT&T account representative.

9.2 Loading Custom Announcement Data

PSM boards may be loaded by each individual office, or they may be loaded at a central location and distributed to the appropriate offices. It is the responsibility of the office to keep records of the announcements loaded in each PSM or EPSM board. It is also suggested that each board be labeled accordingly — with either the tape identifier or the PROM card identifier.

It is recommended that the spare PSM and EPSM board(s) be stored in either the ASC warm spare slots (EQL 040 or 048) or in any unused active slot. If warm spare slots are to be used, two pair of tracks must be installed in each slot. Tracks from the "terminal field" area can be moved to the warm spare slot(s); or otherwise, new tracks need to be installed. It is more advantageous to store spare PSM and EPSM boards in the active slots (EQL 016, 024, or 032) because these slots are diagnosed during the ISPI REX (routine exercise).

Note: If the ASC is equipped with two PSM boards in active slots that have the same announcement segments, the board farthest to the right is used.

Proceed to 9.2.1 to load the TM690 PSM board(s), or 9.2.2 to load the TM744 EPSM board(s).

9.2.1 Load TM690 PSM Board(s)

The following apparatus is required for loading the TM690 board(s):

- Up to three (3) TM690 PSM boards per ASC unit (supplied with order)
- Any consumer-quality 1/8 inch format audio cassette tape player with earphone jack (not provided)
- Standard audio cassette tape(s). One tape is supplied (with the order) for each 100 spoken words of data. Any desired duplicate tapes should be indicated on the original order; or tapes may be duplicated by your office.
- One patch cable with male connectors on each end (not provided)
- (Optional) Two pair of tracks per warm spare slot (not provided)
- Circuit pack string tags (not provided).

Proceed as follows:

(1) Toggle the ACI (TM435 board) **ROS/RTS** switch to **ROS** (request OOS).

Response: **OOS** LED flashes (on ACI board)

(2) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady-on).

(3) Depress the **OFF** button on the PMC board (TM507).

(4) Connect the battery of the PSM board to be loaded by moving the plug located at position **X3** to the **B-IN** position.

Note 1: The TM690 PSM board is equipped with a back-up battery which retains data in memory for several months. The battery is shipped disconnected: the plug located at position **X3** in the **B-OUT** position.

(5) Plug the PSM circuit board into EQL 016, 024, or 032 on the ASC unit.

(6) Depress the **ON** button on the PMC board.

(7) Place the ASC in the loopback state to prevent automatic restoral; enter:

ISPI-C-LBS bbb 0000.

bbb = ISPIC member number (000 - 063).

(8) Insert the tape into the tape player; move the volume control to its maximum position; and if provided, move the tone control to its most treble position.

Note 2: The loading process ***must*** start from the beginning of side A of the tape. Rewind if necessary.

(9) Connect one end of the patch cable to the earphone output jack of the tape player and the other end to the faceplate jack of the PSM board.

(10) Open and then close the locking tab on the PSM board.

Response: The PSM board goes into its diagnostic mode to determine the integrity of the internal circuitry. Upon passing this test, the **XMIP** LED blinks twice (ready for data to be loaded).

(11) Press the play button on the tape player.

Response: Once data is detected by the PSM board, the **XMIP** LED lights momentarily and then blinks once a second to indicate that data transmission is progressing successfully.

The amount of time required by the loading process is directly related to the number of words on the tape. It takes approximately 1 hour to load 100 words. If the **READY** LED lights within 15 seconds after the **XMIP** LED goes out, then the loading process is completed. If (a) the **READY** LED does not light, (b) the **ERROR** LED flashes once per minute, and (c) the entire side of the tape has played; then more data remains on the other side of the tape. At times during the loading process, the **ERROR** LED can flash once per minute. In this case, allow the tape to play to the end of the current side; turn the tape over; re-insert the tape into the tape player, and play side B. On multiple tape loads, upon completion of side B, insert and play side A of the next tape.

If an error is encountered during the loading process, the **ERROR** LED flashes an error code (refer to CPS TM690 for explanation). In this case, remove the cable from the faceplate jack on the PSM board, and then wait for the **ERROR** LED to stop flashing before attempting the load again. Continual loading errors are usually a result of an improper setup of the tape recorder or a defective tape. If necessary, contact AT&T for assistance.

(12) Remove the cable connection from the PSM board faceplate jack.

(13) Label (uniquely) the PSM board according to local practices.

(14) Will this PSM board be used as a warm spare?

If **YES**, continue with Step 15.

If **NO**, then proceed to Step 17.

(15) Install tracks for the warm spare slot(s) in EQL 040 and/or 048.

(16) Remove the spare PSM board just loaded from EQL 016, 024, or 032. Re-insert the spare board into a warm spare slot, then continue with Step 18.

(17) Will this PSM board be used as an active spare?

If **YES**, repeat Steps 3 through 13 for the active PSM board (board used by ISPI).

If **NO**, continue with Step 18.

(18) When loading of all PSM boards is completed, remove the ASC from the loopback state by entering:

ISPI-C-LBR bbb 0000.

bbb = ISPIC member number (000 - 063).

(19) Toggle the ACI **ROS/RTS** switch to **RTS** (return to service).

Response: **OOS** LED flashes

(20) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady off).

