

FEATURE DOCUMENT
2-WIRE TOLL/TANDEM OPERATION FEATURE
2-WIRE NO. 1 AND NO. 1A ELECTRONIC SWITCHING SYSTEMS

CONTENTS	PAGE	CONTENTS	PAGE
<i>FEATURE DEFINITION AND DESCRIPTION</i>	3	9. PLANNING	11
1. DEFINITION/INTRODUCTION	3	10. HARDWARE	11
2. USER PERSPECTIVE	3	11. DETERMINATION OF QUANTITIES	11
3. SYSTEM PERSPECTIVE	5	12. ASSIGNMENTS AND RECORDS	11
<i>FEATURE ATTRIBUTES</i>	5	13. NEW INSTALLATION AND GROWTH	15
4. APPLICABILITY	5	14. TESTING	15
5. LIMITATIONS AND RESTRICTIONS	5	15. MEASUREMENTS	17
6. COMPATIBILITY AND INTERACTIONS	5	16. CHARGING	17
7. COST FACTORS	11	<i>SUPPLEMENTARY INFORMATION</i>	17
8. AVAILABILITY	11	17. GLOSSARY	17
<i>CONSIDERATIONS FOR INCORPORATION OF FEATURE INTO SYSTEM</i>	11	18. REASONS FOR REISSUE	17
		19. REFERENCES	17

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FIGURES	PAGE
1. Expanded Trunk Class Code Translation Words for Non-CAMA 2-Wire Toll/Tandem Use	6
2. Procedure for Adding the 2-Wire Toll/Tandem Feature	16

TABLES	PAGE
A. Availability of Toll/Tandem Features	12
B. Non-CAMA Trunk Circuits for 2-Wire Toll/Tandem Operation	13
C. Traffic Measurements for Non-CAMA Toll/Tandem Trunk Traffic	18

FEATURE DEFINITION AND DESCRIPTION**1. DEFINITION/INTRODUCTION****DEFINITION**

1.01 The 2-wire toll/tandem feature provides the ESS in a 2-wire switching environment with the ability to serve as a tandem (non-DDD) and toll switching center.

INTRODUCTION

1.02 This feature document provides a general description of the toll/tandem capabilities of 2-wire No. 1 and No. 1A ESS offices. References are made to other documents for most of the detailed information. The intent is to tie together the various 2-wire toll/tandem capabilities in one document.

1.03 The ESS unlike other switching systems (eg, crossbar) can be used for any combination of local, tandem, and toll switching functions. This flexibility makes the ESS particularly desirable for installations in which a relatively small amount of toll switching is to be done along with local switching; because in these instances, there is no need to buy a separate toll switcher.

1.04 The 2-wire ESS also has advantages as a moderate-size, pure toll switcher [eg, it is less expensive than a No. 4A crossbar office with similar capacity and it is capable of providing centralized automatic message accounting (CAMA) more easily].

2. USER PERSPECTIVE**TELEPHONE COMPANY****A. General**

2.01 Various features are needed for performing the toll/tandem functions efficiently. These features are discussed in the following paragraphs.

B. Operator Tandem

2.02 This feature provides the 2-wire No. 1/1A ESS with the ability to recognize dialing patterns and to route traffic from incoming secondary intertoll, intertoll, and DDD access trunks. These dialing patterns include operator codes, test codes,

terminating toll center codes, and all other address information associated with a combined local/toll office. See reference A(2) in Part 19.

C. Toll Operator Signaling and Compatibility With TSPS Residual Traffic (TORT) Feature

2.03 The TORT feature provides the ability to receive and transmit operator control signals such as ringback and ring forward when the No. 1/1A ESS office is acting as a toll office or as a combined local/toll office. If the office interfaces with a Traffic Service Position System (TSPS), certain operator-assisted calls require switchboard handling and are passed to a toll switchboard operator by a TSPS operator. The ability of the No. 1/1A ESS office to receive special signaling (double ring-forward disconnect) from the TSPS switcher is required. See reference B(5) in Part 19 for details of the TORT feature.

D. No Line Link Network (NOLLN) (No. 1 ESS Only)

2.04 This feature is necessary for the No. 1 ESS to function as a toll/tandem machine without having a line link network (LLN). The following functions are affected by the NOLLN feature.

- Network Access to the No-Test Vertical (NTV) Circuit of Junctor Switch Frames: In offices having an LLN, this access is provided via lines. The NOLLN feature provides the capability to perform NTV functions via trunks.
- Manual Trunk Testing From the Trunk and Line Test Panel (TLTP) or the Supplementary Trunk Test Panel (STTP): In offices having an LLN, trunk test requests made from the TLTP or STTP are transmitted to the central control over the master test line. The NOLLN feature provides the capability to transmit these requests over the master test trunk.
- Monitoring the Overall Sanity of the ESS: In offices having an LLN, this monitoring is done by generating line originations and determining whether dial tone is returned. The NOLLN feature, along with the receiver attachment delay report (RADR) feature, provides the capability to perform this function in a NOLLN office. See reference

B(8) in Part 19 for details of the RADR feature.

