HASP-II***HASP-II***HASP-II	START JOB 175	1.27.27 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	START JOB 175	1.27.27 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	START JOB 175	1.27.27 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	START JOB 175	1.27.27 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	START JOB 175	1.27.27 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	START JOB 175	1.27.27 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II

Ken Boucher
W6IK
1770

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HASP SYSTEM LOG

DSW 297161

```
$ 13.24.07 JOB 175 -- HAGBERG  -- BEGINNING EXEC - INIT 2 - CLASS A
 *13.24.15 JOB 175 IEF403I HAGBERG  STARTED
 *13.24.45 JOB 175 IEF404I HAGBERG  ENDED
$ 13.24.48 JOB 175 END EXECUTION.
```

HASP-II JOB STATISTICS -- 72 CARDS READ -- 433 LINES PRINTED -- 0 CARDS PUNCHED -- 0.68 MINUTES EXECUTION TIME

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```
//HAGBERG  JOB (1000,CE2417,05,0100,000),'CGHAGB'                    JOB 175
//        EXEC MG,PARM='BCD'
XX       EXEC PGM=MONFORT,PARM=NOSOURCE,REGION=120K                 65159000
XXSYSPRINT DD  SYSOUT=A,DCB=(RECFM=F,BLKSIZE=120)                   65159100
XXFT06F001 DD  SYSOUT=A                                             65159200
XXSYSLIN   DD  UNIT=DISK,SPACE=(CYL,(5,1)),                        X65159300
XX             DCB=(BLKSIZE=3200,RECFM=FB)                          65159400
XXSYSLOUT  DD  SYSOUT=A                                             65159500
XXSYSLIB   DD  DSNAME=MLIB,DISP=SHR                                 65159600
XX             DD  DSNAME=SYS1.FORTLIB,DISP=SHR                     65159700
XX             DD  DSNAME=TSLS,DISP=SHR                             65159800
XXFT05F001 DD  DDNAME=DATA                                          65159900
//SYSIN    DD  *              PUT FORTRAN DECK AFTER THIS CARD
//DATA     DD  *              PUT DATA DECK AFTER THIS CARD
//
IEF236I ALLOC. FOR HAGBERG
IEF237I 7A2   ALLOCATED TO SYSPRINT
IEF237I 7A3   ALLOCATED TO FT06F001
IEF237I 152   ALLOCATED TO SYSLIN
IEF237I 7A9   ALLOCATED TO SYSLOUT
IEF237I 162   ALLOCATED TO SYSLIB
IEF237I 265   ALLOCATED TO
IEF237I 151   ALLOCATED TO
IEF237I 712   ALLOCATED TO FT05F001
IEF237I 701   ALLOCATED TO SYSIN
IEF142I - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SYS73271.T132411.RV000.HAGBERG.R0000003      DELETED
IEF285I   VOL SER NOS= DSK005.
IEF285I   MLIB                                         KEPT
IEF285I   VOL SER NOS= DSK007.
IEF285I   SYS1.FORTLIB                                 KEPT
IEF285I   VOL SER NOS= RES165.
IEF285I   TSLS                                         KEPT
IEF285I   VOL SER NOS= SYSLIB.
********************MONSANTO COMPANY - MANAGEMENT INFORMATION AND SYSTEMS DEPARTMENT - CREVE COEUR COMPUTER CENTER********************
*     TIME STARTED 13.24.16    REGION SIZE 120K    I/O TIME     .050    MACHINE UNITS      .303    STEP COST              $.73     *
*     TIME ENDED   13.24.38    CORE USED   120K    CPU TIME     .080    I/O UNITS          .044    PGM/SETUP CHARGE       $.00     *
*     STEP ABEND CODE   000    D.S. ALLOCS.  04    RUN TIME     .130    OCCUPANCY          .259    I.D.      7327113241695401      *
****MISD****370/165****MISD****370/165****MISD****370/165****MISD****370/165****MISD****370/165****MISD****370/165****MISD*******11*
********************MONSANTO COMPANY - MANAGEMENT INFORMATION AND SYSTEMS DEPARTMENT - CREVE COEUR COMPUTER CENTER********************
*     JOB COST          $.73          DATE    FRI 28 SEPT 73          JOB CLASS A  PRIO 10          TIME STARTED 13.24.16      *
*     MACHINE UNITS     .303          RUN TIME        .130            PSEUDO CODE     1000          TIME ENDED   13.24.44      *
