

AD-A076 218

INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA PROGRAM --ETC F/G 17/2
IMPLEMENTING USAGE-SENSITIVE CHARGES FOR AUTODIN. VOLUME II. AU--ETC(U)
NOV 78 J P BELL , J N FRY , D L MOODY DAHC15-73-C-0200

UNCLASSIFIED

IDA-S-504-VOL-2

IDA/HQ-79-21639

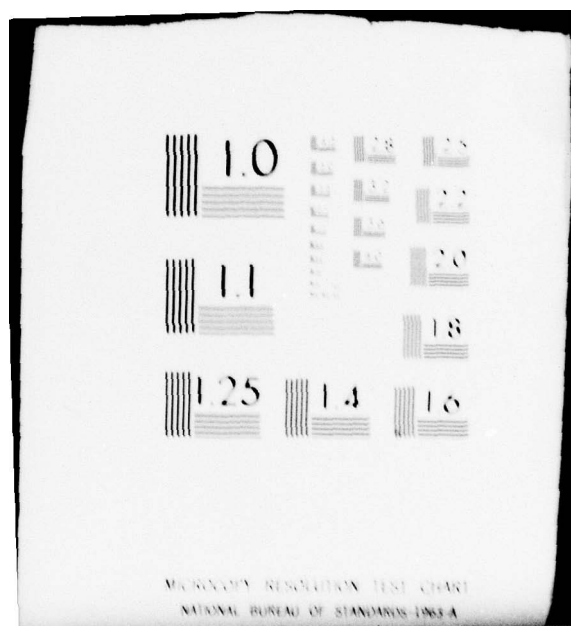
ALL

| OF |

AD
A076218



END
DATE
FILMED
3-80
DDC



ADA076218

IDA STUDY S-504

IMPLEMENTING USAGE-SENSITIVE CHARGES FOR AUTODIN

VOLUME II: AUTODIN Technical Appendices

James P. Bell
John N. Fry
Dale L. Moody

November 1978

Prepared for
Defense Communications Agency

DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited



INSTITUTE FOR DEFENSE ANALYSES
PROGRAM ANALYSIS DIVISION

IDA Log No. HQ 79-21639

79 10 29 049

The work reported in this document was conducted under Contract DANC15 73 C 0200, Task 652-2, for the Defense Communications Agency. The publication of this IDA Study does not indicate endorsement by the Defense Communications Agency, nor should the contents be construed as reflecting the official opinion of that agency.

Approved for public release; distribution unlimited.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) IMPLEMENTING USAGE-SENSITIVE CHARGES FOR AUTODIN - VOL II: AUTODIN Technical Appendices		5. TYPE OF REPORT & PERIOD COVERED FINAL
7. AUTHOR(s) James Bell, John Fry, Dale Moody		6. PERFORMING ORG. REPORT NUMBER IDA Study S-504
9. PERFORMING ORGANIZATION NAME AND ADDRESS Institute for Defense Analyses 400 Army-Navy Drive Arlington, VA 22202		8. CONTRACT OR GRANT NUMBER(s) DAHC 15 73 C 0200
11. CONTROLLING OFFICE NAME AND ADDRESS Defense Communications Agency (670) 8th and Courthouse Road Arlington, VA 22201		10. PROGRAM ELEMENT PROJECT TASK AREA & WORK UNIT NUMBERS DCA T-652-2
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) n/a		12. REPORT DATE November 1978
		13. NUMBER OF PAGES 80
		15. SECURITY CLASS (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release, distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Digital Communications, Cost Allocation, Computer Simulation, Industrial Fund, Management Accounting and Budgeting.		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) A technique is developed for accumulating and processing data on AUTODIN digital communication usage, applying usage rates and computing user charges for billing purposes. The program was activated on Defense Commercial Communications Office computers and tested using a special 1978 sample of actual system traffic and several alternate rate structures. Resulting cost distributions are shown and discussed. The problems of system implementation and interpretation of data are discussed.		

IDA STUDY S-504

**IMPLEMENTING USAGE-SENSITIVE CHARGES
FOR AUTODIN**

VOLUME II: AUTODIN Technical Appendices

**James P. Bell
John N. Fry
Dale L. Moody**

November 1978



**INSTITUTE FOR DEFENSE ANALYSES
PROGRAM ANALYSIS DIVISION
400 Army-Navy Drive, Arlington, Virginia 22202**

**Contract DAHC15 73 C 0200
Task 652-2**

PREFACE

The appendices in this volume are intended to provide the user with the technical information needed to reproduce or modify the programs used in the analysis and to process additional samples of AUTODIN traffic or additional cost allocations with different connectivity charges and utilization rates.

PRECEDING PAGE BLANK - NOT FILMED

CONTENTS

APPENDIX A - PROGRAM DAILY

- Description of Program DAILY
- Flow Chart of Program DAILY
- Input to Program DAILY
- Computer Program
- Sample Outputs

APPENDIX B - PROGRAM SUMMY

- Description of Program SUMMY
- Flow Chart of Program SUMMY
- Inputs to Program SUMMY
- Computer Program
- Sample Outputs

APPENDIX C - PROGRAM COSAL

- Description of Program COSAL
- Flow Chart of Program COSAL
- Inputs to Program COSAL
- Computer Program
- Sample Outputs

APPENDIX D - SPECIALIZED SYSTEM FEATURES

APPENDIX E - A GENERALIZED MODEL FOR ALLOCATING COSTS

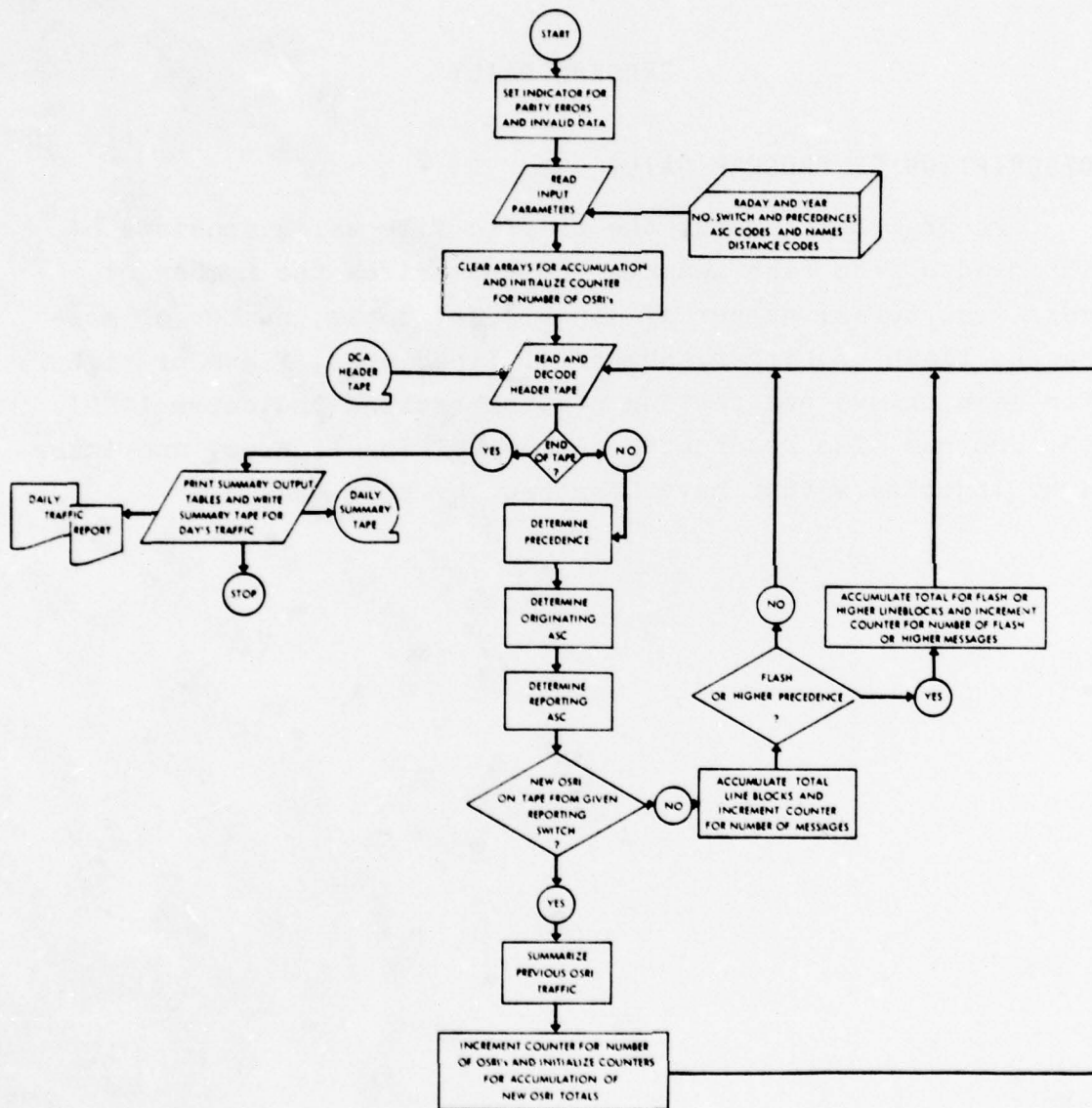
APPENDIX A

PROGRAM DAILY

PROGRAM DAILY

DESCRIPTION OF PROGRAM DAILY

Program DAILY reads the traffic file which consists of the header from each message and summarizes the number of messages, total; number of lineblocks, total; number of messages, flash or higher; number of lineblocks, flash or higher. For each unique originating station routing indicator (OSRI) the program also records the number of local, area, and inter-area lineblocks that have been sent by that OSRI.



PROGRAM DAILY

INPUT CARD 1

FORTRAN			
Field	Position	Variable Name	Format
1	1 - 5	NRD	15
2	6 - 10	NYR	15
		Year (Last two digits)	
		Item	RADAY

INPUT CARD 2

FORTRAN			
Field	Position	Variable Name	Format
1	1 - 5	N1	15
2	6 - 10	NP	15
		Item	Number of switches
			Number of precedences

INPUT CARD 3

FORTRAN			
Field	Position	Variable Name	Format
1	1 - 10	PP(1)	A1
2	11 - 20	PP(2)	A1
3	21 - 30	PP(3)	A1
4	31 - 40	PP(4)	A1
.	.	.	.
.	.	.	.
.	.	.	.
NP		PP(NP)	A1
		Item	Code for 1st Precedence
			Code for 2nd Precedence
			Code for 3rd Precedence
			Code for 4th Precedence
			NP th Precedence

PROGRAM DAILY

INPUT CARD 4

Field	Position	FORTTRAN Variable Name	Format	Item
1	1	ASC (1)	A1	Code for 1st ASC
2	2	ASC (2)	A1	Code for 2nd ASC
3	3	ASC (3)	A1	Code for 3rd ASC
4	4	ASC (4)	A1	Code for 4th ASC
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
N1	.	ASC (N1)	A1	Code for N1 th ASC

INPUT CARD 5

Field	Position	FORTTRAN Variable Name	Format	Item
1	1-4	ASCN (1)	A4	Name of 1st ASC
2	5-8	ASCN (2)	A4	Name of 2nd ASC
3	9-12	ASCN (3)	A4	Name of 3rd ASC
4	13-16	ASCN (4)	A4	Name of 4th ASC
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
N1	.	ASCN (N1)	A4	Name of N1 th ASC
N2	*	ASCN (N3)	A4	Label for total column

*Maximum of 20 elements per card, may be continued on another card.

#ASC N2 is ASC N1 + 1 to account for any mis-coded or invalid ASC

codes

PROGRAM DAILY

INPUT CARD 6

Field	Position	FORTTRAN Variable Name	Format	Item
1	1-4	KDIST(1,1)	I4	Distance Code for ASC 1 to ASC 1
2	5-8	KDIST(1,2)	I4	Distance Code for ASC 1 to ASC 2
3	9-12	KDIST(1,3)	I4	Distance Code for ASC 1 to ASC 3
4	13-16	KDIST(1,4)	I4	Distance Code for ASC 1 to ASC 4
.	.	.	.	
.	.	.	.	
.	.	.	.	
N2 ¹	*	KDIST(1,N2)	I4	Distance Code for ASC 1 to ASC N2
.				
.				
1	1-4	KDIST(2,1)	I4	Distance Code for ASC 2 to ASC 1
2	5-8	KDIST(2,2)	I4	Distance Code for ASC 2 to ASC 2
3	9-12	KDIST(2,3)	I4	Distance Code for ASC 2 to ASC 3
4	13-16	KDIST(2,4)	I4	Distance Code for ASC 2 to ASC 4
.				
.				
.				
N2	*	KDIST(2,N2)	I4	Distance Code for ASC 2 to ASC N2
.				
.				
.				
1	1-4	KDIST(N2,1)	I4	Distance Code for ASC N2 to ASC 1
2	5-8	KDIST(N2,2)	I4	Distance Code for ASC N2 to ASC 2
3	9-12	KDIST(N2,3)	I4	Distance Code for ASC N2 to ASC 3
4	13-16	KDIST(N2,4)	I4	Distance Code for ASC N2 to ASC 4
.	.	.		
.	.	.		
.	.	.		
N2	*	KDIST(N2,N2)		Distance Code for ASC N2 to ASC N2

¹ASC N2 is ASC N1 + 1 to account for any mis-coded or invalid ASC codes.