- Operation of the Remote Office Test Line (ROTL): While the operation of the ROTL does not require an LLN, it does require that the ROTL be assigned a directory number (DN) which may be reached over the DDD network and that the ROTL have access to the DDD network. An office with no LLN, and thus no subscriber lines, may not fulfill both of these requirements. In these applications, three foreign exchange trunks to a nearby class 5 office must be provided. See reference A(1) in Part 19 for details of the NOLLN feature.

E. Through Balance Test Facilities (TBTF) Feature

2.05 This feature provides a machine aid to simplify the balancing of the hybrids in the 4-wire intertoll trunk circuits. See reference B(1) in Part 19.

F. 2048 Junctor Trunk Link Network

2.06 The 2048 junctor trunk link network is a trunk switching network which terminates 2048 junctors. It provides an increase in both terminal and network traffic capacities, and it is intended for use in large toll/tandem ESS offices. See reference A(1) in Part 19.

G. Fast Repeat of Answer Supervision (FANS) Feature

2.07 The FANS feature reduces the time required to pass answer supervision through an ESS office. This reduces the probability of clipping of the called customer's initial response and reduces the possible distortion of the gateway wink signal on international direct distance dialing (IDDD) calls. See reference B(3) in Part 19.

H. Test Lines

2.08 Various test lines provide test facilities for toll trunks. These test lines are briefly described below.

2.09 The code 100 test line provides a test termination for one-way transmission loss and noise measurements. See reference A(4) in Part 19.

2.10 The code 101 test line feature provides a communication and test line to a testboard or test position which can be reached over any trunks incoming to the switching system served by the test position. See reference A(3) in Part 19.

2.11 The code 102 test line provides a test termination at the far end of a trunk for one-way transmission measurements. See reference A(5) in Part 19.

2.12 The code 103 test line feature provides for overall tests of the supervisory and signaling features of intertoll trunks. See reference A(6) in Part 19.

2.13 The code 104 test line feature provides a termination in an ESS central office for test calls directed to the transmission measuring and noise checking equipment originated from a distant testboard or automatic test circuit. It also transmits either a favorable or an unfavorable noise report to the originating end. See reference A(7) in Part 19.

2.14 The code 105 test line feature provides central office termination for test calls directed to a responder of the Automatic Transmission Measuring System (ATMS). The code 105 test line, in conjunction with an ATMS responder, provides for automatic 2-way loss and noise measurements of telephone trunks and lines requiring transmission testing. In addition to providing central office termination to an ATMS responder, a group of 105 test lines serves as a parking chain for 105-type test calls awaiting connection to the ATMS responder. See reference A(8) in Part 19.

2.15 The code 108 test line (echo suppressor test termination circuit) provides the far end loop-around termination for in-service testing of echo suppressors, and it is to be used in conjunction with the 58-type echo suppressor measuring system. See reference A(9) in Part 19.

I. Automatic Selection of Transmission Test Tone Level (TP02) Feature

2.16 The TP02 feature enables incoming trunks to be connected to the transmission test line (type 100, 102, 104, or 105) supplying a milliwatt test tone at 0 dBm (TP0) or -2 dBm (TP2) at the network terminals of the test line. The TP02

feature is covered in the appropriate (code 101, 102, 104, and 105) test line documents. See references A(3), A(5), A(7), and A(8) in Part 19.

J. Combined Operator Office Trunk (COOT) Feature

2.17 The COOT feature provides a single trunk facility for completion of calls from a toll switchboard to a step-by-step community dial office (CDO), from the CDO to the dial switchboard, and from the No. 1/1A ESS to the CDO. It is intended for use when a No. 1/1A ESS office is arranged for toll operation in conjunction with small step-by-step CDOs in a class 4 toll or local/toll environment. See reference B(9) in Part 19.

K. Centralized Automatic Message Accounting (CAMA) Feature

2.18 The CAMA feature enables the No. 1/1A ESS to provide toll billing for class 5 central offices on an automatic number identification or operator number identification basis. See reference B(8) in Part 19.

L. Network Management Feature

2.19 The network management feature provides the capabilities to improve total network processing by selectively limiting traffic destined for congested offices or areas. The capabilities include:

- (a) Code blocking
- (b) Trunk group controls [manual and automatic via receipt of dynamic overload control (DOC) signals]
- (c) Generation of DOC signals
- (d) Providing an interface for a remote display of office and network discrete indicators.

See references A(10) and B(9) in Part 19.

