

**CHANGES WORK UNITS  
CENTRAL OFFICE — FORM E-4420  
(CLASS 5 OFFICES, Etc.)**

**1. GENERAL**

1.101 This section covers a description of the method of counting and reporting central office change items, using Form E-4420, for the purpose of developing work units for the following offices:

- (a) All Class 5 offices.
- (b) Local tandem offices. (Switches trunks between Class 5 offices only.)
- (c) Offices where a single machine (such as a #5 Crossbar Machine) performs the functions of two or more classes, one of which is Class 5.
- (d) Offices where a single force maintains a Class 5 or local tandem office plus an office or offices of higher classification.

*Note:* Refer to Switching Plan in Section 010-510-100 for definitions of office classes.

1.102 This section is reissued to renumber it in the Plant Series, to include centrex trunks in counts of main station and PBX trunks, and to allow work unit credit for toll restriction changes in centrex units. Forms E-4420 (5-64) and E-4907 (5-64) have been revised to refer to the new Plant Series number. The revised forms will not be available until present stock of Forms E-4420 (1-63) and E-4907 (1-62) are exhausted.

1.103 The Form E-4420 consists of five sections, identical except for work unit factors.

- (1) E-4420-A Manual (17M)
- (2) E-4420-B Panel (27M)
- (3) E-4420-C S x S (37M)
- (4) E-4420-D #1 X-Bar (47M)
- (5) E-4420-E #5 X-Bar (47M) (Incl. Local X-Bar Tandem)

1.104 The item counts will, in general, be derived from data currently assembled for the Installation Cost Results Plan, Forms E-4432, E-4437 and E-4438 (or their source data). However, some separate counts will be necessary as follows:

- (1) Trunk (interoffice), private line, etc.
- (2) Denials — suspensions and restorals will utilize "lists" of such activity in addition to data obtained from Form E-4432.
- (3) Tie cable adjustment will require the count of cable pairs terminated on the M.D.F., by subaccounts, both tie cables and O.S.P.
- (4) Main stations, centrex trunks and PBX trunks in service.
- (5) Station In Number Change — In and Out.
- (6) Intercept (Operator to Machine).
- (7) Toll restriction (centrex units).

**All item counts must be derived in the manner and from source materials specified in this section.**

The territory covered by a particular Form E-4420 will correspond to the geographical area covered by the basic report unit for the Installation Cost Results Plan.

1.105 In order to minimize the clerical effort required to count items, a system of prorating, to subaccounts, has been developed. The basis of the prorate requires "Main Station-In" activity, in detail by subaccount. The data are available from Station Statistical Records, by central office codes, as accumulated for billing purposes. Form E-4907 has been provided for use in recording "Main Station-In" data. The "Main Station-In" data are shown in total for the reporting area, as well as totals by subaccounts for both main frame and other frame activity. These totals by main frame and other frame are recorded on Form E-4420, Lines 1 and 2 respectively, under the proper Column B, as determined by the subaccount. Ratios of main frame and other frame items, by subaccount, to the total item count are then developed on Lines 36 and 37 of Form E-4420. These ratios are subsequently used to prorate the total item count to subaccounts for the remaining lines indicated by "M" and "O" on Form E-4420. This enables

work units, for work performed under the several subaccounts, to be developed without the necessity of detailed item counts by subaccount.

**1.106** Form E-4907 is provided as a work sheet to obtain "Main Station-In" data, by subaccounts, and to be used for both the basic area report and monthly summary. Plant Department will initiate a Form E-4907 for each basic report area listing the central office codes plus their respective subaccounts. Monthly summaries will use Form E-4907 to record the "Main Station-In" activity for each basic area distributed by type of office (subaccount) as indicated by the basic area reports.

## 2. PREPARATION OF FORM E-4907

### Basic Area Report

**2.101** Prepare a Form E-4907 listing each central office (3 digit) code such as EX 3 and 346. Make one entry for each office in the reporting area corresponding to the basic report area for the Installation Cost Results Plan.

**2.102** Indicate the proper subaccount opposite each central office entry for both the Main Frame and Other Frame work. Use an "X" in the appropriate columns.

**2.103** The offices listed on Form E-4907 will define the basic report area for Form E-4420 and will correspond to the basic report unit for the Installation Cost Results Plan.

