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DECUS NO.	8-550
TITLE	MODIFIED MATRIX INVERSION – REAL NUMBERS
AUTHOR	John W. Horm
COMPANY	University of Pittsburgh Pittsburgh, Pennsylvania
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SOURCE LANGUAGE	PS/8 FORTRAN

MODIFIED MATRIX INVERSION – REAL NUMBERS

This is similar to "Matrix Inversion – Real Numbers" (DECUS NO. 8-72) by
Professor A. E. Sapega. It has been modified to run under PS/8. Input is
from the high speed paper tape reader and the output is routed to the DECwriter
with the option of having a paper tape made of the inverse.
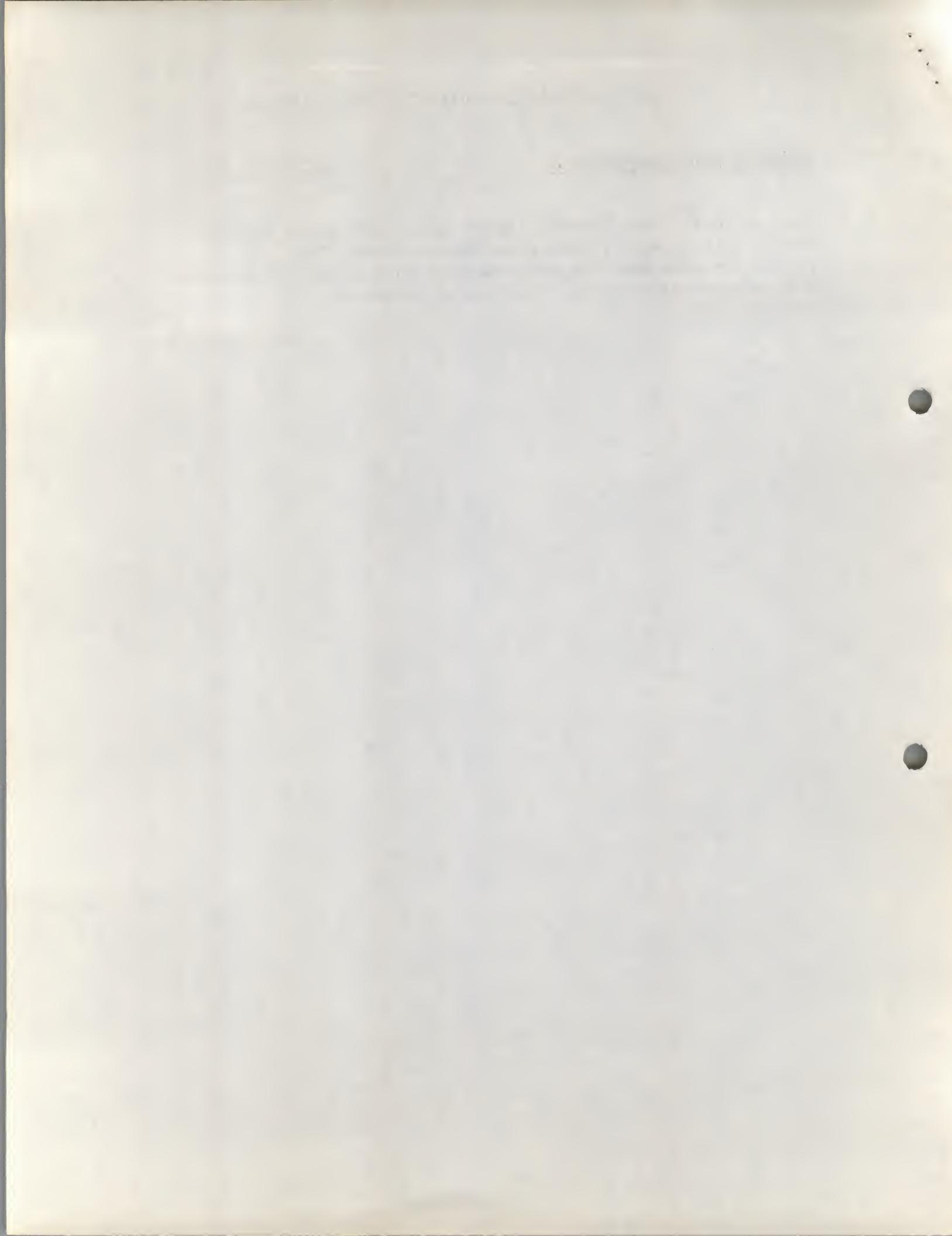
MATRIX INVERSION

