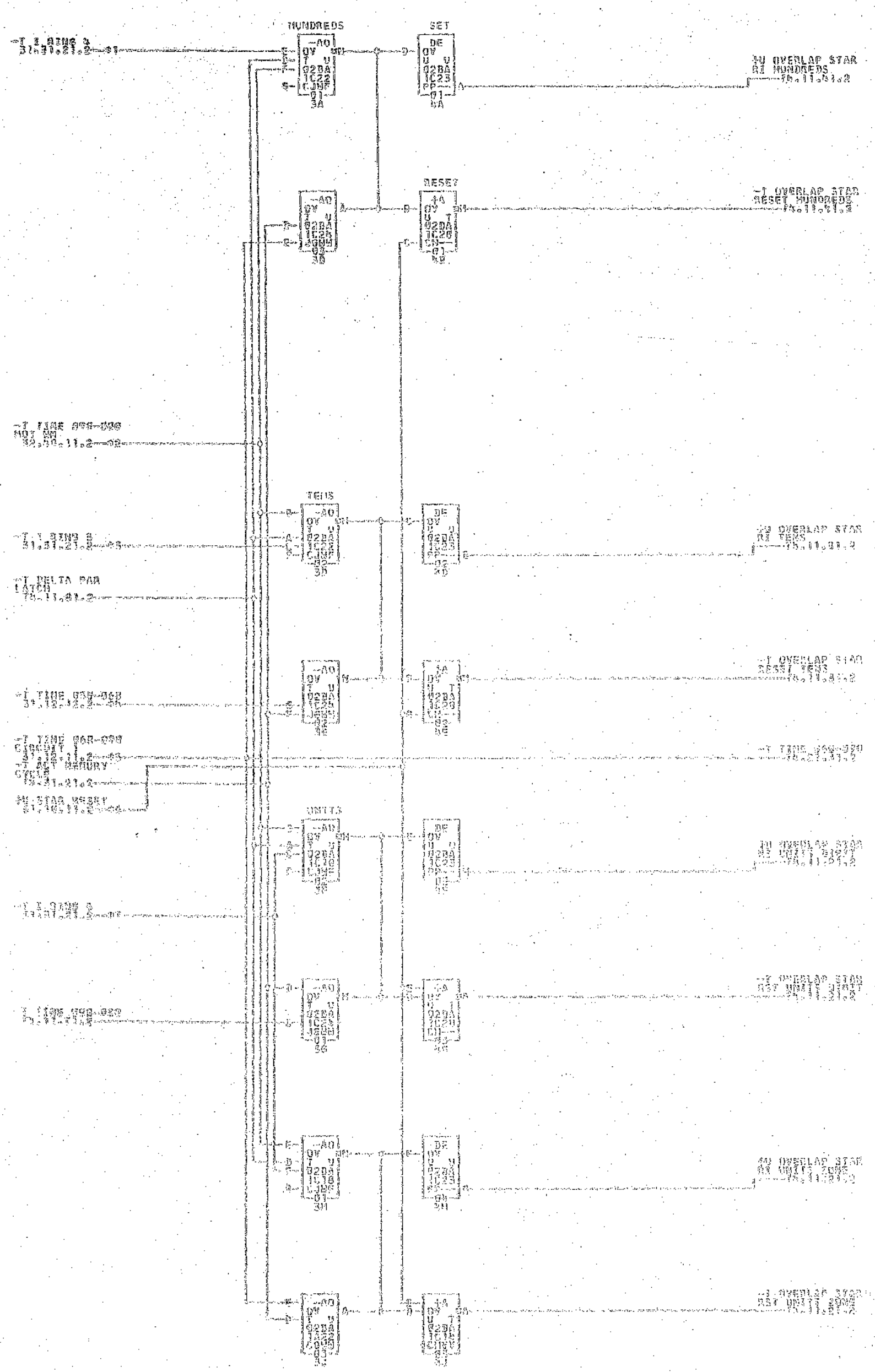
HUNDREDS
SET
RESET
TENS
UNITS
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-I OVERLAP STAR RESET HUNDREDS
-I OVERLAP STAR RI TENS
-I OVERLAP STAR RESET TENS
-I OVERLAP STAR RI UNITS
-I OVERLAP STAR RESET UNITS
-I TIME 050-059
-I TIME 060-069
-I TIME 070-079
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-I TIME 090-099
-I TIME 100-109
-I TIME 110-119
-I TIME 120-129
-I TIME 130-139
-I TIME 140-149
-I TIME 150-159
-I TIME 160-169
-I TIME 170-179
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-I TIME 190-199
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-I TIME 680-689
-I TIME 690-699
-I TIME 700-709
-I TIME 710-719
-I TIME 720-729
-I TIME 730-739
-I TIME 740-749
-I TIME 750-759
-I TIME 760-769
-I TIME 770-779
-I TIME 780-789
-I TIME 790-799
-I TIME 800-809
-I TIME 810-819
-I TIME 820-829
-I TIME 830-839
-I TIME 840-849
-I TIME 850-859
-I TIME 860-869
-I TIME 870-879
-I TIME 880-889
-I TIME 890-899
-I TIME 900-909
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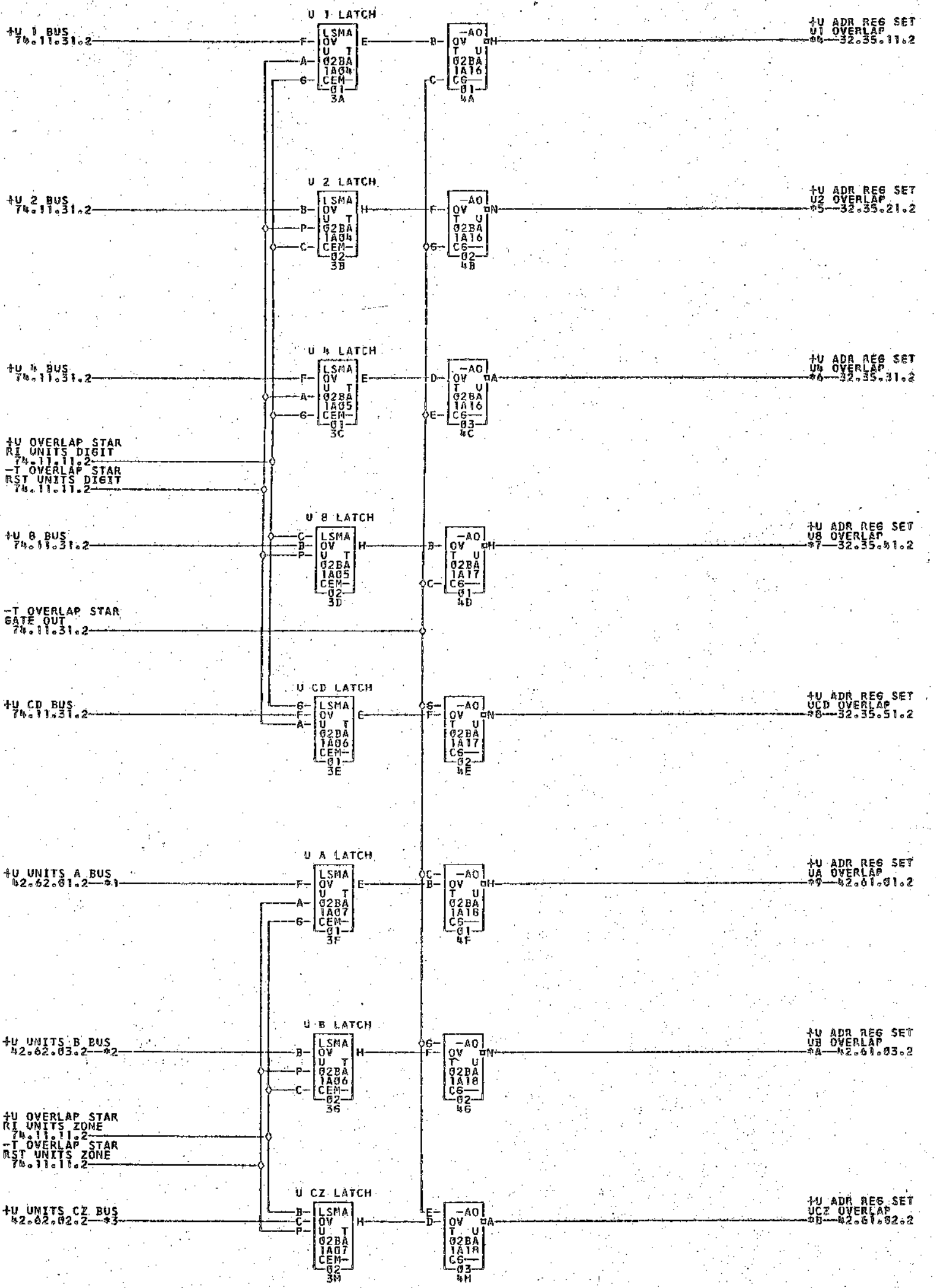
-I DELTA PAR LATCH
-I TIME 000-049



*1—02B1AG2N *2—02B1AG2K *3—02B1AG2L *4—02B1AG1A ———02A9BG2A ———01A7A24A
*5—02B1AG1B ———02A9BG4A ———01A7A24B *6—02B1AG1C ———02A9BG6A ———01A7A24C
*7—02B1AG1D ———02A9BG8A ———01A7A24D *8—02B1AG1E ———02A9B10A ———01A7A24E
*9—02B1AG2R ———02A9EG6A ———01A8F26R *A—02B1AG2Q ———02A9EG4A ———01A8F26Q

COMMENTS

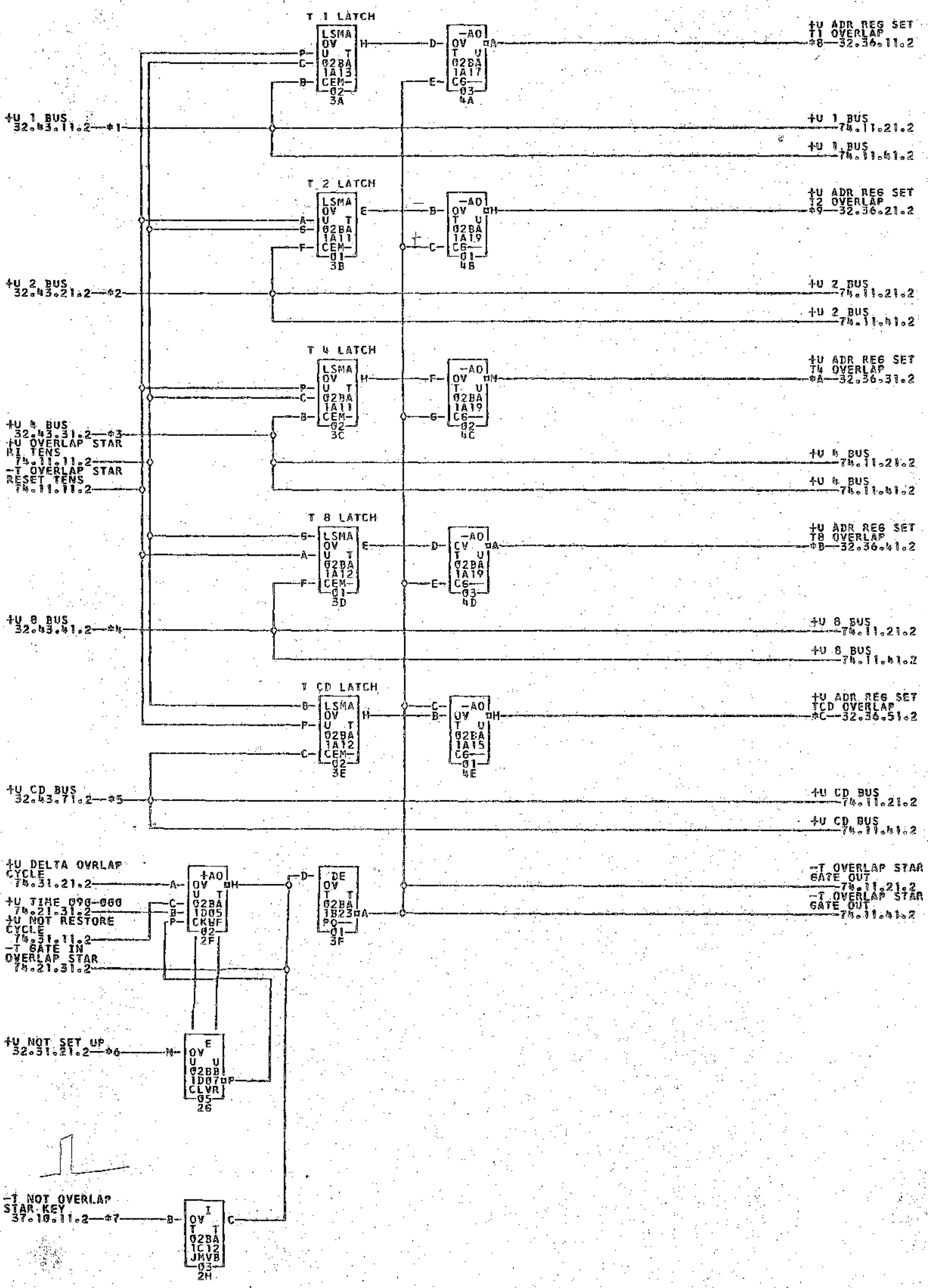
TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	03-07-62	114614	B	12-26-62	114179						

TAG

A 23.5.
TA 133

B 16.4.
TA 181

8724763



*1—02B1AG2F
*7—02B1E02R
—01A7A2M6
—01A7A24J

*2—02B1AG2E
*8—02B1AG1F
*A—02B1AG1H
*C—02B1AG1K

*3—02B1AG2D
—02A9B12A
—02A9B16A
—02A9B20A

*4—02B1AG2C
—01A7A24F
—01A7A24H
—01A7A24K

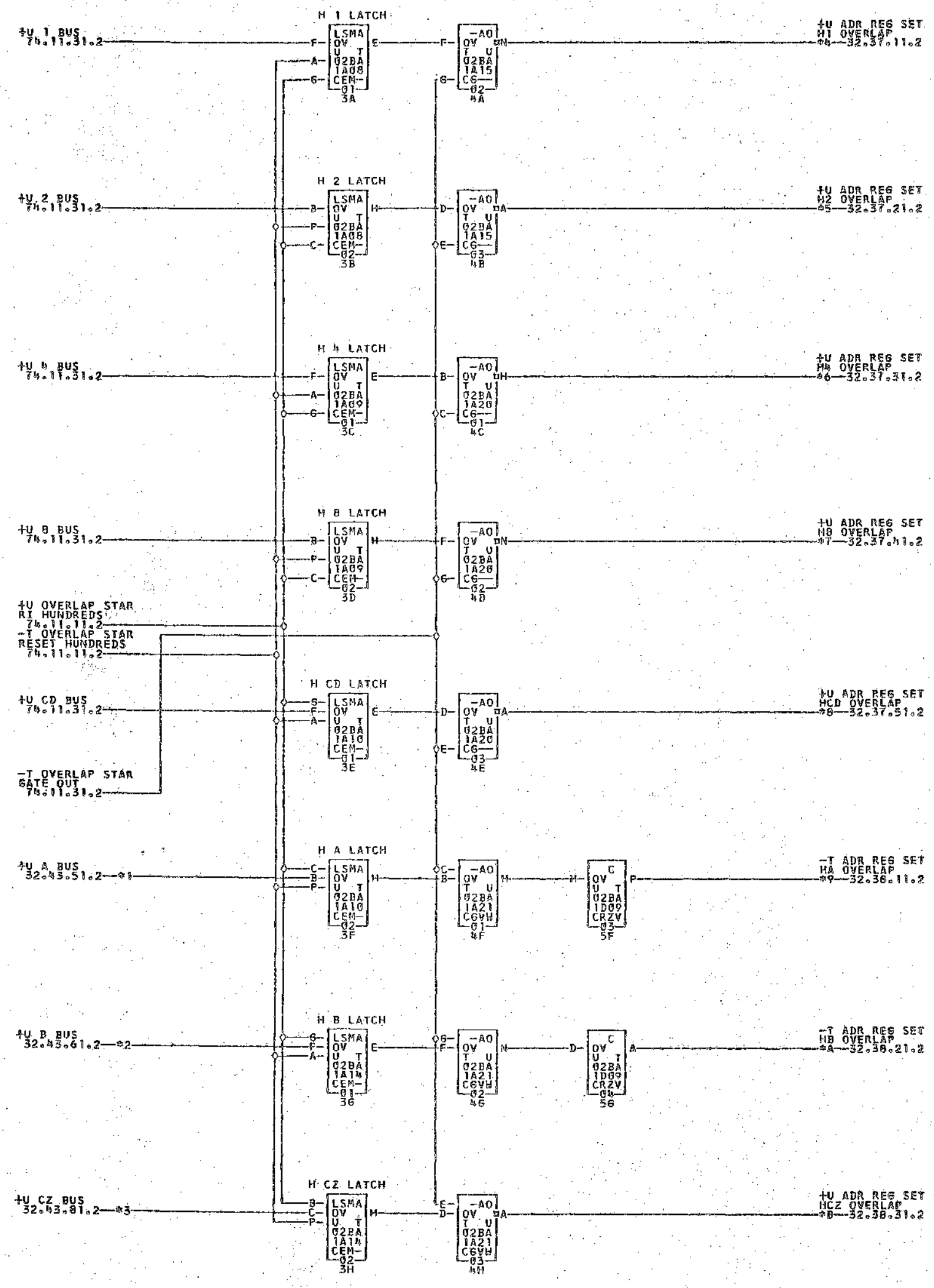
*5—02B1AG2B
*9—02B1AG16
*B—02B1AG1J

*6—02B1F03N
—02A9B14A
—02A9B18A

COMMENTS

TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	03-07-62	114614	B	12-26-62	114179						