PROGRAM DAILY
INPUT TRAFFIC FILE--HEADER EXTRACT

PHYSICAL CHARACTERISTICS

Tape: 7 track
Density: 800 bsi
Parity: Even
Character Code: BCD
Record Size: 90 Characters/logical record
Blocking: 8 logical records/physical block
Label: Unlabeled

LOGICAL RECORD

Field	FORTRAN		Item
	Position	Variable Name	
1	1	P	Precedence
2	5	SWO	Originating ASR
3	8-14	OSRI	Originating station routing indicator
4	19-21	LB	Line-block count
5	76	SWR	Reporting ASC

C	SET INDICATOR TO SKIP ANY RECORD WITH INVALID DATA ELEMENTS	1000370
C		1000380
C		1000390
	100=1	1000400
	CALL INCK(N)	1000410
	GO TO (1,1000). IGO	1000420
	1 CONTINUE	1000430
	100=2	1000440
C	HEAD MADAY AND YEAR (LAST TWO DIGITS)	1000450
C		1000460
C		1000470
	HEAD(5,7001) MOD,NYR	1000480
C		1000490
C	HEAD NUMBER OF SWITCHES AND NUMBER OF PRECEDENCES	1000500
		1000510
C	HEAD (5,7001) N1,NP	1000520
	N2 = N1 + 1	1000530
	N3 = N1 + 2	1000540
C		1000550
C	HEAD PRECEDENCE CODES	1000560
C		1000570
	HEAD (5,7002) (PP(K),K=1,NP)	1000580
C		1000590
C	HEAD ASC CODES	1000600
C		1000610
	HEAD (5,7002) (ASC(K),K=1,N1)	1000620
C		1000630
C	HEAD ASC NAMES	1000640
C		1000650
	HEAD (5,7002) (ASCN(K),K=1,N3)	1000660
C		1000670
C	HEAD DISTANCE CODE	1000680
C		1000690
	HEAD(5,7004) ((KDIST(K1,K2),K2=1,N2),K1=1,N2)	1000700
C		1000710
C	CLEAR ARRAYS USED FOR ACCUMULATION	1000720

THIS PAGE IS BEST QUALITY FRAGMENT
FROM COPY FURNISHED TO DDG


```

210 CONTINUE
K1=1
220 CONTINUE
C
C
C
    DETERMINE ORIGINATING ASC
    DO 230 K=1,M1
    K1=K
    IF (SWO.EQ.ASC(K)) GO TO 240
230 CONTINUE
    K1=N2
240 CONTINUE
C
C
C
    DETERMINE REPORTING ASC
    DO 250 K=1,M1
    K2=K
    IF (SWR.EQ.ASC(K)) GO TO 260
250 CONTINUE
    K2=N2
260 CONTINUE
C
C
C
    NOTE:
    THE ABOVE STATEMENT WILL SET AN INVALID
    ASC TO 17 AND AN INVALID PRECEDENCE TO ROUTINE
    DETERMINE IF DDSI HAS CHANGED
    IF CHANGED SUMMARIZE AND WRITE SUMMARY STATISTICS
    IF (FORI.NE.OOI) GO TO 400
C
300 CONTINUE
C
C
C
    COUNT MESSAGES AND LINELOCKS
    NM(K1,K2)=NM(K1,K2)+1

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC


```

C      IF (NTORI.GT.5000) NTORI=5000
C      KORI=NTORI
C      TMT(KORI)=FORT
C      530 CONTINUE
C      DO 540 KD=1,3
C      KSUM(KORI,KD)=KSUM(KORI,KD)+KIM(KD)
C      KTSUM(KD)=KTSUM(KD)+KIM(KD)
C      KUM(KD)=0
C      540 CONTINUE
C      550 CONTINUE
C      IF END OF FILE HAS BEEN FOUND GO TO FND
C      IF (KFIRST.EQ.3) GO TO 700
C      KFIRST = 2
C      FORT = ORI
C      1000 CONTINUE
C      READ NEXT BLOCK
C      GO TO 100
C      CALCULATE TOTALS FOR EACH TABLE
C      700 CONTINUE
C      DO 710 J1=1,N2
C      DO 710 J2=1,N2
C      NMT(N3,J2)=NMT(N3,J2)+NMT(J1,J2)
C      NMT(J1,N3)=NMT(J1,N3)+NMT(J1,J2)
C      NLPT(N3,J2)=NLPT(N3,J2)+NLPT(J1,J2)

```

THIS PAGE IS BEST QUALITY AVAILABLE
 FROM COPY FURNISHED TO DDC


```

C      WRITE(2) NMT,N(RT,NFMT,NFLBY
      DO 200 J=1,NTOTI
      WRITE(2) J,THI(J),(KSUM(J,L),L=1,3)
      200 CONTINUE
C
C      STOP
C
C      PARITY ERROR ON INPUT TAPE
C      2000 CONTINUE
C      NPF=NPF+1
C
C      WRITE REMARK IN DAYFILE
C      CALL REMARK(17,READ PARITY ERROR)
C      WRITE(6,9001) NPF
C
C      WRITE OUT ENTIRE BLOCK AND IGNORE BLOCK FOR DATA
C
C      DO 2010 L1=1,72,8
C      L2=L1+7
C      WRITE(6,9002) L1,(BUF(L),L=L1,L2)
C      2010 CONTINUE
C      CONTINUE WITH READING NEXT BLOCK
C
C      GO TO 100
C
C      END OF TAPE
C      3000 CONTINUE
C      KFPST=3

```

```

1003610
1003620
1003630
1003640
1003650
1003660
1003670
1003680
1003690
1003700
1003710
1003720
1003730
1003740
1003750
1003760
1003770
1003780
1003790
1003800
1003810
1003820
1003830
1003840
1003850
1003860
1003870
1003880
1003890
1003900
1003910
1003920
1003930
1003940
1003950
1003960

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

60 TO 400
 C FORMATS FOR INPUT
 C
 7000 FORMAT(A1,3X,A1,2X,A1,4X,13,54X,A1)
 7001 FORMAT(2I5)
 7002 FORMAT(20A1)
 7003 FORMAT(20A4)
 7004 FORMAT(17I4)
 C
 C FORMATS FOR OUTPUT TABLES
 C
 8002 FORMAT(1H1//20X,26H NUMBER OF MESSAGES--TOTAL,44X,
 1 6HRDAY,13,11H OF YEAR 19,12///10H FROM/TO ,
 2 12(5X,A4,1X)/)
 8003 FORMAT(////20X,39H NUMBER OF MESSAGES--TOTAL (CONTINUED),
 1 ///10H FROM/TO ,5(5X,A4,1A),9X,5HTOTAL/)
 8004 FORMAT(1H1//20X,26H NUMBER OF LINE BLOCKS--TOTAL,41X,
 1 6HRDAY,13,11H OF YEAR 19,12///10H FROM/TO ,
 2 12(5X,A4,1X)/)
 8005 FORMAT(////20X,41H NUMBER OF LINE BLOCKS--TOTAL (CONTINUED),
 1 ///10H FROM/TO ,5(5X,A4,1A),9X,5HTOTAL/)
 8006 FORMAT(1H1//20X,36H NUMBER OF MESSAGES--FLASH OR HIGHER,34X,
 1 6HRDAY,13,11H OF YEAR 19,12///10H FROM/TO ,
 2 12(5X,A4,1X)/)
 8007 FORMAT(////20X,49H NUMBER OF MESSAGES--FLASH OR HIGHER (CONTINUED
 1),22X, ///10H FROM/TO ,5(5X,A4,1A),9X,5HTOTAL/)
 8008 FORMAT(1H1//20X,39H NUMBER OF LINE BLOCKS--FLASH OR HIGHER,31X,
 1 6HRDAY,13,11H OF YEAR 19,12///10H FROM/TO ,
 2 12(5X,A4,1X)/)
 8009 FORMAT(////20X,51H NUMBER OF LINE BLOCKS--FLASH OR HIGHER (CONTIN
 1UED), ///10H FROM/TO ,5(5X,A4,1A),9X,5HTOTAL/)
 8010 FORMAT(2X,A4,3X,12I10)
 8011 FORMAT(2X,A4,3X,5I10,115)
 8012 FORMAT(3I10)
 8014 FORMAT(110,A7,3I15)

