NO. 4A AND 4M SWITCHING SYSTEMS
INEFFECTIVE MACHINE ATTEMPT REPORT
PREPARATION AND ANALYZATION

CONTENTS PAGE

1. GENERAL

1.01 The No. 4A/4M switching systems are vital parts of the telephone network which consists of various types of switching machines and trunk circuits used to complete domestic and international customer-dialed and operator-handled toll calls. It is essential that management have complete knowledge and understanding of the service provided by the No. 4A/4M switching machines.

1.02 The Ineffective Machine Attempt (IMA) Report provides a uniform measurement of the service provided and is a means of directing management's attention and efforts toward service improvement. The measured IMAs are no circuit conditions—intertoll and toll completing (includes local), reorders, sender overloads, vacant codes, and other items associated with the Centralized Automatic Message Accounting (CAMA) and overseas portion of the No. 4A/4M switching systems. The procedure and forms covered in this Dial Facilities Management Practices (DFMP) section are designed for daily recording of office data so that problems

may be recognized and corrective action taken as data are accumulated for the System report.

1.03 The System report is submitted via a computer system called "IMA Data Management System." This system allows the operating companies to transmit, via teletypewriter (TTY), the IMA data directly to a central data file, to correct any inconsistencies the computer program may uncover, and to obtain a summary of the results for their own company machines. In addition, during a specified interval each month, reports can be obtained on machines in other companies, on System averages, and on performance rank of each machine within the System. Separate instructions for using this method are contained in DFMP, Division D, Section 3a.

2. FREQUENCY OF REPORT

2.01 The System report is a monthly time-consistent (same hours for each day of the month) busy-hour report covering normal business days. All weekdays (Monday through Friday) are included except Christmas Day, Christmas Eve, and Thanksgiving Day. Peak Day planning letters will request special Peak Day IMA reports. These letters will include the necessary input form and instructions.

2.02 Two reports will be required from No. 4-type overseas switching machines to separate the overseas and the domestic IMA results. The domestic report will be based on the incoming trunk link frame peg count and the overseas report will be based on the overseas sender peg count. The domestic and the overseas report will cover normal business days as described in 2.01 except at locations where the Sunday overseas busy hour exceeds the Friday busy hour due to time and date variances. Sunday through Thursday data should then be used on the overseas report and should exclude Mother's Day and Easter in addition to those holidays excluded from the domestic report.

2.03 The time-consistent busy hour should be determined by quarterly office busy-hour studies with selection based on the hour which has the highest incoming trunk link frame peg count for the most weekdays of the study. The overseas report shall be based on the hour which has the highest overseas sender peg count for the most days of the study. The busy hour must be a full hour but may cover an interval beginning on the clock-hour, half-hour, or quarter-hour. Note, however, that most trunking and other machine data are collected for clock-hour intervals and may make data comparisons difficult.

2.04 The report period shall be from the 23rd of each month until the 22nd of the following month.

2.05 A data minimum of 5 days is required for each item. If fewer than 5 days are available, that item should be reported as not available (NAV).

3. AUTHORIZED EXCLUSIONS

3.01 The only authorized exclusion of call blockages will be those due to customer-controlled conditions as follows:

(a) ***INWATS***—The overflow of lines to high-volume Inward Wide Area Telephone Service (INWATS) customers when the No. 4A/4M is the terminating INWATS office. These calls should be routed to a line busy tone (60 ipm) group.

(b) ***Centrex***—The overflow of lines directly to a centrex customer where the customer determines the quantities of trunks and the No. 4A/4M is the serving central office. These calls should be routed to a line busy tone (60 ipm) group.

(c) ***Dedicated Choke Network***—The overflow of calls directed to a limited number of trunks as part of a choke network arrangement designed to block as close to the source as possible those calls which had little chance of completing because the customer had insufficient answering capacity to handle the offered calls. This exclusion applies only to those attempts directed toward the 900 NPA or toward an NNX code used exclusively for mass calling. The system-dedicated 900 NPA choke network is designed to route overflow calls to the NCA group. The routing of overflow from dedicated local NNX choke networks may vary by type of office and availability of tones. Where possible, these calls should be routed to the line busy tone (60 ipm) group.

3.02 The above items of traffic are the only authorized exclusions. Overflow of test lines,

operator trunks, weather, rate quoting, or other similar groups provided for telephone company use should not be excluded.

3.03 Adherence to these guidelines is essential if uniformity is to be maintained in the measurement of IMAs.

4. RESPONSIBILITY OF DIAL ADMINISTRATOR

4.01 It is the responsibility of the dial administrator to ensure proper and accurate preparation of all forms. This responsibility may include the computer input which produces the system report and the extraction of area, company, and system reports or these functions may be assigned to a centralized group.

4.02 The dial administrator should be aware of the importance of maintaining acceptable service levels and should recognize the necessity for complete and accurate data followed with prompt corrective action where required. The dial administrator should continually work to maintain service levels within established company and System objective levels and should make known to higher management any problems that could develop into weak spots.

4.03 A monthly average business day busy hour (ABH) report is most representative of the service provided in a No. 4A/4M switching system and is therefore used as a Bell System report to compare machine and company results, to establish System averages, and to obtain performance rank of each machine within the System. It is the responsibility of the dial administrator to ensure that a proper level of service is maintained at all times. Therefore, it may be desirable to periodically prepare a total day, Sunday evening, midnight to 8 AM, or additional weekday hourly report to determine if the service provided meets the objectives. Such studies may reveal problems not evident during the office busy hour and will serve as a tool in improving the switching machine performance.

4.04 This responsibility is simplified with the peripheral bus computer (PBC) which allows the dial administrator to establish IMA thresholds, to receive exception reports, and to schedule or demand a complete IMA report for any hour of the day, the previous 15-minute interval, and for the month-to-date.