TAG
A 23.
TA 1
B 16.
TA 1



*1—02B1AG26 *2—02B1AG2H *3—02B1AG2J *4—02B1AG1L ———02A9C02A ———01A7A24L
*5—02B1AG1M ———02A9C04A ———01A7A24M *6—02B1AG1N ———02A9C06A ———01A7A24N
*7—02B1AG1P ———02A9C0BA ———01A7A24P *8—02B1AG1C ———02A9C10A ———01A7A24D
*9—02B1FG3L ———02A0F13F ———01A7C22L *A—02B1F03M ———02A0F15F ———01A7C22N
*B—02B1AG1R ———02A9C12A ———01A7A24R

COMMENTS

TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	03-07-62	114614	B	12-26-62	118179						

0724766 FEED THRU SHEET 1401 OV 74.11.51.2

+U DATA 1 74.51.21.2	*1	*G	+U DATA 1 74.11.61.2
+U DATA 2 74.51.21.2	*2	*H	+U DATA 2 74.11.61.2
+U DATA 4 74.51.21.2	*3	*J	+U DATA 4 74.11.61.2
+U DATA 8 74.51.21.2	*4	*K	+U DATA 8 74.11.61.2
+U DATA A 74.51.21.2	*5	*L	+U DATA A 74.11.61.2
+U DATA B 74.51.21.2	*6	*M	+U DATA B 74.11.61.2
+U DATA C 74.51.21.2	*7	*N	+U DATA C 74.11.61.2
-T SET A REG 1 OVLP 74.11.61.2	*8	*P	-T SET A REG 1 OVLP 35.11.11.2
-T SET A REG 2 OVLP 74.11.61.2	*9	*Q	-T SET A REG 2 OVLP 35.11.51.2
-T SET A REG 4 OVLP 74.11.61.2	*A	*R	-T SET A REG 4 OVLP 35.12.11.2
-T SET A REG 8 OVLP 74.11.61.2	*B	*S	-T SET A REG 8 OVLP 35.12.51.2
-T SET A REG A OVLP 74.11.61.2	*C	*T	-T SET A REG A OVLP 35.13.11.2
-T SET A REG B OVLP 74.11.61.2	*D	*U	-T SET A REG B OVLP 35.13.51.2
-T SET A REG C OVLP 74.11.61.2	*E	*V	-T SET A REG C OVLP 35.14.11.2
-T SET A REG WM OVLP 74.11.61.2	*F	*W	-T SET A REG WM OVLP 35.14.51.2

*1—02B1F01J	*2—02B1F01K	*3—02B1F01L	*4—02B1F01M	*5—02B1F01N	*6—02B1F01P
*7—02B1F01Q	*8—02B1B04A	*9—02B1B04B	*A—02B1B04C	*B—02B1B04D	*C—02B1B04E
*D—02B1B04F	*E—02B1B046	*F—02B1B04H	*G—02B1B04R	*H—02B1B04K	*J—02B1B04L
*K—02B1B04M	*L—02B1B04N	*M—02B1B04P	*N—02B1B04Q	*P—02B1B03A	*Q—02B1B03B
*R—02B1B03C	*S—02B1B03D	*T—02B1B03E	*U—02B1B03F	*V—02B1B036	*W—02B1B03H

COMMENTS

TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	03-07-62	114614	B	12-26-62	114179						

6729259

WRITE GATING-0 REG. STORE A REG. 1401 OV 7v.11.61.2

TAG DATE

B 14.12.62
TA 16878A

C 16.4.63
TA 1815A

+U DATA 1 76.51.21.2 *1

+U DATA 2 76.51.21.2 *2

+U DATA 4 76.51.21.2 *3

-T A REG TO 0 REG GATE IN 76.11.71.2 *5

+U 0 REG TO A REG GATE OUT 76.11.71.2 *5

-T NOT 0 REG RESET 76.11.71.2 *6

+U DATA 8 76.51.21.2 *7

+U DATA A 76.51.21.2 *8

+U DATA C 76.51.21.2 *9

+U DATA F 76.51.21.2 *A

NOTE X

NOTE Y

1 LATCH

2 LATCH

4 LATCH

A LATCH

B LATCH

E LATCH

HM LATCH

-T SET A REG 1 OVLP *B 35.11.11.2

-T SET A REG 2 OVLP *C 35.11.51.2

-T SET A REG 4 OVLP *D 35.12.11.2

-T SET A REG 8 OVLP *E 35.12.51.1

-T SET A REG A OVLP *F 35.13.11.2

-T SET A REG B OVLP *G 35.13.51.2

-T SET A REG C OVLP *H 35.14.11.2

-T SET A REG HM OVLP *J 35.14.51.2

*1 00XAE05R
*2 00XAE05K
*3 00XAE05L
*4 00XAE05B
*5 00XAE06A
*6 00XAE06C
*7 00XAE05N
*8 00XAE05P
*9 00XAE05S
*A 00XAE05F
*B 00XAE05A
*C 00XAE05E
*D 00XAE06E
*E 00XAE05D
*F 00XAE05J
*H 00XAE05G
*J 00XAE05M

COMMENTS
NOTE X--THESE CARDS ARE 4JMX IP GATE
02A4 IS NOT INSTALLED.
NOTE Y--CARD IS A 4QVM IP GATE
02A8 IS NOT INSTALLED

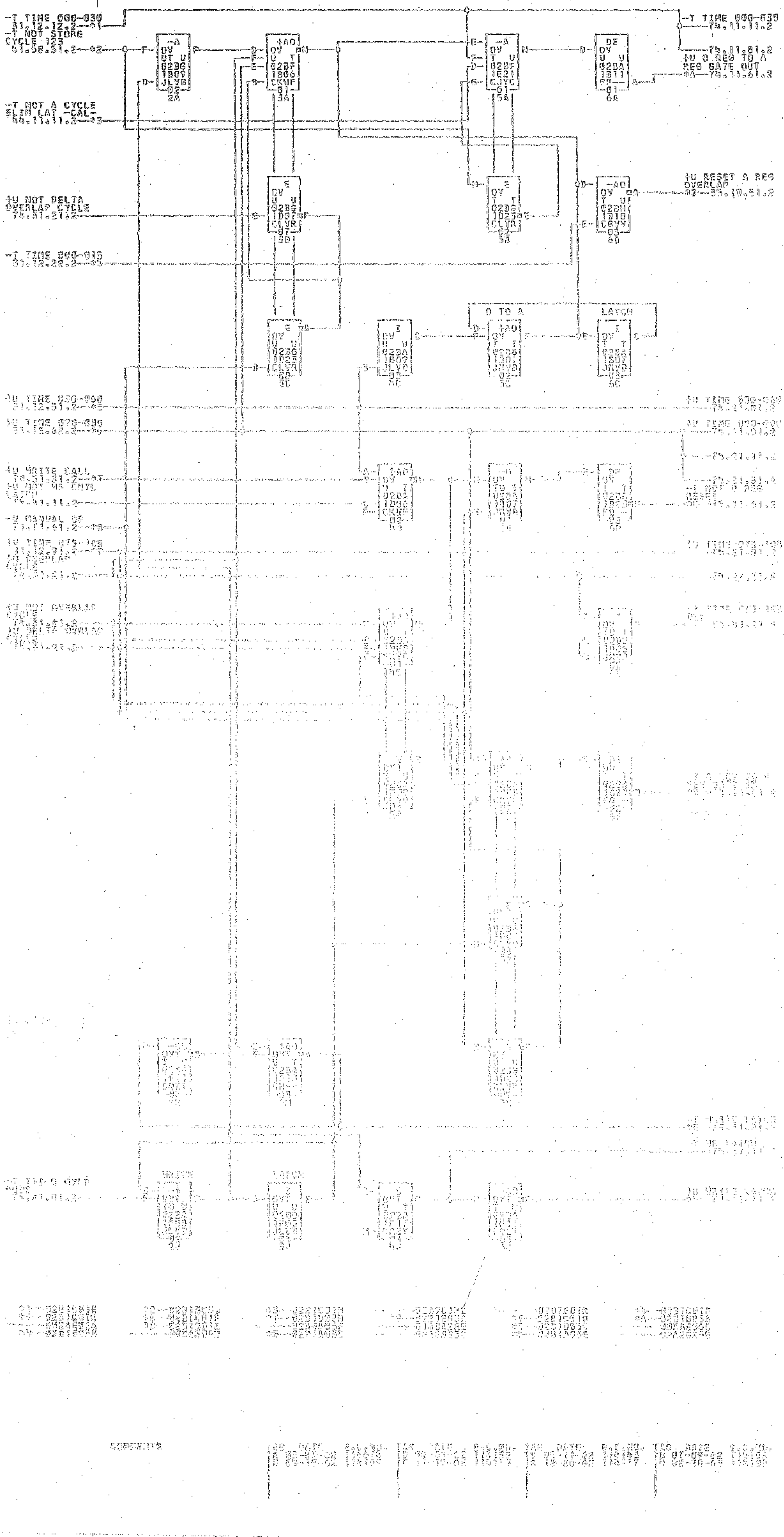
TAG DATE E.C.NO.
A 01-20-62 115859

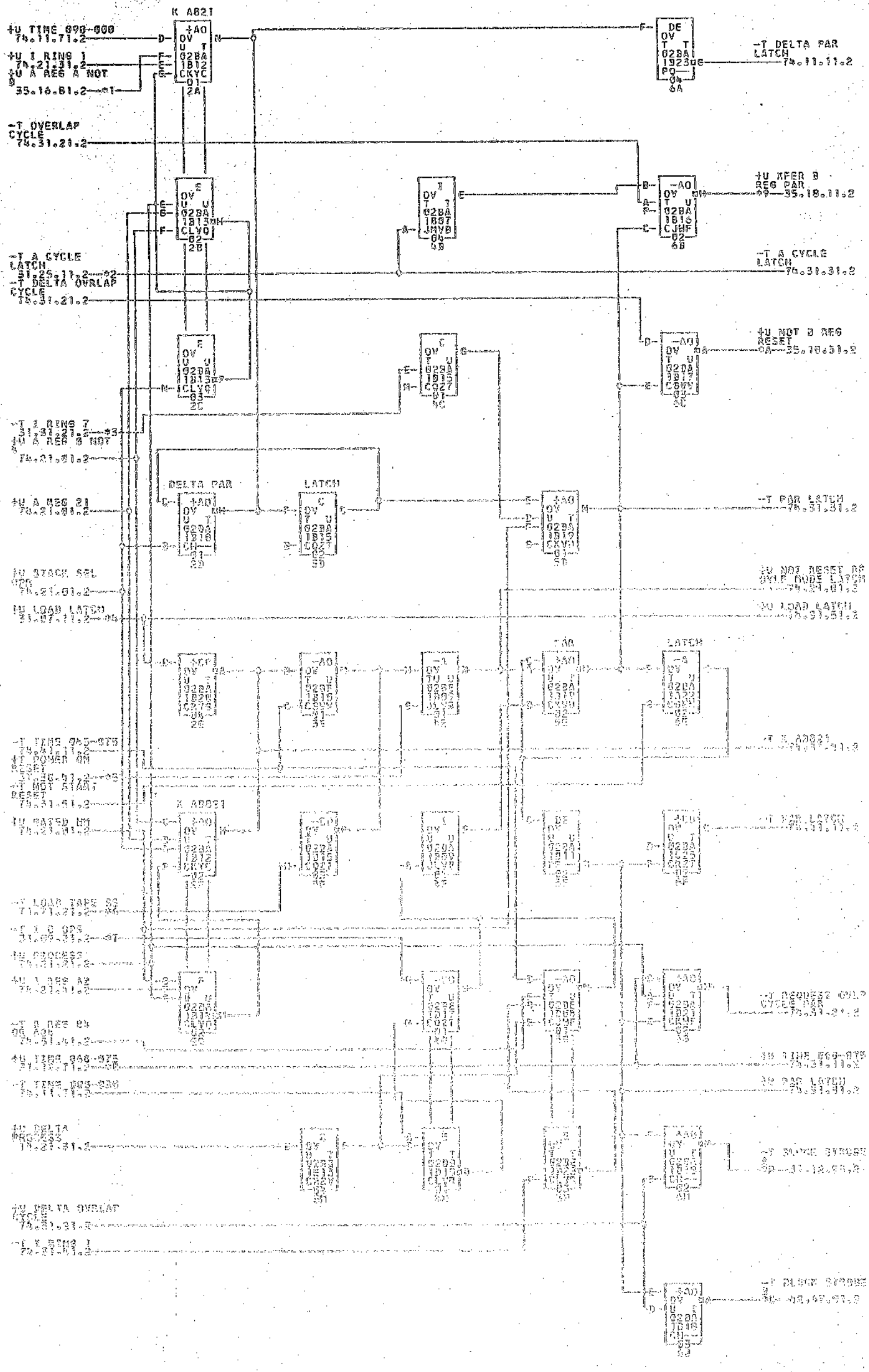
TAG DATE E.C.NO.
B 10-03-62 116046

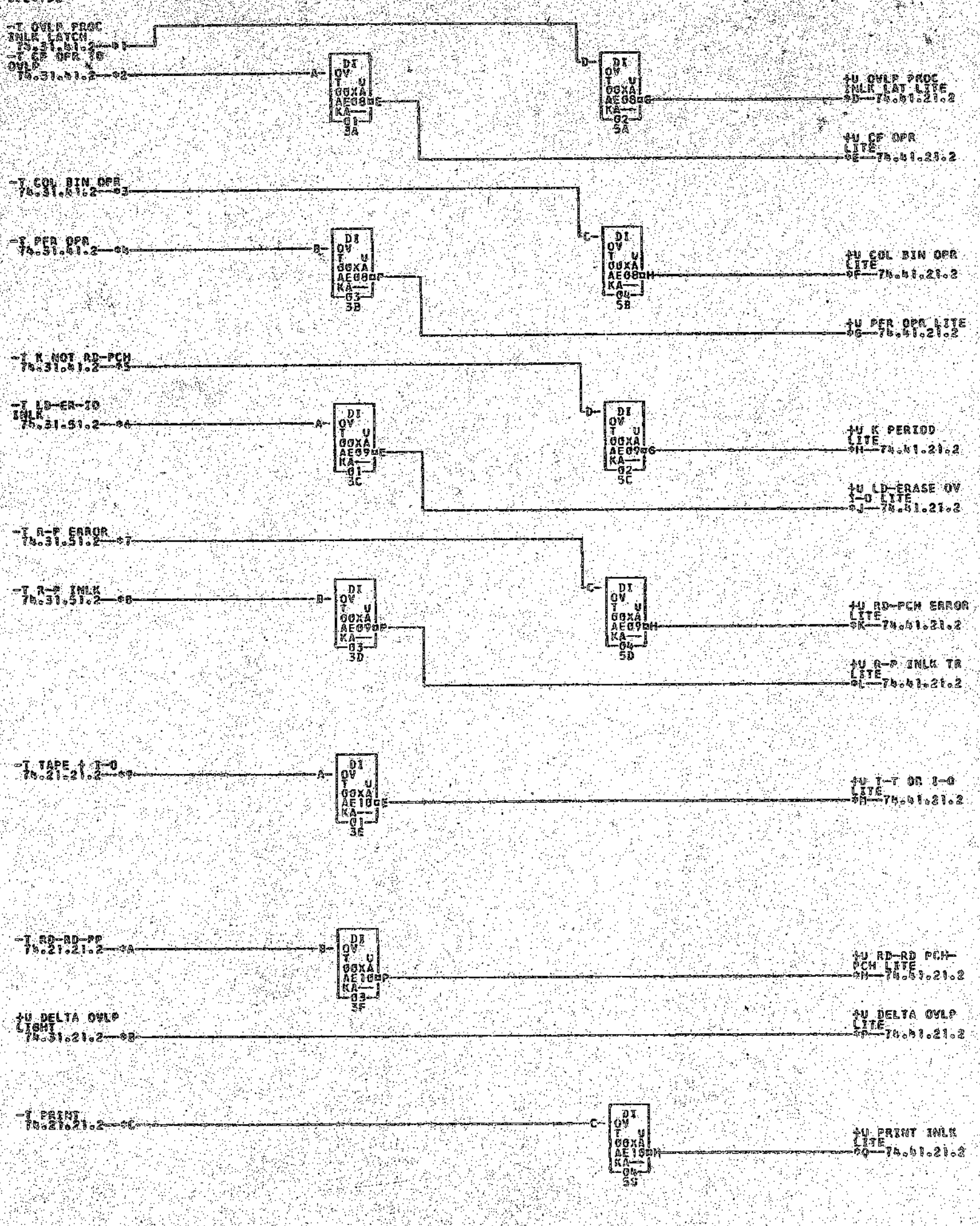
TAG DATE E.C.NO.
C 12-13-62 116179

TAG DATE E.C.NO.