1003970
 1003980
 1003990
 1004000
 1004010
 1004020
 1004030
 1004040
 1004050
 1004060
 1004070
 1004080
 1004090
 1004100
 1004110
 1004120
 1004130
 1004140
 1004150
 1004160
 1004170
 1004180
 1004190
 1004200
 1004210
 1004220
 1004230
 1004240
 1004250
 1004260
 1004270
 1004280
 1004290
 1004300
 1004310
 1004320

```

C      FORMATS FOR TEMPORARY OUTPUT TABLES
C
C      6001 FORMAT(1H1//2-X,6HRAWAY,13,11H OF YEAR 19,12//
1      20X,15HNUMBER OF DSRT,11X//)
6002 FORMAT(20X,15HTRAFFIC BY ORST//
1      70H NUMBER NSPT LOCAL
2      INTER-AREA //)
6003 FORMAT(110,5X,17,2X,3115)
6004 FORMAT(//15X,9HCUR-TOTAL,3X,3115)
6005 FORMAT(//15X,5HTOTAL,37X,115)
C      FORMATS FOR SYSTEM DATA
C
C      9001 FORMAT(18H PARTY ERKON NO.,15)
9002 FORMAT(1X,11,4X,1H*,0A10,1H*)
9003 FORMAT(//13HEND OF TAPES,//5X,15,12H BLOCKS READ//
1      5X,15,14H PARITY ERRORS)
C
C      END
1004370
1004340
1004350
1004360
1004370
1004380
1004390
1004400
1004410
1004420
1004430
1004440
1004450
1004460
1004470
1004480
1004490
1004500
1004510
1004520

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

NUMBER OF MESSAGES--TOTAL

NUMBER OF MESSAGES--TOTAL

FROM/TO	RUEB	RUEA	RUEC	RUEH	RUEO	RUEG	RUEI	RUEJ	RUEK	RUEL	RUEM	RUEP	RUEQ	RUER	RUES	RUEU	RUEV	RUEW	RUEX	RUEY	RUEZ
RUEB	12380	1072	171	937	868	179	475	532	486	529	433	561	501	501	501	501	501	501	501	501	501
RUEA	1332	2269	110	117	222	130	452	817	153	289	545	345	345	345	345	345	345	345	345	345	345
RUEC	52	83	2426	172	113	466	15	57	308	139	207	17	17	17	17	17	17	17	17	17	17
RUEH	1308	1313	298	614	983	123	766	886	616	947	560	549	549	549	549	549	549	549	549	549	549
RUEO	2127	105	41	219	3985	50	61	150	91	72	50	932	932	932	932	932	932	932	932	932	932
RUEG	125	13	383	114	16	1418	18	35	199	96	149	17	17	17	17	17	17	17	17	17	17
RUEI	661	940	87	678	230	107	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUEJ	438	552	92	766	244	107	536	1340	93	467	302	283	283	283	283	283	283	283	283	283	283
RUEK	557	13	310	94	5	133	12	19	2565	90	86	3	3	3	3	3	3	3	3	3	3
RUEL	514	592	174	838	97	229	429	271	235	3525	1131	56	56	56	56	56	56	56	56	56	56
RUEM	640	820	245	715	108	567	562	339	311	901	1965	255	255	255	255	255	255	255	255	255	255
RUEP	1879	386	10	441	1719	27	106	157	21	89	115	3999	3999	3999	3999	3999	3999	3999	3999	3999	3999
RUEQ	445	130	11	1470	651	2	49	139	13	32	43	613	613	613	613	613	613	613	613	613	613
RUER	42	7	32	94	2	3	15	18	193	16	63	3	3	3	3	3	3	3	3	3	3
RUES	683	685	245	954	329	162	547	1094	212	933	712	505	505	505	505	505	505	505	505	505	505
RUEU	445	148	1054	735	59	753	78	240	1038	864	693	53	53	53	53	53	53	53	53	53	53
RUEV	0	2	0	2	0	0	0	2	7	0	2	3	3	3	3	3	3	3	3	3	3
RUEW	23548	9130	5719	13021	6632	4427	5525	7045	6702	9378	8155	7489	7489	7489	7489	7489	7489	7489	7489	7489	7489
RUEX																					
RUEY																					
RUEZ																					

NUMBER OF MESSAGES--TOTAL (CONTINUED)

FROM/TO	RUEB	RUEA	RUEC	RUEH	RUEO	RUEG	RUEI	RUEJ	RUEK	RUEL	RUEM	RUEP	RUEQ	RUER	RUES	RUEU	RUEV	RUEW	RUEX	RUEY	RUEZ
RUEB	235	86	450	418	0	19872	475	532	486	529	433	561	501	501	501	501	501	501	501	501	501
RUEA	321	35	449	137	0	8642	452	817	153	289	545	345	345	345	345	345	345	345	345	345	345
RUEC	7	56	157	403	0	4668	15	57	308	139	207	17	17	17	17	17	17	17	17	17	17
RUEH	1484	191	773	521	0	16239	766	886	616	947	560	549	549	549	549	549	549	549	549	549	549
RUEO	865	0	121	20	0	8797	61	150	91	72	50	932	932	932	932	932	932	932	932	932	932
RUEG	6	22	35	340	0	2987	18	35	199	96	149	17	17	17	17	17	17	17	17	17	17
RUEI	332	54	457	141	0	7642	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUEJ	332	197	327	104	0	6177	536	1340	93	467	302	283	283	283	283	283	283	283	283	283	283
RUEK	9	87	99	651	0	4733	12	19	2565	90	86	3	3	3	3	3	3	3	3	3	3
RUEL	168	111	737	799	0	9905	429	271	235	3525	1131	56	56	56	56	56	56	56	56	56	56
RUEM	192	57	604	854	0	9114	562	339	311	901	1965	255	255	255	255	255	255	255	255	255	255
RUEP	2447	4	147	28	0	10675	106	157	21	89	115	3999	3999	3999	3999	3999	3999	3999	3999	3999	3999
RUEQ	3760	0	66	18	0	7087	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUER	2	1194	21	168	0	1873	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUES	511	87	1814	442	0	9636	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUEU	82	149	278	257	0	9054	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUEV	0	0	0	1	0	14	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUEW	10693	2330	4535	7202	0	137132	1425	919	170	388	477	205	205	205	205	205	205	205	205	205	205
RUEX																					
RUEY																					
RUEZ																					

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

0000 UNCLASSIFIED 0000

09/02/78

PAGE NO. 000015

NUMBER OF LINE BLOCKS--TOTAL

09/02/78

FROM/TO	RUEB	RUEC	RUEH	RUEJ	RUEK	RUEL	RUEM	RUEO	RUEP	RUEQ	RUER	RUES	RUEU	RUEV	RUEW	RUEX	RUEY
RUEA	39079	37152	4322	48/03	39010	56441	5200	57075	19771	24077	19314	19122					
RUEB	41568	90381	2091	24039	0094	12302	2740	22821	3202	5785	19246	8502					
RUEC	1138	3952	21642	5660	5371	337	10324	2505	9115	1731	6213	705					
RUED	47004	52320	11916	28050	3232	62448	3598	85559	24865	33213	22385	22740					
RUEE	78446	3275	1821	5335	68463	2197	1219	1469	3282	1577	1398	25007					
RUEF	3017	699	9210	2432	767	485	17533	39794	4643	2229	2501	501					
RUEG	21688	44833	1418	28097	14093	63303	4952	39794	7545	11299	77562	11702					
RUEH	32423	24247	3531	28195	12983	52050	3542	12999	2479	19293	36361	32961					
RUEI	19566	644	14511	1442	341	568	9411	511	36776	2189	1471	141					
RUEJ	12064	34543	5367	49468	4379	17005	6269	18209	7088	115399	44999	1151					
RUEK	22503	38009	7429	24031	4465	84749	34655	18308	9773	30387	77565	19427					
RUEL	41024	9159	210	17139	48730	4867	591	6515	563	1690	7735	54902					
RUEM	12147	3916	353	38113	28054	18	2756	5178	588	949	1775	18749					
RUEN	1375	205	1576	3264	70	456	44	1105	6379	417	23793	01					
RUEO	37324	33975	9699	42405	13470	59031	4609	76170	9457	91711	35478	36184					
RUEP	9341	4192	31769	19240	1125	2128	22090	7742	7411	21225	17750	1989					
RUEQ	0	41	0	6	0	0	0	6	28	0	41	0					
RUER	740251	381343	122925	619219	267347	421164	119795	473611	198065	363160	396927	251993					

NUMBER OF LINE BLOCKS--TOTAL (CONTINUED)

THIS PAGE IS BEING FURNISHED TO DDC FROM COPY FURNISHED TO DDC

FROM/TO	RUEB	RUEC	RUEH	RUEJ	RUEK	RUEL	RUEM	RUEO	RUEP	RUEQ	RUER	RUES	RUEU	RUEV	RUEW	RUEX	RUEY
RUEA	6544	2380	14716	14011	0	752637											
RUEB	7866	472	7214	1465	0	245128											
RUEC	109	1100	01746	0220	0	77869											
RUED	44839	8052	27454	19610	0	774787											
RUEE	23914	0	1755	22	0	218270											
RUEF	289	757	635	7699	0	54117											
RUEG	8531	1277	21167	14414	0	370134											
RUEH	13519	4831	6083	4693	0	408559											
RUEI	179	2332	6902	16441	0	97464											
RUEJ	3948	3891	22373	16231	0	368800											
RUEK	8362	6336	34708	24406	0	431105											
RUEL	47357	177	2275	429	0	275044											
RUEM	75891	0	1502	892	0	175672											
RUEO	26	21834	1641	5256	0	67522											
RUEP	24456	2244	124437	8371	0	607123											
RUEQ	1218	8260	5485	4411	0	266357											
RUER	0	0	0	0	0	124											
RUES	287828	63943	278065	178674	0	5182714											

0000 UNCLASSIFIED 0000

09/02/78

PAGE NO. 000015

RADAY 8 OF YEAR 1978

NUMBER OF LINE BLOCKS--FLASH OR WISHER

FROM/TO	RUER	RUCL	RUMM	RUEO	RUD0	RUMJ	RUCI	RUED	RUAD	RUM4	RJMJ	RJPT
RUER	82	6	0	42	39	0	34	40	0	47	0	15
RUCL	181	342	105	460	140	112	149	120	105	138	235	142
RUMM	0	0	345	36	0	446	0	35	292	90	110	0
RUEO	363	355	189	435	240	424	284	240	238	282	256	175
RUD0	90	24	0	24	395	0	36	76	0	60	0	522
RUMJ	0	0	32	5	0	36	0	0	56	10	15	0
RUCI	73	138	26	18	52	0	158	175	26	144	97	0
RUED	92	44	0	11	46	0	198	54	0	114	33	0
RUAD	0	0	0	51	0	0	0	0	244	0	0	0
RUM4	64	0	0	7	58	0	49	101	0	62	0	15
RJMJ	0	56	0	28	9	0	0	0	12	0	21	24
RJPT	0	91	0	24	13	0	0	0	0	0	24	165
RUFL	0	3	0	31	218	0	0	0	0	0	0	680
RUMF	0	0	0	32	0	0	0	0	155	0	0	0
RUMT	0	81	0	31	0	0	0	22	0	0	31	41
RUMH	140	160	497	92	170	205	112	140	512	189	169	117
XXXX	0	0	0	0	0	0	0	0	0	0	0	0
TOT	1085	1300	1194	1127	1423	1023	920	1004	1640	1137	990	1901

NUMBER OF LINE BLOCKS--FLASH OR WISHER (CONTINUED)

FROM/TO	RUFL	RUAK	RUMT	RUMH	XXXX	TOTAL
RUER	8	0	0	0	0	314
RUCL	98	42	283	160	0	2612
RUMM	0	78	35	236	0	1704
RUEO	180	77	483	232	0	4304
RUD0	514	0	0	0	0	1741
RUMJ	0	6	0	40	0	200
RUCI	26	0	41	23	0	990
RUED	0	0	0	0	0	495
RUAD	0	108	19	102	0	524
RUM4	0	0	5	0	0	386
RJMJ	24	0	35	34	0	219
RJPT	134	0	24	28	0	507
RUFL	849	0	0	0	0	1781
RUAK	0	242	0	64	0	493
RUMT	0	0	23	27	0	256
RUMH	108	210	270	305	0	3394
XXXX	0	0	0	0	0	0
TOT	1953	763	1218	1451	0	19929

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

RAUAY 3 OF YEAR 1978

NUMBER OF DOST 1404

TRAFFIC BY DOST

NUMBER	DOST	LOCAL	AREA	INTER-AREA
1		251350	141703	315142
2	RAYVCKA	464	0	0
3	RCCADAA	127	0	0
4	RCCANAA	32	0	0
5	RCCENAA	18	0	0
6	RCCNCAA	14	0	0
7	RCCPNHA	14	0	0
8	RCCPNSA	28	0	0
9	RCCPUCA	14	0	0
10	RCCPYIA	33	15	0
11	RCCPAAA	11	0	0
12	RCCPACA	4	0	0
13	RCCPAAA	241	0	0
14	RCCPAAU	35	0	0
15	RCCPASA	4	0	0
16	RCCPASP	20	0	0
17	RCCPASN	14	0	0
18	RCCPATS	5	0	0
19	RCCPATS	27	0	0
20	RCCPASN	24	0	0
21	RCCPASN	27	0	0
22	RCCPASN	11	0	0
23	RCCPASN	10	0	0
24	RCCPAAA	1614	0	13
25	RCCPAAA	1704	0	6
26	RCCPAAA	92	0	0
27	RCCPAAA	0	0	56
28	RCCPAAA	0	3	0
29	RCCPAAA	0	0	0
30	RCCPAAA	0	144	0
31	RCCPAAA	0	0	0
32	RCCPAAA	0	13	0
33	RCCPAAA	16	0	0
34	RCCPAAA	8	0	0
35	RCCPAAA	4	0	0
36	RCCPAAA	5	0	0
37	RCCPAAA	344	0	0
38	RCCPAAA	198	0	0
39	RCCPAAA	32	0	0
40	RCCPAAA	16	0	0
41	RCCPAAA	0	0	6
42	RCCPAAA	0	0	17
43	RCCPAAA	0	0	24
44	RCCPAAA	0	0	13
45	RCCPAAA	13	0	0
46	RCCPAAA	0	0	11
47	RCCPAAA	4	0	0
48	RCCPAAA	0	0	4
49	RCCPAAA	0	36	0
50	RCCPAAA	0	0	10
51	RCCPAAA	0	0	34
52	RCCPAAA	0	0	0
53	RCCPAAA	0	14	0
54	RCCPAAA	0	0	85
55	RCCPAAA	0	0	103
56	RCCPAAA	0	0	5
57	RCCPAAA	0	0	11
58	RCCPAAA	0	0	99
59	RCCPAAA	0	0	36
60	RCCPAAA	0	0	76
61	RCCPAAA	0	0	0
62	RCCPAAA	0	0	0
63	RCCPAAA	0	0	0
64	RCCPAAA	0	0	0
65	RCCPAAA	0	0	0
66	RCCPAAA	0	0	0
67	RCCPAAA	0	0	0
68	RCCPAAA	0	0	0
69	RCCPAAA	0	0	0
70	RCCPAAA	0	0	0
71	RCCPAAA	0	0	0
72	RCCPAAA	0	0	0
73	RCCPAAA	0	0	0
74	RCCPAAA	0	0	0
75	RCCPAAA	0	0	0
76	RCCPAAA	0	0	0
77	RCCPAAA	0	0	0
78	RCCPAAA	0	0	0
79	RCCPAAA	0	0	0
80	RCCPAAA	0	0	0
81	RCCPAAA	0	0	0
82	RCCPAAA	0	0	0
83	RCCPAAA	0	0	0
84	RCCPAAA	0	0	0
85	RCCPAAA	0	0	0
86	RCCPAAA	0	0	0
87	RCCPAAA	0	0	0
88	RCCPAAA	0	0	0
89	RCCPAAA	0	0	0
90	RCCPAAA	0	0	0
91	RCCPAAA	0	0	0
92	RCCPAAA	0	0	0
93	RCCPAAA	0	0	0
94	RCCPAAA	0	0	0
95	RCCPAAA	0	0	0
96	RCCPAAA	0	0	0
97	RCCPAAA	0	0	0
98	RCCPAAA	0	0	0
99	RCCPAAA	0	0	0
100	RCCPAAA	0	0	0
101	RCCPAAA	0	0	0
102	RCCPAAA	0	0	0
103	RCCPAAA	0	0	0
104	RCCPAAA	0	0	0
105	RCCPAAA	0	0	0
106	RCCPAAA	0	0	0
107	RCCPAAA	0	0	0
108	RCCPAAA	0	0	0
109	RCCPAAA	0	0	0
110	RCCPAAA	0	0	0
111	RCCPAAA	0	0	0
112	RCCPAAA	0	0	0
113	RCCPAAA	0	0	0
114	RCCPAAA	0	0	0
115	RCCPAAA	0	0	0
116	RCCPAAA	0	0	0
117	RCCPAAA	0	0	0
118	RCCPAAA	0	0	0
119	RCCPAAA	0	0	0
120	RCCPAAA	0	0	0
121	RCCPAAA	0	0	0
122	RCCPAAA	0	0	0
123	RCCPAAA	0	0	0
124	RCCPAAA	0	0	0
125	RCCPAAA	0	0	0
126	RCCPAAA	0	0	0
127	RCCPAAA	0	0	0
128	RCCPAAA	0	0	0
129	RCCPAAA	0	0	0
130	RCCPAAA	0	0	0
131	RCCPAAA	0	0	0
132	RCCPAAA	0	0	0
133	RCCPAAA	0	0	0
134	RCCPAAA	0	0	0
135	RCCPAAA	0	0	0
136	RCCPAAA	0	0	0
137	RCCPAAA	0	0	0
138	RCCPAAA	0	0	0
139	RCCPAAA	0	0	0
140	RCCPAAA	0	0	0
141	RCCPAAA	0	0	0
142	RCCPAAA	0	0	0
143	RCCPAAA	0	0	0
144	RCCPAAA	0	0	0
145	RCCPAAA	0	0	0
146	RCCPAAA	0	0	0
147	RCCPAAA	0	0	0
148	RCCPAAA	0	0	0
149	RCCPAAA	0	0	0
150	RCCPAAA	0	0	0
151	RCCPAAA	0	0	0
152	RCCPAAA	0	0	0
153	RCCPAAA	0	0	0
154	RCCPAAA	0	0	0
155	RCCPAAA	0	0	0
156	RCCPAAA	0	0	0
157	RCCPAAA	0	0	0
158	RCCPAAA	0	0	0
159	RCCPAAA	0	0	0
160	RCCPAAA	0	0	0
161	RCCPAAA	0	0	0
162	RCCPAAA	0	0	0
163	RCCPAAA	0	0	0
164	RCCPAAA	0	0	0
165	RCCPAAA	0	0	0
166	RCCPAAA	0	0	0
167	RCCPAAA	0	0	0
168	RCCPAAA	0	0	0
169	RCCPAAA	0	0	0
170	RCCPAAA	0	0	0
171	RCCPAAA	0	0	0
172	RCCPAAA	0	0	0
173	RCCPAAA	0	0	0
174	RCCPAAA	0	0	0
175	RCCPAAA	0	0	0
176	RCCPAAA	0	0	0
177	RCCPAAA	0	0	0
178	RCCPAAA	0	0	0
179	RCCPAAA	0	0	0
180	RCCPAAA	0	0	0
181	RCCPAAA	0	0	0
182	RCCPAAA	0	0	0
183	RCCPAAA	0	0	0
184	RCCPAAA	0	0	0
185	RCCPAAA	0	0	0
186	RCCPAAA	0	0	0
187	RCCPAAA	0	0	0
188	RCCPAAA	0	0	0
189	RCCPAAA	0	0	0
190	RCCPAAA	0	0	0
191	RCCPAAA	0	0	0
192	RCCPAAA	0	0	0
193	RCCPAAA	0	0	0
194	RCCPAAA	0	0	0
195	RCCPAAA	0	0	0
196	RCCPAAA	0	0	0
197	RCCPAAA	0	0	0
198	RCCPAAA	0	0	0
199	RCCPAAA	0	0	0
200	RCCPAAA	0	0	0

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

1388	RUWNFMK	0	n	62
1389	RUWNGFJ	0	n	8
1390	RUWNHLL	0	n	10
1391	RUWNHGH	0	n	21
1392	RUWNTJA	0	n	16
1393	RUWNJSO	0	n	42
1394	RUWNLXZ	3	n	0
1395	RUWNQYE	0	n	15
1396	RUWNPNC	0	n	154
1397	RUWNTMF	0	n	55
1398	RUWNHLO	0	n	132
1399	RUWNHTN	0	n	34
1400	RUWNWME	0	n	44
1401	RUWNWOS	0	n	22
1402	RUWNZKI	0	n	59
1403	RUWNCXA	0	n	7
1404	RUWNISQJ	0	214	0
SUB-TOTAL		1413101	2338346	1171218
TOTAL				1182715

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

APPENDIX B

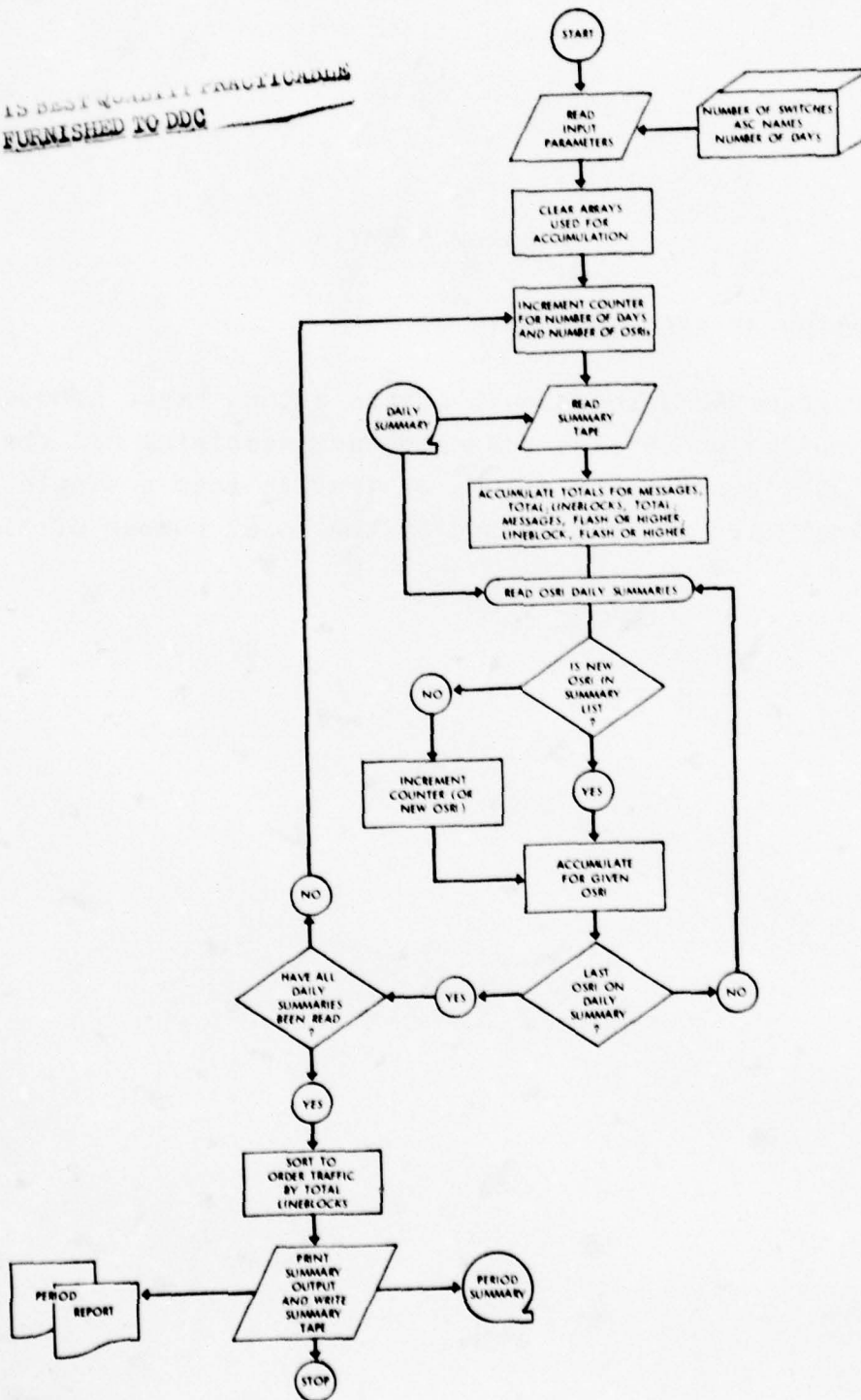
PROGRAM SUMMY

PROGRAM SUMMY

DESCRIPTION OF PROGRAM SUMMY

Program SUMMY reads each of the output tapes produced by Program DAILY and writes a single tape combining all the unique OSRI's and their volume of traffic into a single list. This final list is then sorted by the total number of line-blocks.

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC



PROGRAM SUMMY

INPUT CARD 1

<u>Field</u>	<u>Position</u>	<u>FORTRAN Variable Name</u>	<u>Format</u>	<u>Item</u>
1	1-5	N1	I5	Number of switches

PROGRAM SUMMY

INPUT CARD 2

Field	Position	FORTRAN		Item
		Variable Name	Format	
1	1-4	ASCN(1)	A4	Name of 1st ASC
2	5-8	ASCN(2)	A4	Name of 2nd ASC
3	9-12	ASCN(3)	A4	Name of 3rd ASC
4	13-16	ASCN(4)	A4	Name of 4th ASC
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
N1		ASCN(N1)	A4	Name of N1 th ASC
N2		ASCN(N2)	A4	Dummy ASC**
N3	*	ASCN(N3)	A4	Label for total column

*Maximum of 20 elements per card, may be continued on another card.

**ASC N2 is ASC N1 + 1 to account for any mis-coded or invalid ASC codes.

PROGRAM SUMMY

INPUT CARD 3

FORTRAN			
<u>Field</u>	<u>Position</u>	<u>Variable Name</u>	<u>Format</u>
1	1-5	NDAY	I5
			Number of days to be summarized