M. Incoming Trunk Service Observing (ITSO) Feature

2.20 The ITSO feature provides the telephone company the ability to monitor incoming trunk traffic that completes to another trunk or completes to a terminating line. See reference B(12) in Part 19.

3. SYSTEM PERSPECTIVE

SOFTWARE DATA STRUCTURES

A. General

3.01 For details of software data structures for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

B. Trunks

3.02 See Fig. 1 for trunk class code expansions for various non-CAMA toll/tandem trunks. For other trunk translations, see references A(2) and B(8) in Part 19.

HARDWARE

3.03 For details of hardware requirements for the various toll/tandem features, see references A(1) through A(10) and B(1) through B(11) in Part 19.

FEATURE OPERATION

3.04 For details of feature operation for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

FEATURE ATTRIBUTES

4. APPLICABILITY

4.01 The toll/tandem features are provided on a per-central office basis.

5. LIMITATIONS AND RESTRICTIONS

5.01 For details of limitations and restrictions for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

6. COMPATIBILITY AND INTERACTIONS

6.01 For details of compatibility and interactions for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

SECTION 231-090-372

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
*	0	CONF	0	0	SDS	WDD	FE	BAT	*3	COMP	*1	OP	*2	SUPV = 1	0	TU = 0								
*	0																						0	
*	0																						0	
*	FA	0							0	FR	FT	TGT	PAD = 2	0	CPI = 2									

*1 - TSP/XT *2 - ICT = 1 *3 - SG/FHP

A. OUTGOING TOLL CONNECTING 2-WIRE, RB, WINK OR DELAY DIAL, DP, MF, RP, PCI, TT, OR NO PULSING;
SD1A165-02 OR -05

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0	CONF	0													0	*1	SUPV = 1	0	TU = 1			
*	COFN	HFNOC					NOCTN					0	QDR			SDS	RTG	INPUL					
*	0																						0
*	0							0	FR	FT	TGT	PAD = 2	0	CPI = 4									

*1 - ICT = 1

B. INCOMING TOLL CONNECTING 2-WIRE, RB, WINK OR DELAY DIAL, DP, MF, RP, PCI, TT, OR NO PULSING;
SD1A166-02 OR -05

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
*	0	CONF	0	0	1	1	FE	0	*1	COMP	0	OP	1	SUPV = 3	0	TU = 2								
*	0	HFNOC					NOCTN					0	QDR			SDS = 1	RTG	INPUL = 2						
*	0																						0	
*	FA	0							0	FR	FT	TGT	PAD = 2	0	CPI = 49									

*1 - SG/FHP

C. 2-WAY TOLL CONNECTING 2-WIRE, ESM, WINK, DP; SD1A163-02 OR -05

Fig. 1—Expanded Trunk Class Code Translation Words for Non-CAMA 2-Wire Toll/Tandem Use (Sheet 1 of 6)

SECTION 231-090-372

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0	CONF	*1	0	SDS	WDD	FE	0	*2	COMP	0	OP		1	SUPV = 4				0	TU = 2			
*	COFN	HFNOC				NOCTN				0	QDR		SDS	RTG	INPUL								
*	0																						
*	1	0				0	FR	FT	TGT	PAD = 2	0	CPI = 24											

*1 - SDSTIM *2 - SG/FHP

G. 2-WAY TOLL CONNECTING, 2-WIRE, HI-LO OUT, RB IN, WINK OR DELAY DIAL, MF, DP, TT/DP OR NO PULSING;
SD1A264-01

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0	CONF	0											0	SUPV = 1		0	TU = 1					
*	COFN	0				NOCTN				0	QDR		SDS = 1	RTG	INPUL								
*	0																						
*	0				0	FR	FT	0	PAD = 2	0	CPI = 51												

H. INCOMING TOLL CONNECTING, 2-WIRE, RB, DELAY DIAL, MF, DP, TT/DP OR NO PULSING; SD1A266-02 OR -05

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0	CONF	0	1	SDS	WDD	FE	0	*1	COMP	*2	OP		1	SUPV = 4				*3	TU = 0			
*	0																						
*	0																				*4	WINK	OT
*	0				0	AIC	0	0	0	PAD = 2	OT	CPI = 15											

*1 - SG/FHP *2 - TSP/XT *3 - WORD 3 *4 - INBND

I. OUTGOING TOLL CONNECTING, 2-WIRE, TO CROSSBAR TANDEM OR TSPS NO. 1, HI-LO OUT, RB IN, WINK OR DELAY DIAL, MF OR DP, SD1A203-01 OR -05

Fig. 1.—Expanded Trunk Class Code Translation Words for Non-CAMA 2-Wire Toll/Tandem Use (Sheet 3 of 6)

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0 _____ 0															1	SUPV = 1			0	TU = 1		
*	0 _____ 0															SDS = 2		0	0	INPUL = 1			
*	0 _____ 0																						
*	0 _____ 0															PAD = 2		0	CPI = 38				