SIZE OF MATRIX=
3

IS PUNCH PAPER TAPE OUTPUT DESIRED?
YES=0; NO=1
0
PLACE DATA TAPE IN READER, TOP OF FORM, HIT CONTINUE
TOP OF FORM, HIT CONTINUE

MATRIX INVERSION RESULTS

ORIGINAL MATRIX VALUES

ROW 1

 0.10000000E+01   0.20000000E+01   0.30000000E+01
ROW 2

 0.60000000E+01   0.50000000E+01   0.39999999E+01
ROW 3

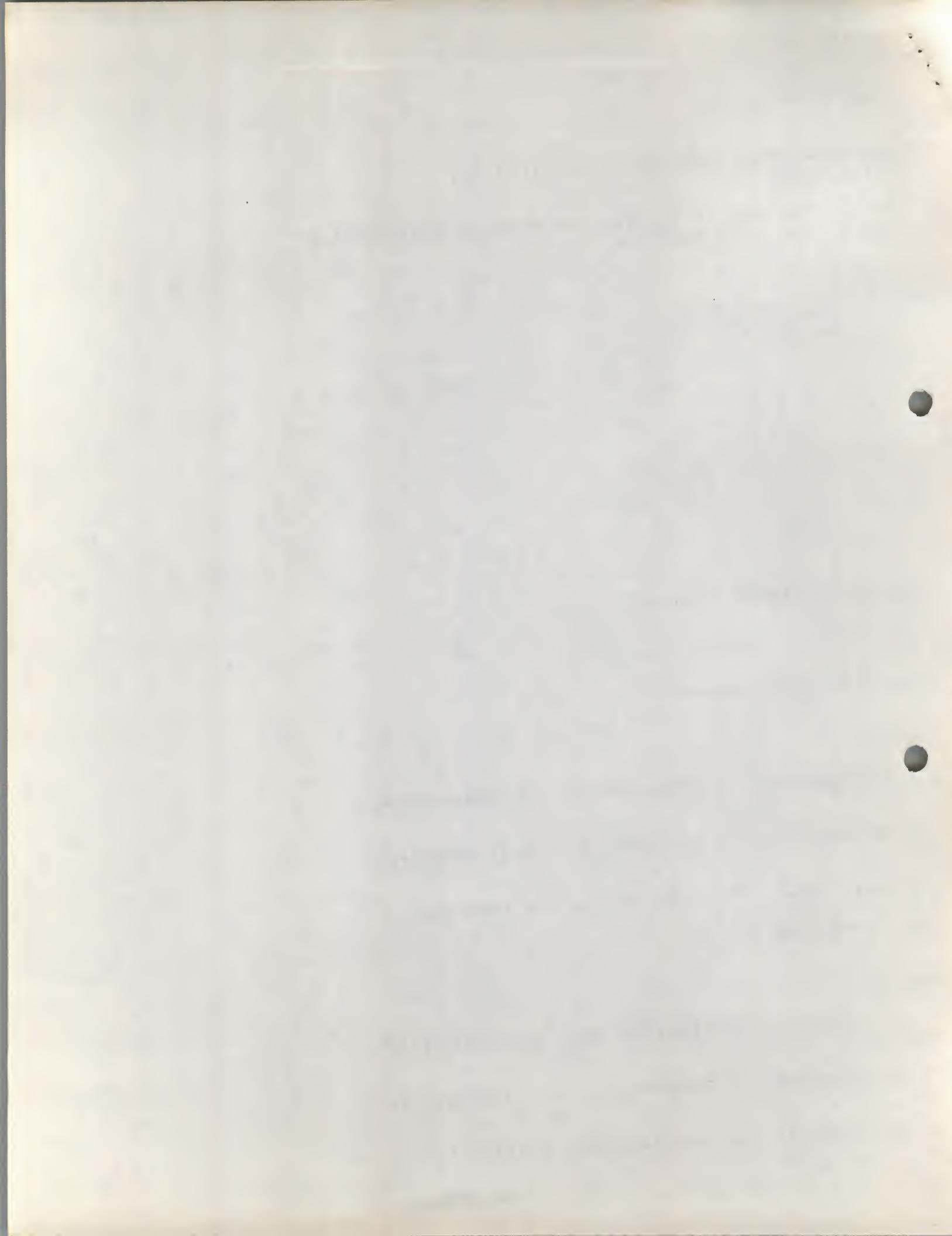 0.79999999E+01   0.70000000E+01   0.89999999E+01