5. TRAFFIC REGISTERS

5.01 Knowledge of call processing through a No. 4A/4M switching machine and scoring of the various registers is required to prepare an accurate report and to perform the analyzation essential to the maintenance of good service. DFMP Division H, Section 13e(2) covers the availability and provision of registers. A brief description of the traffic registers required for this report and their use in preparing the report is discussed in 5.02 through 5.31. The number in parentheses is a column reference on the No. 4A/4M IMA Worksheet, Forms E-3876A (Fig. 1) and E-3876A (OVS) (Fig. 2).

5.02 ***Incoming Trunk Link Frame Peg Count (1):*** Scores the number of times a connection has been established through the office and is used as a base for computing the percentage of IMAs on domestic switching machines and on the domestic report on the overseas switching machines. Overseas offices must subtract the overseas sender peg count from the incoming trunk link peg count.

5.03 ***Reorder Announcement (ROA) Peg Count (2) Overflow (3):*** Scores when equipment blockage is encountered. These calls include permanent signals, partial digits, matching loss, normal sender time-outs, sender failures, decoder/decoder channel, and marker second trial failures and CAMA position failures. Electrical busies received after the sender has completed outpulsing to the overseas office and sender-blocked calls due to the incoming overseas sender screening feature are also routed to this announcement group. To obtain the domestic ROA figure, overseas offices must subtract the overseas reorders from the ROA peg count.

5.04 ***Vacant Code Announcement (VCA) Peg Count (5) Overflow (6):*** Calls are routed to this announcement group when translation has not been provided for the received code. These calls include customer and operator dialing errors, screening, and out-of-band INWATS calls.

5.05 ***Sender Overload Announcement (SOA) Peg Count (8) Overflow (9):*** Calls are routed to this announcement when the outgoing trunk fails to obtain a sender in the distant office when short sender timing is in effect.

5.06 ***No Circuit Announcement (NCA) Peg Count (16) Overflow (17):*** The adjusted NCA peg count must represent the total no circuit conditions encountered on final intertoll trunk groups for the purpose of computing the no circuit-intertoll (NC-IT). The type of office, routing arrangements, and the use of network controls will determine the method of obtaining the adjusted NCA peg count. The overflows of overseas trunk groups are directed to this group but are subtracted from the total and reported on the overseas report.

(a) ***Card Translator (CT) Office***—The NCA peg count and overflow data are collected via mechanical registers and need no adjustment unless route relays have been used on toll completing trunk groups, necessitating the "follow with master busy—NCA" routing instructions.

(b) ***Electronic Translator (ET) Without PBC***—There are external mechanical and internal ET memory (software) NCA peg count and overflow registers which must be added to obtain the total registrations. The mechanical register will be scored on final nonscannable groups and on "follow-with-second-trial all-trunks-busy" (FST-ATB) conditions which cause the ET to use modified hold-routing through to the end of the routing pattern. The FST-ATB failures will be routed to the NCA group and will score the mechanical NCA peg count register whenever the "cancel follow with second trial" feature is activated. The software NCA register will be scored when the ET fails to find an idle trunk on a final scannable route. The overflow of final intertoll and toll completing trunk groups is directed to the NCA group. This requires additional data and effort to separate into the correct "no circuit" (NC-IT or NC-TC) classification.

(c) ***ET With PBC***—The total NCA peg count and overflow will be obtained from software registers. The NCA group is used for both intertoll and toll completing trunk group overflows and additional data has been provided for proper classification.

5.07 ***No Circuit Intertoll (NC-IT) and No Circuit Toll Completing (NC-TC):*** These two software registers are used to separate the software NCA peg count into no circuit conditions encountered on intertoll trunk groups (NC-IT) and no circuit conditions encountered on toll completing trunk groups (NC-TC). No circuit conditions encountered on local trunk groups should be treated the same as NC-TC.

(a) ***ET Without PBC***—Calls routed to the NCA, EA #1, or EA #2 group via the network control console will not score the NC-IT or NC-TC registers.

(b) ***ET With PBC***—Calls routed to the NCA, EA #1, or EA #2 group via the network control console will score the NC-IT or the NC-TC register based on the TPC classification of the trunk group overflowed.

5.08 ***Emergency Announcement #1 and #2 Peg Count and Overflow:*** During periods of network congestion or overloads, calls are directed to either of these announcement groups at the discretion of the network manager. All calls routed to these announcements are considered as no circuit conditions and must be included in the IMA report.

5.09 ***Final Reorder Announcement (FRA) Peg Count (26) Overflow (27):*** The adjusted FRA peg count must represent the total no circuit conditions encountered on final toll- and local-completing groups, test groups, other announcement groups, and by FST-ATB conditions in a card translator office. The type of office, routing arrangements, and use of network controls will determine the method of obtaining the adjusted FRA peg count.

(a) ***Card Translator***—In some locations it has been found advantageous to use route relays on toll completing groups. Due to machine design, error is introduced in the number of IMAs classified as ROA and FRA when the usual method of counting is used. This design limitation causes the overflow on relay-routed calls to be routed to reorder (ROA) when FRA routing instructions are provided. When a route relay is used on a toll-completing group, an NCA routing instruction should be used. In addition, an overflow register should be provided on each trunk group which can be read at the same time as the other IMA registers. With this arrangement, the proper NCA and FRA counts can be obtained by subtracting the trunk group overflow from the NCA peg count register and adding it to the FRA peg count register. The overflow to all final toll-completing groups (except those with route relays) is routed to the FRA

E-3876A
(7-74)