J. INCOMING TSPS OPERATOR, 2-WIRE, RB, WINK, MF; SD1A321-01 OR -05

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0	CONF	*1	0	SDS	WDD	0 _____ 0					OP		1	SUPV = 3			*2	TU = 2				
*	COFN	HFNOC				NOCTN				0	QDR			SDS	RTG	INPUL							
*	TONE		0	TTL	0 _____ 0					*3	NT	CR	TS	0 _____ 0		*4	WINK	OT					
*	FA	0 _____ 0					FR	FT	TGT	PAD		OT	CPI = 21										

*1 - SDSTIM

*2 - WORD 3

*3 - ACTO/TTO

*4 - INBND

K. 2-WAY INTERTOLL OR TSPS OPERATOR, 4-WIRE, E&M, WINK OR DELAY DIAL, MF OR NO PULSING, SD1A236-02 OR -05

23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
*	0	CONF	*1	0	SDS	WDD	0	0	*2	COMP	0	OP		1	SUPV = 3			*3	TU = 2				
*	COFN	HFNOC				NOCTN				0	QDR			SDS	RTG	INPUL							
*	TONE		0 _____ 0					*4	NT	CR	TS	0 _____ 0		*5	WINK	OT							
*	FA	0 _____ 0					AIC	FR	FT	TGT	PAD		OT	CPI = 22									

*1 - SDSTIM

*2 - SG/FHP

*3 - WORD 3

*4 - ACTO/TTO

*5 - INBND

L. 2-WAY INTERTOLL 4-WIRE, E&M, WINK OR DELAY DIAL, DP OR NO PULSING, SD1A237-02 OR -05

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

Fig. 1—Expanded Trunk Class Code Translation Words for Non-CAMA 2-Wire Toll/Tandem Use (Sheet 4 of 6)

LEGEND (CONTINUED):

- ESM, OR 4 FOR HI-LO REVERSE BATTERY.
 TONE - TONE, 0 FOR NONE, 1 FOR STEADY, 2 FOR INTERRUPTED, 3 FOR ANNOUNCEMENT OR RECEIVER OFF-HOOK.
 TS - TOLL SWITCH. 1 IF INDICATED.
 TSP/XT - TRAFFIC SERVICE POSITION OR REVERTIVE PULSE TO CROSSBAR, 1 IF INDICATED.
 TTL - CIRCUIT MODIFIED FOR TANDEM TIE LINE. 1 IF INDICATED.
 TU - TRUNK USAGE. 0 FOR OUTGOING, 1 FOR INCOMING OR SERVICE LINK NETWORK, 2 FOR 2-WAY, 3 FOR MISCELLANEOUS.
 WDD - WINK START DIAL VERSUS DELAY DIAL. 1 IF WINK START DIAL, 0 IF DELAY DIAL.
 WINK - WINK FOR INBAND SIGNALING. 1 IF INDICATED.
 WORD3 - WORD 3 IS APPLICABLE, 1 IF INDICATED.

Fig. 1—Expanded Trunk Class Code Translation Words for Non-CAMA 2-Wire Toll/Tandem Use (Sheet 6 of 6)

7. COST FACTORS

7.01 For details of cost factors for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

8. AVAILABILITY

8.01 Table A lists the availability of the various toll/tandem features.

CONSIDERATIONS FOR INCORPORATION OF FEATURE INTO SYSTEM

9. PLANNING

9.01 For detailed information on planning for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

10. HARDWARE**GENERAL**

10.01 For details on hardware requirements for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

TRUNKS

10.02 See Table B for trunk circuits applicable to No. 1/1A ESS 2-wire toll/tandem operations, except CAMA trunks. For CAMA trunking information, see reference B(8) in Part 19. Table B is not intended to be all inclusive, but it is designed to show the types of trunks that are available for No. 1/1A ESS 2-wire toll/tandem operation. For details on trunks, see reference B(11) in Part 19.