THE INVERSE MATRIX IS

ROW 1

-0.80952380E-00   -0.14285714E-00   0.33333333E-00
ROW 2

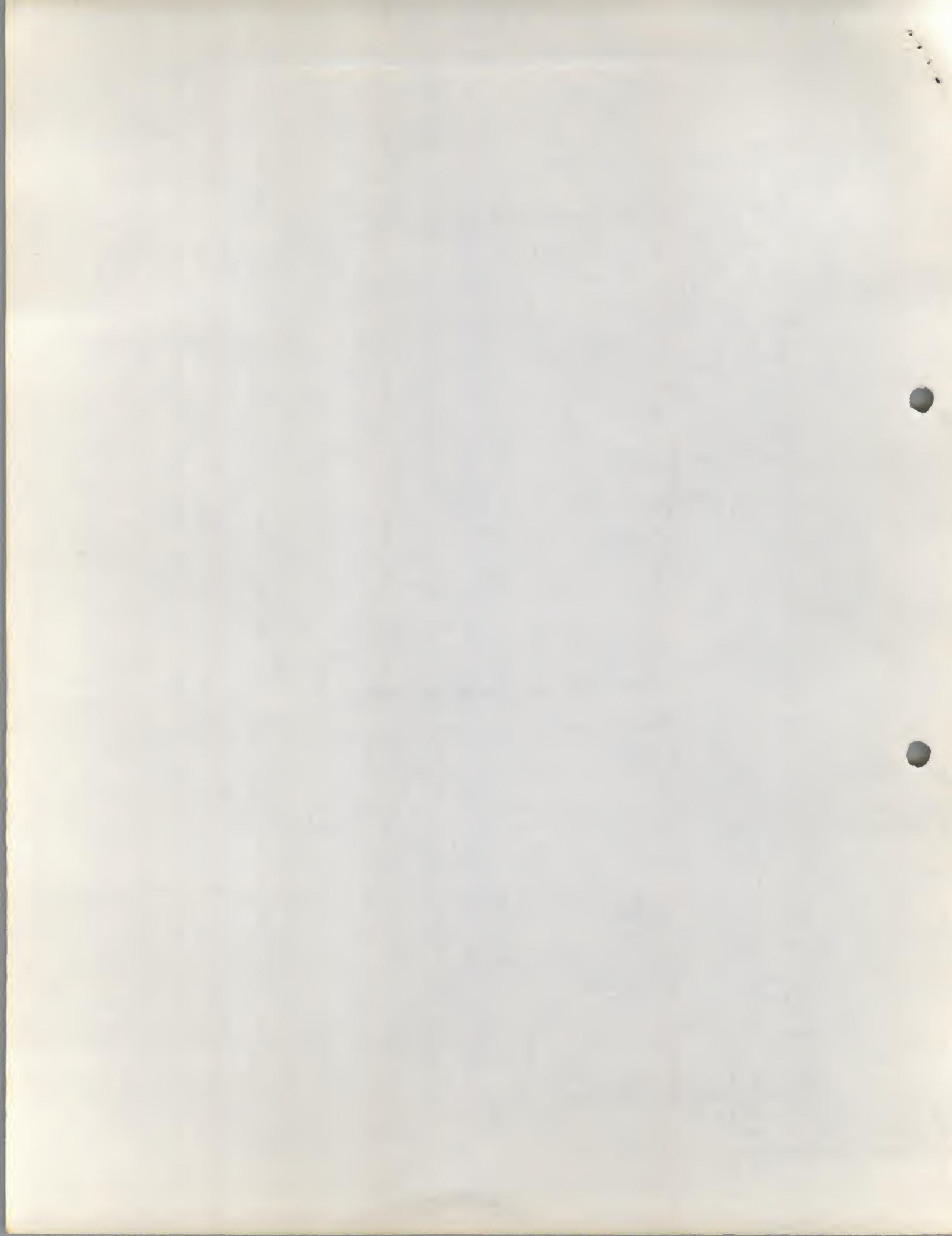 0.10476190E+01   0.71428572E-00   -0.66666666E-00
ROW 3