**2.104** The basic area report, provided for use in preparing the Monthly Summaries, will remain in effect until superseded by a change in the basic reporting area. A change may be occasioned by the addition or deletion of a central office code or a change in an existing subaccount. At such time a revised basic area report shall be furnished for use in making Monthly Summaries.

### Monthly Summaries

**2.105** Prepare a Form E-4907, listing the central office codes involved in the basic area Report.

**2.106** For each listed code, record in Column A the total "Main Stations-In" for the month under report. "Main Stations-In" for the purpose of this report includes Main Stations, → PBX Trunks, centrex trunks, and centrex stations directly switched by Central office equipment.

**2.107** Enter in the appropriate Column B the figure in Column A as indicated by the "X" on the basic area report for each central office entry.

**2.108** Total Column A, also each subcolumn, under the Columns B on Line 30.

**2.109** Line 30 is then ready to be transcribed to the Form E-4420, Lines 1 and 2, under the appropriate columns.

## 3. PREPARATION OF FORM E-4420

**3.101** *Column A: Total Item Count:* This column is provided to record the total activity for certain line entries, within the basic report area. These data will be derived essentially from source documents for the Installation Cost Results Plan. The counts recorded in Column A will be prorated to the proper subaccount (Columns B) based on "Main Station-In" factors developed on Lines 36 and 37.

Enter in Column A the number of items handled during the report period as obtained from sources specified for each line.

**3.102** *Columns B: Items:* These entries are obtained by one of two methods as follows:

(1) Line having an "M" or "O" designation in Column A: The Column B entry is obtained by multiplying the total items in Column A for the "M" lines by the factor on Line 36. For the "O" lines, multiply the total items in Column A for the previous "M" line by the factor developed on Line 37. Exceptions to the above are:

- (a) Lines 1 and 2 (transcribed directly from Form E-4907).
- (b) Lines having no "M" or "O" designation in Column A. (These Column B entries are obtained by direct transcription.)

Those Columns B having no entry on either Line 36 or 37 would have no entries in the columns. In the event you have an entry on only one of the Lines 36 or 37. Column B would have only the "M" or "O" lines calculated, depending upon which line (36 or 37) contained a factor.

(All entries shall be to the nearest whole number.)

(2) Lines having no Column A provided: Item counts will be recorded directly to the proper subaccount (Column B). The prorate *does not apply* on these lines.

**3.103 Column C: Work Unit Factor (W.U.F.):** These columns contain the work unit factor per item.

**3.104 Columns D: Work Units:** Col. D. The number of items (Col. B) multiplied by the Work Unit Factor (Col. C) equals Work Units (Col. D). All entries shall be to the nearest whole number.

**3.105 Lines 1 and 2: Main Station and PBX Trunks — In:** This includes the inward movement of main station, PBX trunks, and centrex stations directly switched by Central office equipment. Entries are transcribed from corresponding entries on Line 30 of the monthly summary Form E-4907 as described in Paragraph 2.109.

**Note:** Calculate B Column Factors on Lines 36 and 37 following the entries on Lines 1 and 2. These factors are necessary to continue preparation of the report. Refer to Paragraph 3.125 for description of Lines 36 and 37.

**3.106 Lines 3 and 4: Line and Station Transfers — Service Order:** Enter in A3 the total number of Line and Station Transfers (Service Order) handled during the period under report. These data shall be obtained from Form E-4438 (or its source data), from the entry on the line designated "Line and Station Transfers — Service Order" under the Installation Assignment Section.

Entries in B3 and B4 are obtained as follows for each section having an entry in B36 and/or B37:

$$B3 = A3 \times B36$$

$$B4 = A3 \times B37$$

**3.107 Lines 5 and 6: Line and Station Transfers — Other:** Enter in A5 the total number of *completed* line and station transfers handled in connection with party line, reassociations, reconcentrations, transfers to clear clashes, cable transfers, etc. These data shall be obtained from Form E-4438 (or its source data), from the entry on the line designated "Line and Station Transfers — Other" under the Installation Assignment Section.

Entries in B5 and B6 are obtained as follows for each section having an entry in B36 and/or B37:

$$B5 = A5 \times B36$$

$$B6 = A5 \times B37$$

**3.108 Lines 7 and 8: Regrades and Reassociations:** Enter in A7 the total number of regrades and reassociations, both residence and business main stations. These data shall be obtained from Form E-4432 (or its source data) from the sum of the entries on the lines designated "Regrade and Reassociation" in both the residence and business sections.