(21) Verify the new announcements and a representative sample of other announcements; refer to 8.2.2 for details.

Caution: If at any time it is desired to power down an OOS ASC unit after installation of the PSM board(s), first lower the locking tab(s) which shuts off the internal circuitry of the PSM board(s). This ensures the integrity of the data that is loaded into the board(s).

End of Procedure

9.2.2 Load TM744 EPSM Board(s)

The following apparatus is required for loading the TM744 board(s):

- Up to three (3) TM744 EPSM boards per ASC unit (supplied with order)
- One PROM card. Any desired duplicate PROM card should be indicated on the original order.
- (Optional) Two pair of tracks per warm spare slot (not provided).
- Circuit pack string tags (not provided).

Proceed as follows:

(1) Toggle the ACI (TM435 board) **ROS/RTS** switch to **ROS** (request OOS).

Response: **OOS** LED flashes (on ACI board)

(2) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady on).

(3) Depress the **OFF** button on the PMC board (TM507).

(4) Connect the battery of the EPSM board to be loaded by moving the plug located at position **X20** to the **B-IN** position.

Note: The TM744 EPSM board is equipped with a back-up battery which retains data in memory for several months. The battery is shipped disconnected: the plug located at position **X20** in the **B-OUT** position.

(5) Plug the EPSM circuit board into EQL 016, 024, or 032 on the ASC unit.

(6) Depress the **ON** button on the PMC board.

(7) Place the ASC in the loopback state to prevent automatic restoral; enter:

ISPI-C-LBS bbb 0000.

bbb = ISPIC member number (000 - 063).

(8) Insert the PROM card into the faceplate slot on the TM744 board. The card can **only** be inserted in **one way**; if inserted correctly, a **click** is heard.

(9) Open and then close the locking tab on the EPSM board.

Response: If the PROM card is present and the locking tab is toggled, the TM744 EPSM board goes into a diagnostic mode, the PROM card data is loaded, and other tests are run (see Table L). The amount of time required to complete this loading process is constant, 15 minutes.

Response: If the PROM card is *not* present and the locking tab is toggled, only the "test CRC" and "test parity" self-test processes are run, lasting 4 minutes.

TABLE L

TM744 EPSM BOARD

LOAD & SELFTEST PROCESSES FLOWCHART

STEP	STEP NAME	LED STATUS
A	Power on (initialization)	**ERROR** LED on (ERROR TYPE 2)
B	Close lock tab (initialization)	No LEDs on
C	PROM card present?	If NOT, go to "test CRC" (Step H); else, continue
D	Diagnostic	**DIAG** LED blinks
E	Copy PROM card data	**SLFTST & DIAG** LEDs toggle simultaneously after each bank
F	Generate CRC	**DIAG** LED blinks
G	Generate parity	**DIAG** LED blinks
H	Test CRC	**SLFTST** LED on
I	Test parity	**SLFTST** LED blinks
J	In service	**READY** LED on

(10) Is either the **READY** or **ERROR** LED on?

If the green **READY** LED is on, the loading process is complete; continue with Step 11.

If the red **ERROR** LED is on or flashing, there is a loading error; repeat Steps 3 through 9. See error type explanations below:

ERROR TYPE 0: (**ERROR** LED blinks twice/second) CRC failure during selftest.
Probable cause: Battery or PROM card problem.

ERROR TYPE 1: (**ERROR** LED blinks once/second) Diagnostic failure.
Probable cause: EPSM board problem.

ERROR TYPE 2: (**ERROR** LED constantly on) Parity failure.
Probable cause: Battery or EPSM board problem.

Continual loading errors are usually a result of an improper PROM card insertion or a defective PROM card. If necessary, contact AT&T for assistance.

(11) Remove the PROM card from the EPSM board faceplate slot.

(12) Label (uniquely) the EPSM board according to local practices.

(13) Will this EPSM board be used as a warm spare?

If **YES**, continue with Step 14.

If **NO**, then proceed to Step 16.

(14) Install tracks for the warm spare slot(s) in EQL 040 and/or 048.

(15) Remove the spare EPSM board just loaded from EQL 016, 024, or 032. Re-insert the spare board into a warm spare slot, then continue with Step 17.

(16) Will this EPSM board be used as an active spare?

If **YES**, repeat Steps 3 through 12 for the active EPSM board (board used by ISPI).

If **NO**, continue with Step 17.

(17) When loading of all EPSM boards is completed, remove the ASC from the loopback state by entering:

ISPI-C-LBR bbb 0000.

bbb = ISPIC member number (000 - 063).

(18) Toggle the ACI **ROS/RTS** switch to **RTS** (return to service).

Response: **OOS** LED flashes

(19) Wait for ACI **OOS** LED to stop flashing (i.e., **OOS** LED steady off).

(20) Verify the new announcements and a representative sample of other announcements; refer to paragraph 8.2.2 for details.

Caution: If at any time it is desired to power down an OOS ASC unit after installation of the EPSM board(s), first lower the locking tab(s) which shuts off the internal circuitry of the EPSM board(s). This ensures the integrity of the data that is loaded into the board(s).

End of Procedure

10. ISSUING ORGANIZATION

Published by
The AT&T Documentation Management Organization