-0.95238089E-01   -0.42857143E-00   0.33333333E-00

2

```
            WRITE (1,1)
1           FORMAT (//'MATRIX INVERSION')
            WRITE (1,2)
2           FORMAT (//'SIZE OF MATRIX= ')
            READ (1,3) N
3           FORMAT (I2)
            WRITE (1,620)
            WRITE (1,625)
            READ (1,630) PUNCH
            WRITE (1,635) ID,
            WRITE (1,636)
            PAUSE
            LAST=N*N
            COMMON A
            DIMENSION A(1000)
            I1=1
            I2=LAST-N+1
            DO 100 J=1,N
            DO 101 I=I1,I2,N
            READ (2,5) A(I)
5           FORMAT (E15.8)
101         CONTINUE
            I1=I1+1
            I2=I2+1
100         CONTINUE
            WRITE (1,8)
8           FORMAT (///'MATRIX INVERSION RESULTS'//)
            WRITE (1,9)
9           FORMAT (//'ORIGINAL MATRIX VALUES'/)
            JOG=1
            GO TO 200
149         DO 150 J=1,N
            DO 105 I=1,N
            A(LAST+I)=0.0
105         CONTINUE
            A(LAST+J)=1.0
            PVT=A(J)
            J3=LAST+J
            DO 106 KP=J,J3,N
            A(KP)=A(KP)/PVT
106         CONTINUE
            DO 110 KRT=1,N
            IF(KRT-J) 107,110,107
107         KR1=KRT
            KR2=KR1+LAST
            KPR=J
            RWC=A(KR1)
            DO 109 KR=KR1,KR2,N
            A(KR)=A(KR)-RWC*A(KPR)
            KPR=KPR+N
109         CONTINUE
110         CONTINUE
            DO 111 I=1,LAST
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        H(I)=H(I+N)
111     CONTINUE
150     CONTINUE
        WRITE (1,160)
160     FORMAT (///THE INVERSE MATRIX IS//)
        JOG=2
        BJOG=FLOAT(JOG)
        GO TO 200
161     CALL EXIT
200     ILNE=4
        NR=1
        NRC=1
        WRITE (1,201) NR
201     FORMAT (//ROW /,I2,/)
        I1=1
        I2=LAST-N+1
        KONT=1
        DO 210 JP=1,N
        DO 213 I=I1,I2,N
        WRITE (1,212) A(I),ID,
212     FORMAT (E15.8,2H   ,I0)
        IF(BJOG-1.5)660,660,651
651     IF(PUNCH-0.5)650,650,660
660     IF(N-NRC) 216,216,215
216     IF(N-NR) 213,213,217
217     NR=NR+1
        NRC=1
        KONT=1
        ILNE=4
        WRITE (1,201) NR
        GO TO 213
215     IF(KONT-ILNE) 214,220,214
220     ILNE=ILNE+4
        WRITE (1,221)
221     FORMAT (//)
214     KONT=KONT+1
        NRC=NRC+1
213     CONTINUE
        I1=I1+1
        I2=I2+1
210     CONTINUE
        GO TO (149,161)JOG
650     WRITE (2,665) A(I)
        GO TO 660
620     FORMAT (//IS PUNCH PAPER TAPE OUTPUT DESIRED?/)
625     FORMAT (/YES=0;  NO=1/)
630     FORMAT (F2.0)
635     FORMAT (/PLACE DATA TAPE IN READER,/,I0)
636     FORMAT ( TOP OF FORM, HIT CONTINUE/)
665     FORMAT (E15.8)
        END

#
```