```

      NPMT(K1,K2)=0
      NLRT(K1,K2)=0
      NPMT(K1,K2)=0
      NPLRT(K1,K2)=0
20  CONTINUE
      C
      KDAY=0
      NIPRI=0
      C
      C 100 CONTINUE
      C
      REWIND 2
      C
      KDAY=KDAY+1
      C
      HEAD SUMMARY TAPE
      C
      HEAD (2)      NPD,NYM,NORI
      C
      HEAD (2) NM,NLP,NFM,NFLB
      C
      DU 105 J1=1,N3
      DU 105 J2=1,N3
      NM(J1,J2)=NM(J1,J2)+NM(J1,J2)
      NLRT(J1,J2)=NLRT(J1,J2)+NLB(J1,J2)
      NPMT(J1,J2)=NPMT(J1,J2)+NFM(J1,J2)
      NPLRT(J1,J2)=NPLRT(J1,J2)+NPLP(J1,J2)
105 CONTINUE
      C
      DU 200 J=1,NORT
      C
      HEAD (2) K,NORI,(KUM(L),L=1,3)
      KCHECK=0
      DU 107 L=1,3
      KCHECK=KCHECK+KUM(L)
107 CONTINUE

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

```

C      IF (KCHECK.EQ.0) GO TO 200
C
C      IF (NTORI.EQ.0) GO TO 120
C
C      DO 110 K=1,NTORI
C      KMSK
C      IF (ORI.EQ.TPI(K)) GO TO 130
C      110 CONTINUE
C
C      120 CONTINUE
C      NICTI=NTORI+1
C      KMT=NTORI
C      IMI(KMI)=OPT
C
C      130 CONTINUE
C
C      DO 140 L=1,3
C      KSUM(KPI,L)=KSUM(KPI,L)+KUM(L)
C      140 CONTINUE
C
C      200 CONTINUE
C
C      IF (KDAY.EQ.NDAY) GO TO 300
C
C      REWIND 2
C      CALL MESWAIT(24H000 MOUNT NEXT TAPE AND ENTER GO ***)
C      GO TO 100
C
C      300 CONTINUE
C
C      CALCULATE TOTAL TRAFFIC FOR EACH OSMT
C
C      DO 310 J=1,NTORI
C      KSUM(J,4)=0
C      DO 305 KD=1,3

```

THIS PAGE IS BEST QUALITY FRAGMENT
FROM COPY FURNISHED TO DDC


```

C      WRITE(6,6003) J,TPI(J),KSUM(I,I),L=1.4)
C      IF(I.NE.4) GO TO 810
C      WRITE(1,5003) TPI(J),KSUM(J,L),L=1.4)
C      810 CONTINUE
C      WRITE(6,6004) KTSUM(I),L=1.3)
C      KTOTAL=0
C      DO 830 L=1.3
C      KTOTAL=KTOTAL+KTSUM(L)
C      830 CONTINUE
C      WRITE(6,6005) KTOTAL
C      900 CONTINUE
C      ENDFILE 1
C      STOP
C      FORMATS FOR INPUT
C      7001 FORMAT(2I5)
C      7002 FORMAT(20A1)
C      7003 FORMAT(20A4)
C      FORMATS FOR OUTPUT TABLES
C      8002 FORMAT(1H1//20Y,25H NUMBER OF MESSAGES--TOTAL,24X,
C      1 14,24H DAYS ENDING WITH WADAY ,12,11H OF YEAR 19,12///10H FROM/T
C      X0)
C      2 12(5X,A4,1X)/)
C      8003 FORMAT(////20Y,38H NUMBER OF MESSAGES--TOTAL (CONTINUED),
C      1 ///10H FROM/10 ,2(5X,A4,1X),9X,5HTOTAL/)
2001A10
2001A20
2001A30
2001A40
2001A50
2001A60
2001A70
2001A80
2001A90
2001B00
2001B10
2001B20
2001B30
2001B40
2001B50
2001B60
2001B70
2001B80
2001B90
2001C00
2001C10
2001C20
2001C30
2001C40
2001C50
2001C60
2001C70
2001C80
2001C90
2002000
2002010
2002020
2002030
2002040
2002050
2002060
2002070
2002080
2002090
2002100
2002110
2002120
2002130
2002140
2002150
2002160