6729259


-T TIME 000-030
31.12.12.2
-T NOT STORE CYCLE 123
31.58.51.2
-T NOT A CYCLE SLIP LAT -CAL-
60.11.11.2
-U NOT DELTA OVERLAP CYCLE
75.31.21.2
-T TIME 000-010
31.12.28.2
-U TIME 000-090
31.12.51.2
-U TIME 070-090
31.12.62.2
-U WRITE CALL
31.31.31.2
-U NOT WR CNTL
(SCTL)
75.11.11.2
-U MANUAL OP
75.11.69.2
-U TIME 070-100
31.12.71.2
-T TIME 000-030
75.11.11.2
-U 0 REG TO A REG GATE OUT
75.11.61.2
-U RESET A REG OVERLAP
75.10.51.2
0 TO A
LATCH


K A821
+U TIME 000-000
74.11.71.2
+U I RING 1
74.21.31.2
+U A REG A NOT 0
35.16.81.2
-T OVERLAP CYCLE
74.31.21.2
-T A CYCLE LATCH
31.29.11.2
-T DELTA OVRLAP CYCLE
74.31.21.2
-T I RING 7
31.31.21.2
+U A REG B NOT 0
74.21.81.2
+U A REG 21
74.21.81.2
DELTA PAR
LATCH
+U STACK SEL 000
74.21.81.2
+U LOAD LATCH
31.07.11.2
-T TIME 000-075
74.11.71.2
+T POWER ON RESET
35.31.2
-T MOST SIGN RESET
74.31.81.2
+U GATED M1
74.21.81.2
K AB031
-T LOAD TAPE 00
74.31.21.2
-T I 0 025
31.09.31.2
+U PROCESS
74.11.31.2
+U I REG A2
74.31.41.2
-T B REG B4 00 A2
74.31.41.2
+U TIME 000-075
74.11.71.2
-T TIME 000-030
74.11.71.2
+U DELTA PROCESS
74.21.31.2
+U DELTA OVRLAP CYCLE
74.31.31.2
-T I STOP 1
74.31.81.2
-T A REG 21
74.31.81.2
-T PAR LATCH
74.31.31.2
+U NOT RESET OP CYLE CODE LATCH
74.31.81.2
+U LOAD LATCH
74.31.81.2
TAG
LATCH
-T A ADD21
74.31.81.2
-T PAR LATCH
74.31.11.2
-T DEFER CYLE CYCLE CODE
74.31.21.2
+U TIME 000-075
74.11.11.2
+U PAR LATCH
74.31.41.2
-T SLOW STROBE
31.10.61.2
-T BLOCK STROBE
30.02.81.2
-T DELTA PAR LATCH
74.11.11.2
+U XFER B REG PAR
35.18.11.2
-T A CYCLE LATCH
74.31.31.2
+U NOT B REG RESET
35.18.31.2



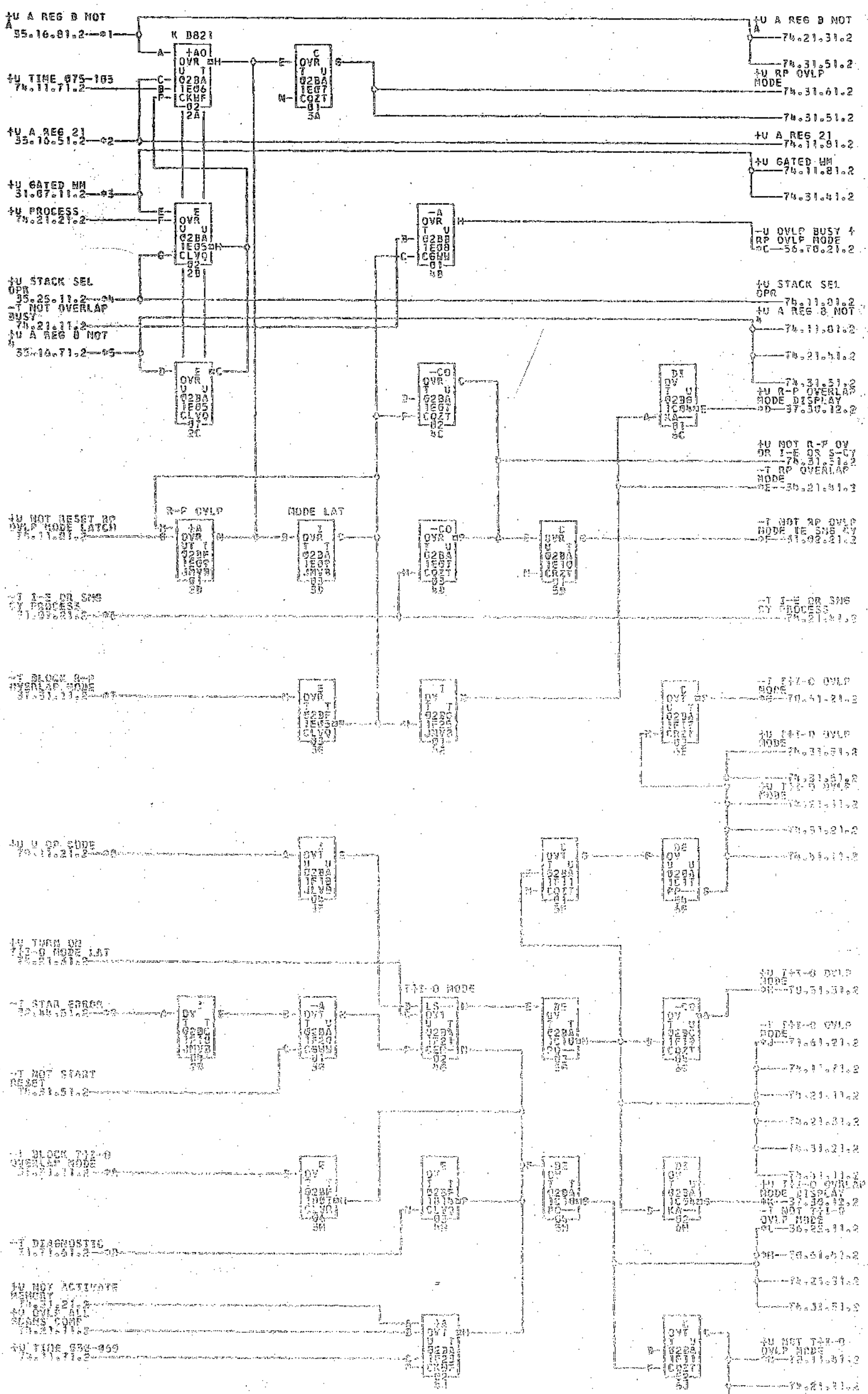
COMMENTS

TAG	DATE	E.C.NO.
A	03-21-62	116477
B	05-04-62	116181
C	12-13-62	116178

TAG D

B 12.7.
TA 137

C 16.4.
TA 181



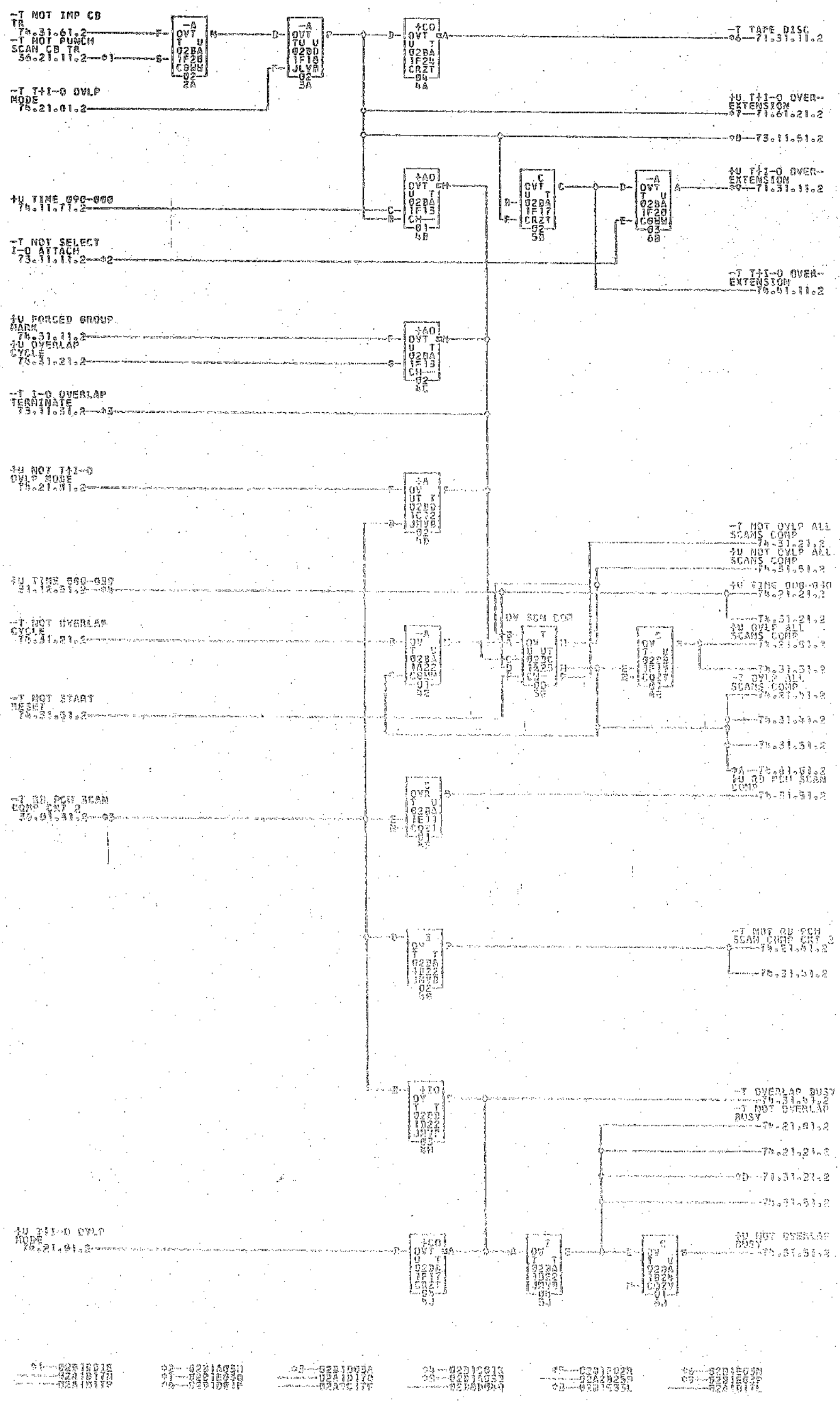
COMMENTS

TAG	DATE	ENG
0	02-27-68	110179

TAG	DATE	ENG
D	03-06-68	110179

TAG	DATE	ENG
08	04-26-68	110179

TAG	DATE	ENG
B	06-11-68	110179



CONTENTS

TAG DATE PAGE NO. | TAG DATE PAGE NO. | TAG DATE PAGE NO. | TAG DATE PAGE NO.

-T RD END STOP OVLP 74.31.61.2

+U OVL INLK STOP 74.31.61.2

+U PROCESS CHECK 31.09.11.2 *1

+U OVERLAP CYCLE 74.31.21.2

+U NOT PROCESS CHK RESET 34.21.51.2 *2

-T PROC CHK STOP SW ON 37.31.11.2 *3

-T NOT OVERLAP BUSY 74.21.11.2

-T OVERLAP CYCLE 74.31.21.2

-T A REG CHECK 35.30.31.2 *4

-T TIME 075-105 31.12.41.2 *5

-T TAPE OP I-O ERROR 70.61.21.2 *6

+U TAPE+I-O 74.31.41.2

+U PRINT 74.31.41.2

-T OVERLAP STAR KEY 74.31.11.2

+U DELTA OVRLAP CYCLE 74.31.21.2

+U TIME 000-030 74.21.11.2

+U NOT STAR KEY 31.09.11.2 *7

+U RD-RD-PP 74.31.41.2

+U PROCESS 31.02.41.2 *8

OVLP ERROR

LATCH

O CY DISP

+U BLOCK D P TURN ON OVLP *9 74.21.41.2

+U STOP OVLP *9 31.01.11.2

+U OVLP ERROR DISPLAY *A 37.30.12.2

+U BRANCH ON PROC ERROR *B 34.21.31.2

+U OVERLAP ERROR *C 73.11.31.2

-T TAPE+I-O *D 74.11.91.2

-T PRINT *E 74.11.91.2

+U OVERLAP LIGHT A *F 37.30.12.2

+U OVERLAP LIGHT C *G 37.30.12.2

-T RD-RD-PP *H 74.11.91.2

+U PROCESS *8 74.11.81.2
74.21.61.2
74.31.51.2

*1 02B1C03H
*7 02B1C03P
02A9F13A
02A2B23F
*G 02B1E02Q

*2 02B1D02R
*8 02B1D02C
01A2A14N
*D 02B1B05E
02A9F17A

*3 02B1E01P
*9 02B1E01H
*B 02B1D02K
*E 02B1B05F
01A2A14Q

*4 02B1D02Q
02A0A07C
02A0F13D
*F 02B1E02P
*H 02B1B05G

*5 02B1C01H
01B2A05H
01B6F026
02A9F15A

*6 02B1A03L
*A 02B1E02N
*C 02B1D03F
01A2A14P

COMMENTS

TAG	DATE	E.C.NO.
A	03-07-62	114614
B	04-04-62	114133
C	12-26-62	114179

1 of 2

TAG D.

S 16.4.6
TA 1815.

F 18,6.6
TA 1859

+U RESET A REG TAPE 74.51.11.2

-T I-O READY 73.12.21.2

-T TAU NOT BUSY 71.31.11.2

-T READ IN CYCLE 71.61.11.2

-T 73.11.21.2

-T I-O DEVICE READY 74.51.11.2

+U DELTA OVRLAP CYCLE 73.31.21.2

+U NOT MS CNTL LATCH 74.41.11.2

+U NOT T11-D OVLP MODE 74.21.01.2

-T TIME 060-090 74.11.11.2

-T T11-D OVLP MODE 74.21.01.2

J BRANCH

+U BRANCH 74.11.21.2

+U A REG B NOT A 74.21.01.2

+U A REG 1 NOT 2 74.21.04.2

+U TIME 090-000 74.11.11.2

-T NOT T11-D OVLP MODE 74.21.01.2

+U A REG NOT 00 74.11.41.2

+U DELTA PROCESS 31.62.11.2

+U A REG NOT 00 74.15.01.2

+U A REG 01 74.15.11.2

+U 1 RING 1 31.31.11.2

+U NOT BLOCK UNIT SELECT 74.11.31.2

+U I-O CONTROL 31.65.21.2

+U A REG NOT 01 74.21.31.2

+U TIME 015-105 74.11.21.2

+U NOT OVERLAP CYCLE 74.31.21.2

-U RESET 0-U TAPE 71.31.21.2

-T NOT TIME 060-090 74.51.11.2

74.31.21.2

+U PROGRAM SKIP OVLP 31.00.11.2

-T SET I-O TAPE 74.51.31.2

+U TIME 090-000 74.11.31.2

-T GATE IN OVERLAP STAT 74.11.31.2

+U DELTA PROCESS 74.31.31.2

74.11.31.2

74.31.31.2

-T NOT MOVEMENT 74.11.31.2

-T START RD 74.51.51.2

52.30.21.2

+U 1 RING 1 74.11.31.2

+U TURN ON T11-D MODE LAT 74.21.01.2

-T TURN ON UNIT SELECT 74.11.21.2

+U I-E CONTROL 74.31.41.2

01—02B1A03D	02—02B1E03D	03—02B1A03N	04—02B1A03P	05—02B1E01J	06—02B1E01K
07—02B1B03L	08—02B1E01L	09—02B1E03S	10—02A13MYG	11—02B1E01M	12—02A0B02E
13—01A22C15	14—02B1A02F	15—02B1C03J	16—02B17001C	17—02A0B02C	18—01A11226
19—02B1D03L	20—02B1A03M	21—02B1E03C	22—02B1F03D	23—02B1E01K	24—02A1D11F
25—02B1A03K	26—02B1A03R	27—02B1E03G	28—02B1E01P	29—02B1E01G	30—02A0B02E
31—02B1A03D	32—02B1E03D	33—02B1A03N	34—02B1A03P	35—02B1E01J	36—02B1E01K
37—02B1B03L	38—02B1E01L	39—02B1E03S	40—02A13MYG	41—02B1E01M	42—02A0B02E
43—01A22C15	44—02B1A02F	45—02B1C03J	46—02B17001C	47—02A0B02C	48—01A11226