NO. 4A/4M I.M.A. WORK SHEET

NO. 4 OFFICE _____ MONTH _____ INTERVAL _____

COL.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
DATE	INCOMING TLF P.C.	R.O.A.			V.C.A.			S.O.A.								N.C.A. (NC – IT)										F.R.A.		EA 1 & 2 OFL.	ANN. OFL. TO FRA	FRA MINUS ANN. OFL.	FRA %		
		P.C.	OFL.	%	P.C.	OFL.	%	P.C.	OFL.	%						ADJ. P.C.	OFL.	%								ADJ. P.C.	OFL.						
1																																	1
2																																	2
3																																	3
4																																	4
5																																	5
6																																	6
7																																	7
8																																	8
9																																	9
10																																	10
11																																	11
12																																	12
13																																	13
14																																	14
15																																	15
16																																	16
17																																	17
18																																	18
19																																	19
20																																	20
21																																	21
22																																	22
23																																	23
24	TOTAL																																24
25	No. Days																																25
26	Average																																26

COL.	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55		56	57	58	59	60	61	62	63	64	65	66	67
	TRANSVERTER P.C.			M.C.A.			U.C.A.			MATCH CHECK		WRC.		POSITION DISC.		NO. POS. ATTCH.		INCOMING CAMA REGISTER							SENDER ATTACHMENT DELAY RECORDER – OVER 3 SECONDS												
																									MF			DP			RP			CAMA		
DATE	ONI	ANI	TOTAL	P.C.	OFL.	%	P.C.	OFL.	%	P.C.	%	P.C.	%	P.C.	%	P.C.	%	P.C.	SERV. CODE	P.C. S.C.	P.S.	%	P.D.	%		TEST	DEL.	%	TEST	DEL.	%	TEST	DEL.	%	TEST	DEL.	%
1																																					1
2																																					2
3																																					3
4																																					4
5																																					5
6																																					6
7																																					7
8																																					8
9																																					9
10																																					10
11																																					11
12																																					12
13																																					13
14																																					14
15																																					15
16																																					16
17																																					17
18																																					18
19																																					19
20																																					20
21																																					21
22																																					22
23																																					23
24	TOTAL																									NO. OF DAYS SADR DELAY OVER 1.0% _____			NO. OF DAYS SADR DELAY OVER 1.0% _____			NO. OF DAYS SADR DELAY OVER 1.0% _____			NO. OF DAYS SADR DELAY OVER 1.0% _____			24
25	No. Days																																				25
26	Average																																				26

Fig. 1—No. 4A/4M IMA Worksheet—Form E-3876A

NO. 4 OFFICE _____
MONTH _____
INTERVAL _____

E-3876A (OVS)
(3-75)

NO. 4A/4M I.M.A. WORK SHEET
(OVERSEAS SECTION)

COL.	68	69	70	71	72	73	74	75		76	77		78	79	80
DATE	OVERSEAS SENDER P.C.	REORDERS (OVERSEAS SENDER)								NC – OVS			SADR OVER 3 SEC.		
		PS	PD	MD	PE	FATR	TOTAL	%		OFL OF OVS.GRP.	%		TEST	DELAY	%
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24 TOTAL													NO. OF DAYS SADR DELAY OVER 1.0%		
25 No. Days															
26 Average															

COL.	81	82	83	84	85	86	87	88						
DATE	INCOMING (Overseas) Screening		ELECTRICAL BUSY SIGNALS				TOTAL OVERSEAS ROA's	ADJUSTED OVERSEAS SENDER P.C.						
	P.C.	%	STD-EB P.C.	SIMP-EB P.C.	TOTAL	%								
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24 TOTAL														
25 No. Days														
26 Average														

Fig. 2—No. 4A/4M IMA Worksheet (Overseas Section)—Form E-3876A (OVS)

group. Also, FST-ATB conditions result in calls being routed to the FRA group.

(b) ***ET Without PBC***—Overflow of final nonscannable routes may be directed to this group. However, most locations are arranged to direct the overflow of all final groups (intertoll and toll completing) to the NCA group.

(c) ***ET With PBC***—Overflows of all final groups (intertoll and toll completing) are to be directed to the NCA group.

(d) All announcement groups (NCA, SOA, VCA, UCA, MCA, ROA, line busy tone, EA #1, and EA #2) overflow to the FRA trunk group in all No. 4A/4M offices.

5.10 ***Line Busy Tone Peg Count and Overflow:*** Calls which overflow lines directly to a customer from the No. 4A/4M office will be routed to this group. The line busy tone (60 ipm) is the proper tone used to inform the calling customer that the number called is busy. Special CBA groups arranged to provide 60-ipm tone may be used in offices not equipped with line busy tone trunks.

> ***Note:*** The peg count on this group has not been included in the count of IMAs. If calls other than those described in Part 3 are directed to this group, special arrangements must be made for their proper classification and inclusion in the IMA report.

5.11 ***Sender Attachment Delay Recorder (SADR) Tests (56, 59, 62, 65, 78) and Delays (57, 60, 63, 66, 79):*** Scores the number of tests made and the number of delays exceeding 3 seconds by type of sender.

5.12 ***Transverter Attempts Automatic Number Identification (ANI) (33):*** Scores when the calling customer's number is identified automatically by the originating office.

5.13 ***Transverter Attempts Operator Number Identification (ONI) (32):*** Scores when the calling customer's number is obtained by calling in an operator who requests this information from the customer.

5.14 ***Misrouted Non-CAMA Announcement (MCA) Peg Count (35) Overflow (36):*** Local calls which are misrouted because the customer misdialed or the equipment malfunctioned are routed to this announcement.

5.15 ***Unauthorized CAMA Code (UCA) Announcement Peg Count (38) Overflow (39):*** Calls blocked to codes which are not equipped to switch customer-dialed traffic.

5.16 ***Match Check (41):*** Scores when the customer gives the called number rather than the customer's own telephone number to the operator.

5.17 ***Wrong Calling Code (43):*** Scores when the calling number keyed by the operator is a wrong prefix for the recorder.