11. DETERMINATION OF QUANTITIES

11.01 For details on determination of quantities for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

12. ASSIGNMENTS AND RECORDS**INPUT AND RECORD KEEPING****A. General**

12.01 For details on input and record keeping for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

TABLE A

AVAILABILITY OF TOLL/TANDEM FEATURES

FEATURE	AVAILABILITY	
	NO. 1 ESS	NO. 1A ESS
Operator Tandem	CTX-6 and later	all generic programs
Combined Operator Office Trunks	CTX-7 and later	all generic programs
Toll Operator Signaling and Compatibility with Residual TSPS Traffic	CTX-7 and later	all generic programs
No Line Link Network	CTX-7 and later	not offered
Through Balance Test Facilities	CTX-7 and later	all generic programs
2048 Junctor Trunk Link Network	CTX-7 and later	all generic programs
Fast Repeat of Answer Supervision	CTX-8, Issue 2 and later	1AE4 and later
Code 100 Test Line	CTX-4 and later	all generic programs
Code 101 Test Line	all active generic programs	all generic programs
Code 102 Test Line	all active generic programs	all generic programs
Code 103 Test Line	CTX-7 and later	all generic programs
Code 104 Test Line	CTX-7 and later	all generic programs
Code 105 Test Line	CTX-4 and later	all generic programs
Code 108 Test Line	CTX-7 and later	all generic programs
Automatic Selection of Transmission Test Tone Level	CTX-7 and later	all generic programs
CAMA	CTX-6 and later	all generic programs
Network Management	CTX-6 and later	all generic programs
Incoming Trunk Service Observing	1E5 and later	1AE5 and later

TABLE B

NON-CAMA TRUNK CIRCUITS FOR 2-WIRE

SD NUMBER		USE	SUPERVISION	ORDER CODE(S)	
REGULAR	REDUCED SIZE			REGULAR	REDUCED SIZE
1A236-02	1A236-05	2-Way Intertoll or TSPS Operator 4-Wire, MF Signaling	E&M	021T5 021T6	021T7 021T8
1A237-02	1A237-05	2-Way Intertoll 4-Wire, DP Signaling	E&M	022T7 022T8	022T0 022T1
1A165-02	1A165-05	Outgoing Toll Connecting 2-Wire	RB	00205	00206
1A166-02	1A166-05	Incoming Toll Connecting 2-Wire	RB	00405	00406
1A163-02	1A163-05	2-Way Toll Connecting 2-Wire	E&M	04905 04907*	04909
1A220-01	1A220-05	Incoming Bylink Toll Connecting 2-Wire	RB	0031C 0039C	00303 00304
1A252-01	1A252-05	2-Way Toll Connecting 2-Wire	E&M	00700	00702
1A264-01	—	2-Way Toll Connecting 2-Wire	HI-LO OUT, RB IN	02400	—
1A266-02	1A266-05	Incoming Toll Connecting 2-Wire	RB	05100	02500
1A203-01	1A203-05	Outgoing Toll Connecting 2-Wire to XBAR Tandem or TSPS No. 1	RB	01541	01503
1A321-01	1A321-05	Incoming TSPS Operator 2-Wire	RB	03800	03801

* Order Code 4907 is for combined operator-office service to a step-by-step community dial c trunk circuit. See reference B(3) in Part 19.

TOLL/TANDEM OPERATION

J-SPEC. NUMBER		TRUNK FRAME		NUMBER OF CIRCUITS PER UNIT	POINTS PER CIRCUIT	
REGULAR	REDUCED SIZE	REGULAR	REDUCED SIZE		SCAN	SIGNAL DISTRIBUTION
1A033CB2	1A088CB	M	CMT	1	4	5
1A033CC3	1A088CC	M	CMT	1	4	5
1A032BB	1A084BB	U	MUT	2	2	3
1A032AB	1A084AB	U	MUT	2	2	3
1A033CA	1A088CA	M	CMT	1	5	5
1A033AB	J1A088AB	M	MUT	1	3	2
1A032CC	1A084CC	U	MUT	1	3	4
1A033CG	—	M	—	1	2	4
1A032AE	1A084AE	U	MUT	1	2	3
1A032BF	1A084BF	U	MUT	1	3	4
1A033AE	1A088AE	M	MUT	1	2	3

office. There is no reduced size version of the combined office-operator version of this

B. Trunks**Translation Forms**

12.02 The following translation forms, found in TG-1A, are used for toll/tandem trunks (non-CAMA):

- (1) ESS 1200—Universal Trunk Frame Record:
This form relates on a frame basis the universal trunk equipment location to the corresponding trunk network appearances and the universal trunks assigned to these equipment locations.
- (2) ESS 1201A/B—Miscellaneous Trunk Frame Record: This form relates equipment location on a frame basis with the trunk network number trunk group, trunk number, trunk class code, CPD points, service link network, and Automatic Identified Outward Dialing (AIOD) index. It also records signal distributor points, scan points, common distributor points, and interrupter points.
- (3) ESS 1219A1/2—Combined Miscellaneous Trunk Frame Record: This form is used to record the same information for miniaturized universal trunks as is recorded on the ESS 1201A/B form for regular universal trunks.
- (4) ESS 1202—Trunk Group Record: This form is used to furnish trunk network number to trunk group and trunk member number translations for all trunks.
- (5) ESS 1204—Trunk Class Code Record: This form associates the trunk class code with the trunk class code expansion.
- (6) ESS 1204A—Trunk Class Code Inventory: This form is used as an inventory of the trunk class codes arranged for an ESS office.
- (7) ESS 1204B—Trunk Class Code Sharing:
With CTX-7 and later generic programs (No. 1 ESS) and all generic programs for No. 1A ESS, the use of multiple trunk order codes for a given trunk class code is permitted. The ability to mix trunk order codes allows miniaturized and nonminiaturized trunk circuits to be assigned to the same trunk group. Only one trunk class code can be assigned to a trunk group. This form is used to record this trunk order code sharing.