Entries for B7 and B8 are obtained as follows for each section having an entry in B36 and/or B37:

$$B7 = A7 \times B36$$

$$B8 = A7 \times B37$$

**3.109 Line 9: Cable Pair Transfer:** Enter in A9 the total number of working lines on *completed* cable pair transfer forms. These data shall be obtained from Form E-4438 (or its source data) from the entry on the line designated "Cable Pair Transfer — Total (working lines)" in the Exchange Testing section.

Entries for B9 are obtained as follows for each section having an entry in B36:

$$B9 = A9 \times B36$$

**3.110 Line 10: Column A Subtotal and Prorate:** Enter in A10 the total of A1 to A9 inclusive.

Entries in B10 are obtained as follows for each section having an entry in B36:

$$B10 = A10 \times B36$$

**3.111 Line 11: Cable Pairs on M.D.F. — Tie Cable:** Count the total interframe and/or intraframe tie cable pairs terminated on the M.D.F. (Count intraframe pairs only once.) Count one for each pair so terminated. Enter these counts on B11 as determined by the subaccount for the M.D.F. (i.e., Column B having an entry on Line 36).

**Note:** If no tie cable pairs exist, Lines 10 to 13 inclusive are not used.

**3.112 Line 12: Cable Pairs on M.D.F. — O.S.P.:** Count the total outside plant pairs terminated on the M.D.F. Count one for each pair so terminated. Enter these counts on B12 as determined by the subaccount for the M.D.F. See note under Paragraph 3.111.

**3.113 Line 13: Tie Cable Adjustment:** For each section having entries in B11 and B12, calculate B13 as follows and record:

$$B13 = B10 \times B11 \div B12.$$

**3.114 Lines 14 and 15: Main Station and PBX Trunks — Out:** Enter in A14 the total number of outward main stations, PBX trunks, and centrex station directly switched by central office equipment.

Entries for B14 and B15 are obtained as follows for each section having an entry in B36 and/or B37:

$$B14 = A14 \times B36$$

$$B15 = A14 \times B37$$

**3.115 Lines 16 and 17: Denial Suspensions and Restoral (Including Temporary):** Enter in A16 the total number of denials, temporary suspensions, and restorals of main stations. Denials and restoral data are to be obtained from Form E-4437 (or its source data) from the entry on the line designated "Denial and Restoral." Temporary suspensions and restorals are to be obtained from Form E-4432 (or its source data) from the entry on the line designated "Temporary Suspensions and Restorals." Also large volume seasonal temporary suspension and restoral lists should be added to the above count. This would be such as summer movement to and from "Resort Areas," etc.

Entries for B16 and B17 are obtained as follows for each section having an entry in B36 and/or B37:

$$B16 = A16 \times B36$$

$$B17 = A16 \times B37$$

**3.116 Lines 18 and 19: Traffic Line Transfers:** Enter in A18 the total number of central office lines transferred as shown on completed Traffic Department line transfer forms. These data are to be obtained from Form E-4438 (or its source data) from the entry on the line designated "Traffic Department Line Transfers" in the Exchange Testing section. Also tally one for each line equipment transfer (not on Traffic Department line transfer forms) done for toll restriction.

Entries for B18 and B19 are obtained as follows for each section having an entry in B36 and/or B37:

$$B18 = A18 \times B36$$

$$B19 = A18 \times B37$$

**3.117 Line 20: Main Station and PBX Trunks in Service:** Enter in B20 the total Main Stations, PBX Trunks, centrex trunks, and centrex stations directly switched by Central office equipment in service. Entries for B20 should be recorded for each subsection having an entry in B36.

**3.118 Lines 21 and 22: Station in Number Change — In:** Enter in A21 the total number of *main* stations involved in central office number changes (*misc. service orders or lists*) which are being placed in service during conversions, area transfers, etc.

*Note:* Where the work extends over more than one report period, the total number of stations may be prorated to this report. However, care should be taken to include in the aggregate of all reporting periods no more stations than the total involved.

**3.119 Lines 23 and 24: Station in Number Change — Out:** Enter in A23 the total number of *main* stations involved in central office number changes (*misc. service orders or lists*) which are being removed from service during conversions, area transfers, etc. See Note under Paragraph 3.118.

*Note:* If this report covers both the "In" and the "Out" central office these stations should be recorded in both A21 and A23.