5.18 ***Position Disconnected (45):*** Scores the number of times the position is disconnected by the operator.

5.19 ***No Position Attached (47):*** Scores when a CAMA sender times out with no position attached while handling an ONI call.

5.20 ***Incoming DP Register (49):*** Scores on CAMA calls including service code (11X) attempts.

5.21 ***Service Code Seizure (50):*** Scores when the first digit is a "1" indicating a service call.

5.22 ***Permanent Signals—Incoming Register (52):*** Scores when an incoming register is seized but receives no digits during a predetermined interval.

5.23 ***Partial Digits—Incoming Register (54):*** Scores when the "A" digit has been registered without receiving sufficient digits to complete the call.

5.24 ***Overseas Sender Peg Count (68):*** Scores each time the overseas sender is connected to a decoder connector. The overseas sender peg count is used as the base figure for determining the number of overseas calls switched by the No. 4A/4M office and for determining the percentage of overseas IMAs.

5.25 ***Permanent Signal Overseas Sender (69):*** Scores when the sender encounters no KP pulse within a specified interval after seizure or

with any condition causing an off-hook signal to be received prior to any digits.

5.26 ***Partial Digits Overseas Sender (70):*** Scores when the sender recognizes incomplete dialing within a specified interval.

5.27 ***Mutilated Digits Overseas Sender (71):*** Scores when the sender receives more than two frequencies to indicate a particular digit.

5.28 ***Pulsing Error Overseas Sender (72):*** Scores when the sender recognizes a failure of a call to conform to a predetermined format.

5.29 ***Final Attempt Trouble Record Overseas Sender (73):*** Scores on all incoming and outgoing second trial failures to overseas and domestic points, failures to seize decoder within a specified interval, and when pulsing leads are open.

5.30 ***Incoming Overseas Screening (81):*** Calls blocked by the overseas sender on foreign customer-dialed calls which fail to adhere to a predetermined format.

5.31 ***Electrical Busy (EB) (83):*** This signal is generated by overseas switching machines to advise the originating switching machine to release the connection because the call cannot be completed. If the EB signal is received before the sender has completed outpulsing, a second attempt is generated. If outpulsing has been completed when the EB signal is received, the connection is released and the EB register scores. The EB registrations represent good connections through the No. 4 type office but are ineffective attempts to the customer because of some condition (busy, reorder, no circuit, etc) in the foreign network. Offices that have been modified for the simplified EB arrangement may require additional computation to obtain a complete count of all EB registrations. Columns 84 and 85 have been provided on the No. 4A/4M IMA worksheets for this purpose.

6. PREPARATION OF NO. 4A/4M IMA WORKSHEET, FORM E-3876A

6.01 The No. 4A/4M IMA Worksheet, Form E-3876A, provides the dial administrator with a daily record of the office data. The form is designed for use in the collection and analyzation of the data required to monitor the office performance daily and to accumulate the figures required for the "Computer Input Worksheet."

6.02 It is necessary for overseas offices to prepare an overseas section for the domestic busy hour for the purpose of subtracting the overseas sender peg count from the incoming trunk link frame peg count, the overseas reorders from the ROA peg count, and the overseas no circuit conditions from the NCA peg count. This may be done on a daily basis ***or*** the subtractions may be made on the monthly totals as the No. 4 System Computer IMA Input Worksheet (Fig. 3) is prepared. A separate overseas section of the No. 4 IMA Worksheet (Fig. 4) is required for the overseas busy hour unless the overseas busy hour and the domestic busy hour are the same.

6.03 Instructions for preparing Form E-3876A are covered in Table A.

7. PREPARATION OF NO. 4A/4M SUMMARY IMA COMPUTER INPUT WORKSHEET, FORM E-3876B

7.01 The IMA computer input worksheet (Fig. 3 and 4) is used as the data source in preparing the TTY message required to enter the data into the computer program. Raw data, total monthly peg count, and overflow figures are required as the program performs validation functions, makes calculations, and produces a TTY IMA report. The considerations discussed in 7.02 through 7.11 must be made in determining the correct value or message to be entered on each line.

7.02 If a particular item is not applicable (not a function of this switching machine), enter NAP.

7.03 If a particular item is not available (normally reported but not this time), enter NAV.

7.04 If a particular item is not measured (register not provided), enter NMS.

7.05 If a No. 4A/4M office is used as a directional tandem handling only incoming toll traffic, the value for NCA (line 8) should be shown as 0, not NAP. A No. 4A/4M office handling only outgoing toll traffic should report the values for NCA (line 8) and FRA (line 10) as computed on the No. 4 IMA worksheet. In this situation the value for FRA (line 10) would represent only the

E-3876B
(7-74)

NO. 4 SYSTEM IMA SUMMARY
COMPUTER INPUT WORK SHEET

NO. 4 OFFICE _____ MONTH _____

IMA – _____ Ⓔ
Company

REPORT = #4T–ABH Ⓔ

ITEMS = _____ Ⓔ

MACHINE = ___ ___ ___ ___ _____ Ⓔ
NO. DAYS

VALUES =

1. TLF PEG COUNT (Col. 1) _____,
2. ROA (Col. 2) _____,
3. ROA OVERFLOW (Col. 3) _____,
4. VCA (Col. 5) _____,
5. VCA OVERFLOW (Col. 6) _____,
6. SOA (Col. 8) _____,
7. SOA OVERFLOW (Col. 9) _____,
8. NCA (Col. 16) _____,
9. NCA OVERFLOW (Col. 17) _____,
10. FRA (Col. 26) _____,
11. FRA OVERFLOW (Col. 27) _____,
12. TRANSV. ATTS. (Col. 34) _____,
13. MCA (Col. 35) _____,
14. MCA OVERFLOW (Col. 36) _____,
15. UCA (Col. 38) _____,
16. UCA OVERFLOW (Col. 39) _____,
17. TRANSV. ONI ATTS. (Col. 32) _____,
18. MATCH CHECK (Col. 41) _____,
19. WRONG CALLING CODE (Col. 43) _____,
20. POSITION DISC. (Col. 45) _____,
21. IN DP REGISTER (Col. 49) _____,
22. SVC CODE SEIZURES (Col. 50) _____,
23. PERMANENT SIGNALS (Col. 52) _____,
24. PARTIAL DIGITS (Col. 54) _____,
25. NO. DAYS SADR–MF (Col. 58) _____,
26. NO. DAYS SADR–DP (Col. 61) _____,
27. NO. DAYS SADR–CA (Col. 67) _____,
28. NO. DAYS SADR–OT (Col. 64) _____ Ⓔ