```

8004 FORMAT(1H)///20Y,29H NUMBER OF LINE WBLOCKS--TOTAL,21X, 2002170
 1 14,24H DAYS ENDING WITH RADAY ,13,11H OF YEAR 19,12///10H FROM/T 2002180
 X0 , 2002190
 2 12(5X,A4,1X)/// 2002200
 8005 FORMAT(///20X,41H NUMBER OF LINE WBLOCKS--TOTAL (CONTINUED), 2002210
 1 ///10H FROM/10 ,5(5X,A4,1X),9X,5HTOTAL// 2002220
 8006 FORMAT(1H)///20Y,36H NUMBER OF MESSAGES--FLASH OR HIGHER,14X, 2002230
 1 14,24H DAYS ENDING WITH RADAY ,13,11H OF YEAR 19,12///10H FROM/T 2002240
 X0 , 2002250
 2 12(5X,A4,1X)/// 2002260
 8007 FORMAT(///20X,49H NUMBER OF MESSAGES--FLASH OR HIGHER (CONTINUED 2002270
 1),22X, ///10H FROM/10 ,5(5X,A4,1X),9X,5HTOTAL// 2002280
 8008 FORMAT(1H)///20Y,39H NUMBER OF LINE WBLOCKS--FLASH OR HIGHER,11X, 2002290
 1 14,24H DAYS ENDING WITH RADAY ,13,11H OF YEAR 19,12///10H FROM/T 2002300
 X0 , 2002310
 2 12(5X,A4,1X)/// 2002320
 8009 FORMAT(///20X,51H NUMBER OF LINE WBLOCKS--FLASH OR HIGHER (CONTIN 2002330
 JUED) ///10H FROM/10 ,5(5X,A4,1X),9X,5HTOTAL// 2002340
 8010 FORMAT(2X,A4,3X,12I10) 2002350
 8011 FORMAT(2X,A4,3Y,5I10,115) 2002360
 8012 FORMAT(3I10) 2002370
 8014 FORMAT(110,A7,3I15) 2002380
 5001 FORMAT(4I10) 2002390
 5002 FORMAT(110,A7,3I15) 2002400
 5003 FORMAT(A7,4I15) 2002410
 6001 FORMAT(1H)///20X,14,24H DAYS ENDING WITH RADAY ,13,11H OF YEAR 19, 2002420
 X 12// 2002430
 1 20X,15HNUMBER OF DSRT ,11// 2002440
 6002 FORMAT(20X,15HTRAFFIC BY DSRT/// 2002450
 1 27H NUMBER 05H1 LOCAL ARE 2002460
 2A INTER-AREA TOTAL// 2002470
 6003 FORMAT(110,5X,A7,5X,4I15) 2002480
 6004 FORMAT(///15X,9H SUB-TOTAL,3X,3I15) 2002490
 6005 FORMAT(///15X,5HTOTAL,52X,115) 2002500
 C THIS PAGE IS BEST QUALITY PRACTICABLE 2002510
 FROM COPY FURNISHED TO DDG 2002520
 END

05/09/78

0000 UNCLASSIFIED 0000

PAGE NO. 000010

NUMBER OF MESSAGES--TOTAL

7 DAYS ENDING WITH RADAY 10 OF YEAR 1978

FROM/TO	RUEB	MUCL	RUMM	RUEO	MUDO	MUMJ	RUCI	MUEN	RUAD	RUM	RUMJ	RUFT
MJER	120367	25077	2080	21223	1485	3409	10671	9514	6815	12727	9248	9385
MUCL	22754	40847	1511	17020	3907	1796	15536	10700	1828	6592	12765	9233
RUMM	1133	1534	17669	3094	1250	2387	571	1454	3186	1315	1854	190
RUEO	32471	36641	4782	84141	16004	2229	18565	16907	9242	18189	13220	11295
MUDO	29071	2083	366	5209	43380	453	2199	2291	591	1549	701	14208
RUMJ	2010	506	5813	1771	291	13372	634	1084	2807	1937	2052	191
RUCI	9455	14369	1034	12129	3374	1002	28077	15049	2193	7545	14503	1419
MUED	9472	14356	2505	16001	4991	1876	11367	25309	1781	10195	8444	4574
RUAD	5070	460	5531	2931	94	1915	820	791	24454	2314	2469	50
RUMM	0200	4631	2928	13130	1156	3115	4088	6534	3046	39329	14817	988
RUMJ	11414	14924	3440	11112	2624	7246	9638	6121	3854	13616	29144	4639
RUFT	18052	4062	110	7496	18610	204	2533	2250	291	1379	1279	30571
MUCL	5852	4809	100	16741	12288	52	2149	2522	168	979	1024	17683
MUCL	401	568	975	1575	44	93	473	831	2394	544	676	46
MUFT	13411	15594	2463	14854	4726	2338	18141	15409	3076	15505	11714	5994
RUMM	5886	2743	11645	9578	557	7361	1857	4407	9360	11087	7431	254
AXAX	17	21	0	26	12732	2	5	14	25	6	25	1
TOT	292426	190705	64066	237231	12732	52860	131324	126287	77016	144888	131374	117633

FROM/TO	RUEB	MUCL	RUMM	RUEO	MUDO	MUMJ	RUCI	MUEN	RUAD	RUM	RUMJ	RUFT
RUEB	5837	2419	18699	6138	0	271104	10671	9514	6815	12727	9248	9385
MUCL	4295	1866	12276	1986	1	167315	15536	10700	1828	6592	12765	9233
RUMM	104	886	1677	3967	1	46054	571	1454	3186	1315	1854	190
RUEO	25205	3721	14879	8629	1	313121	18565	16907	9242	18189	13220	11295
MUDO	11497	41	2776	221	0	114860	2199	2291	591	1549	701	14208
RUMJ	83	706	1020	4318	4	38633	634	1084	2807	1937	2052	191
RUCI	4891	1270	12961	1771	0	137923	28077	15049	2193	7545	14503	1419
RUED	6152	2423	11252	2387	0	131601	11367	25309	1781	10195	8444	4574
RUAD	114	4130	2361	6937	0	62919	820	791	24454	2314	2469	50
RUMM	2207	1174	12135	8565	2	136125	4088	6534	3046	39329	14817	988
RUMJ	3729	1282	11085	8422	6	130460	9638	6121	3854	13616	29144	4639
RUFT	27036	71	3242	229	1	124356	2533	2250	291	1379	1279	30571
MUCL	57093	26	2309	189	0	117946	2149	2522	168	979	1024	17683
MUCL	45	13263	919	2472	2	25526	473	831	2394	544	676	46
MUFT	7316	1482	43151	2611	1	177142	18141	15409	3076	15505	11714	5994
RUMM	788	2898	2457	24832	2	103387	1857	4407	9360	11087	7431	254
AXAX	0	8	5	18	74	260	5	14	25	6	25	1
TOT	149382	32466	145519	85734	97	2108340	131324	126287	77016	144888	131374	117633

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

7 DAYS ENDING WITH RADAY 10 OF YEAR 1978

NUMBER OF LINE BLOCKS--TOTAL

FROM/TO	RUEB	MUCL	RUMH	RUEO	RUDO	MUMJ	RUCI	MUEN	RUAD	RUMH	RUMJ	RUPT
MUEB	348451	861856	92629	928728	586492	101646	633147	347539	232853	471762	446242	354880
MUCL	861856	1702967	40108	767932	100773	35674	892366	492479	38132	239199	625464	144591
RUMH	21726	49725	226176	48493	56257	139142	24986	41428	95190	28191	104171	7298
RUEO	97025	1301672	177114	3847839	577980	73702	941278	926184	313134	656614	647785	470770
RUDO	78189	94680	14800	166581	932245	13188	89768	85649	20783	44794	48747	434334
MUMJ	48488	30526	158053	47709	10474	232399	41678	40720	84072	71667	81203	6439
RUCI	33897	793479	25669	505207	129927	21378	1343547	649272	63719	253147	1231314	191918
RUEO	332491	505327	82971	701022	208407	60054	822818	1013270	52012	321532	728254	208432
RUMH	250608	344714	89343	408612	3676	43866	402083	10149	538210	85347	56962	2387
RUDO	353913	647284	103518	401420	73959	241265	822157	308489	118101	563575	1261492	208095
MUMJ	481545	119519	2871	484209	610877	4926	196299	104449	7566	32233	81133	990204
RUCI	171880	76721	4211	478544	372362	1947	120534	80430	6433	24348	50204	650244
RUEO	16458	11488	26200	43761	885	2898	17564	30419	75983	24442	67444	662
RUMH	768796	830756	94244	682338	203295	68828	1072831	649409	83074	1033761	940731	308087
RUDO	152422	104087	363653	259227	18354	219225	97059	133909	512667	290069	223623	7150
AXXA	71	300	42	70	4	8	15	47	129	12	279	4
TOT	9199371	7696108	1636836	10024609	3922415	1343425	7574953	6441477	2325579	5372693	7238639	4197138

THIS PAGE IS BEST QUALITY REPRODUCTION
FROM COPY FURNISHED TO DDG

NUMBER OF LINE BLOCKS--TOTAL (CONTINUED)

FROM/TO	RUEB	MUCL	RUMH	RUEO	RUDO	MUMJ	RUCI	MUEN	RUAD	RUMH	RUMJ	RUPT
MUEB	207905	85570	536304	219029	0	9806022	0	0	0	0	0	0
MUCL	139488	27937	472934	75000	0	6768090	0	0	0	0	0	0
RUMH	2294	20255	43120	122190	0	1075832	0	0	0	0	0	0
RUEO	754243	211389	883436	314761	0	12964876	0	0	0	0	0	0
RUDO	515711	803	107733	572	0	3457676	0	0	0	0	0	0
MUMJ	3458	36274	43673	110464	0	1003508	0	0	0	0	0	0
RUCI	149757	30778	559742	73238	0	6443489	0	0	0	0	0	0
RUEO	100108	11459	454191	72779	0	6566209	0	0	0	0	0	0
RUDO	4294	40459	77570	201127	0	1614973	0	0	0	0	0	0
MUMJ	44491	39374	432937	166765	0	4384791	0	0	0	0	0	0
RUCI	150370	69501	656876	195347	0	6286876	0	0	0	0	0	0
RUEO	801033	4144	124107	8068	0	4100523	0	0	0	0	0	0
RUDO	1181366	1385	99029	7728	0	3333828	0	0	0	0	0	0
MUMJ	746	32880	36107	9063	0	172242	0	0	0	0	0	0
RUCI	293067	53704	2535604	88691	0	9925458	0	0	0	0	0	0
RUEO	21297	136134	83021	556624	0	3168056	0	0	0	0	0	0
RUDO	0	32	25	1118	0	1118	0	0	0	0	0	0
TOT	4513838	120648	6946479	2369357	0	81913507	0	0	0	0	0	0

*** UNCLASSIFIED ***

05/09/76

PAGE NO. 000012

NUMBER OF MESSAGES--FLASH OR MTMHEM

7 DAYS ENDING WITH RADAY 10 OF YEAR 1978

FROM/TO	RUEB	MUCL	RUMM	RUEO	RUDO	MUMJ	RUCI	MUEN	RUAD	RUMM	RUMJ	RUFT
RUEB	559	73	20	32	135	36	72	74	41	85	25	26
RUCI	309	382	162	244	260	194	261	246	167	239	262	207
RUMM	4	1	157	10	1	145	2	9	104	30	34	0
RUEO	191	383	164	588	426	195	308	252	124	279	240	241
RUDO	89	69	0	27	413	0	42	72	0	64	1	314
MUMJ	16	3	84	10	0	157	0	2	88	40	32	0
RUCI	89	92	45	25	85	30	52	79	35	161	69	12
RUEO	153	31	20	58	140	30	67	111	14	146	16	6
RUAD	9	1	10	25	0	23	0	4	219	0	0	0
RUMM	73	6	13	8	56	11	54	101	0	123	7	2
RUMJ	0	86	13	48	5	43	2	2	40	17	39	41
RUFT	22	74	0	45	80	5	2	6	11	4	21	234
RUFL	15	11	0	51	139	0	4	1	0	2	0	354
RUAK	1	0	6	13	0	4	2	2	46	0	0	0
RUMT	28	123	15	64	29	18	29	35	10	45	58	57
RUMM	77	104	151	61	77	152	55	72	157	94	84	53
AXAX	0	0	0	0	0	0	0	0	0	0	0	0
TOT	1535	1439	868	1319	1839	1043	952	1054	1052	1289	888	1547