****MISD****370/165****MISD****370/165****MISD****370/165****MISD****370/165****MISD****370/165****MISD****370/165****MISD*******11*
```

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```
1  FORTRAN IV G LEVEL  21                    MAIN              DATE = 73271        13/24/21              PAGE 0001
0    0001                  DIMENSION  BIP(100),T(100),CIN(6),COUT(6)
     0002                  DIMENSION XM(6),CWT(6),Y(6)
     0003                  DATA XM/154.2,188.65,188.65,188.65,223.1,258./
                     C
                     C        N = NO OF CSTRS IN SERIES
                     C        BIP(J) = MOLE PERCENT OUT OF CSTR J
                     C        T(J) = TEMPERATURE OF CSTR J
                     C
     0004                    1 READ(5,1000,END=62) N,(BIP(J),J=1,N),(T(J),J=1,N)
     0005                      DO 10 I=1,6
     0006                   10 CIN(I) = 0.
     0007                      CIN(1) = 100.
     0008                      PRINT 3000
     0009                      DO 20 I = 1,N
     0010                      BK = BIP(I)
     0011                      TK = T(I) + 273.
     0012                      CALL CST(CIN,BK,TK,COUT)
     0013                      SUM = 0.
     0014                      DO 40 J=1,6
     0015                      CWT(J) = COUT(J)*XM(J)
     0016                   40 SUM = SUM + CWT(J)
     0017                      DO 50 J=1,6
     0018                   50 CWT(J) = CWT(J)/SUM*100.
     0019                      SUM = 100. - CWT(1)
     0020                      Y(1) = 0.
     0021                      DO 60 J = 2,6
     0022                   60 Y(J) = CWT(J) / SUM*100.
     0023                      PRINT 2000,I,BIP(I),T(I),(CIN(J),COUT(J),CWT(J),Y(J),J=1,6)
     0024                      DO 30 J=1,6
     0025                   30 CIN(J) = COUT(J)
     0026                   20 CONTINUE
     0027                      GO TO 1
     0028                   62 CALL EXIT
     0029                 1000 FORMAT(G1.0)
     0030                 2000 FORMAT(///,5X,'CSTR NO',I4,/,5X,'BIP =',F10.5,/,5X,'TEMPERATURE ='
                             1  ,F8.2,' DEG C',//,10X,'INLET MOL PC ',5X,'OUTLET MOL PC ',
                             2  5X,'OUTLET WT PC ',      5X,'OUTLET WT YIELD',/,
                             3 '      BIP  ',F10.3,10X,F10.3,10X,F10.3,10X,F10.3,/,
                             3 '      OMCP ',F10.3,10X,F10.3,10X,F10.3,10X,F10.3,/,
                             3 '      MMCP ',F10.3,10X,F10.3,10X,F10.3,10X,F10.3,/,
                             3 '      PMCP ',F10.3,10X,F10.3,10X,F10.3,10X,F10.3,/,
                             3 '      DCP  ',F10.3,10X,F10.3,10X,F10.3,10X,F10.3,/,
                             3 '      TCP  ',F10.3,10X,F10.3,10X,F10.3,10X,F10.3,/)
     0031                 3000 FORMAT(1H1,20X,'BIPHENYL CHLORINATION IN A SERIES OF CSTR REACTORS
                             1 ' )
     0032                      END
1  FORTRAN IV G LEVEL  21                    MAIN              DATE = 73271        13/24/21              PAGE 0002
0
      *OPTIONS IN EFFECT*   NOID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
      *OPTIONS IN EFFECT*   NAME = MAIN     , LINECNT =       57
      *STATISTICS*     SOURCE STATEMENTS =       32,PROGRAM SIZE =     2314
      *STATISTICS*   NO DIAGNOSTICS GENERATED
1  FORTRAN IV G LEVEL  21                    CST               DATE = 73271        13/24/21              PAGE 0001
0    0001                  SUBROUTINE CST(CIN,BK,TK,COUT)
     0002                  DIMENSION CIN(1),COUT(1)
     0003                  X = 11.17
     0004                  Y = 1.9266
     0005                  R = 1.9976
     0006                  S = 31.065
     0007                  FAC = 1. + 1./X + 1./Y
     0008                  XK = (CIN(1) - BK) /FAC/BK
```