**3.120 Line 25: Intercept (Operator to Machine):** Enter in A25 the number of changes from operator intercept to machine intercept completed during the report period.

#### TRUNKS (INTEROFFICE), PRIVATE LINES, ETC.

**3.121 Lines 27 to 35 inclusive: General:** Activity on trunks (interoffice), private lines, FX, TWX, battery and/or generator taps, etc. in Class 5 and local tandem offices are included in this category. For purposes of this practice, a local tandem office shall be measured as a Class 5 office using #5 X-Bar units in subsection E-4420-E. Refer to Switching Plan in Section 010-510-100, Paragraph 2.01, for definition of office classes. These items will necessitate a local count by proper subaccount.

Count only one connect, disconnect, or transfer of trunks (interoffice), private lines, etc. regardless of the number of terminations. In other words, count one operation per trunk or circuit handled on a completed basis.

**If hours are charged to other than "M" subaccounts, do not count the items.**

All trunks, private line, etc. activity is measured in those offices described in Paragraph 1.101.

**3.122 Lines 27, 28 and 29: Non Repeater:** Enter the total number of non-repeater trunks (Interoffice), private lines, etc. handled during the report period. Record all such activity of trunks and/or circuits not requiring repeater or carrier terminal equipment *located in this office* on these lines. Record total connects, disconnects, or transfers on Lines 27, 28 and 29 respectively, by proper subaccount.

**3.123 Lines 30, 31 and 32: Repeater:** Enter the total number of repeatered trunks (interoffice), private lines, etc. handled during the report period. Record all such activity of trunks and/or circuits requiring repeater (voice and impulse) equipment *located in this office*. Record total connects, disconnects or transfers on Lines 30, 31 and 32 respectively, by proper subaccount.

**3.124 Lines 33, 34 and 35: Carrier:** Enter the total number of carrier derived trunks (interoffice), private lines, etc. handled during the report period. Record all such activity of trunks and/or circuits requiring *carrier terminal equipment located in this office*. Record total connects, disconnects, or transfers on Lines 33, 34 and 35 respectively, by proper subaccount.

**3.125 Lines 36 and 37: B Column Factors:** Calculate a B Column Factor for each subaccount having entries on Lines 1 and/or 2. The B Column Factor shall be calculated for both "M" (Main Frame) on Line 36, and "O" (Other Frame) on Line 37 for each corresponding entry on Lines 1 and 2 respectively.

Entries for B36 and B37 are obtained as follows for each section having entries in B1 and/or B2.

$$B36 = B1 \times 100 \div A1$$

$$B37 = B2 \times 100 \div A1$$

**Note:** These formulae express "B" Column Factors in terms of percentages. When using these factors to prorate Column A, entries in the various B columns shall be recorded to the *nearest whole number*.

**3.126 Line 38: Total By Subaccounts:** Total Column D for each subaccount and record on Line 38.

**3.127 Line 39: Prepared By:** This may be used at the discretion of the Companies to record the name of the person preparing the form.

**3.128 Line 40: Checked By:** This may be used at the discretion of the Companies to record the name of the person checking the report for reasonableness prior to forwarding.

**3.129 Lines 41, 42, 43, and 44:** Enter the name of the report base as applicable and the period covered by the report.

#### 4. SUMMARIES

**4.101** As a result of using the Installation Cost Results data, the smallest report base will be determined by the report unit for the Installation Cost Results Plan.

**4.102** District, Division, Area, and Company summaries may use Form E-4420 for transmitting only the totals on Line 38. It is possible and permissible to forward such summaries by use of Forms E-4661 and E-2741 or any combination of these available, depending upon the method used to compile the Form E-2740.

CHANGES WORK UNITS  
CENTRAL OFFICE REARRANGEMENTS AND CHANGES  
(CLASS 5 OFFICES, ETC.)