- (8) ESS 1208A/B—Trunk Screening Group Record: This form provides for screening of trunks.
- (9) ESS 1209A—Trunk Group Tandem Record: This form associates the trunk group number, chart column, and tandem table number for tandem trunk groups.
- (10) ESS 1209B—Tandem Table Record: This form provides information for the tandem translator.
- (11) ESS 1216A & B—Trunk Group Supplementary Record: This form provides information for a supplementary trunk group number translator primarily used for maintenance items.

12.03 For information about translation forms used for CAMA trunks, see reference B(8) in Part 19.

UNIFORM SERVICE ORDER CODES

12.04 Not applicable.

13. NEW INSTALLATION AND GROWTH

13.01 Figure 2 is a flow chart of the procedure for adding the 2-wire toll/tandem feature.

14. TESTING**A. General**

14.01 For details on testing for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

B. Trunks

14.02 TTY input and output messages, found in IM-1A001 and OM-1A001 (No. 1 ESS) or in IM-6A001 and OM-6A001 (No. 1A ESS), can be used to verify trunk translations for the 2-wire toll/tandem feature. The procedure is as follows.

- (a) Use the VFY-TKGN message to verify the trunk group number translations. System response is a TR10 message.
- (b) Use the VFY-TNN message to verify the trunk network number translations. System response is a TR14 message.