NUMBER OF MESSAGES--FLASH OR MTMHEM (CONTINUED)

FROM/TO	RUFL	MUAK	RUFT	RUMM	AXAX	TOTAL
RUEB	33	11	52	20	0	994
RUCI	157	81	411	234	0	3810
RUMM	0	37	13	73	0	620
RUEO	556	79	488	221	0	4935
RUDO	313	0	0	0	0	1406
MUMJ	0	19	0	81	0	545
RUCI	56	10	62	46	0	948
RUEO	134	6	35	14	0	951
RUAD	0	29	0	71	0	396
RUMM	3	0	7	14	0	473
RUMJ	0	0	44	60	0	440
RUFT	223	6	23	23	0	779
RUFL	445	0	2	0	0	1224
RUAK	0	113	4	22	0	215
RUMT	19	10	91	51	0	670
RUMM	44	49	112	154	0	1496
AXAX	0	0	0	0	0	0
TOT	2183	450	1358	1084	0	19902

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

7 DAYS ENDING WITH RADAY 10 OF YEAR 1978

NUMBER OF LINE BLOCKS--FLASH OR HIGHER

FROM/TO	RUEB	MUCL	RUMM	RUEO	MUPO	MUMJ	RUCI	MUEN	RUAD	RUMH	RUMJ	RUPT
RUEB	2486	619	209	378	2222	376	683	621	496	631	192	366
RUCI	2028	6521	1176	1926	1943	1430	1711	1517	1223	1466	1629	1559
RUMM	69	3	1454	179	13	1313	35	174	1072	246	192	0
RUEO	3213	6083	1173	6773	6797	1409	2498	1419	1168	1896	1372	2408
MUPO	481	660	0	280	3652	0	264	434	0	424	4	4051
MUMJ	182	10	2005	147	0	1514	0	37	1027	493	406	0
RUCI	457	703	373	192	763	252	412	620	1188	697	467	98
MUED	1487	395	328	945	2248	492	674	1430	192	1114	121	42
MUAD	35	3	143	442	0	329	0	144	2544	0	0	0
RUMH	418	72	138	129	489	191	350	634	0	976	95	16
MUMJ	0	492	176	276	37	347	10	0	240	86	318	281
MUPT	317	579	150	423	1119	125	36	0	275	84	149	2596
MUFL	182	162	0	550	1903	0	32	24	0	25	0	4614
MUAK	24	0	148	222	0	45	35	34	772	0	0	0
MUPT	242	750	117	394	157	143	222	240	80	454	380	416
RUMH	401	563	1637	408	451	1188	272	364	1660	555	542	348
AXAX	0	0	0	0	0	0	0	0	0	0	0	0
TOT	13522	10615	9131	13364	19724	9154	7194	1924	11081	9830	5897	14789

NUMBER OF LINE BLOCKS--FLASH OR HIGHER (CONTINUED)

FROM/TO	RUEB	MUAK	MUPT	RUMH	AXAX	TOTAL
RUEB	438	104	460	148	0	1163
RUCI	1185	592	2514	1918	0	25539
RUMM	0	494	90	441	0	5777
RUEO	8443	531	3003	1279	0	44625
MUPO	3490	0	0	0	0	14330
MUMJ	0	222	0	650	0	6759
RUCI	483	80	418	339	0	7313
MUED	2645	43	255	82	0	12502
MUAD	0	512	117	1940	0	5347
RUMH	24	0	0	215	0	3831
MUMJ	0	0	254	332	0	2758
MUPT	2443	150	164	159	0	9168
MUFL	6744	0	25	0	0	14322
MUAK	0	1621	70	364	0	3135
MUPT	155	75	697	334	0	4860
RUMH	259	458	581	1130	0	10816
AXAX	0	0	0	0	0	0
TOT	27209	4662	8770	7931	0	182905

THIS PAGE IS BEST QUALITY PHOTOGRAPH
FROM COPY FURNISHED TO DDC

7 DAYS ENDING WITH RADAY 10 OF YEAR 1978

NUMBER OF OSRI 3411

TRAFFIC BY OSRI

NUMBER	OSRI	LOCAL	AREA	INTER-AREA	TOTAL
1		2858616	7489744	3714958	9063368
2	RUVARJA	365685	947873	67592	1381150
3	RUEKJCS	399265	516224	241285	1156774
4	RULYSGG	285334	529734	313819	1128892
4	RUEOUAA	210082	901702	681	1112465
4	RUMJZZA	136498	848419	99387	1084304
7	RUEHAAA	105832	961342	675	1067449
8	RUCIZZB	125104	754798	140007	1018914
9	RUMGSGG	180187	474835	950415	1007437
10	RUCIZZC	142641	734856	114338	991935
11	RUFPSGG	270228	354455	366577	991260
12	RUMWZZA	134663	752642	103893	991198
13	RUMWAAA	214238	547622	203701	965561
14	RUEOZZB	96150	701424	156320	953894
15	RUEOZZC	120334	704132	127053	951523
16	RUCBSGG	314968	401530	172721	889219
17	RUMPSGG	170174	329714	352345	852233
18	RUMJATA	125344	612123	98852	836319
19	RUMTRGA	172100	483024	136961	802085
20	RUCIZZA	113835	612981	50477	787193
21	RUEWRHA	97188	514926		612114
22	RUEVAAA	180852	405590		586442
23	RUEOUAA	414992	300167		715159
24	RUMTAAA	68966	6284	0	75250
25	RUCIAPA	182514		0	182514
26	RUMTZZA	98521		4	98525
27	RUMJHFA	11524	0	4	11528
28	RUMTARA	3174	0	4	3178
29	RUEOKFA	30	0	4	34
30	RUEOKKA		4	0	4
31	RUFDAAA		0	4	4
32	RUEODAA		0	4	4
		0	0	4	4
		0	0	0	0
		0	0	0	0
		0	0	0	0
3383	RUCIAPR	0	0	0	0
3384	RUEVDJQ	0	0	0	0
3385	RUTACSA	0	0	0	0
3386	RUEOEFA	0	0	0	0
3387	RUMMAHR	0	0	0	0
3388	RUEORMH	0	0	0	0
3389	RUMGXOZ	0	0	0	0
3390	RUMNPLA	0	0	0	0
3391	RUMPSGG	0	0	0	0
3392	RUMGVJU	0	0	0	0
3393	RUMMAAA	0	0	0	0
3394	RUMKMRB	0	0	0	0
3395	RULYZAP	0	0	0	0
3396	RUMOGAA	0	0	0	0
3397	RUCIPFM	0	0	0	0
3398	RUEVHGF	0	0	0	0
3399	RUCNDPE	0	0	0	0
3400	RUMMWUG	0	0	0	0
3401	RUMFCSA	0	0	0	0
3402	RUMTAGE	0	0	0	0
3403	RUCENBA	0	0	0	0
3404	RUMKDA	0	0	0	0
3405	RUMLSAA	0	0	0	0
3406	RUMWPA	0	0	0	0
3407	RUMWNU	0	0	0	0
3408	RUEBOTL	0	0	0	0
3409	RUEECSS	0	0	0	0
3410	RUEFNER	0	0	0	0
3411	RUEOARC	2	0	0	2

SUB-TOTAL 22061794 42436850 17414918

TOTAL 81913567

B-17

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

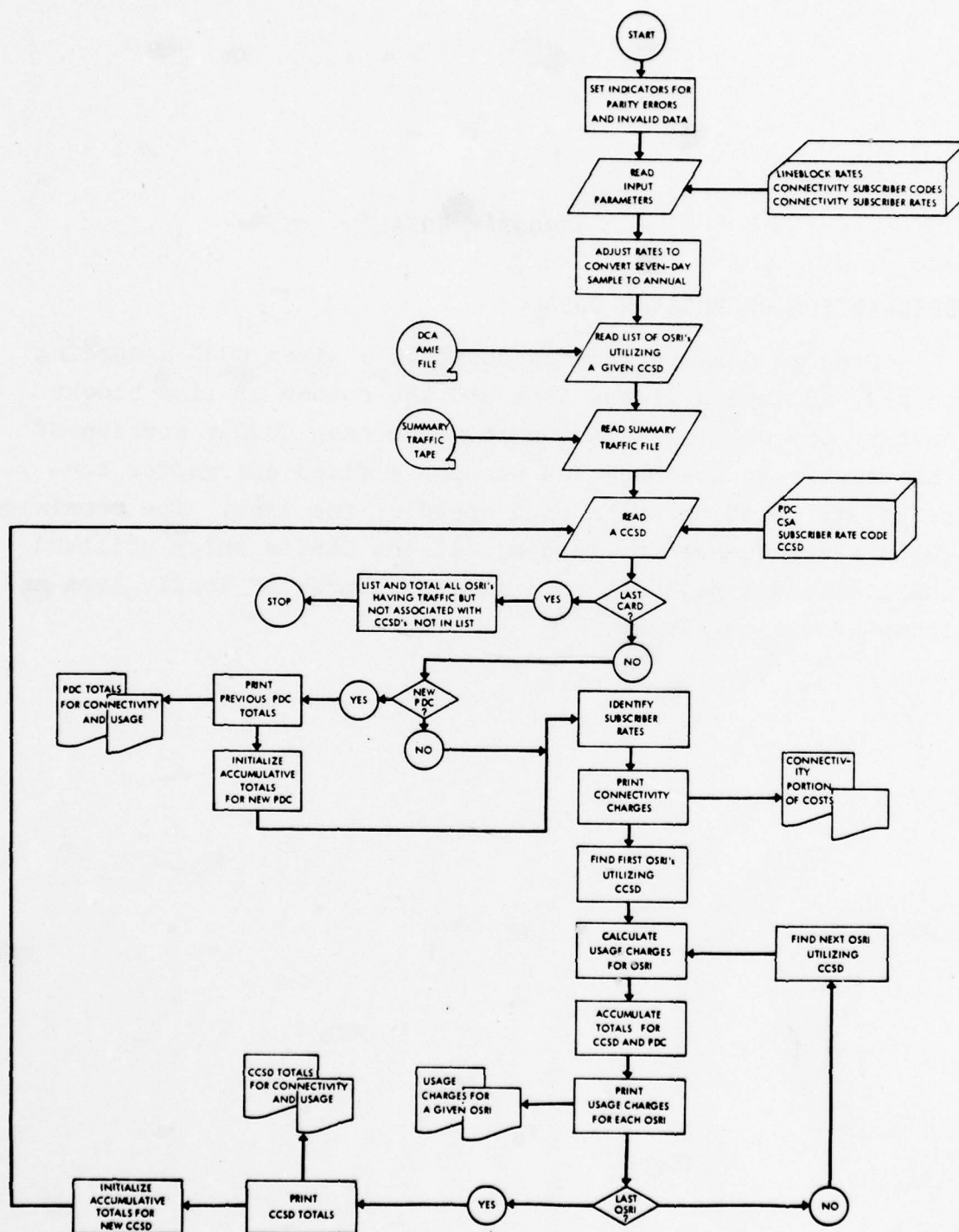
APPENDIX C

PROGRAM COSAL

PROGRAM COSAL

DESCRIPTION OF PROGRAM COSAL

Program Cosal allocates costs to a given CCSD according to the baud speed of the line and the number of line blocks sent by the OSRI's utilizing it. For each CCSD a portion of the total cost are received through a fixed charge for connectivity based upon the baud speed of the line. The remaining costs are recovered by finding all the OSRI's which utilized the line and applying a rate for the number of local, area and inter-area line blocks.



1-10-70-01

PROGRAM COSAL

INPUT CARD 2

FORTRAN				Item	
Field	Position	Variable Name	Format		
1	4-5	SRC(1)	A2	Code for 1st Connectivity Rate	
2	9-10	SRC(2)	A2	Code for 2nd Connectivity Rate	
3	14-15	SRC(3)	A2	Code for 3rd Connectivity Rate	
4	19-20	SRC(4)	A2	Code for 4th Connectivity Rate	
.	.			.	
.	.			.	
.	.			.	
47	.	SRC(47)		Code for 47 th Connectivity Rate	

PROGRAM COSAL

INPUT CARD 1

<u>Field</u>	<u>Position</u>	FORTRAN		<u>Item</u>
		<u>Variable Name</u>	<u>Format</u>	
1	1-10	RLB(1)	F10.0	Rate per line block for local messages
2	11-20	RLB(2)	F10.0	Rate per line block for area messages
3	21-30	RLB(3)	F10.0	Rate per line block for inter-area messages

PROGRAM COSAL

INPUT CARD 3

Field	Position	FORTRAN		Format	Item
		Variable Name			
1	4-5	SR(1)	F5.0	Subscriber rate for 1st connectivity code	
2	9-10	SR(2)	F5.0	Subscriber rate for 2nd connectivity code	
3	14-15	SR(3)	F5.0	Subscriber rate for 3rd connectivity code	
4	19-20	SR(3)	F5.0	Subscriber rate for 4th connectivity code	
.	.	.	.	.	
.	.	.	.	.	
.	.	.	.	.	
48		SR(48)	F5.0	Subscriber rate for 48th connectivity code	

PROGRAM COSAL

INPUT CARD 4

Field	Position	FORTRAN	
		Variable Name	Format
1	1-5	PDC	A5
2	11-30	CSA(J)	4A5
3	36-37	SUBR	A2
4	41-48	CCSD	A7
			Item
			PDC
			CSA
			Subscriber rate
			CCSD

Note: Last card of inputs must have ZZZZZ in field 1.