Ⓔ = CARRIAGE RETURN, LINE FEED

Fig. 3—No. 4A/4M IMA Summary Computer Input Worksheet—Form E-3876B

E-3876B (OVS)

NO. 4 SYSTEM IMA SUMMARY – DOMESTIC & OVERSEAS

COMPUTER INPUT WORK SHEET

NO. 4 OFFICE _____ MONTH _____

(DOMESTIC)		(OVERSEAS)	
IMA – _____ (Company) Ⓔ		IMA – NBS (Company) Ⓔ	
REPORT = #4T-ABH Ⓔ		REPORT = #4T-ABH	
ITEMS = _____ Ⓔ		ITEMS = _____ Ⓔ	
MACHINE = _____ , _____ (NO. DAYS) E		MACHINE = _____ OVS _____ (NO. DAYS) Ⓔ	
VALUES =		VALUES =	
1. TLF PEG COUNT (Col. 1 – Col. 68)	_____ ,	1. ADJ OVS SDR PC [TLF P.C.] (Col. 88)	_____ ,
2. ROA (Col. 2 – Col. 87)	_____ ,	2. OVS SDR ROA (Col. 74)	_____ ,
3. ROA OVERFLOW (Col. 3)	_____ ,	3. ROA OVERFLOW	0 ,
4. VCA (Col. 5)	_____ ,	4. IOS [VCA] (Col. 81)	_____ ,
5. VCA OVERFLOW (Col. 6)	_____ ,	5. VCA OVERFLOW	0 ,
6. SOA (Col. 8)	_____ ,	6. SOA	NAP ,
7. SOA OVERFLOW (Col. 9)	_____ ,	7. SOA OVERFLOW	NAP ,
8. NCA (Col. 16 – Col. 76)	_____ ,	8. NCA – OVS GRP OFL [NCA] (Col. 76)	_____ ,
9. NCA OVERFLOW (Col. 17)	_____ ,	9. NCA OVERFLOW	0 ,
10. FRA (Col. 26)	_____ ,	10. EB [FRA] (Col. 85)	_____ ,
11. FRA OVERFLOW (Col. 27)	_____ ,	11. EB [FRA OVERFLOW] (Col. 85)	_____ ,
12. TRANSVERTER ATTS. (Col. 34)	_____ ,	12. TRANSVERTER ATTS.	NAP ,
13. MCA (Col. 35)	_____ ,	13. MCA	NAP ,
14. MCA OVERFLOW (Col. 36)	_____ ,	14. EB [MCA OVERFLOW] (Col. 85)	_____ ,
15. UCA (Col. 38)	_____ ,	15. UCA	NAP ,
16. UCA OVERFLOW (Col. 39)	_____ ,	16. UCA OVERFLOW	NAP ,
17. TRANS ONI ATTS. (Col. 32)	_____ ,	17. TRANS ONI ATTS.	NAP ,
18. MATCH CHECK (Col. 41)	_____ ,	18. MATCH CHECK	NAP ,
19. WRONG CALLING CODE (Col. 43)	_____ ,	19. WRONG CALLING CODE	NAP ,
20. POSITION DISCONNECT (Col. 45)	_____ ,	20. POSITION DISCONNECT	NAP ,
21. IN DP REGISTER (Col. 49)	_____ ,	21. IN DP REGISTER	NAP ,
22. SVC CODE SEIZURE (Col. 50)	_____ ,	22. SVC CODE SEIZURE	NAP ,
23. PERMANENT SIGNALS (Col. 52)	_____ ,	23. PERMANENT SIGNALS	NAP ,
24. PARTIAL DIGITS (Col. 54)	_____ ,	24. PARTIAL DIGITS	NAP ,
25. NO. DAYS SADR – MF (Col. 58)	_____ ,	25. NO. DAYS SADR – MF	NAP ,
26. NO. DAYS SADR – DP (Col. 61)	_____ ,	26. NO. DAYS SADR – DP	NAP ,
27. NO. DAYS SADR – CAMA (Col. 67)	_____ ,	27. NO. DAYS SADR – CAMA	NAP ,
28. NO. DAYS SADR – OTHER [RP] (Col. 64)	_____ Ⓔ,	28. NO. DAYS SADR – OVS (Col. 80)	_____ Ⓔ

Ⓔ = Carriage Return, Line Feed

Fig. 4—No. 4A/4M IMA Summary—Domestic and Overseas Computer Input Worksheet—Form E-3876B (OVS)

TABLE A
INSTRUCTIONS FOR PREPARING FORMS E-3876A AND E-3876A(OVS)

FORM AREA	ACTION
No. 4 Office	Enter name of office.
Month	Enter month and year of report.
Interval	Enter start and end time of busy hour.
Column-Date	Enter calendar date of each day included in report.
Column 1	Enter total incoming trunk link frame (TLF) peg count. (Overseas offices must subtract the overseas sender peg count from the incoming trunk link frame peg count for their domestic report.)
Column 2	Enter reorder announcement (ROA) peg count. (Overseas offices must subtract the total overseas reorders, column 87, from the ROA peg count for their domestic report.)
Column 3	Enter ROA overflow.
Column 4	Enter computed percentage (column 2 ÷ column 1 x 100).
Column 5	Enter vacant code announcement (VCA) peg count.
Column 6	Enter VCA overflow.
Column 7	Enter computed percentage (column 5 ÷ column 1 x 100).
Column 8	Enter sender overload announcment (SOA) peg count.
Column 9	Enter SOA overflow.
Column 10	Enter computed percentage (column 8 ÷ column 1 x 100).