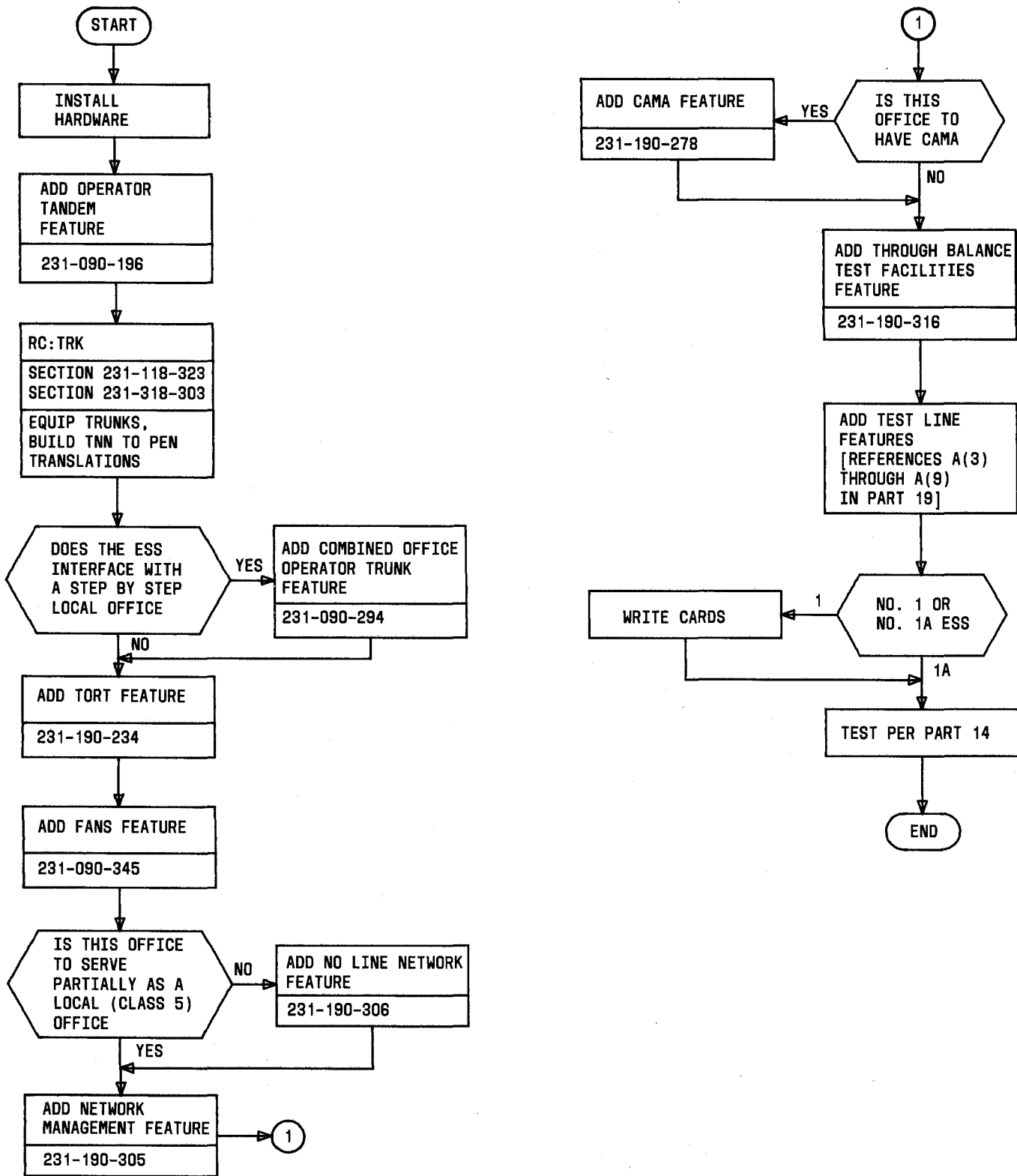


Fig. 2—Procedure for Adding the 2-Wire Toll/Tandem Feature

(c) Use the TAG-TNN-PEN message to verify the trunk network number to peripheral equipment number translations. System response is a TR21 message.

(d) Use the TAG-TNN-TCL message to verify the trunk class code expansion. System response is a TR21 message.

(e) Use the VFY-UTCN message to verify the trunk circuit number translations. System response is a TR11 message.

(f) Use the VFY-MSN message to verify the master scanner number translations. System response is a TR12 message.

(g) Use the VFY-OFFC message to verify 3-digit codes, 6-digit codes, or all office codes from 200 to 999. System response is a TR04 message.

(h) Use the VFY-EXP message to verify a route index translation. System response is a TR05 message.

(i) Use the V-TOLLRT message to verify toll routes. System response is a TR38 message.

15. MEASUREMENTS

A. General

15.01 For details on measurements for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

B. Toll/Tandem Trunk

15.02 Traffic measurements for non-CAMA toll/tandem trunk traffic are shown in Table C.

16. CHARGING

16.01 For details on charging for the various toll/tandem features, see references A(2) through A(10) and B(1) through B(9) in Part 19.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 Not applicable.

18. REASONS FOR REISSUE

18.01 Not applicable.

19. REFERENCES

A. Bell System Practices

(1) Section 231-030-010—Remreed Switching Network Description—No. 1 and No. 1A Electronic Switching Systems

(2) Section 231-090-196—Operator Tandem Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(3) Section 231-090-100—Feature Document—Code 101 Test Line Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(4) Section 231-090-098—Feature Document—Code 100 Test Line Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(5) Section 231-090-101—Feature Document—Code 102 Test Line Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(6) Section 231-090-094—Feature Document—Code 103 Test Line and Synchronous Test Line Features—2-Wire No. 1 and No. 1A Electronic Switching Systems (when published)

(7) Section 231-090-342—Feature Document—Code 104 Test Line Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems (when published)

(8) Section 231-090-099—Feature Document—Code 105 Test Line Feature—2-Wire No.1 and No. 1A Electronic Switching Systems

(9) Section 231-090-404—Feature Document—Code 108 Test Line Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems

(10) Section 231-190-305—Feature Document—Network Management Feature—2-Wire No. 1 Electronic Switching System

(11) Section 231-318-303—Trunk Translation RC Procedures for TG, TGBVT, TRK, CFTRK, TGMEM, and CCIS (Through 1AE5 Generic

TABLE C

TRAFFIC MEASUREMENTS FOR NON-CAMA TOLL/TANDEM
TRUNK TRAFFIC

MEASUREMENT CODE	OFFICE COUNT	DESCRIPTION
05	034	<u>Trunk-to-Trunk Path Memory Peg Count</u> : counts the number of times a trunk-to-trunk path memory register is seized.
05	035	<u>Trunk-to-Trunk Path Memory Overflow</u> : counts the number of times the system attempts to seize a trunk-to-trunk path memory register but fails due to all registers being busy.
05	131	<p><u>Tandem Call Attempts Peg Count</u>: counts the total attempts to switch the following calls through the control group:</p> <ul style="list-style-type: none"> — Calls over incoming trunk groups designated (in translations) to carry only tandem traffic and are routed out of the office via three six-digit translations. — With the CTX-6, G1, and later Generic Program, DDD access from a class 5 office and intertoll incoming calls, requiring outpulsing, will be included in this count. <p>Excludes CTX, CCSA, CAMA, operator tandem and calls over trunks that have screening LENSs. To score this register, the trunk groups must appear on the Tandem Table Record, ESS 1209B Form.</p>
05	132	<u>Tandem Call Attempts Overflow</u> : counts the failures on tandem call attempts due to network, trunk, or service circuit blockage. For CTX-7, G1, and later Generic Programs, counts the final failures to find a network path to service circuits or trunks on tandem call attempts.
05	202	<u>Tandem First Failure to Match (TFFM) Peg Count</u> : counts the number of failures to reserve a talking path between the incoming tandem trunk and the initially selected outgoing trunk (or tone or announcement circuit in the event the desired outgoing trunk group is busy). Available with CTX-7, G1, and later Generic Programs.
05	208	<u>Tandem Calls Failure Due to OGT Busy Peg Count</u> : counts the tandem calls that block due to an all outgoing trunks busy condition. Available with CTX-7, G1, and later Generic Programs.
00	—	<u>Trunk or Service Circuit Group Usage</u> : measures usage on each trunk or service circuit group.
01	—	<u>One-Way Outgoing, One-Way Incoming Trunks, or Service Circuit Groups Peg Count</u> : counts the attempts to seize an outgoing trunk or service circuit, or the actual seizure of an incoming trunk. Includes OVFL scores.
02	—	<u>Trunk or Service Circuit Group Overflow</u> : scores when an attempt to seize a trunk or service circuit fails and is routed to another trunk or tone group.