PROGRAM COSAL

INPUT AMIE FILE

PHYSICAL CHARACTERISTICS

Tape: 7 track
 Density: 800 bsi
 Parity: Even
 Character Code: BCD
 Record Size: 30 characters/logical record
 Blocking: 26 logical records/physical block
 Label: Unlabeled

LOGICAL RECORD

Field	Position	FORTRAN	
		Variable Name	Format
1	1-4	RI(1)	A4
2	5-6	RI(2)	A2
3	7	RI(3)	A1
4	8-15	CCSD	A8
			First four characters of OSRI
			Next two characters of OSRI
			Last digit of OSRI
			CCSD


```

C      HEAD(5,7002) (SRC(L),I=1,47)
C      HEAD SUBSCRIBER RATES FOR CONNECTIVITY CHARGES
C      HEAD(5,7003) (SR(L),L=1,48)
C      PRINT RATES USED IN THIS RUN
C      WRITE(6,8012)
C      WRITE(6,8013) (RLR(L),L=J,3)
C      WRITE(6,8014)
C      DO 10 J=1,47,6
C      K=J*5
C      IF (K.GT.47) K=47
C      WRITE(6,8015) (SRC(L),SR(L),L=J,K)
C      10 CONTINUE
C      CONVERT SEVEN-DAY SAMPLE TO YEARLY TOTALS
C      DO 50 L=1,3
C      RLR(L)=RLR(L)*52.0
C      50 CONTINUE
C      DO 60 L=1,48
C      SR(L)=SR(L)*12.0
C      60 CONTINUE
C      HEAD CROSS-WALK ASSOCIATING AN OSRI TO A GIVEN CCSD
C      BUF IN ALLOWS PROGRAM TO READ ONE ENTIRE RECORDS FROM INPUT TAPE
C      PRINT 8010
C      100 CONTINUE
C      BUFFER IN(1,0) (BUF(1),BUF(78))
C      THIS PAGE IS BEST QUALITY PRACTICABLE
C      FROM COPY FURNISHED TO DDC
C      3000370
C      3000380
C      3000390
C      3000400
C      3000410
C      3000420
C      3000430
C      3000440
C      3000450
C      3000460
C      3000470
C      3000480
C      3000490
C      3000500
C      3000510
C      3000520
C      3000530
C      3000540
C      3000550
C      3000560
C      3000570
C      3000580
C      3000590
C      3000600
C      3000610
C      3000620
C      3000630
C      3000640
C      3000650
C      3000660
C      3000670
C      3000680
C      3000690
C      3000700
C      3000710
C      3000720

```

```

120 CONTINUE
C
C   UNIT STATEMENT CHECKS TO SEE IF BUFFER IN IS DONE
C
C   IF (UNIT,1) 130,140,300,250
C
C   WHEN BUFFER IN IS NOT DONE
C   AMPL ALLOWS OTHER IN QUEUE TO EXECUTE FOR 9 MILLISECONDS
C
130 CONTINUE
C   CALL XRCL
C   GO TO 120

140 CONTINUE
C
C   LENGTH FUNCTION RETURNS (IS THE VALUE OF) THE NUMBER JUST READ
C
C   L=LENGTH(1)
C   LI=10*L
C   LI=LI/30*30
C
C   DO 200 IS=1,11,30
C
C   MCHAR MOVES 30 CHARACTERS AT A TIME TO ANOTHER ARRAY CALLED LINE
C
C   CALL MCHAR(15,BUF,1,LINE,30)
C
C   DECODE IS EQUIVALENT TO A READ STATEMENT FOR UNBLOCKED DATA
C
C   DECODE (30,7004,LINE) MI(1),PI(2),MI(3),CCSD
C
C   NCD=NCD+1
C   WCCSD(NCD)=CCSD
C   DO 150 L=1,7
C   WDI(NCD,L)=PI(L)
C
150 CONTINUE

```

THIS PAGE IS BEST QUALITY AVAILABLE
FROM COPY FURNISHED TO DDC

C	TEMPORARY OUTPUT	3001090
C		3001100
C		3001110
C	WRITE(6,8001) WCD,WCLSU(WCD),(WCDT(WCD,L),L=1,3)	3001120
C		3001130
C	200 CONTINUE	3001140
C		3001150
C	READY FOR NEXT BLOCK	3001160
C		3001170
C	GO TO 100	3001180
C		3001190
C	PARITY ERROR ON INPUT TAPE	3001200
C		3001210
C	250 CONTINUE	3001220
C		3001230
C	NPFSNPF+1	3001240
C		3001250
C	WRITE REMARK IN DAYFILE	3001260
C		3001270
C	CALL REMARK(17HEAD PARITY ERROR)	3001280
C		3001290
C	WRITE(6,9001) NPE	3001300
C		3001310
C	WRITE OUT ENTIRE BLOCK AND IGNORE BLOCK FOR DATA	3001320
C		3001330
C	DO 210 L=1,79,2	3001340
	L2=L1+2	3001350
	WRITE(6,9002) 11,(BUP(L),L=L1,L2)	3001360
	210 CONTINUE	3001370
		3001380
C	CONTINUE WITH READING NEXT BLOCK	3001390
C		3001400
C	GO TO 100	3001410
C		3001420
C	END OF TAPE	3001430
		3001440

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDO


```

C      NL=0
C      400 CONTINUE
C      READ CCSD,OWNERSHIP,AND RATES FROM CARDS
C      FORMAT OF INFORMATION
C      VARIABLE POSITION FORMAT CONTENTS
C      PDC 1-5 A5 PDC
C      CSA 11-30 4A5 CSA
C      SUAR 36-37 A2 SUBSCRIBER RATE
C      CLSD 41-48 A7 CCSU
C      HEAD(5,7007) PDC,(CSA(J),J=1,4),SUAR,CCSD
C      IF NEW PDC POINT PDC TOTALS
C      IF (KPDC.NE.1) GO TO 410
C      IPDC=PDC
C      KPDC=2
C      GO TO 420
C      410 CONTINUE
C      IF (TPDC.EQ.PDC) GO TO 460
C      WRITE(6,800A) TPDC,(PSUM(L),L=1,3),PTORI,PTCCSD,PTOTAL
C      NL=NL+2
C      420 CONTINUE
C      DO 430 L=1,3
C      PSUM(L)=0.0
C      430 CONTINUE
C      PTORI=0.0
C      PTCCSD=0.0

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

```

C 460 CONTINUE
C
C CHECK FOR LAST CARD -- 27ZZ
C
C IF (PDC.EQ.5H777Z) GO TO 1000
C
C TOTAL=0.0
C CCSD=0.0
C
C IDENTIFY SUBSCRIBER DATA
C
C DO 500 K=1,47
C KC=K
C IF (SUBR.EQ.SPC(K)) GO TO 510
C 500 CONTINUE
C KC=48
C 510 CONTINUE
C
C PRINT PDC-CSA-CCSD-SUBSCRIBER RATE
C
C WRITE(6,8003) PDC,(CSA(J),J=1,4),CCSD,SR(KC)
C NL=NL+2
C
C INITIALIZE ARRAYS FOR SUMMATION
C
C DO 520 L=1,3
C SUM(L)=0
C 520 CONTINUE
C
C FIND CCSD IN NSPI LIST
C
C KFIRST=1
C KNCD=1

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

```

C 515 CONTINUE
      IF (KNCD.GT.NCD) GO TO 526
      DO 525 J=KNCD,NCD
      JSN=J
      IF (CCSD.EQ.WCCSD(J)) GO TO 526
525 CONTINUE
      IF (KFIRST.EQ.1) WRITE(6,H002) CCSD
      IF (KFIRST.EQ.1) NL=NL+1
C 526 CONTINUE
      TOPI=0.0
      DO 527 L=1,3
      TOPI=TORI+SUM(L)
527 CONTINUE
C 528 CONTINUE
      TCCSD=TORI
      TOTAL=TCCSD+SR(KC)
      DO 528 L=1,3
      PSUM(L)=PSUM(L)+SUM(L)
528 CONTINUE
      PINRI=PTORI+TORI
      PTCCSD=PTCCSD+SR(KC)
      PTOTAL=PTOTAL+TOTAL
      GRDTOT=GRDTOT+TOTAL
C 529 CONTINUE
      WRITE(6,8005) (SUM(L),L=1,3),TORI,TCCSD,TOTAL
C 530 CONTINUE
      NL=NL+2
      IF (NL.LT.53) GO TO 400
      NL=0
      WRITE(6,8006)
C 531 CONTINUE
      GO TO 400

```

THIS PAGE IS BEST QUALITY AVAILABLE
FROM COPY FURNISHED TO DDC


```

C      FIND OSRI
C
C      530 CONTINUE
C
C      DO 600 J=1,NTORI
C
C      IF (WORI(JSN,1).NE.TRI(J,1)) GO TO 600
C
C      IF (WORI(JSN,2).EQ.2H ) GO TO 540
C
C      IF (WORI(JSN,2).NE.TRI(J,2)) GO TO 600
C
C      IF (WORI(JSN,3).EQ.3H) GO TO 560
C
C      DO 550 K=1,MCD
C
C      DO 540 L=1,3
C      IF (WORI(K,L).NE.TRI(J,L)) GO TO 550
C      540 CONTINUE
C      GO TO 600
C      550 CONTINUE
C
C      560 CONTINUE
C
C      CALCULATE DISTANCE CHANGES
C
C      TORI=0.0
C      DO 570 L=1,3
C      TSUM(L)=KTSUM(1,L)*RLX(L)
C      TORI=TORI+TSUM(L)
C      SUM(L)=SUM(1)+TSUM(L)
C      570 CONTINUE
C
C      WRITE(6,8304) (TRI(J,L),L=1,3), (TSUM(L),L=1,3), TORI
C      TRI(J,1)=447777

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

3003250
3003260
3003270
3003280
3003290
3003300
3003310
3003320
3003330
3003340
3003350
3003360
3003370
3003380
3003390
3003400
3003410
3003420
3003430
3003440
3003450
3003460
3003470
3003480
3003490
3003500
3003510
3003520
3003530
3003540
3003550
3003560
3003570
3003580
3003590
3003600

```

NL=NL+1
IF (NL.LT.53) GO TO 600
NL=0
WRITE(6,8000)
C 600 CONTINUE
C
CHECK OF OTHER NSRI USING SAME CCSU
C
KPTRST=2
KNCD=JSD+1
C
HEAD NEXT CCSU
C
GO TO 515
C
END OF CCSU LIST CHECK FOR NSRI NOT ACCOUNTED FOR
C
1000 CONTINUE
C
WRITE(6,8000)
WRITE(6,8007)
NL=5
C
DO 1110 L=1,3
SUM(L)=0
1110 CONTINUE
TCCSD=0.0
C
DO 1200 J=1,NTORI
C
IF (TRI(J,1).EQ.4HZZZZ) GO TO 1200
TUPI=0
DO 1120 L=1,3
TSUM(L)=KTSUM(L,L)*RLH(L)

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

```

TORI=TORI+TSUM(L)
SUM(L)=SUM(L)+TSUM(L)
1120 CONTINUE
C
WRITE(6,8004) (TRI(J,L),L=1,3), (TSUM(L),L=1,3), TORI
C
NL=NL+1
IF (NL.LT.53) GO TO 1200
NL=0
WRITE(6,8000)
C
1200 CONTINUE
C
TORI=0.0
DO 1210 L=1,3
TORI=TORI+SUM(L)
1210 CONTINUE
C
TCCSD=TORI
TOTAL=TCCSD
GRDTOT=GRDTOT+TOTAL
C
WRITE(6,8005) (SUM(L),L=1,3), TORI, TCCSD, TOTAL
C
WRITE(6,8006) GRDTOT
C
STOP
C
FORMATS FOR INPUT
C
7001 FORMAT(3F10.0)
7002 FORMAT(16(3X,A2))
7003 FORMAT(16F5.0)
7004 FORMAT(A4,A2,A1.1X,A8)
7005 FORMAT(4I10)
7006 FORMAT(A4,A2,A1.3I15)