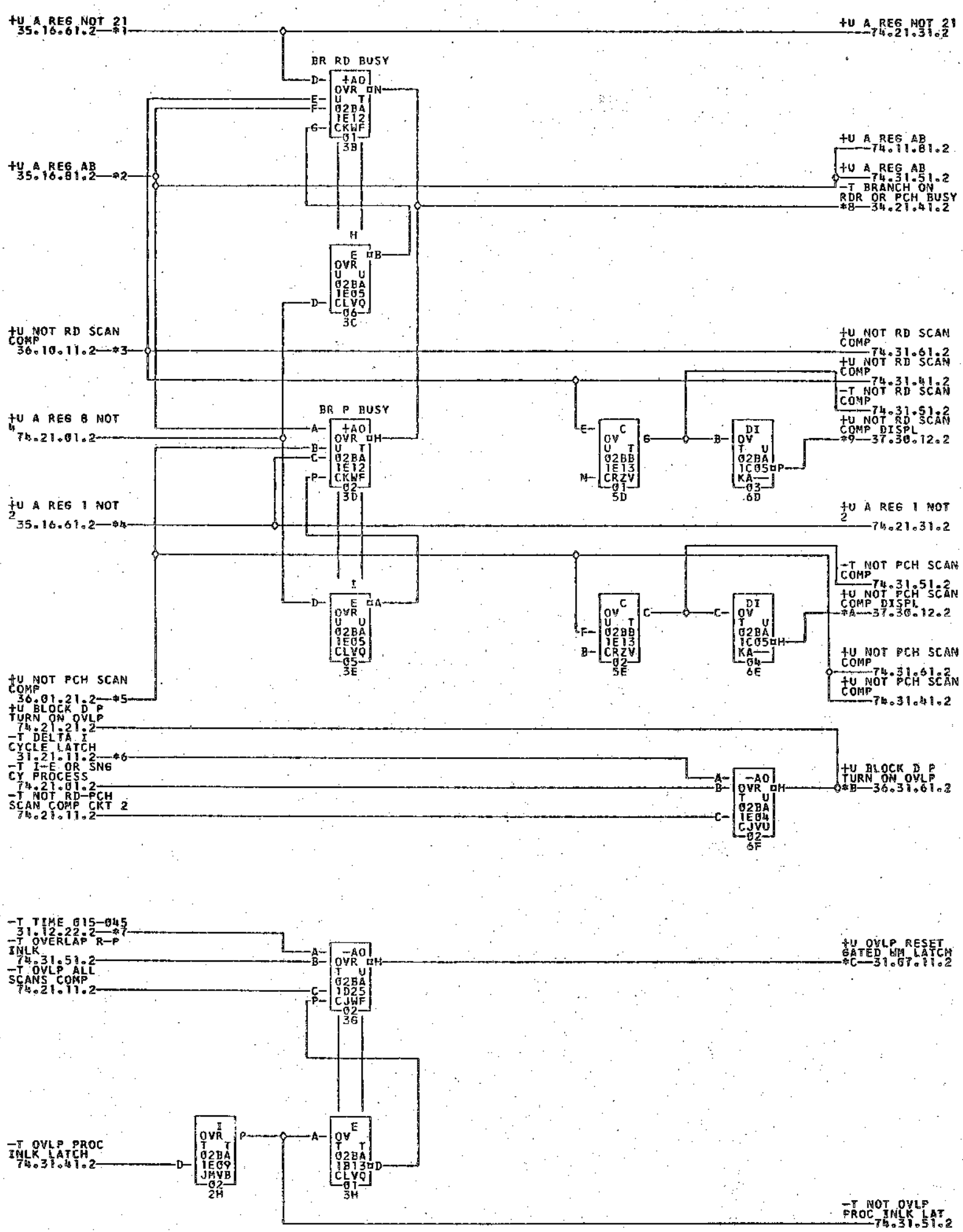
COMMENTS

TAG	DATE	E.C.NO.
E	05-07-62	1176117
F	12-28-62	1176179

TAG	DATE	E.C.NO.
E	05-05-62	1176137
F	02-28-63	1176197

TAG	DATE	E.C.NO.
C	09-26-62	1176137

TAG	DATE	E.C.NO.
D	11-19-62	1176179



*1—02B1C02E
*7—02B1F03K
01B4F04B
01B4A036
01B1E03J

*2—02B1C026
*8—02B1D02M
01B4A03J
01A2A196
01B1D016

*3—02B1B02B
02A9F03D
01A2A19J
*B—02B1E02K
01B2C026

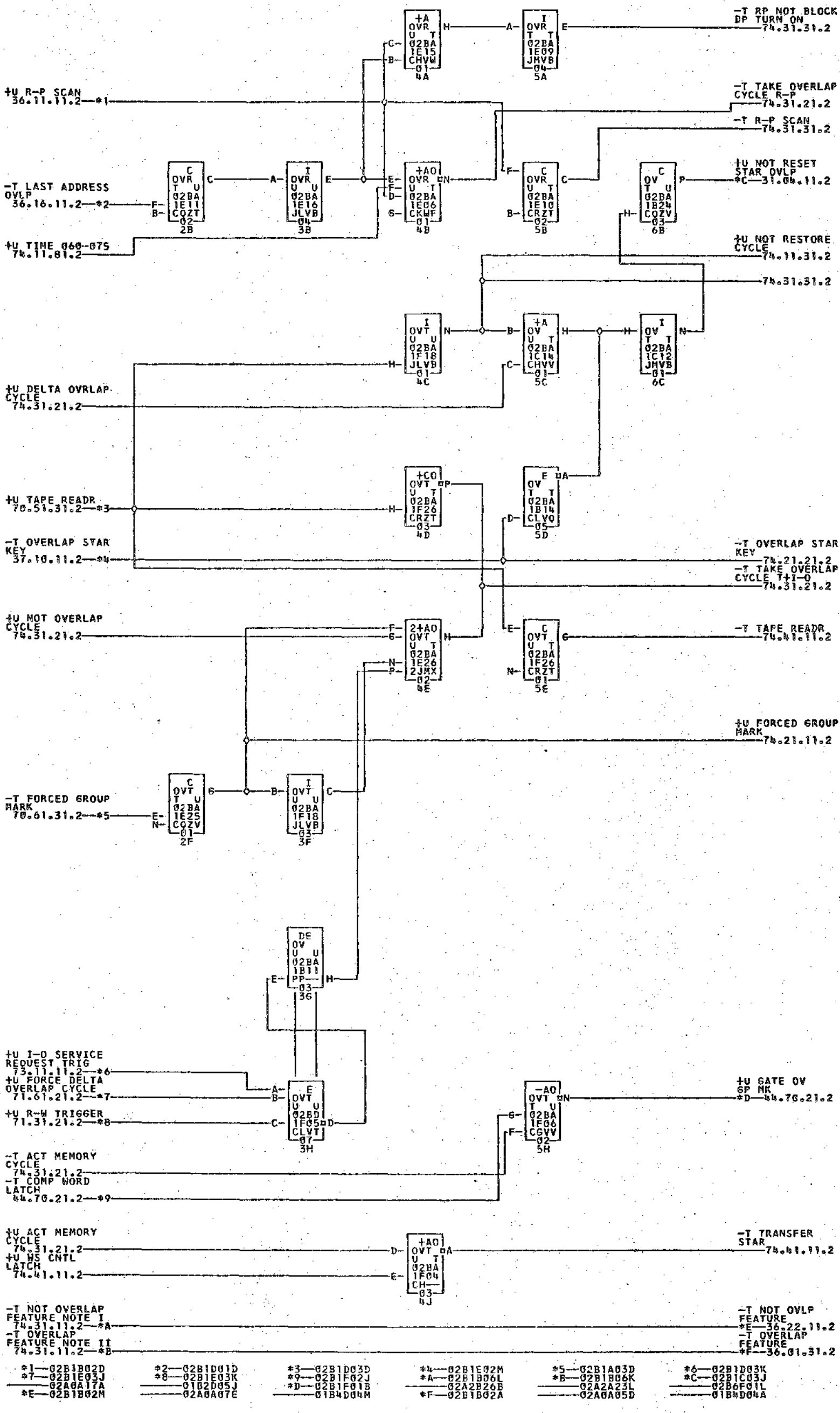
*4—02D1C02D
01B6F02B
*A—02B1D01L
02A9A036
*C—02B1C036

*5—02B1B02C
*9—02B1D01M
02A9A13B
01A6F23P
02A0A13A

*6—02B1C03M
02A9A15B
01B4F04A
01A6D24J
01B2D056

COMMENTS

TAG	DATE	E.C.NO.
A	03-07-62	114614
B	04-04-62	114133
C	05-11-62	114143
D	12-26-62	115179



NOTE I TIED TO +6V AT B06L
NOTE II TIED TO -6V AT B06K

COMMENTS

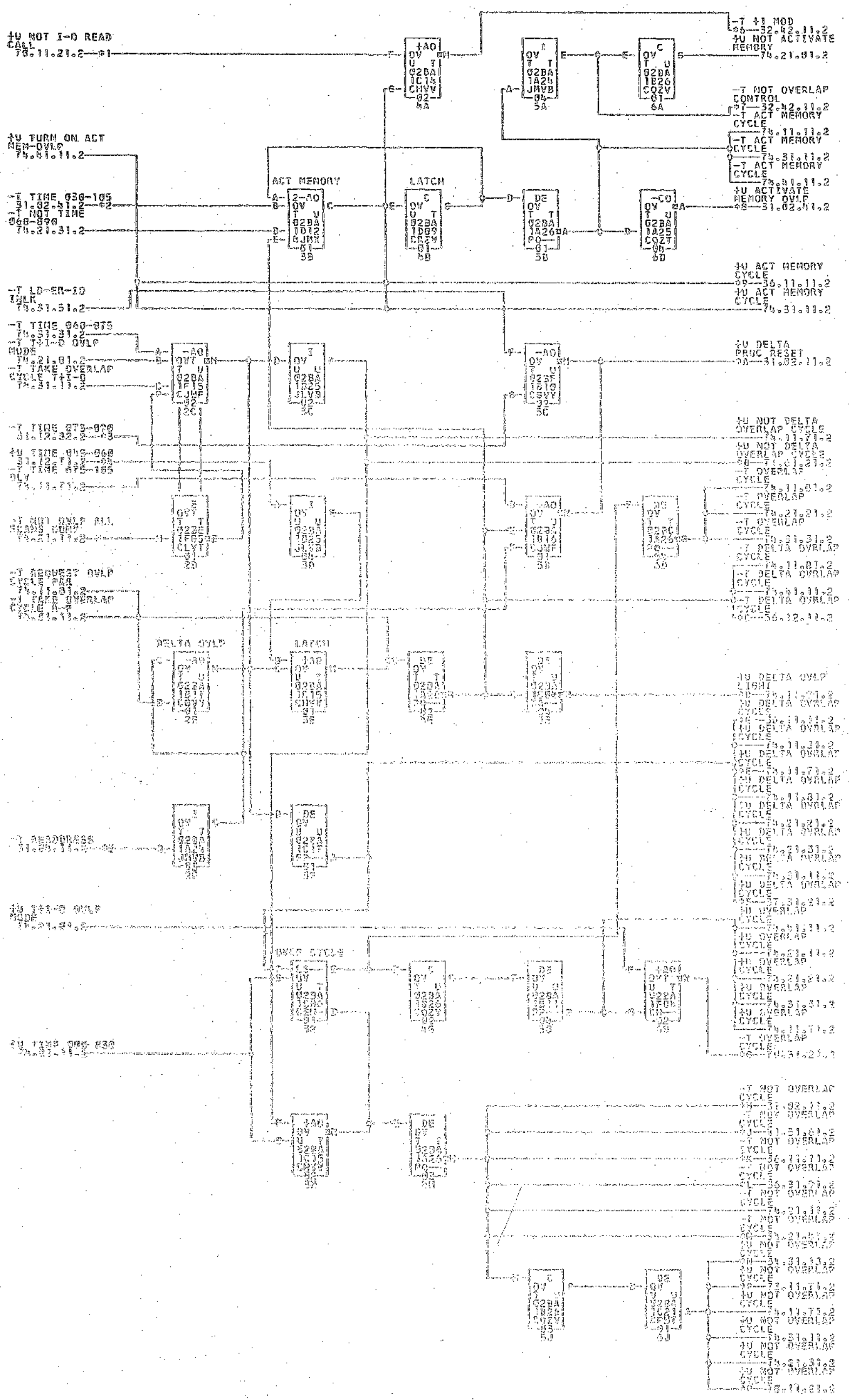
TAG	DATE	E.C.NO.
A	03-07-62	114614
B	07-09-62	114155
C	11-19-62	114173
D	12-26-62	114179

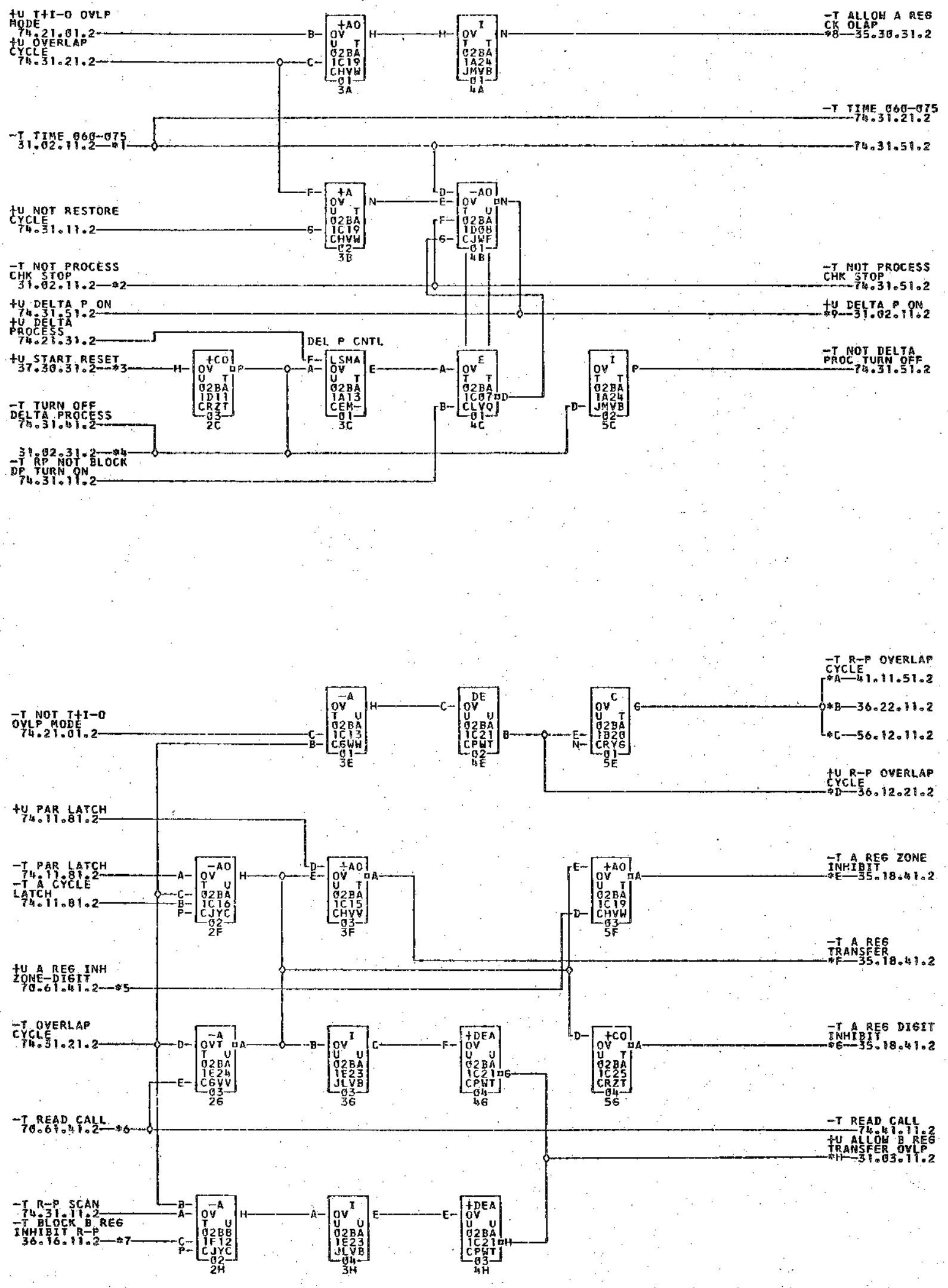
TAG DAT

C 7.2.63
TA 1713A

D 16.4.63
TA 1815A

0724774


+U NOT I-O READ CALL
74.11.21.2
+AO
-T +1 MOD
32.42.11.2
+U NOT ACTIVATE MEMORY
74.21.01.2
-T NOT OVERLAP CONTROL
32.42.11.2
-T ACT MEMORY CYCLE
74.11.11.2
-T ACT MEMORY CYCLE
74.31.11.2
-T ACT MEMORY CYCLE
74.01.11.2
+U ACTIVATE MEMORY OVLP
31.02.01.2
+U TURN ON ACT MEM-OVLP
74.01.11.2
ACT MEMORY
2-AO
-T TIME 930-105
31.02.01.2
-T NOT TIME 930-970
74.21.31.2
LATCH
DE
-CO
+U ACT MEMORY CYCLE
36.11.11.2
+U ACT MEMORY CYCLE
74.31.11.2
-T LD-EN-IO ENBLR
74.31.31.2
-T TIME 960-975
74.31.31.2
-T I-O OVLP MODE
74.21.01.2
-T TAKE OVERLAP CYCLE T+I-O
74.31.11.2
-AO
+U DELTA PROC RESET
31.02.11.2
-T TIME 975-970
31.12.32.2
+U TIME 905-960
-T TIME 975-105
DLY
74.11.21.2
+U NOT DELTA OVERLAP CYCLE
74.11.71.2
+U NOT DELTA OVERLAP CYCLE
74.01.21.2
-T OVERLAP CYCLE
74.11.01.2
-T OVERLAP CYCLE
74.21.21.2
-T DELTA OVERLAP CYCLE
74.31.31.2
-T DELTA OVERLAP CYCLE
74.11.01.2
-T NOT OVERLAP ALL BANKS HOME
74.21.11.2
-T ADDRESS OVLP CYCLE PARA
74.11.01.2
-T TAKE OVERLAP CYCLE A-P
74.31.11.2
DELTA OVLP
LATCH
+U DELTA OVLP LIGHT
74.11.21.2
+U DELTA OVERLAP CYCLE
36.11.11.2
+U DELTA OVERLAP CYCLE
74.11.31.2
+U DELTA OVERLAP CYCLE
74.11.71.2
+U DELTA OVERLAP CYCLE
74.11.01.2
+U DELTA OVERLAP CYCLE
74.21.01.2
+U DELTA OVERLAP CYCLE
74.21.31.2
+U DELTA OVERLAP CYCLE
74.31.11.2
+U DELTA OVERLAP CYCLE
37.31.23.2
+U OVERLAP CYCLE
74.01.31.2
+U OVERLAP CYCLE
74.21.11.2
+U OVERLAP CYCLE
74.21.21.2
+U OVERLAP CYCLE
74.31.31.2
+U OVERLAP CYCLE
74.11.71.2
-T OVERLAP CYCLE
74.31.23.2
-T NOT OVERLAP CYCLE
31.02.11.2
-T NOT OVERLAP CYCLE
31.01.01.2
-T NOT OVERLAP CYCLE
36.11.11.2
-T NOT OVERLAP CYCLE
31.31.21.2
-T NOT OVERLAP CYCLE
74.21.11.2
-T NOT OVERLAP CYCLE
74.21.31.2
+U NOT OVERLAP CYCLE
31.31.31.2
+U NOT OVERLAP CYCLE
74.11.11.2
+U NOT OVERLAP CYCLE
74.11.11.2
+U NOT OVERLAP CYCLE
74.31.11.2
+U NOT OVERLAP CYCLE
74.21.01.2
+U NOT OVERLAP CYCLE
74.10.21.2
+U I-O OVLP MODE
74.21.01.2
+U TIME 905-930
DELAY CYCLE
+AO
DE
-AO
DE
-AO
DE
-