Columns 11 through 15 are provided to record the various items required to obtain the adjusted NCA peg count. The adjusted NCA peg count must be a total of all no circuit conditions on intertoll trunk groups. The use of these columns will vary by type of office.

	CARD TRANSLATOR	ET WITHOUT PBC	ET WITH PBC
Column 11	Enter no circuit announcement (NCA) peg count.	Enter no circuit-intertoll (NC-IT).	Enter NC-IT.
Column 12	Enter overflow of toll completing groups assigned to a route relay with NCA routing instructions.	Enter EA #1 and EA #2 peg counts when calls routed to these groups were due to controls on intertoll groups. *	Enter overflow of code 900 mass calling group when the system choke network is utilized.
Column 13	Enter overflow of code 900 mass calling group when the system choke network is utilized.	Enter total number of calls routed to NCA due to network controls on intertoll groups. †	Not required.

* It is suggested that EA #1 be used for controls on intertoll groups and that EA #2 be used for controls on toll completing groups.

† This figure can be obtained by subtracting the NC-IT and the no circuit-toll completing (NC-TC) from the software NCA peg count register. Also, it is suggested that calls blocked by the use of network controls be directed to the EA groups.

TABLE A (Cont)
INSTRUCTIONS FOR PREPARING FORMS E-3876A AND E-3876A(OVS)

FORM AREA	ACTION		
	CARD TRANSLATOR	ET WITHOUT PCB	ET WITH PBC
Column 14	Not required.	Enter overflow of final nonscannable intertoll trunk groups.	Not required.
Column 15	Not required.	Enter overflow of code 900 mass calling group when the system choke network is utilized if group is scannable.	Not required.
Column 16	Enter computed amount (column 11 — columns 12 and 13). Overseas offices must also subtract column 76 for domestic report.	Enter computed amount (column 11 + 12 + 13 + 14 — 15). Overseas offices must also subtract column 76 for domestic report.	Enter computed amount (column 11 — column 12). Overseas offices must also subtract column 76 for domestic report.
Column 17	Enter NCA overflow (mechanical).	Enter sum of the software and mechanical NCA overflow registers.	Enter NCA overflow (software).
Column 18	Enter computed percentage (column 16 + column 1 x 100).		
Columns 19 through 25 are provided to record the various items required to obtain an adjusted FRA peg count. The adjusted FRA peg count must be a total of all no circuit conditions on test, miscellaneous, and toll completing trunk groups plus the overflow of the announcement groups. The FST-ATB calls will also be included in card translator offices. The use of these columns will vary by type of office.			
	CARD TRANSLATOR	ET WITHOUT PBC	ET WITH PBC
Column 19	Enter final announcement reorder (FRA) peg count.	Enter NCA software peg count.	Enter NC-TC peg count.
Column 20	Enter overflow of toll completing groups assigned to a route relay with NCA routing.	Enter NCA mechanical peg count.	Enter FRA peg count.
Column 21	Enter overflow of local NNX dedicated choke network if calls are directed to FRA.	Enter FRA peg count.	Enter overflow of local NNX dedicated choke network if calls are directed to FRA.
Column 22	Enter overflow of 60-ipm line busy tone group.	Enter EA #1 and EA #2 peg counts.	Enter overflow of 60-ipm line busy tone group.
Column 23	Not required.	Enter overflow of local NNX dedicated choke network if calls are directed to FRA or NCA.	Not required.

TABLE A (Cont)

INSTRUCTIONS FOR PREPARING FORMS E-3876A AND E-3876A(OVS)

FORM AREA	ACTION		
	CARD TRANSLATOR	ET WITHOUT PBC	ET WITH PBC
Column 24	Not required.	Enter overflow of 60-ipm line busy tone group.	Not required.
Column 25	Not required.	Enter overflow of code 900 mass calling group when system choke network is utilized if group is nonscannable.	
Column 26	Enter computed amount (columns 19 + 20 — 21 — 22).	Enter computed amount (columns 19 + 20 + 21 + 22 — 23 — 24 — 25 — 16).‡	Enter computed amount (columns 19 + 20 — 21 — 22).
Column 27	Enter FRA overflow.		
Column 28	Enter overflow of EA #1 and EA #2.		
Column 29	Enter computed amount (columns 3 + 6 + 9 + 17 + 28 + 36 + 39).		
Column 30	Enter computed amount (column 26 — column 29).		
Column 31	Enter computed percentage (column 30 ÷ column 1 x 100).		
Column 32	Enter transverter operator number identification (ONI) peg count.		
Column 33	Enter transverter automatic number identification (ANI) peg count.		
Column 34	Enter computed amount (column 32 + column 33).		
Column 35	Enter misrouted non-CAMA announcement (MCA) peg count.		
Column 36	Enter MCA overflow.		
Column 37	Enter computed percentage (column 35 ÷ column 34 x 100).		
Column 38	Enter unauthorized CAMA code announcement (UCA) peg count.		
Column 39	Enter UCA overflow.		
Column 40	Enter computed percentage (column 38 ÷ column 34 x 100).		
Column 41	Enter match check peg count.		
Column 42	Enter computed percentage (column 41 ÷ column 32 x 100).		
Column 43	Enter wrong calling code (WCR) peg count.		
Column 44	Enter computed percentage (column 43 ÷ column 32 x 100).		