```

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

POC	CSA	CCSD	ITEM	LOCAL	AREA	INTER- AREA	OSRI TOTAL	SUBTOTAL	TOTAL
AA030	WU	D	11447	12244.61	4866.83	141.82	17152.46	17152.46	21832.46
			CONNECTIVITY						
			RUCIP0A	9703.47	6413.94	284.54	16491.96	16491.96	38531.96
			TOTAL	9703.47	6413.94	284.54	16491.96	16491.96	
AA030	WU	D	11446						
			CONNECTIVITY						
			RUCIAPA	8501.66	13015.08	286.42	21883.16	21883.16	35923.16
			TOTAL	8501.66	13015.08	286.42	21883.16	21883.16	
AA030	WU	D	11441						
			CONNECTIVITY						
			RUCIEMA	11524.45	11354.55	339.46	23219.46	23219.46	37259.46
			TOTAL	11524.45	11354.55	339.46	23219.46	23219.46	
AA030	WU	D	11445						
			CONNECTIVITY						
			RUCIDPA	18046.40	15952.25	227.76	26226.41	26226.41	48266.41
			TOTAL	18046.40	15952.25	227.76	26226.41	26226.41	
AA030	WU	D	11217						
			CONNECTIVITY						
			RUCJSLA	5531.14	11684.53	989.66	18125.33	18125.33	
			RUCJSLC	1927.33	3284.77	711.36	5963.46	5963.46	38068.78
			TOTAL	7458.46	14869.30	1701.02	24028.78	24028.78	
AA030	TOTAL			287448.93	572474.70	108415.01	968334.64	345940.00	1333374.64
AA040	WU	D	00470						
			CONNECTIVITY						
			RUCIAPA	497.12	81.43	5.62	584.17	584.17	5264.17
			TOTAL	497.12	81.43	5.62	584.17	584.17	
AA040	WU	D	00440						
			CONNECTIVITY						
			RUCIAPA	283.42	374.14	0.00	581.57	581.57	5261.57
			TOTAL	283.42	374.14	0.00	581.57	581.57	
AA040	WU	D	00010						
			CONNECTIVITY						
			RUCIAPA	497.08	297.18	238.99	943.85	943.85	5623.85
			TOTAL	497.08	297.18	238.99	943.85	943.85	
AA040	WU	D	00493						
			CONNECTIVITY						
			RUCIAPA	21717.70	43774.12	96.10	65591.92	65591.92	
			RUCIAPA	2787.62	16701.52	7091.76	24580.89	24580.89	
			RUCIAPA	4380.61	8917.27	96.22	13312.10	13312.10	
			RUCIAPA	1216.38	7023.28	386.26	8625.92	8625.92	
			RUCIAPA	99.01	3017.66	239.62	3356.29	3356.29	
			RUCIAPA	0.00	2914.70	0.00	2914.70	2914.70	

APPENDIX D

SPECIALIZED SYSTEM FEATURE UTILIZED

SPECIALIZED SYSTEM FEATURE UTILIZED

The three programs included in these appendices are written in FORTRAN for the CDC 6400 computer. With very minor modifications in the program, the routines are adaptable to any computer with core storage of at least 120K words. Although several special features of SCOPE 3.20.0 SCM Version A 8/31/70 FORTRAN were utilized, none are indispensable for use of the programs. These special functions and subroutines are described below.

1. INCK (0) An input check that provides a means of determining, under program control, that illegal characters have been encountered during a FORTRAN BCD input operation, and provides an optional return to execution if an input error has occurred.

2. NOPCHK (0) A parity error check that shifts responsibility for handling physical tape parity errors to the standard system routine.

3. BUFFER IN
 (j.p) (A,B) The statement transfers information from tape unit j in mode p to storage locations A through B. Only one logical record is read for each BUFFER IN statement. A p of zero designates even parity while one designates odd parity.

4. IF (UNIT,j) A test on unit j to determine the record being transferred from unit u to buffer has been completed.
5. XCRL A check on the buffering-in of data that permits others in system to execute if buffering operation is not yet completed.
6. LENGTH (J) Number of words read on previous read request on file J.
7. MCHAR
(J,A,I,B,N) This statement transfers N characters starting at the Ith character in the string (array) A into the string B starting with the Ith character position.
8. DECODE
(c,n,v) L The information in c consecutive BCD characters (starting at location v) is transmitted according to the Format n and stored in the list variables, L.
9. REMARK Allows user to print a statement in the day file.
10. MESWAIT Writes a message on the console and waits for the operator to perform a specified operation.

APPENDIX E

A GENERALIZED MODEL FOR ALLOCATING COSTS

A GENERALIZED MODEL FOR ALLOCATING COSTS

The material below is reprinted from IDA Study S-487
Cost Allocation for AUTODIN: An Economic Analysis, Volume
I, pp 28-34.

If we wish to exercise the option of assigning a fixed charge per message it is only necessary to select a value for m and then calculate the revenue that these charges bring in:

$$(6) \quad M_1 = m_x x'$$

$$(7) \quad M_2 = m_y y'$$

$$(8) \quad M_3 = m_z z'.$$

The revenue from the messages must be subtracted from the usage cost and the remainder allocated by line blocks.

$$(3-a) \quad \tilde{C}_1 = \frac{S - R - M_1 - M_2 - M_3}{x + y + z}$$

$$(4-a) \quad \tilde{C}_2 = \frac{S - R - M_1 - M_2 - M_3}{x + y + z} + \frac{aR + T_c}{y + z}$$

$$(5-a) \quad \tilde{C}_3 = \frac{S - R - M_1 - M_2 - M_3}{x + y + z} + \frac{aR + T_c}{y + z} + \frac{bR + T_{os}}{z}.$$

If we wish to exercise the option of allocating a certain fraction of usage costs to messages and the remainder to line blocks, the procedure is even more simple. The per unit costs of messages would be:

$$(3-b) \quad \hat{C}_1 = \frac{\beta(S - R)}{x' + y' + z'}$$

$$(4-b) \quad \hat{C}_2 = \frac{\beta(S - R)}{x' + y' + z'} + \frac{\beta(aR + T_c)}{y' + z'}$$

$$(5-b) \quad \hat{C}_3 = \frac{\beta(S - R)}{x' + y' + z'} + \frac{\beta(aR + T_c)}{y' + z'} + \frac{\beta(bR + T_{os})}{z'}$$

The per unit line block costs for local, area, and inter-area would be:

$$(3-c) \quad \bar{C}_1 = \frac{(1 - \beta)(S - R)}{x + y + z}$$

$$(4-c) \quad \bar{C}_2 = \frac{(1 - \beta)(S - R)}{x + y + z} + \frac{(1 - \beta)(aR + T_c)}{y + z}$$

$$(5-c) \quad \bar{C}_3 = \frac{(1 - \beta)(S - R)}{x + y + z} + \frac{(1 - \beta)(aR + T_c)}{y + z} + \frac{(1 - \beta)(bR + T_{os})}{z}$$

2. Precedence Charges

It is a simple matter to introduce differential charges for precedence into the formulas. One only need normalize on the cost of non-FLASH messages and then multiply this cost by a factor or add some fixed amount to arrive at the FLASH message cost. Equations (2), (3), and (4) would need to be modified slightly to obtain the unit cost for non-FLASH messages. If a factor is used, the modification would consist of multiplying the number of FLASH messages contained in x, y, and z by the factor before summing. The denominators in these equations then would be the number of normalized messages. Alternatively, if a fixed charge per FLASH message is assigned, the total FLASH charge can be subtracted from the costs (S-R) before allocating the remainder. Our program permits any of these methods to be used and also permits local, area, and inter-area FLASH messages to be assessed differently.

We would recommend, however, that precedence *not* be made a part of the process of calculating before-the-fact charges for usage. We believe there should be a charge for precedence but the revenue collected simply should be subtracted from the following year's costs before they are allocated. Agencies cannot reasonably forecast FLASH usage, but a charge and an accounting for such use are desirable from a managerial viewpoint.

Having examined all the characteristics of AUTODIN that impinge upon the problem of allocating costs, it is possible now to integrate them and arrive at a general model that can be used to calculate appropriate connectivity, usage, area, and precedence charges as a function of various decision parameters and variables. All of the variables and parameters have been discussed earlier so we simply shall define them and describe how they can be put together to solve the cost allocation problem.

We define the following symbols:

- S = total annual cost of switches (including both memory and throughput but not trunk leases)
- $R = \alpha S$ = total connectivity costs (total annual cost of memory)¹
- D = portion of switch (connectivity) costs to be allocated by connectivity charges
- d = connectivity fee per weighted unit
- a = ratio of memory used for CONUS trunks to total CONUS memory available (this is 0.23 in the previous example)²
- b = ratio of memory used for overseas connecting trunks to total CONUS memory available
- aR = cost of memory for CONUS long distance
- bT = cost of memory for overseas long distance
- T_c = cost of CONUS trunks plus area trunks overseas
- T_{os} = cost of overseas connecting trunks
- N = number of weighted units (obtained by multiplying number of low-speed lines by 3, medium speeds by 9, high speeds by 14, and adding)

¹R can be measured directly or it can be defined as the product of a ratio α and the cost of switches: $R = \alpha S$. This definition is useful if α is either constant over time or is the decision parameter whose value is changed from period to period.

² Some thought should be given to whether the denominator of this ratio should be total CONUS capacity or total memory used for all connections. The latter allocates the cost of "unused" memory capacity to both local and long distance.

$$\begin{aligned}
\text{Total Revenue is } & (1 - a - b)R + xC_1 + yC_2 + zC_3 \\
& = (1 - a - b)R + S - R + aR + T_c + bR + T_{os} \\
& = (1 - a - b)R + S - R + aR + bR + T_c + T_{os} \\
& = S + T_c + T_{os} .
\end{aligned}$$

The latter is equal to total costs.

1. Usage Charges for Both Messages and Line Blocks

The methodology described above is applicable regardless of whether messages or line blocks are the measure of usage. The variables, x, y, and z could be defined as the number of units of either. It is a relatively simple matter to extend the methodology to permit charges to be levied for both messages and line blocks. The breakdown between them can be determined in either of two essentially equivalent ways. One permits a decision to be made on the cost per message, for example 10 cents per local message, while the other permits a decision to be made on what fraction of costs are to be allocated by messages and what fraction by line blocks.

To illustrate how each would be applied, we shall define the following variables:

- x = number of local line blocks
- y = number of area line blocks
- z = number of inter-area line blocks
- x' = number of local messages
- y' = number of area messages
- z' = number of inter-area messages
- m_x = fixed charge per local message
- m_y = fixed charge per area message
- m_z = fixed charge per inter-area message
- β = fraction of usage costs allocated to messages
- 1-β = fraction of usage costs allocated to line blocks.

x = number of local or single switch messages
 y = number of area (e.g., CONUS) long distance messages
 z = number of inter-area messages.

In accordance with the earlier discussion, aR , bR , T_c and T_{os} (trunks and trunk connections) should be allocated among long distance users as a function of usage. This means that aR and bR should be subtracted from the total connectivity cost before connectivity charges are calculated. Costs to be allocated by *connectivity charges* (symbolized by D) thus would be:

$$(1) \quad D = R - (a + b)R = (1 - a - b)R.$$

The connectivity fee per *weighted unit* would be:

$$(2) \quad d = \frac{D}{N} = \frac{(1 - a - b)R}{N}.$$

This cost should be multiplied by 3, 9, and 14 to obtain the access charges for slow, medium, and high speed, respectively.

The message unit charges must be calculated separately for local, area, and inter-area calls.¹ The cost per message unit for local (single switch) calls, C_1 , will include none of the costs associated with long distance. It is equal to switch costs less connectivity costs divided by the total number of message units:

$$(3) \quad C_1 = \frac{S - R}{x + y + z}.$$

The total revenue collected for single switch calls would be xC_1 .

¹The term "message unit" here refers to either messages or line blocks, whichever is selected as the unit of measure. We later describe the process of calculating charges when both messages and line blocks are assessed.

The cost per message unit for area (CONUS, Europe, or Asia) messages would be that for single switch plus the allocation of costs associated with trunks and trunk connectivity within all areas:

$$(4) \quad C_2 = \frac{S - R}{x + y + z} + \frac{aR + T_c}{y + z}.$$

The area trunk costs are allocated to both area and overseas messages because any overseas message originating at a switch other than the gateway switch will use area trunks and memory capacity as well as the overseas trunks and capacity. The total revenue collected for area messages would be yC_2 .

The cost per message unit for inter-area messages would be that for an area message plus the allocation of costs for overseas trunks and connectivity:

$$(5) \quad C_3 = \frac{S - R}{x + y + z} + \frac{aR + T_c}{y + z} + \frac{bR + T_{os}}{z}.$$

The total revenue collected for overseas calls would be zC_3 . If one were to add the total connectivity charges and the sum of the usage charges one would find that our formulas produce the correct amount of revenue. This can be shown rather easily.

Connectivity revenue is: $D = (1 - a - b)R$,

Single switch revenue is: $xC_1 = \frac{x(S - R)}{x + y + z}$,

Area revenue is: $yC_2 = y \left[\frac{S - R}{x + y + z} + \frac{aR + T_c}{y + z} \right]$,

Overseas revenue is: $zC_3 = z \left[\frac{S - R}{x + y + z} + \frac{aR + T_c}{x + y} + \frac{bR + T_{os}}{z} \right]$,