*1—02B1D02F
*7—02B1B02E
01B2C03N
01B4D04H
*D—02B1B02K
*F—02B1B01N
*H—02B1C03B

*2—02B1D026
*8—02B1B03K
*A—02B1B02H
*C—02B1B02H
02A0A03E
02A0A016
02A0A03A

*3—02B1F02A
02A0F16D
02A0A19D
02A0A19D
01B4D04K
01A3A22N
01B2D05B

*4—02B1E01K
01B6F02H
02B8E03K
01B4D04H
*E—02B1B01M
*6—02B1B01L

*5—02B1F01A
*9—02B1D02B
*B—02B1B02H
01B4C04H
02A0A19F
02A0A17F

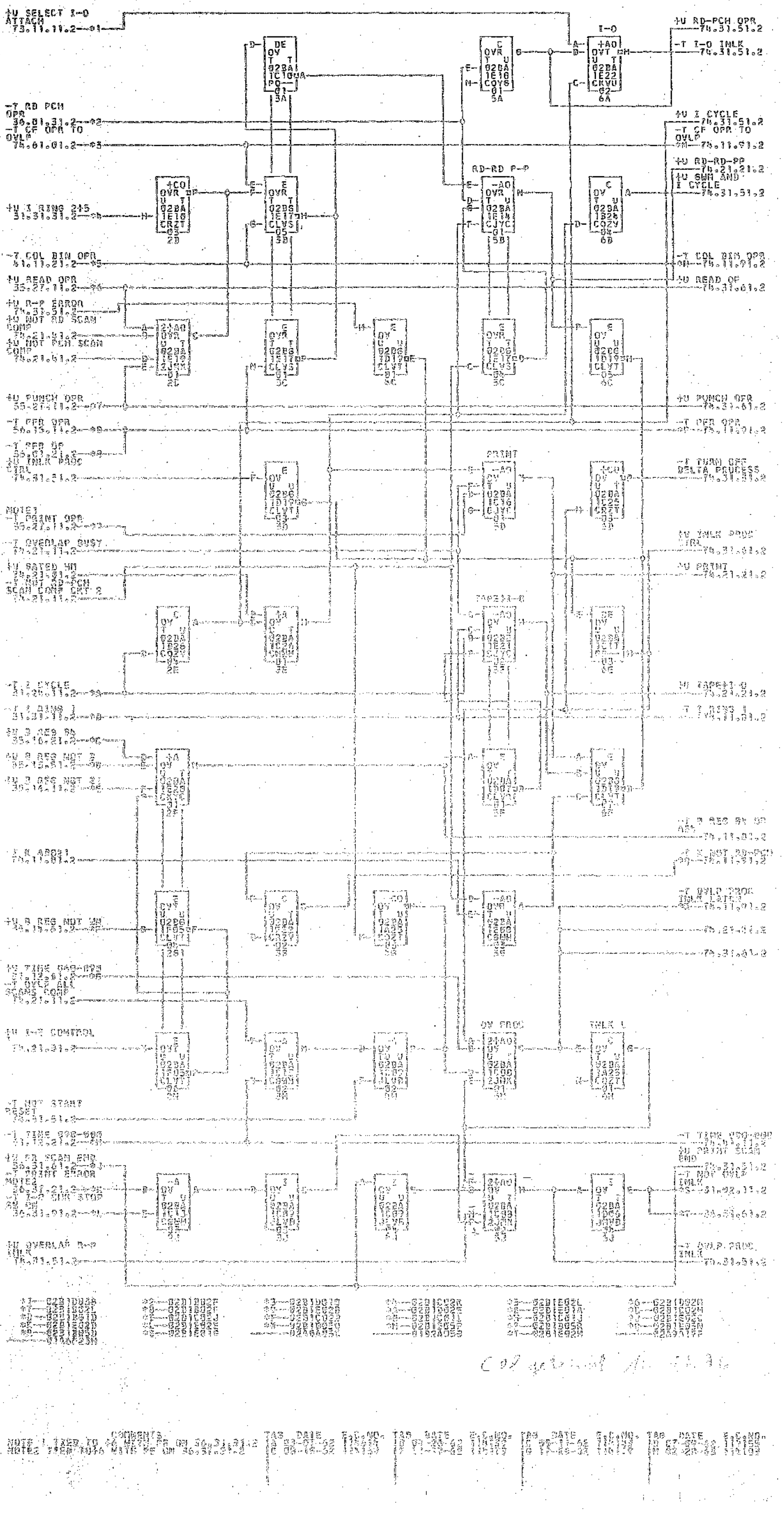
*6—02B1D03N
02A0D206
02A0A19D
01B7C01H
01A3A22M
01A3A22L

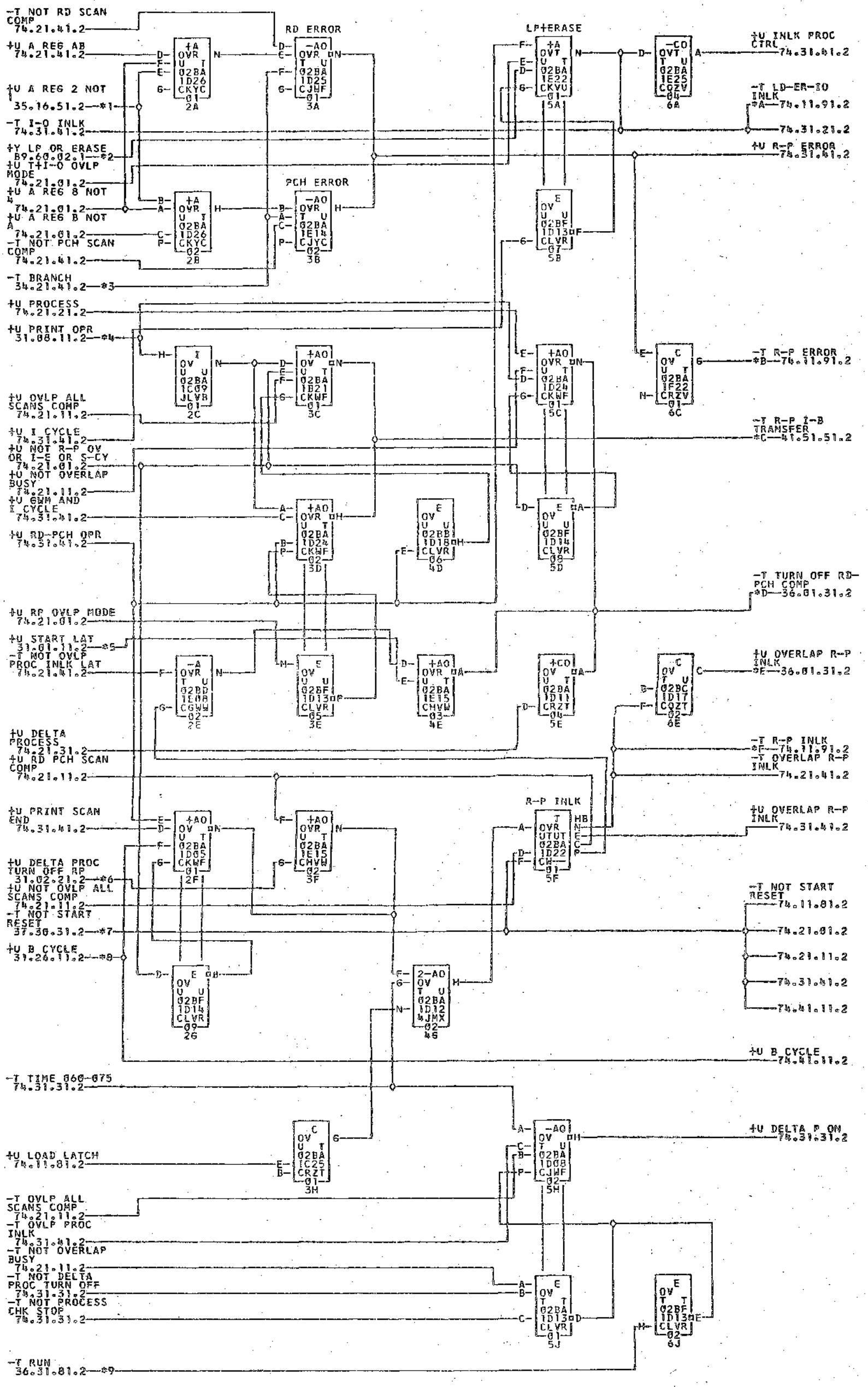
COMMENTS	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
	A	03-07-62	114614	B	04-26-62	114139	C	12-26-62	114179			

TAG

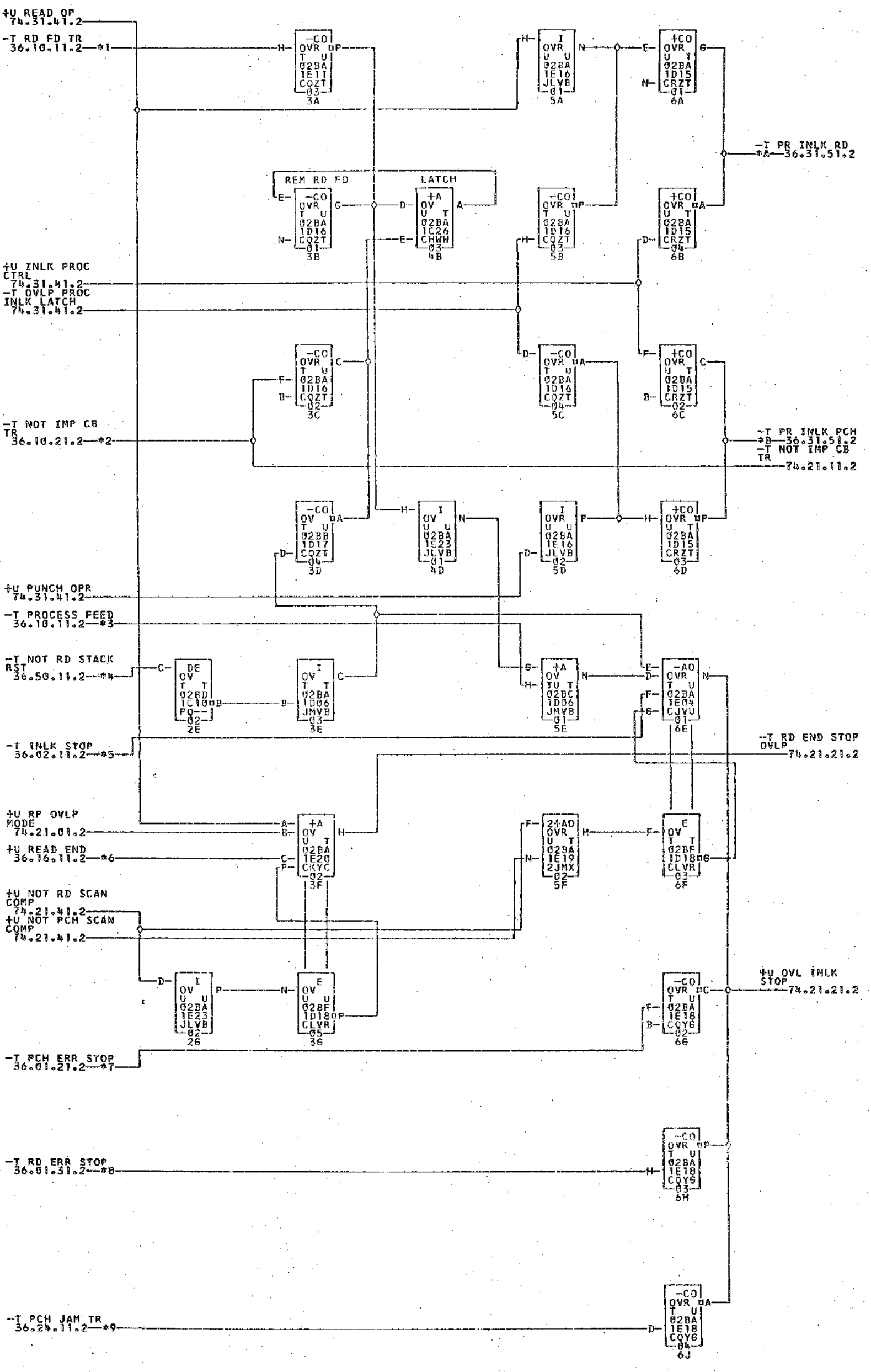
B 12.7
TA 13'

C 16.4
TA 181


+U SELECT I-O ATTACH 73.11.11.2
-T RD PCH OPR 30.81.31.2
-T CF OPR TO OVLP 74.61.01.2
+U I RING 245 31.31.31.2
-T COL BIN OPR 51.11.21.2
+U READ OPR 35.27.11.2
+U R-P ERROR 74.31.51.2
+U NOT RD SCAN COMP 74.21.51.2
+U NOT PCH SCAN COMP 74.21.61.2
+U PUNCH OPR 35.21.11.2
-T PCH OPR 50.15.11.2
-T PCH OP 35.61.21.2
+U INLK PROC CIRC 74.31.31.2
NOTE1
-T PRINT OPR 35.27.11.2
-T OVERLAP BUSY 74.21.11.2
+U RATED MO 74.21.31.2
-T NOT RD-PCH SCAN COMP CKT 2 74.21.11.2
-T I CYCLE 31.25.11.2
-T I RING 1 31.31.11.2
+U B REG RA 35.16.21.2
+U B REG NOT 3 35.16.31.2
+U B REG NOT 2 35.16.11.2
I R ARDS1 74.11.01.2
+U B REG NOT MO 74.11.61.2
+U TIME RAS-RPR 74.11.61.2
+U OVLP ALT SCANS COMP 74.21.11.2
+U I-O CONTROL 74.21.31.2
-T NOT START PRESET 74.31.51.2
-T TIME RPR-RWD 31.15.21.2
+U CR SCAN ERR 35.31.61.2
-T PRINT ERROR NOTE2 35.31.21.2
-T I-O SYNC STOP RA OR 35.31.91.2
+U OVERLAP R-P INLK 74.31.51.2
+U RD-PCH OPR 74.31.51.2
-T I-O INLK 74.31.51.2
+U I CYCLE 74.31.51.2
-T CF OPR TO OVLP 74.11.01.2
+U RD-RD PP 74.21.21.2
+U SWH AND I CYCLE 74.31.51.2
-T COL BIN OPR 74.11.01.2
+U READ OP 74.31.61.2
+U PUNCH OPR 74.31.61.2
-T PCH OPR 74.11.01.2
-T TURN OFF DELTA PROCESS 74.31.31.2
+U INLK PROC CIRC 74.31.01.2
+U PRINT 74.21.01.2
+U TAPE11-0 74.21.21.2
-T T RING 1 74.11.01.2
-T I RES RA OP ADR 74.11.01.2
-T S NOT RD-PCH 74.11.01.2
-T OVLP TRUE INLK 74.11.01.2
-T TIME RPR-RWD 74.11.61.2
+U PRINT SCAN END 74.31.51.2
-T NOT OVLP INLK 74.31.02.12.2
-T OVLP TRUE INLK 74.31.51.2
NOTE 1 USED TO GATE RA ON 30.31.31.2
NOTE2 USED WITH RA OR 30.31.91.2



COMMENTS	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
	A	03-07-62	114614	B	04-03-62	114133	C	04-26-62	114139	D	05-11-62	114143
	E	11-19-62	114173	F	12-26-62	114179						



COMMENTS

TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	03-07-62	114614	B	04-04-62	114133	C	07-09-62	114155	D	08-15-62	114160
E	11-19-62	114173	F	12-26-62	114179						