‡ To obtain the adjusted FRA peg count, NCAs, EAs, and FRAs have all been included and then the authorized exclusion and the identified NC-IT (column 16) is subtracted. Therefore, any NC-IT not counted in column 16 will be included as FRA.

TABLE A (Cont)

INSTRUCTIONS FOR PREPARING FORMS E-3876A AND E-3876A(OVS)

FORM AREA	ACTION
Column 45	Enter position disconnected peg coung.
Column 46	Enter computed precentage (column 45 ÷ column 32 x 100).
Column 47	Enter no position attached peg count.
Column 48	Enter computed percentage (column 46 ÷ column 32 x 100).
Column 49	Enter CAMA incoming DP register peg count.
Column 50	Enter incoming DP register service code seizures.
Column 51	Enter computed percentage (column 49 — column 50).
Column 52	Enter CAMA incoming DP register permanent signals (PS).
Column 53	Enter computed percentage (column 52 ÷ column 51 x 100).
Column 54	Enter CAMA incoming DP register partial digits.
Column 55	Enter computed percentage (column 54 ÷ column 51 x 100).
Column 56	Enter MF SADR tests.
Column 57	Enter MF SADR delays.
Column 58	Enter computed percentage (column 57 ÷ column 56 x 100).
Column 59	Enter DP SADR tests.
Column 60	Enter DP SADR delays.
Column 61	Enter computed percentage (column 60 ÷ column 59 x 100).
Column 62	Enter RP SADR tests.
Column 63	Enter RP SADR delays.
Column 64	Enter computed percentage (column 63 ÷ column 62 x 100).
Column 65	Enter CAMA SADR tests.
Column 66	Enter CAMA SADR delays.
Column 67	Enter computed percentage (column 66 ÷ column 65 x 100).
Column 68	Enter overseas sender peg count.
Column 69	Enter overseas sender permanent signals.
Column 70	Enter overseas sender partial digits.
Column 71	Enter overseas sender mutilated digits.
Column 72	Enter overseas sender pulse error.
Column 73	Enter overseas sender final attempt trouble record.
Column 74	Enter computed amount (columns 69 + 70 + 71 + 72 + 73).
Column 75	Enter computed percentage (column 74 ÷ column 68 x 100).
Column 76	Enter total of overflow of all final overseas trunk groups.

TABLE A (Cont)

INSTRUCTIONS FOR PREPARING FORMS E-3876A AND E-3876A(OVS)

FORM AREA	ACTION
Column 77	Enter computed percentage (column 76 ÷ column 68 x 100).
Column 78	Enter overseas SADR tests.
Column 79	Enter overseas SADR delays.
Column 80	Enter computed percentage (column 79 ÷ column 78 x 100).
Column 81	Enter incoming overseas screening.
Column 82	Enter computed percentage (column 81 ÷ column 68 x 100).
Columns 83, 84, and 85	In some locations, a portion of the trunk relay equipment has been modified to return an electrical busy (EB) without initiating a second attempt. Two arrangements exist. With one arrangement the EB and ROA registers are scored and require no data adjustment. However, under the other arrangement, the EB and ROA registers are not scored. It will be necessary for offices with this arrangement to determine what percentage of EB signals are not being recorded. This can be obtained by dividing the total number of overseas (operator tandem, loop around, and intermachine) trunk relays in service which have been modified for simplified EB arrangement by the total number of trunks in service. Use column 83 to record the EB peg count data. Compute the number of EBs that were not scored (percentage of relays modified of column 83) and enter in column 84. Total columns 83 and 84 for the total EB signals, and enter result in column 85. Offices without this modification may record the EB peg count in column 85.
Column 86	Enter computed percentage (column 85 — column 68 x 100).
Column 87	Enter computed amount (column 74 + 81 + 85).
Line 24	Total all columns except the percentage (%) columns.
Line 25	Count number of days of data entries per column. The number of days must be the same for each column and all items must be reported for the same day. Columns 58, 61, 64, 67, and 80 count the number of days the percentage of sender delays exceeded 1.0 percent.
Line 26	Compute average (line 24 ÷ line 25) then compute percentage (%) for each column. The time-shared computer program will make these computations.

test and announcement trunk groups overflows and the FST-ATB calls in a translator card office.

7.06 If a No. 4A/4M office is used as a local tandem, the value of NCA (line 8) should be shown as NAP.

7.07 The CAMA data (lines 12 through 24) are not required for System summarization. The CAMA items spaces still exist within the IMA program and may be used by those companies that wish to continue using the IMA program to obtain company CAMA results. Those No. 4-type offices not reporting CAMA data must report information on lines 14 and 16 as the MCA and UCA overflow figures are required in the computation of FRA.

7.08 Complete the No. 4 IMA computer input worksheet (form E-3876B) as follows:

AREA	ENTER
No. 4 Office	Name of No. 4 office

Month	Month and year of report
IMA	Company name
#4T	Enter ABH to identify monthly reports
Items	The word "ALL" should be entered to indicate that a value or message will be included in the input for each item
Machine	Enter CLLI name
No. Days	Enter figure from line 25 of the worksheet
Values	The values required are monthly totals of each individual item and may be obtained directly from line 24 of the No. 4 IMA worksheet (Form E-3876A). The associated column number is provided in parentheses on each value line.

7.09 The value entered for line 10 (FRA peg count) must equal or be greater than the sum of the values entered on lines 3 (ROA overflow), 5 (VCA overflow), 7 (SOA overflow), 9 (NCA overflow), 14 (MCA overflow), and 16 (UCA overflow) as the program subtracts the announcement group overflows from the FRA peg count.

7.10 The number of days SADR is a positive report should be entered on lines 25 through 28. Enter 0 if the delay did not exceed 1.0 percent on any busy hour in the month.