FRAME ITEMS	A	TOTAL ITEM COUNT	FRAME	E-4420-A			E-4420-B			E-4420-C			E-4420-D			E-4420-E			
				MANUAL (17M)			PANEL (27M)			SKS (37M)			#1 X-BAR (47M)			#5 X-BAR (47M)			
				ITEMS	W.U.F.	W.U.	ITEMS	W.U.F.	W.U.	ITEMS	W.U.F.	W.U.	ITEMS	W.U.F.	W.U.	ITEMS	W.U.F.	W.U.	
1	Main Station & PBX Trunks	IN	M		.993			1.746			.993			1.671			1.178		
2			O	X X X	1.637			3.073			1.637			2.946			2.266		
3	Line and Station Transfers	Service Order	M		.993			1.397			.993			1.339			1.178		
4			O	X X X	.544			.768			.544			.734			.648		
5		Other	M		.993			1.397			.993			1.339			1.178		
6			O	X X X	.544			.768			.544			.734			.648		
7	Regrades & Reassociations		M		.993			1.746			.993			1.671			1.178		
8		O	X X X	1.637			3.073			1.637			2.946			2.266			
9	Cable Pair Transfer		M		.497			.768			.497			.670			.589		
10	Col. A Sub-Total & Prorate		M		X X	X X X		X X	X X X		X X	X X X		X X	X X X		X X	X X X	
11	Cable Pairs on M.D.F.	Tie Cable		X X X	-		X X	X X X		X X	X X X		X X	X X X		X X	X X X		
12		O.S.P.		X X X	-		X X	X X X		X X	X X X		X X	X X X		X X	X X X		
13	Tie Cable Adj. (B10 x B11 + B12)		X X X	-		.497		.768			.497			.670			.589		
14	Main Station & PBX Trunks	OUT	M		.345			.628			.345			.632			.412		
15			O	X X X	.653			1.227			.653			.889			.578		
16	Denial - Suspensions and Restorals (Incl. Temp.)		M		.199			.279			.199			.064			.236		
17		O	X X X	.326			.459			.326			.295			.391			
18	Traffic Line Transfers		M		.993			1.746			.993			1.671			1.178		
19		O	X X X	1.637			2.689			1.637			2.946			2.592			
20	Main Station & PBX Trks. In Svc.		X X X	-		.005		.005			.005			.005			.005		
21	Station in	IN	M		.993			1.746			.993			1.671			1.178		
22			O	X X X	1.637			3.073			1.637			2.946			2.266		
23	Station in	OUT	M		.345			.628			.345			.632			.412		
24			O	X X X	.653			1.227			.653			.889			.578		
25	Intercept (OPR. To Mech.)		O		.653			1.227			.653			.889			.578		
26																			
27	Trunks (Inter-Office), Private Lines, Etc.	Non-Repeater	Conn	-	1.845			2.095			1.490			2.009			1.767		
28			Disc	-	.922			1.047			.743			1.002			.884		
29			Trans	-	2.767			3.142			2.233			3.010			2.651		
30		Repeater	Conn	-	4.304			4.888			3.477			4.687			4.124		
31			Disc	-	2.152			2.444			1.736			2.341			2.062		
32			Trans	-	6.456			7.332			5.212			7.027			6.186		
33		Carrier	Conn	-	9.224			10.475			7.450			10.043			8.837		
34			Disc	-	4.612			5.237			3.723			5.019			4.419		
35			Trans	-	13.835			15.712			11.172			15.061			13.256		
36	B Column Factors	B1 x 100 + A1	X X X	M	%	X X	X X X	%	X X	X X X	%	X X	X X X	%	X X	X X X	%	X X	X X X
37		B2 x 100 + A1	X X X	O	%	X X	X X X	%	X X	X X X	%	X X	X X X	%	X X	X X X	%	X X	X X X
38	Totals by Subaccounts				17M			27M			37M			47M			47M		

39 Prepared By \_\_\_\_\_  
40 Checked By \_\_\_\_\_

41 City-Test Center \_\_\_\_\_  
42 Dist.-Division \_\_\_\_\_

43 Co.-Area \_\_\_\_\_  
44 Period Covered \_\_\_\_\_

MAIN STATION-IN DATA

Monthly Summary ( ) Check  
 Basic Area Report ( ) One

Central Office	A	B		B		B		B		Notes
	Total Item Count	(17)	(27)	(37)	(47)	(47)				
		Manual	Panel	SxS	#1 X-Bar	#5 X-Bar				
		Frame	Frame	Frame	Frame	Frame	Main	Other		
	Main	Other	Main	Other	Main	Other	Main	Other		
1										
2										
3										
4										
5										
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29										
30	Total Main Station - In									

31 City - Test Center \_\_\_\_\_  
 32 Dist. - Division \_\_\_\_\_

33 Co. - Area \_\_\_\_\_  
 34 Month - Year \_\_\_\_\_