TAG

E 7.2.
TA 17

F 16.4
TA 18

74/11/23

TAPE OVERLAP CONTROL REGISTER

SYSTEM

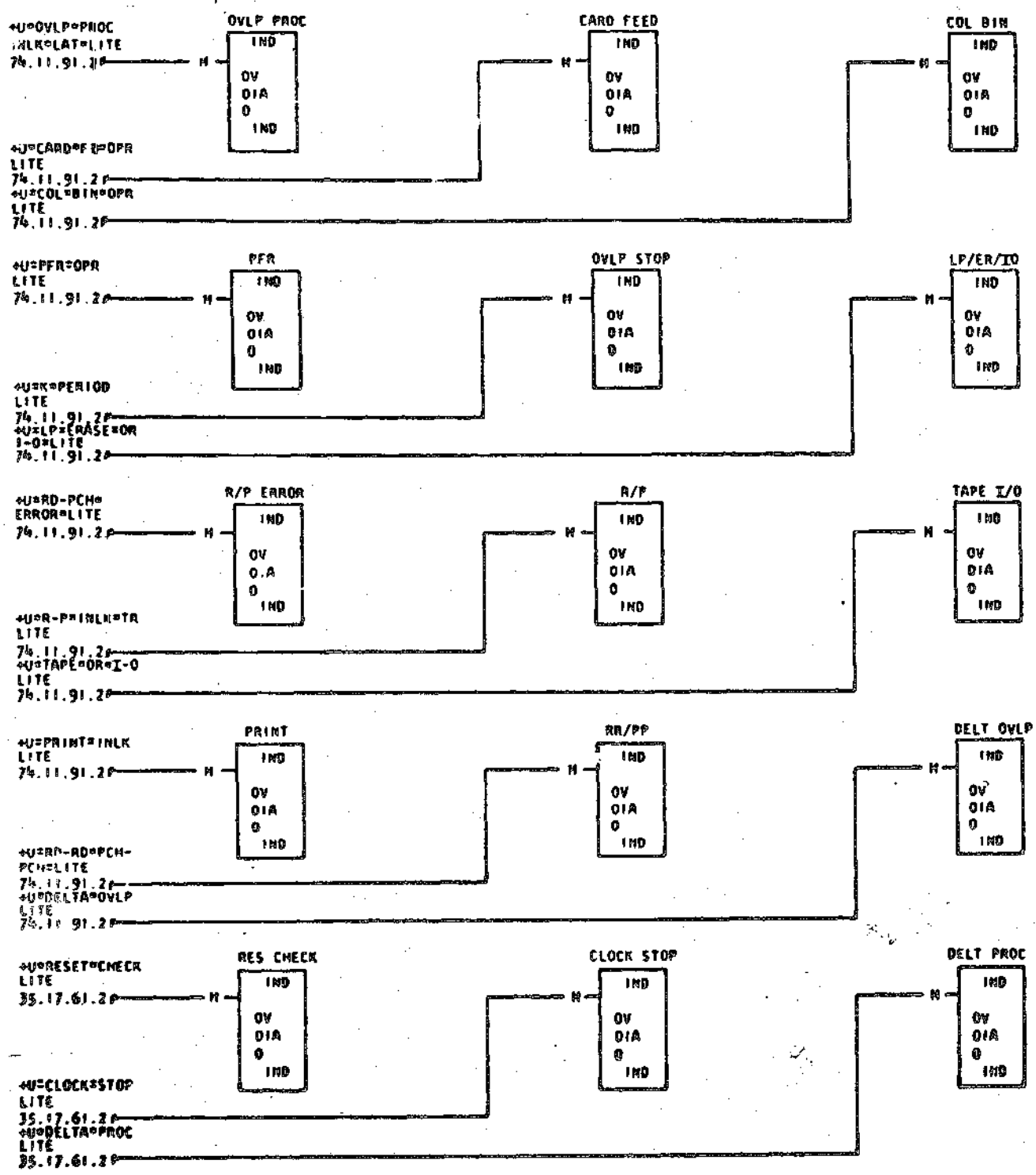
FRAME 01 P/N 724826 TITLE INDICATORS-OVERLAP MACH 1401 OV LOGIC

PANEL OVERLAP INDICATOR REF DWG. 74.41.21.2

OOXA

TAG DATI

A 12.7.62
TA 1370F



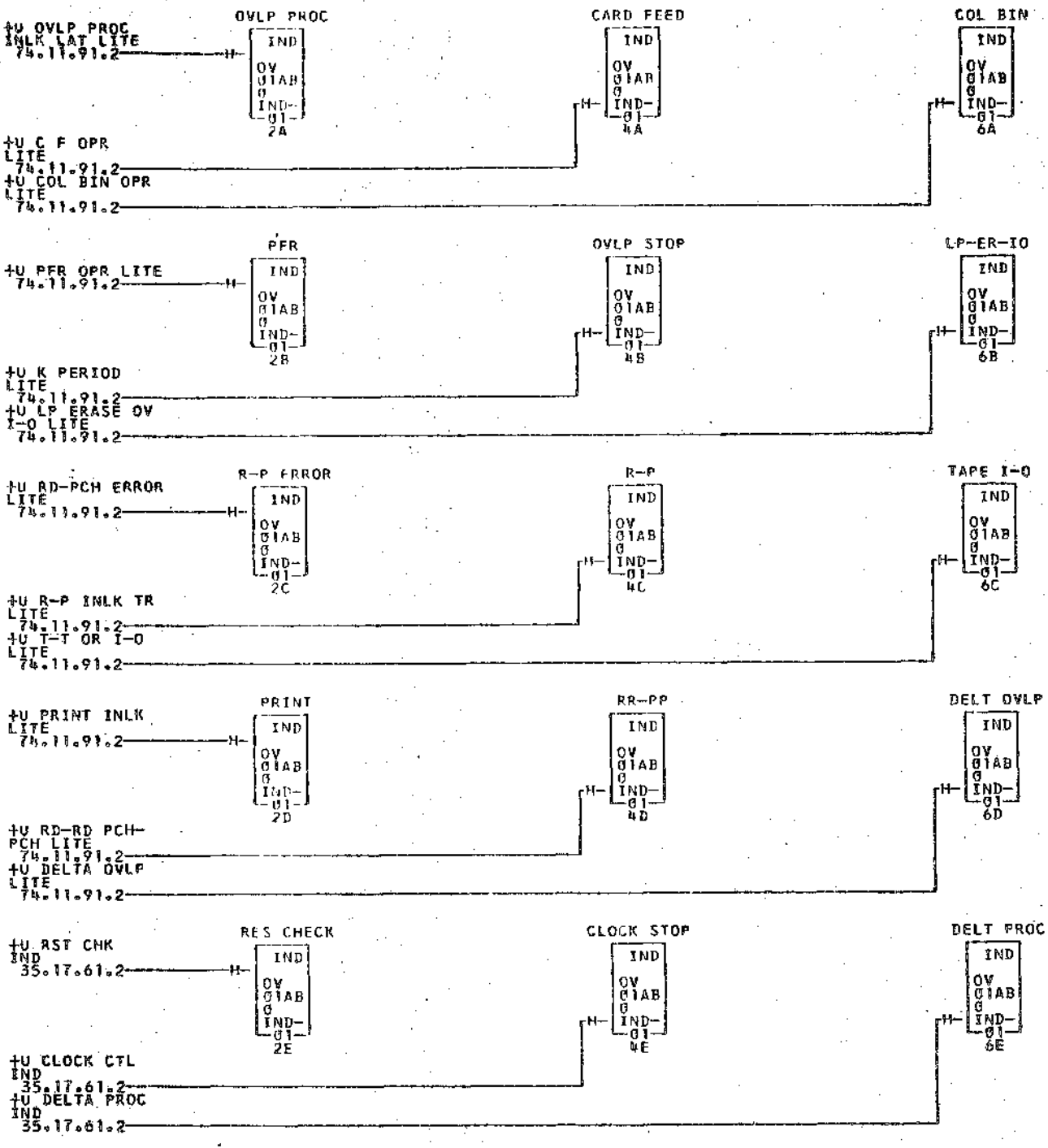
NOTES

1 ALL IND RETURN TO -12V ON 0282 TB-4

2 ALL INPUT CONNECTIONS ARE MADE DIRECTLY FROM AN AUX OVLP IND CABLE

DATE	EC NO	DATE	EC NO	DATE	EC NO
5-31-62	114141				

623432



COMMENTS

NOTE 1 ALL IND. RETURN TO -12V ON G2B2 TB-4

NOTE 2 ALL INPUT CONNECTIONS ARE MADE DIRECTLY FROM AN AUX. OVLP IND CABLE.

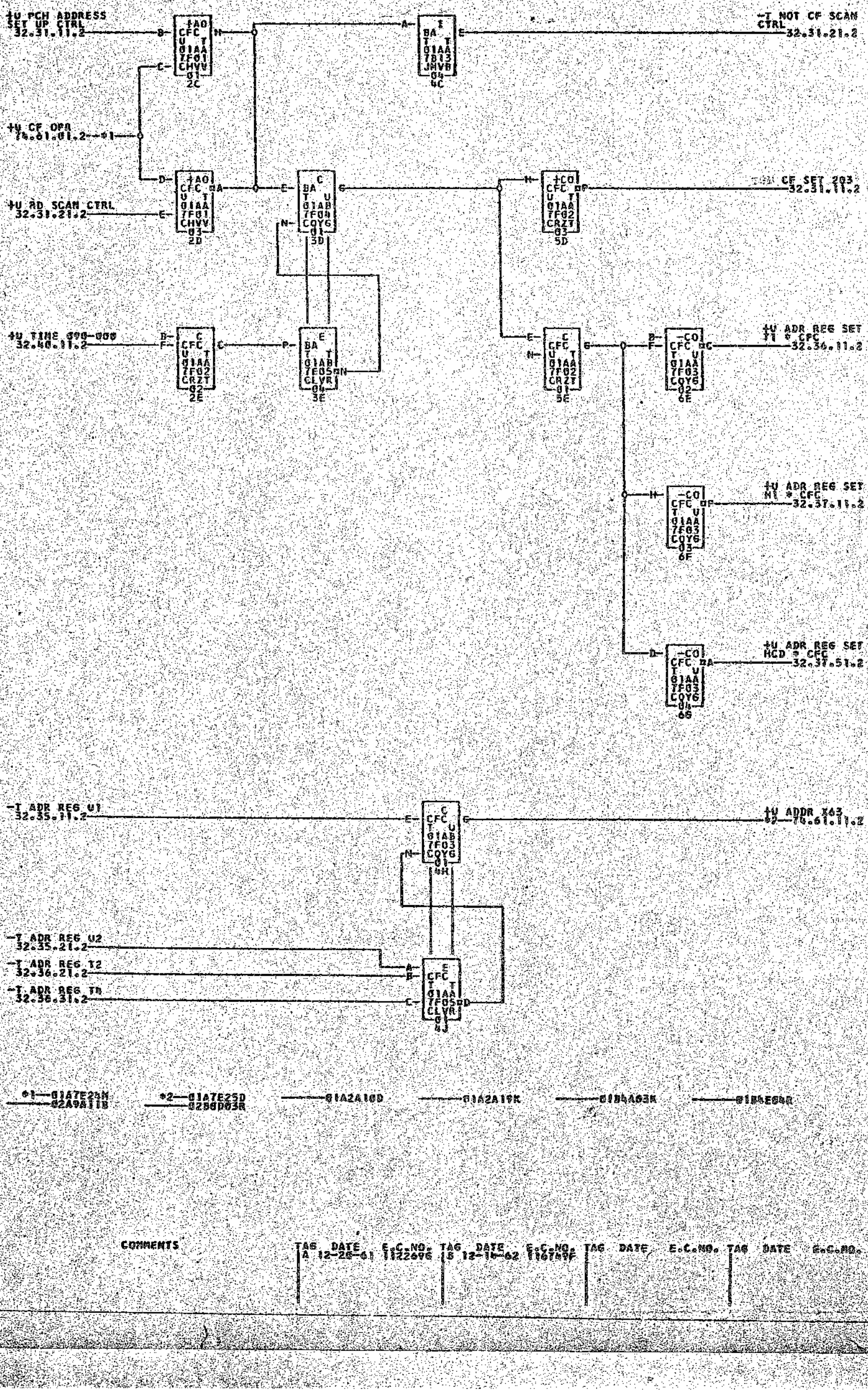
TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	04-26-62	114139	B	12-26-62	114179						

TAG D

A 12.7.
TA 137(

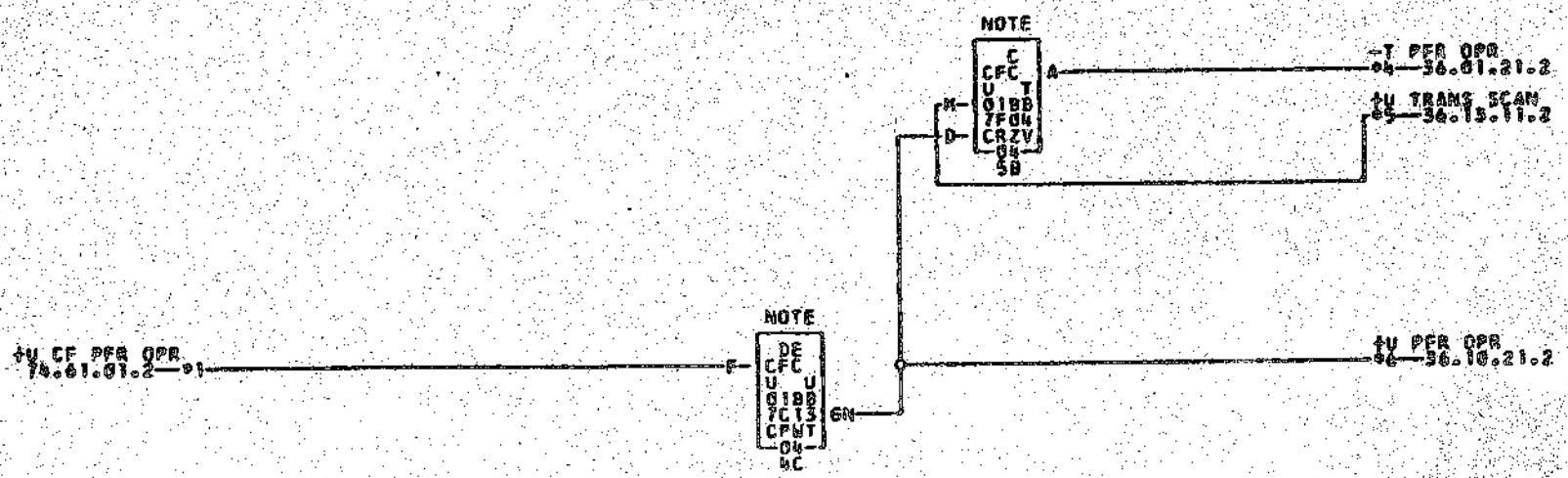
B 16.4.
TA 181

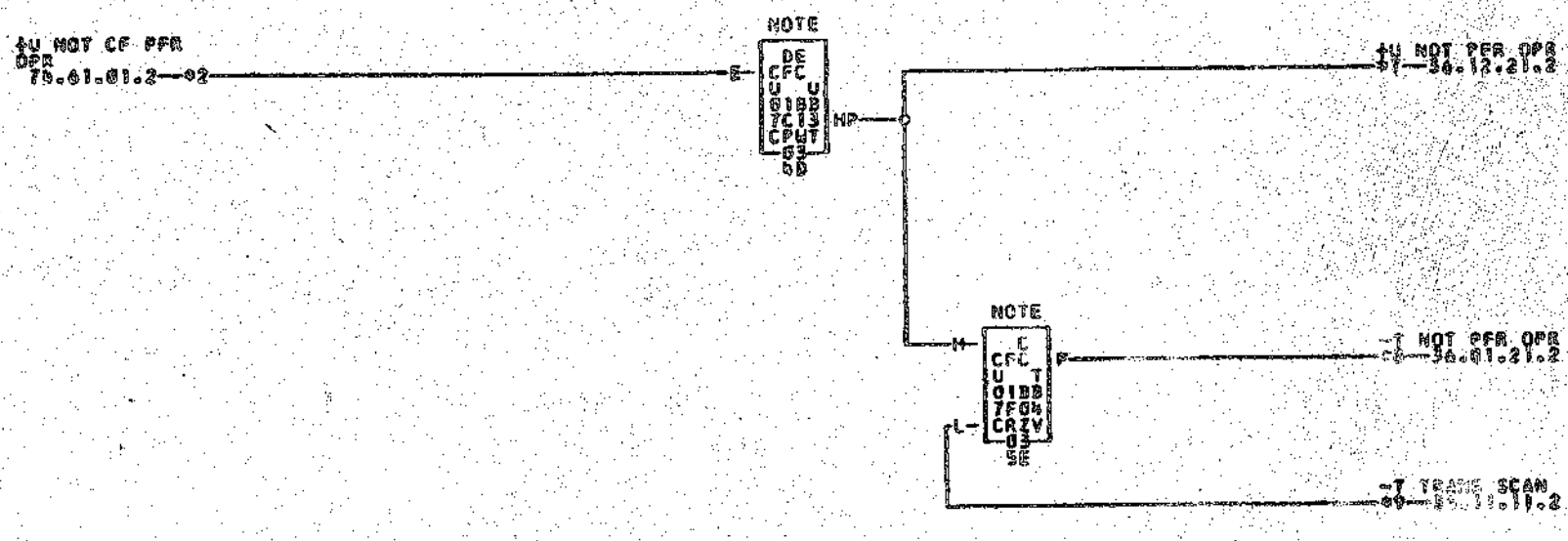
0724876



COMMENTS

TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.	TAG	DATE	E.C.NO.
A	12-28-61	1122696	B	12-14-62	1167699						