7.11 The overseas report will be printed out with the regular office data abbreviations. The TLF attempts shown will be the reported Overseas Sender Peg Count, ROA will be the reported Sender Reorders, and NC-IT will be the reported Overflows on Overseas Groups. SOA will be shown "NAP" and FRA will always be zero. The VCA will be the reported Incoming Overseas Screening and OVFL FRA will represent total electrical busies (EB).

7.12 The Electrical Busy Peg Count (Col. 85 of Form 3876A) should be entered on lines 10, 11, and 14 of Form 3876B. This is required to locate the EBs under the OVFL FRA column of the IMA printout.

8. SUMMARY OF NO. 4A/4M INEFFECTIVE MACHINE ATTEMPTS, FORM E-3876C

8.01 The summary of No. 4A/4M Ineffective Machine Attempts Results, Form E-3876C (Fig. 5) is designed to provide a current view of service, to maintain a record of past performance for trending purposes, to display established objectives for reviewing progress, and to keep management personnel informed of the service performance.

8.02 The System IMA Report may be used as the data source for the busy hour report. If results are desired for other intervals, use the worksheet, Form E-3876A, to collect data and, upon completion of the computations on line 26, transcribe the percentage of IMAs by categories to the summary.

9. ANALYZATION OF IMA RESULTS

9.01 Before releasing the IMA report, the dial administrator should check for accuracy and reasonableness. It is suggested that data be collected and summarized daily to prevent a service or register problem from going undetected. Prompt detection of a problem often helps to identify the cause as it may be related to current maintenance or installation work, recently implemented network changes, or difference in traffic due to public events. Unusual changes from the previous month, up or down, should be investigated, documented, and discussed with the appropriate personnel.

9.02 If the incoming trunk link frame peg count or the overseas sender peg count are collected on a totalizer circuit, the totalizer registrations should be checked with the total of the individual frame registers monthly as results may be distorted by totalizer errors.

9.03 In an ET office, all of the no circuit conditions may be identified by totaling the final trunk group overflows. It is suggested that this be performed regularly and emphasis be placed on correcting any trunk deficiencies. If the dial administrator is unable to identify all of the no circuit conditions, verification of records of final groups (intertoll, toll completing, and test) should first be made with the routing supervisor and then

Office _____

Period of Study _____

Year _____

SUMMARY OF NO. 4A/4M INEFFECTIVE MACHINE ATTEMPTS

E-3876C
(3-75)

			Obj.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1	Incoming Trunk Link Frame P.C.(000)													
	2	% ROA													
	3	% SOA													
	4	% NC – IT													
	5	% FRA													
	6	Total													
	7	% VCA													
	8	% High & Dry (FRA OFL)													
	9	Transverter Attempts (000)													
	10	% MCA													
	11	% UCA													
	12	Transverter ONI Attempts (000)													
	13	% Match Check													
	14	% Wrong Calling Code													
	15	% Position Disconnected													
	16	% No. Position Attached													
	17	Incoming DP Reg. P.C. (000)													
	18	Service Seizure													
	19	CAMA Att. on Inc. Reg. (000)													
	20	% Permanent Signals													
	21	% Partial Digits													
	22	Overseas Sender P.C. (000)													
	23	% ROA (Ovs. Sdr)													
	24	% NC – OVS													
	25	TOTAL													
	26	% IOS													
	27	% EB													
	28														
	29	Sender Attachment Delay Recorder													
	30	No. of Delay Days Over 1.0% MF													
	31	DP													
	32	RP													
	33	CAMA													
	34	OVS													
	35	Miscellaneous & Remarks													
	36														
	37														
	38														
	39														
	40														
	41														
	42														

Fig. 5—Summary of No. 4A/4M Ineffective Machine Attempts—Form E-3876C

with ET memory. If no solution is found, verification of registers assigned in memory may be required. Investigation should continue until the trouble is found and identification of all no circuit conditions is possible on a daily basis.

9.04 In a card translator office, identification of all no circuit conditions is not always possible due to FST-ATB failures and to the lack of overflow measurements on various test groups. It is felt that the volume of these calls should normally be small and that every effort should be made to identify the scoring on both the NCA and FRA announcement groups as GB relay troubles, trunk access problems, underscoring of overflow registers, or routing errors may be detected in the identification process. Judgment based on the percentage of IMAs experienced in the NC-IT and FRA categories should determine the frequency and the depth of the identification efforts.

9.05 The dial administrator and the maintenance supervisor share the responsibility for reorder results and must work together to maintain acceptable service results. The dial administrator should collect data on the individual reorder items, partial digits, permanent signals, matching loss, CAMA items, etc, to further identify the causes of reorders and should be aware of reorder trap arrangements and analysis activities in the office.

9.06 The vacant code trap should, regardless of results, be run on a scheduled basis to obtain a sample of VCA calls for analyzation by the dial administrator. Vacant code screening at the source, INWATS translation, screening of codes, operator bulletin errors, sender "AC" and "NAC" domain indications, and end or distant toll office translation problems may be uncovered through this process. It is suggested that VCA analyses be performed with each cutover or toll rehoming requiring national routing changes into the No. 4A/4M office.

10. DISTRIBUTION OF REPORT

10.01 The data may be entered into the computer program between the 1st and the 15th of the following month. System averages and company results may be obtained between the 16th and the end of the month following the report period.

10.02 The IMA results are included in the No. 4 Machine Results Plan office report. Immediate distribution of the IMA report is necessary if IMA results are to be included for the same interval as the No. 4 Machine Results Plan.

10.03 The No. 4 Ineffective Machine Attempt Report may be distributed to all groups directly or indirectly concerned with service. This would normally include Network Administration, Switching Maintenance, Testboard, Network Management, DDD Service Bureau or International Service Coordination Center, Service Observing, Trunk Administration, and Area or Company Staff Organizations.