TABLE C (Contd)

TRAFFIC MEASUREMENTS FOR NON-CAMA TOLL/TANDEM TRUNK TRAFFIC

MEASUREMENT CODE	OFFICE COUNT	DESCRIPTION
03	—	<u>2-Way Trunk Group — Incoming Peg Count</u> : counts the incoming seizures of a 2-way trunk group.
04	—	<u>2-Way Trunk Group — Outgoing Peg Count</u> : counts the attempts to seize a 2-way trunk group on an outgoing basis.
06	—	<u>Trunk or Service Circuit Maintenance Usage</u> : measures the maintenance usage of trunk or service circuit groups. Do <u>not</u> assign fast scan.
23	—	<u>Tandem Trunk Group Peg Count</u> : counts outgoing through-switched or incoming through-switched calls.

Program)—2-Wire and HILO 4-Wire No. 1A Electronic Switching System

(12) Section 231-118-323—Trunk Translation Recent Change Procedures for TG, TGBVT, TRK, CFTRK, and TGMEM (CTX-6 through 1E4 Generic Programs)—2-Wire and HILO 4-Wire No. 1 Electronic Switching System

(13) Section 231-130-120—Manual Trunk Test Circuit and Auxiliary Manual Test Circuit—General Description—2-Wire and HILO 4-Wire No. 1 Electronic Switching Systems

(14) Section 231-130-320—Manual Trunk Test Position and Auxiliary Manual Test Position—Method of Operation—2-Wire and HILO 4-Wire No. 1 Electronic Switching Systems.

B. Other References

(1) GL 75-12-090 (EL 5061)—Through Balance Test Facilities (TBTF) Feature—FD 231-190-316—2-Wire No. 1 Electronic Switching System

(2) GL 76-08-098 (EL 4837)—Fast Repeat of Answer Supervision Feature—FD 231-090-345—2-Wire Answer Supervision Feature—FD 231-090-305—2-Wire No. 1 and No. 1A Electronic Switching Systems

(3) GL 76-03-060—Combined Office Operator Trunk Feature—FD 231-090-294—2-Wire No. 1 and No. 1A Electronic Switching Systems

(4) GL 75-12-099—Toll Operator Signaling and Compatibility With TSPS Residual Traffic (TORT) Feature—FD 231-190-234—2-Wire No. 1 Electronic Switching System

(5) GL 74-03-012 (EL 3125)—2048 Junctor Trunk Link Network Feature (2048 TLN)—FD 231-190-237—2-Wire No. 1 Electronic Switching System

(6) GL 75-01-026 (EL 3755)—No Line Link Network Feature—FD 231-190-306—2-Wire No.1 Electronic Switching System

(7) GL 75-10-193—Receiver Attachment Delay Report (RADR) Feature—FD 231-190-309—2-Wire No.1 Electronic Switching System

(8) GL 75-01-013 (EL 3762)—Centralized Automatic Message Accounting (CAMA) Feature—FD 231-190-278—2-Wire No. 1 Electronic Switching System

(9) GL 74-03-062 (EL 3131)—Network Management Feature (Phase II)—FD 231-190-305, Issue 1A—2-Wire No. 1 Electronic Switching System

(10) GL 73-03-129 (EL 2461)—No. 1 ESS—2-Wire Toll Operation With Centrex 7 Generic Program; Engineering Information

(11) J1A063-1 Trunk and Service Circuit Engineering Specification

(12) FD 231-090-410—Incoming Trunk Service Observing Feature—2-Wire No. 1 and

SECTION 231-090-372

No. 1A Electronic Switching Systems (when published)

(13) FD 231-090-409—Multifrequency signaling on Bylink Trunks (BYMF) Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems (when published)

(14) GL 77-12-019—HILO 4-Wire Switching Feature—FD 231-090-366—2-Wire No. 1 and No. 1A Electronic Switching Systems

(15) FD 231-090-416—Toll Common Channel Interoffice Signaling Feature—2-Wire No. 1 and No. 1A Electronic Switching Systems (when published).