*1—01B7D01H
01A6D25D
01B4F01P
01B4F01C

*2—01B7D01J
01A6F26A
*B—01B7A01E

*3—01B7D01L
01B4A01A
01B4C03E

*4—01B7A01D
*6—01B7E03Q
*9—01B7A01B

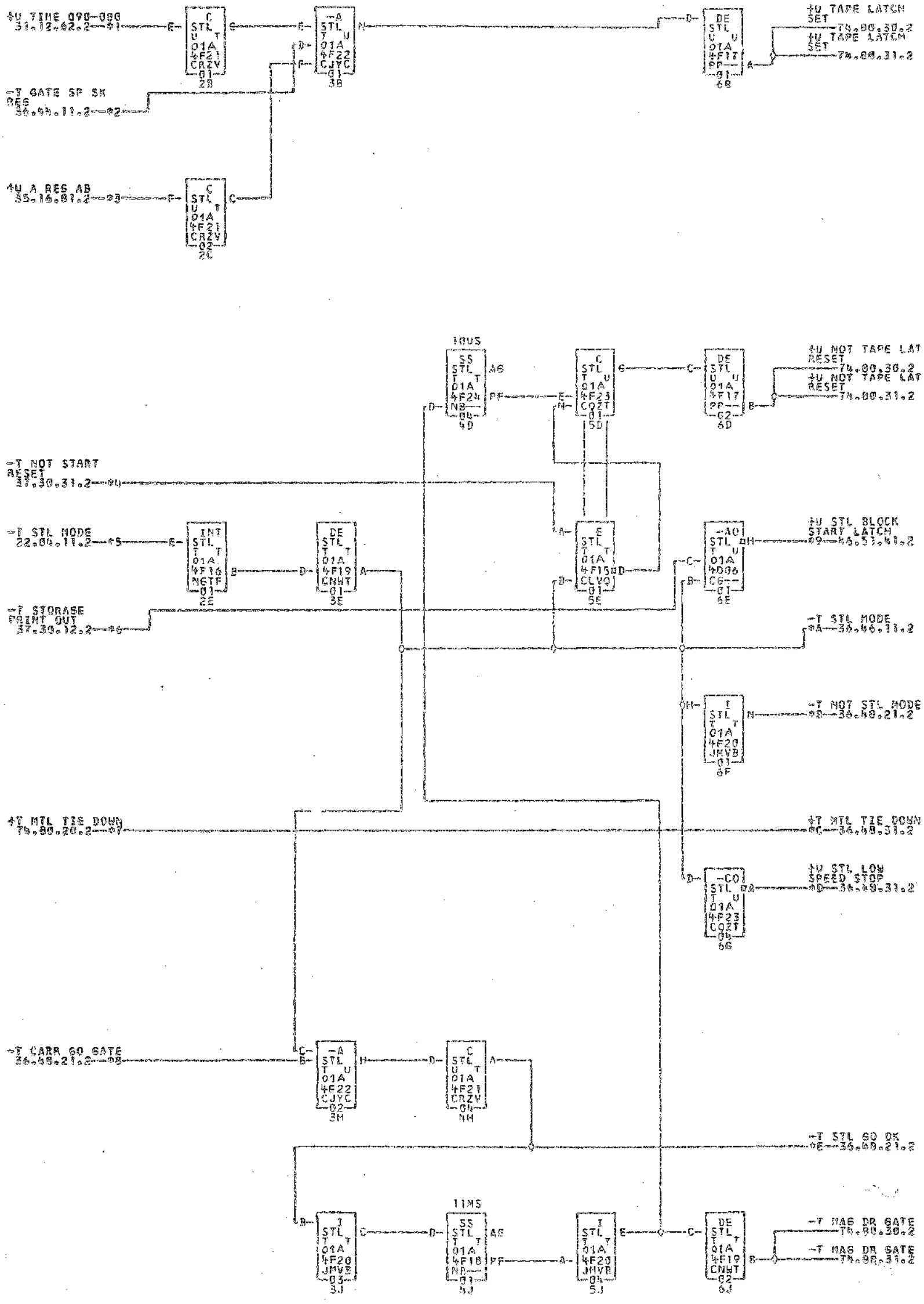
01B4C03D
01B4F01N
01B4C0

*5—01B7A02D
*7—01B7E03P
*A—01B7E03C

-N-

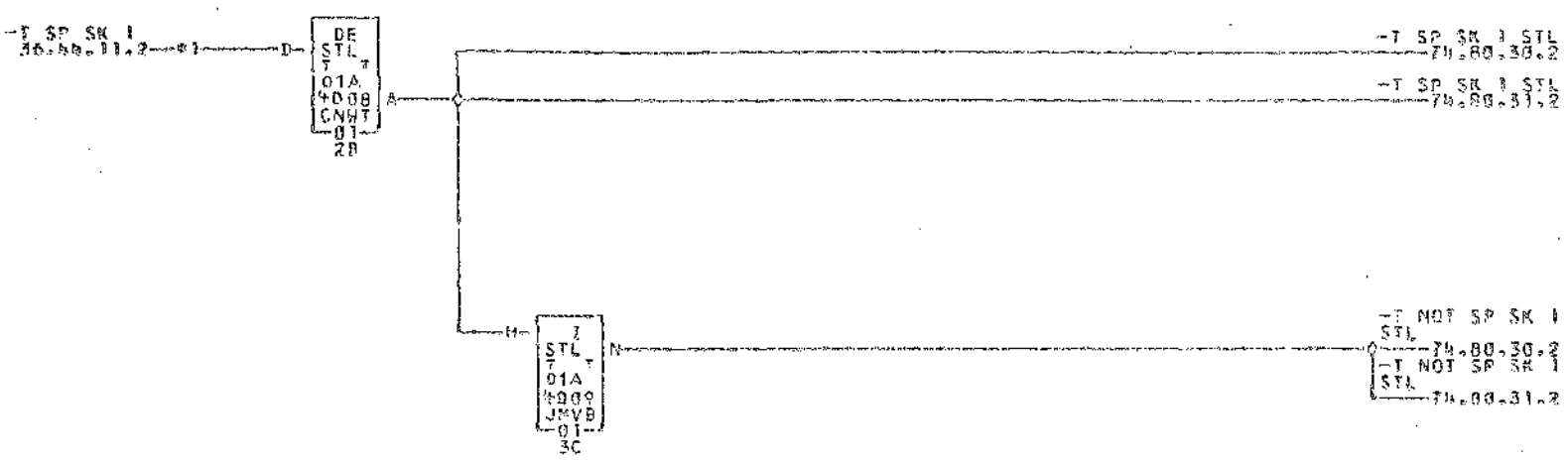
COMMENTS
NOTE THESE CARDS INSTALLED WITH CF FEATURE IF PFA FEATURE IS NOT PRESENT

TAG	DATE	E.C.NO.
A	12-10-61	113530
B	05-03-62	114161
C	02-28-63	114[illegible]



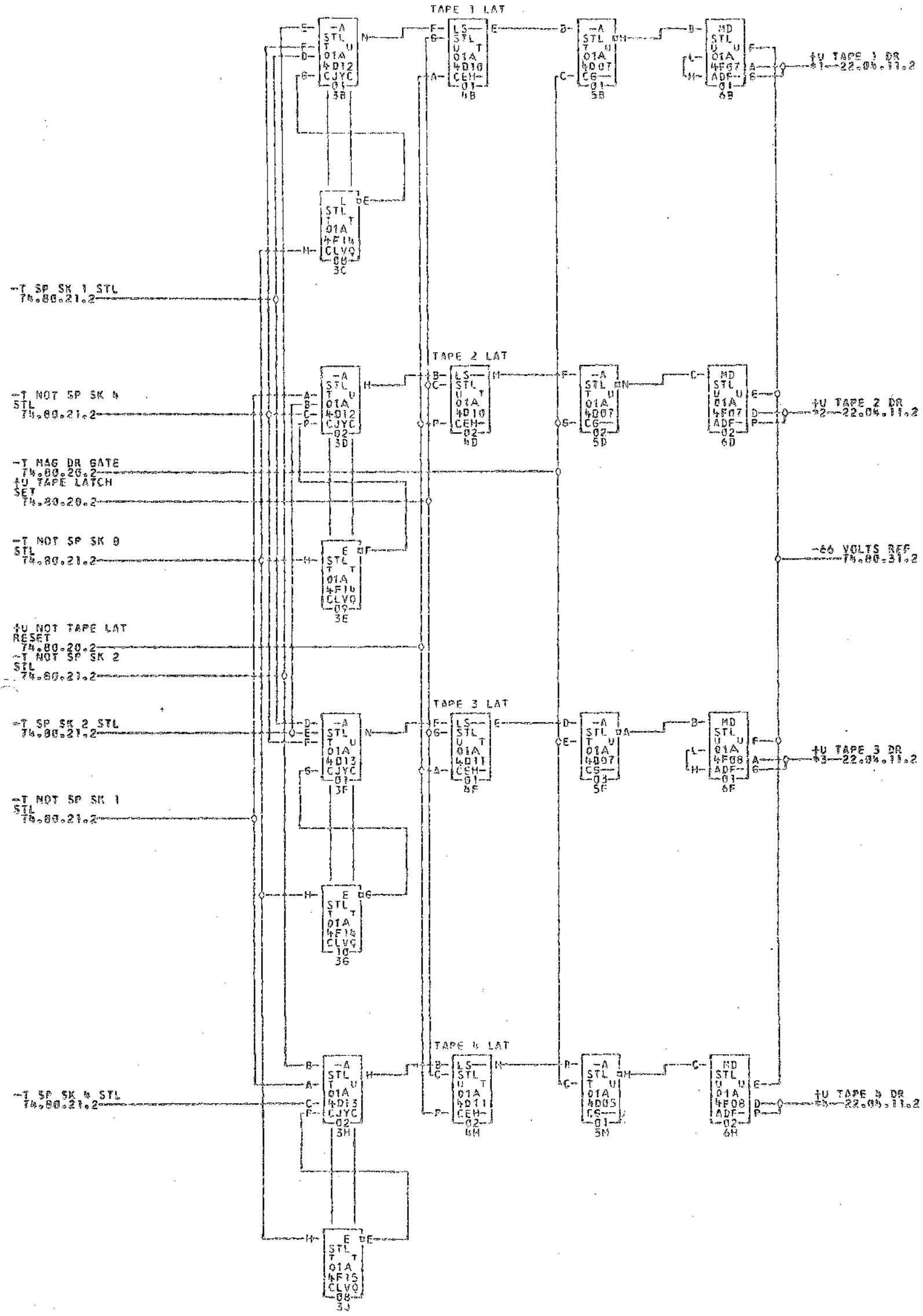
*1 -- 01A4C25N	*2 -- 01A4C26D	*3 -- 01A4 C25Q	*4 -- 01A4C25P	*5 -- 01A4C24A	*6 -- 01A4C25L
*7 -- 01A4C28L	*8 -- 01A4C26E	*9 -- 01A4C25M	------ 02A9C13G	------01A5E26M	*A -- 01A4C26C
*B -- 01A4C26N	------ 02A9A08E	------01B1F02C	*C -- 01A4C26R	------02A9A15E	------01B1F02E
*D -- 01A4C26B	*E -- 01A4C25P	------02A9A11F	------ 01B1F02P		

RSDP Y81893

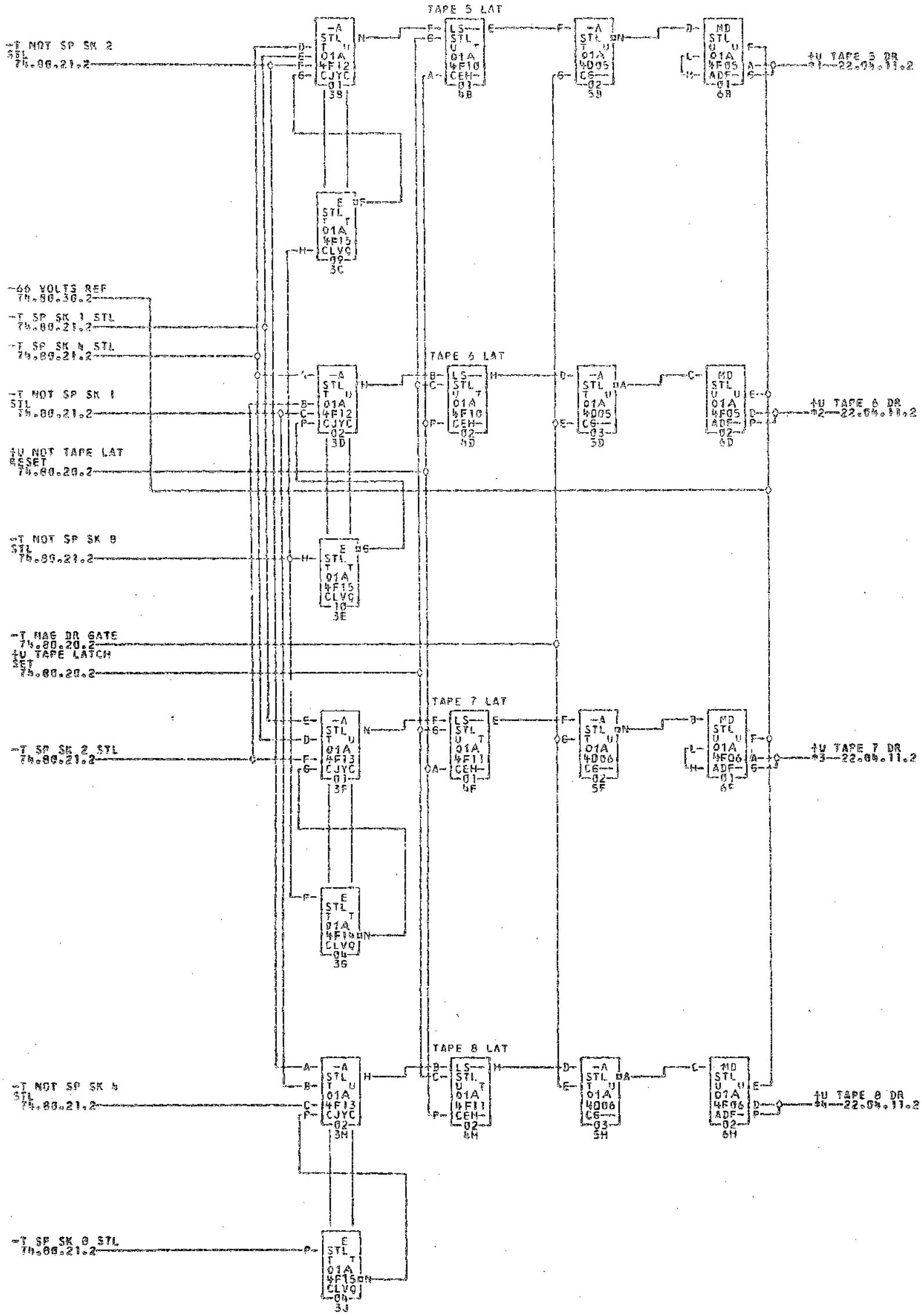


*1 -- 01A4C26H *2 -- 01A4C26J *3 -- 01A4 C26K *4 -- 01A4C26L

RSDP Y61893



*1 -- 01A4C24C *2 -- 01A4C24D *3 -- 01A4C24E *4 -- 01A4C24F



*1 -- 01A4C24G *2 -- 01A4C24N *3 -- 01A4C24J *4 -- 01A4C24K

WM
1
2
4
8
A
B
C

Bit Switches
C
B
A
8
4
2
1
WM
Manual Enter

C Bit Gen
35.17.11

Arith C Digit
Arith C Zone

Arith Digit Inh Controls
Arith Digit Inhibit 35.18.51

Xlate From Qui-Binary to BCD
To Display Lights 34.32.18

Arith Zone Inhibit 35.18.51

Arith Zone Inh Controls

Zone Adder 34.33.12-13

Sign

Zone Bit Gen 34.33.11

Adder Output

Quinary Adder 34.32.14-15

Binary Adder 34.32.16

Transfer B Reg 35.16.11

35.18.21 B Reg Zone Inh
35.18.31 B Reg Digit Inh
35.18.21 B Reg Wm Inh
35.18.71 B Reg C Inh

B Reg Inh Controls

B Reg
C Zone
A Reg
C Digit

A Reg Inh Controls

A Reg
C Zone
B Reg
C Digit

A Reg Zone
A Reg Digit 35.18.41
A Reg Wm 35.18.61

B Reg B
B Reg A
A Reg B
A Reg A

Translates From BCD to Qui-Binary

X L A T O R

34.32.12

I/C Translate To A Complement for Subt.

A Reg 1
A Reg 1

34.32.13

X L A T O R

34.32.11

Strobe 014-030

42.39.11 Sense Amp

42.41.11

C Plane
B Plane
A Plane
8 Plane
4 Plane
2 Plane
1 Plane
WM Plane
Core Storage

Inhibit Drivers 42.58.11

068-105

35.11.11
35.13.51
B Reg

35.11.11
35.13.61
A Reg

A or Not Wm

045-075

50 X Lines

80 Y Lines

Reset 000-015

Address Decoder
42.53.11 42.54.11 42.55.11 42.56.11

Serial Lines

360-090

030-060

000-030

Hunds
Tens
Units
MAIN STAR
A STAR
B STAR
1 STAR

32.35.11 - 32.38.31
Main, 1, A & B Stors
Are All on Scene
Logic Pages

Units Manual Adar Switch

Tens

Hundreds

Alter
Clear Disp
Start

D Cycle

Modifier 32.43.11-81

32.42.21 + 1
32.42.21 - 1
Mod Control Xfer 32.42.41

1 Cycle
Not 1 Cycle

CD

030-060
Not Units B/C 060-090
Not Tens B/C

Start Reset
E to I Change
Program Skip

Set IOP Latch

IOP

31.30.11

31.31.31-41

I1 I2 I3 I4 I5 I6 I7 I8

000-015
I Ring Drive

Δ 1 Cycle 31.?