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```
      0010                COUT(2) = (CIN(2) +     XK*COUT(1)) / (1.+XK/R)
      0011                COUT(3) = (CIN(3) +     XK*COUT(1)/X) / (1. + XK/R)
      0012                COUT(4) = (CIN(4) +     XK*COUT(1)/Y) / (1. + XK/R)
      0013                SUM = COUT(2) + COUT(3) + COUT(4)
      0014                COUT(5) = (CIN(5) +     XK*SUM/R) / (1. + XK/R/S)
      0015                COUT(6) = CIN(6) +    XK*COUT(5) /R/S
      0016                RETURN
      0017                END
1   FORTRAN IV G LEVEL  21                  CST              DATE = 73271      13/24/21          PAGE 0002
0
       *OPTIONS IN EFFECT*   NOID,BCD,SOURCE,NOLIST,NODECK,LOAD,NOMAP
       *OPTIONS IN EFFECT*   NAME = CST      , LINECNT =      57
       *STATISTICS*     SOURCE STATEMENTS =       17,PROGRAM SIZE =      648
       *STATISTICS*   NO DIAGNOSTICS GENERATED
0      *STATISTICS*   NO DIAGNOSTICS THIS STEP 2
```

DSW 297164

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STLCOPCB4067078

DSW 297165

```
                                    OS/360 LOADER

OPTIONS USED - PRINT,NOMAP,NOLET,CALL,RES,NOTERM,SIZE=96256,NAME=**GO
               EP=MAIN

  TOTAL LENGTH      5E50
  ENTRY ADDRESS     B4010
```

BIPHENYL CHLORINATION IN A SERIES OF CSTR REACTORS

DSW 297166

CSTR NO 1
BIP = 99.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	100.000	99.000	98.779	0.0
OMCP	0.0	0.620	0.756	61.938
MMCP	0.0	0.055	0.068	5.545
PMCP	0.0	0.322	0.393	32.149
DCP	0.0	0.003	0.005	0.370
TCP	0.0	0.000	0.000	0.000

CSTR NO 2
BIP = 98.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	99.000	98.000	97.562	0.0
OMCP	0.620	1.237	1.507	61.821
MMCP	0.055	0.111	0.135	5.535
PMCP	0.322	0.642	0.782	32.088
DCP	0.003	0.009	0.014	0.559
TCP	0.000	0.000	0.000	0.000

CSTR NO 3
BIP = 97.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	98.000	97.000	96.350	0.0
OMCP	1.237	1.853	2.252	61.701
MMCP	0.111	0.166	0.202	5.524
PMCP	0.642	0.962	1.169	32.026
DCP	0.009	0.019	0.027	0.749
TCP	0.000	0.000	0.000	0.000

CSTR NO 4
BIP = 96.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	97.000	96.000	95.143	0.0
OMCP	1.853	2.467	2.991	61.582
MMCP	0.166	0.221	0.268	5.513
PMCP	0.962	1.280	1.552	31.964
DCP	0.019	0.032	0.046	0.941
TCP	0.000	0.000	0.000	0.000

STLCOPCB4067079

CSTR NO 5
BIP = 95.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	96.000	95.000	93.941	0.0
OMCP	2.467	3.078	3.724	61.461
MMCP	0.221	0.276	0.333	5.502
PMCP	1.280	1.598	1.933	31.901
DCP	0.032	0.048	0.069	1.136
TCP	0.000	0.000	0.000	0.000

DSW 297167

CSTR NO 6
BIP = 94.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	95.000	94.000	92.743	0.0
OMCP	3.078	3.688	4.451	61.339
MMCP	0.276	0.330	0.399	5.491
PMCP	1.598	1.914	2.311	31.838
DCP	0.048	0.068	0.097	1.332
TCP	0.000	0.000	0.000	0.000

CSTR NO 7
BIP = 93.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	94.000	93.000	91.550	0.0
OMCP	3.688	4.295	5.173	61.215
MMCP	0.330	0.385	0.463	5.480
PMCP	1.914	2.229	2.685	31.774
DCP	0.068	0.091	0.129	1.531
TCP	0.000	0.000	0.000	0.001

CSTR NO 8
BIP = 92.00000
TEMPERATURE = 150.00 DEG C

	INLET MOL PC	OUTLET MOL PC	OUTLET WT PC	OUTLET WT YIELD
BIP	93.000	92.000	90.361	0.0
OMCP	4.295	4.900	5.888	61.090
MMCP	0.385	0.439	0.527	5.469
PMCP	2.229	2.543	3.056	31.709
DCP	0.091	0.117	0.167	1.732
TCP	0.000	0.000	0.000	0.001

CSTR NO 9
BIP = 91.00000
TEMPERATURE = 150.00 DEG C

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HASP-II***HASP-II***HASP-II	END JOB 175	1.28.34 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	END JOB 175	1.28.34 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	END JOB 175	1.28.34 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	END JOB 175	1.28.34 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	END JOB 175	1.28.34 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II
HASP-II***HASP-II***HASP-II	END JOB 175	1.28.34 PM	28 SEP 73	BIN 0100	CGHAGB	HASP-II***HASP-II***HASP-II

DSW 297171

STLCOPCB4067081