Δ 1 090-000 32.34.21

Δ A 090-000 32.32.21

Δ B 090-000 32.33.31

IOP
OP Reg
35.21.11

1 Cycle Not WM
090-000

IBM 1401 SYSTEM DATA FLOW

1401 TIMING CHARTS

ARITHMETIC OPERATIONS

1 RESET ADD 0 (AAA)(BBB)
2 TRUE ADD
3 COMPLEMENT ADD-RECOMPLEMENT A (AAA)(BBB)
4 COMPLEMENT ADD-NO RECOMPLEMENT
5 COMPLEMENT ADD-ONE CHARACTER FIELD

MOVE, LOAD, COMPARE AND LOGIC OPERATIONS

6 MOVE M (AAA)(BBB)
7 MOVE DIGIT D (AAA)(BBB)
8 MOVE ZONE Y (AAA)(BBB)
9 MOVE ZERO SUPPRESS Z (AAA)(BBB)
10 LOAD L (AAA)(BBB)
11 CLEAR OP / (AAA)
12 WORD MARK CLEAR (AAA)(BBB)
13 WORD MARK SET (AAA)(BBB)
14 COMPARE C (AAA)(BBB)
15 HIGH-LOW-EQUAL COMPARE SEQUENCE C (AAA)(BBB)
16 BRANCH B (III), UNCONDITIONAL BRANCH
17 TEST AND BRANCH B (III) d (TEST ANY ONE OF TEN CHARACTER)
18 TEST CHARACTER AND BRANCH B (III)(BBB) d (ANY ONE OF NINE CHARACTERS)
19 TEST ZONE OR WORD MARK OR BOTH AND BRANCH V (III)(BBB) d
20 CLEAR AND BRANCH / (III)(BBB)
21 STOP AND BRANCH . (III)
22 STOP (.)
23 NO-OP (NO
24 EDIT OPERATION - ZERO SUPPRESS

ADVANCE PROGRAMMING

25 INSTRUCTION CYCLE WITH INDEXING
26 STORE A STAR Q (AAA) STORE B STAR H (AAA)
27 BRANCH B (III) ADVANCED PROGRAMMING (I-B STAR TRANSFER)
28 MOVE RECORD P (AAA)(BBB)

INPUT OUTPUT

29 READ
30 PUNCH

32 COLUMN BINARY READ SEQUENCE
33 COLUMN BINARY PUNCH SEQUENCE
34 MOVE AND UNSCRAMBLE COLUMN BINARY SEQUENCE
35 MOVE AND SCRAMBLE COLUMN BINARY SEQUENCE
36 PUNCH FEED READ SEQUENCE
37 STACKER SELECT K AND STACKER SELECT BRANCH

MAGNETIC TAPE

38 MOVE (LOAD) TAPE READ OPERATION
39 MOVE (LOAD) WRITE OPERATION
40 LOAD TAPE AND READ A WORD SEPARATOR CHARACTER
41 LOAD TAPE AND WRITE A WORD SEPARATOR CHARACTER
42 BACKSPACE TAPE OPERATION
43 ERASE TAPE OPERATION
44 WRITE TAPE MARK
45 REWIND TAPE OPERATION
46 REWIND AND UNLOAD TAPE
47 TAPE END OF FILE INDICATOR TEST AND TAPE TRANSMISSION ERROR TEST
48 MOVE COMPRESSED TAPE READ OPERATION
49 MOVE WITH ZERO INSERTION X (AAA)(BBB)

EXPANDED STORAGE

50 ADDRESS MODIFY TIMING # (AAA)(BBB)

SHEET 1 OF 1 | 723925

(900) 4 ORIG A-FIELD
(901) 0 (458) (678) ORIG B-FIELD
(908) 2

A2 6 5 RESULTANT A-FIELD
ABS 4 3 2 81 FINAL RESULTANT B-FIELD Q 0 A2 6 5
2 6 ABS

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	–		32,35,XX,2
2	B-REGISTER	–		35,11,XX,2
3	A-REGISTER	–		35,11,XX,2
4	-T RESET ADD OP	01B1		35,24,11,2
5	-T ARITH OPERATION	01B1		35,27,11,2
6	-T GATED WORD MARK	01B2		31,07,11,2
7	-T I-E CHANGE	01B2		31,05,31,2
8	+U DELTA I CYCLE	01B2		31,21,11,2
9	-T I-CYCLE LATCH	01B2		31,24,11,2
10	+U I-STAR RESTORE GATE	01A7		32,39,11,2
11	+U DELTA A-CYCLE	01B2		31,22,11,2
12	-T A-CYCLE LATCH	01B2		31,25,11,2
13	-T DELTA B-CYCLE LATCH	01B2		31,23,11,2
14	+U B-CYCLE	01B2		31,26,11,2
15	-T FIRST B-CYCLE TRIGGER	01B3		34,31,13,2
16	-T B-REGISTER ZONE INHIBIT	01A3		35,18,21,2
17	-T B-REGISTER DIGIT INHIBIT	01A3		35,18,31,2
18	-T B-REGISTER C-BIT INHIBIT	01A3		35,18,21,2
19	-T B-REGISTER WORD MARK INHIBIT	01A3		35,18,21,2
20	-T A-REGISTER DIGIT INHIBIT	01A3		35,18,41,2
21	-T ARITHMETIC ZONE INHIBIT	01A3		35,18,51,2
22	+U INHIBIT C-ZONE	01A3		35,15,11,2
23	+U A-WORD MARK LATCH	01B2		31,06,11,2
24	+U A-CYCLE ELIMINATE	01B2		31,06,11,2
25	-T ARITHMETIC A-WORD MARK LATCH	01A3		35,18,61,2
26	+U A-REG SET B-2-C	01A3		35,18,61,2
27	+U MODIFIER CONTROL ƒ 1	01A8		32,42,11,2
28	+U MODIFIER CONTROL – 1	01A8		32,42,11,2
29	-T MODIFIER CONTROL XFER	01A8		32,42,41,2
30	+U MODIFIER OUTPUT ON BUS LINES	–		32,43,XX,2
31	DATA ON INHIBIT DRIVE LINES	–		–

CYCLE: I 7 | A | B | A | B | A | B | B | B | I OP

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113330 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP
NAME FIGURE 1 RESET ADD 6
(AAA) (BBB)
DESIGN | TYPE
DETAIL | SCALE NONE
CHECK | DRAW VE 9-23-62
APPRO | CHECK

SHEET 1 OF 1 | 723926

(900) 4
(901) 5 458 678
(908) 2

ORIGINAL A-FIELD A0 2 6 B5
ORIGINAL B-FIELD A1 9 8 A4

RESULTANT A-FIELD A0 2 6 B5
FINAL RESULTANT B-FIELD B2 2 4 A9

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.35.XX.2
2	B-REGISTER	—		35.11.XX.2
3	A-REGISTER	—		35.11.XX.2
4	-T SUBTRACT OP	01B1		35.76.11.2
5	-T ARITH OPERATION	01B1		35.27.11.2
6	-T GATED WM	01B2		31.07.11.2
7	-T T-E CHANGE	01B2		31.05.31.2
8	+U DELTA T CYCLE	01B2		31.21.11.2
9	-T T-CYCLE LATCH	01B2		31.24.11.2
10	+U T-STAR RESTORE GATE	01A7		32.39.11.2
11	+U DELTA A + CYCLE	01B2		31.22.11.2
12	-T A-CYCLE LATCH	01B2		31.25.11.2
13	-T DELTA B-CYCLE LATCH	01B2		31.23.11.2
14	+U B-CYCLE	01B2		31.26.11.2
15	-T FIRST B-CYCLE TRIGGER	01B3		34.31.13.2
16	-T SECOND B-CYCLE TRIGGER	01B3		34.31.13.2
17	-T B-REGISTER ZONE INHIBIT	01A3		35.18.21.2
18	-T B-REGISTER DIGIT INHIBIT	01A3		35.18.31.2
19	-T B-REGISTER C-BIT INHIBIT	01A3		35.18.21.2
20	-T B-REGISTER WORD MARK INHIBIT	01A3		35.18.21.2
21	-T ARITHMETIC ZONE INHIBIT	01A3		35.18.51.2
22	-T ARITHMETIC DIGIT INHIBIT	01A3		35.18.51.2
23	+U INHIBIT C-ZONE	01A3		35.15.11.2
24	+U TRANSFER STAR	01B3		34.31.13.2
25	-T ADDER CARRY	01B3		34.31.15.2
26	-T CARRY TRIGGER	01B3		34.31.14.2
27	+U ZONE ADDER GATE	01B3		34.33.11.2
28	+U MODIFIER CONTROL PLUS 1	01A8		32.42.11.2
29	+U MODIFIER CONTROL MINUS 1	01A8		32.42.11.2
30	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
31	+U MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
32	DATA ON INHIBIT DRIVE LINES	—		—

CYCLE

I 7 | A | B | A | B | A | B | A | B | A | B | I OP

3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

908	458	678	458	678	457	677	456	676	455	675	908	
C2	B41	CA4	B41	CA4	C42	8	2	C81	CA82	A1	C2	
8	B41		B41		C42		2		CA82		C82	
OP DECODE A 8 2 4 8												
1												
4												7
B WM										A WM	B WM	
6											16	
7 9											7	7
8												8
6,9												
7 9	NOT 7 RESET 13											
	14											
	12											
	13											
5 6 9	14											
	13 NOT 16			14								
8 NOT MANUAL ENTRY					XFER B REG							
8 NOT MANUAL ENTRY			XFER B REG									
8 XFER B-REG												
NOT MANUAL ENTRY												
										B WR & NOT 15 ORIG		
	4 NOT 24											
				22 NOT 16 OR 21							21	
4 15 NOT 0	15											
						4	14 25	NOT 15 OR 16		NOT 25		
										8 WM NOT 15		
8											8	
	NOT 9 OR 10											
24	24											
909/908	458	678	457	677	456	676	455	675	454	674	909	
C2	B41	CA4	B41	A81	C42	4	2	2	CA82	B2	C2	

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	TA 1836 D	31.7.62	TA 1870 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 2 TRUE ADD

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	4-10-62
APPRD			CHECK		

907 A ORIG A-FIELD A4 A2 A1 B8 B5 RESULTANT A-FIELD A2 A1 B5 C 8
901 A MSR(CPS) ORIG B-FIELD A 0 1 6 RESULTANT B-FIELD I 5 AB1 2 < 9 (C2 < B 8 2)
908 B AD 1 6

	SIGNAL NAME	FRAME GATE CH	LOGIC
1	STORAGE ADDRESS REGISTER	—	32.35.XX.2
2	B-REGISTER	—	35.11.XX.2
3	A-REGISTER	—	35.11.XX.2
4	ADD OPR	01B1	35.26.11.2
5	ADD OR SUBT OPR	01B1	35.27.11.2
6	ARITH OPR	01B1	35.27.11.2
7	GATED WM	01B2	31.07.11.2
8	E-E CHANGE	01B2	31.06.31.2
9	DELTA E-CYCLE LATCH	01B2	31.21.11.2
10	E-CYCLE LATCH	01B2	31.24.11.2
11	E-STAGE RESTORE GATE	01A7	32.39.11.2
12	DELTA A-CYCLE LATCH	01B2	31.22.11.2
13	A-CYCLE LATCH	01B2	31.25.11.2
14	DELTA B-CYCLE LATCH	01B2	31.23.11.2
15	B-CYCLE	01B2	31.26.11.2
16	FIRST B-CYCLE TRIGGER	01B3	34.31.15.2
17	SECOND B-CYCLE TRIGGER	01B3	34.31.13.2
18	B-REG WM INHIBIT	01A3	35.15.21.2
19	B-REG C-BIT INHIBIT	01A3	35.16.21.2
20	B-REG ZONE INHIBIT	01A3	35.16.21.2
21	B-REG DIGIT INHIBIT	01A3	35.16.31.2
22	ARITHMETIC ZONE INHIBIT	01A3	35.16.51.2

CYCLE: I 7 | A | B | A | B | A | B | A | B | B READR | B | B | B READR | B READR | B | B READR | B | B READR | I OP

CYCLE: 3 6 9 0

908 | 456 | 678 | 456 | 678 | 457 | 677 | 456 | 676 | 677 | 678 | 677 | 676 | 908

C2 | B41 | C42 | B41 | C4942 | C42 | 1 | CA2 | CB2 | C42 | C41 | AB1 | AB1 | CB2 | C41 | CB2 | C42 | CB2 | C2

B | B41 | B41 | CA2 | CA2 | AB1 | C41 | C42 | CB2

OP DECODE 5 4 2 A B

4

4

B WM | E WM | B WM

T 10

B 10 | B IS DELTA CYCLE LATCH GATE

9

T 10

B 10 | RESET B4 NOT B | 31

12

15 | 15 | 9 15

15 | 14 31

6 7 9 | 6 NOT 38 | 34 NOT 35 | 15 NOT 38

16 | 6 NOT 5 | 15 NOT 38

NOT 34

NOT MANUAL ENTRY

9 NOT MANUAL ENTRY | 36

9 NOT MANUAL ENTRY 5 17 | 36

5 6 NOT 34 | 35 | 36

26 NOT 34 | 16 | 16 34 NOT 38 15 34 NOT 35

DATE	CHANGE NO.
4-10-62	TA-1270-K
31-7-62	

INTERNATIONAL BUSINESS MACHINES CORP

SIZE C | DRAWING NO. 723927 | SHEET 1 OF 2

NAME FIGURE 3 CONTINUED ADD-RECOMPLEMENT A (AAA) (BBB)

DESIGN | DETAIL | CHECK | APPRO

DRAWN | TRACE | CHECK | VE 5-28-62

900 4 ORIG A-FIELD A4 A2 8 B5 RESULTANT A-FIELD A2 8 B5 C B
901 4 (456) (678) ORIG B-FIELD A 0 1 6 RESULTANT B-FIELD T 5 A8 2 4 9 (C2 4 B B1)
908 2 A0 1 6

	SIGNAL NAME	FRAME GATE CH	LOGIC
23	-T ARITHMETIC DIGIT INHIBIT	01A3	35.16.51.2
24	+U INHIBIT C ZONE	01A3	35.15.11.2
25	+U TRANSFER STAR	01B3	34.31.15.2
26	-T COMPLEMENT LATCH	01B3	34.31.11.2
27	-T ADDER CARRY	01B3	34.31.19.2
28	-T CARRY TRIGGER	01B3	34.31.14.2
29	+U ARITHMETIC READDRESS	01B3	34.31.16.2
30	+U A WM LATCH	01B2	31.06.11.2
31	+U A CYCLE ELIMINATE	01B2	31.06.11.2
32	-T READDRESS LATCH	01B2	31.04.11.2
33	+U REVERSE SCAN TRIGGER	01B2	31.04.11.2
34	+U RECOMPLEMENT LATCH	01B3	34.31.17.2
35	+U CYCLE CNTL REV SCAN	01B2	31.04.11.2
36	+U TRANSFER B REGISTER	01A3	35.15.11.2
37	+U REVERSE SCAN READDRESS	01B3	34.31.15.2
38	-T READDRESS TRIGGER	01B3	34.31.17.2
39	-T FORCE B-2	01A3	35.16.31.2
40	+U MODIFIER CONTROL 1	01A6	32.42.11.2
41	+U MODIFIER CONTROL -1	01A6	32.42.41.2
42	-T MODIFIER CONTROL XFER	01A6	32.42.41.2
43	MODIFIER OUTPUT ON BUS LINES	—	32.43.11.2
44	DATA ON INH DRIVE LINES	—	—

CYCLE: I 7 | A | B | A | B | A | B | A | B | B READR | B | B | B READR | B READR | B | B READR | B | B READR | I OP

909/908 456 676 457 677 456 676 455 675 677 676 679 677 677 676 676 675 675 909

B41 CAB42 B41 A81 C42 C41 CA2 C421 C421 C41 A81 C82 B81 C82 4 C82 C2 C2

NO ADDRESS MODIFICATION | FIRST FORWARD SCAN | REVERSE SCAN | SECOND FORWARD SCAN

	DATE	CHANGE NO.
	1-10-62	11336-62
		33-7-62 TA 1870 K

	NAME
DESIGN	
DETAIL	
CHECK	
APPRO	

INTERNATIONAL BUSINESS MACHINES CORP

FIGURE 3 COMPLEMENT ADD-RECOMPLEMENT A (AAA) (BBB)

SIZE D | DRAW NO. 1E | TYPE | SCALE NONE | DATE 3-28-62

SHEET 2 OF 2 | 723937

SHEET 1 OF 1 | 723928

(9001) 4
(901) A 458 678
(908) 2

ORIGINAL A-FIELD A2 6 B5
ORIGINAL B-FIELD A0 3 1 A6

RESULTANT A-FIELD A2 6 B5
FINAL RESULTANT B-FIELD Q 0 5 AB1

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.35.XX.2
2		B REGISTER	—		35.11.XX.2
3		A-REGISTER	—		35.11.XX.2
4	-T	ADD OPERATION	01B1		35.24.11.2
5	-T	ARITH OPERATION	01B1		35.27.11.2
6	-T	GATED WORD MARK	01B2		31.07.11.2
7	-T	I/E CHANGE	01B2		31.05.31.2
8	+U	DELTA T CYCLE LATCH	01B2		31.21.11.2
9	-T	T-CYCLE LATCH	01B2		31.26.11.2
10	+U	DELTA A-CYCLE LATCH	01B2		31.22.11.2
11	-T	A-CYCLE LATCH	01B2		31.25.11.2
12	-T	DELTA B-CYCLE LATCH	01B2		31.23.11.2
13	+U	B-CYCLE	01B2		31.26.11.2
14	-T	FIRST B-CYCLE LATCH	01B3		34.31.13.2
15	-T	SECOND B-CYCLE LATCH	01B3		35.31.13.2
16	-T	B-REGISTER ZONE INHIBIT	01A3		35.18.21.2
17	-T	B-REGISTER DIGIT INHIBIT	01A3		35.18.31.2
18	-T	B-REGISTER C-BIT INHIBIT	01A3		35.18.21.2
19	-T	B-REGISTER WORD MARK INHIBIT	01A3		35.18.21.2
20	-T	ARITHMETIC DIGIT INHIBIT	01A3		35.18.51.2
21	-T	ARITHMETIC ZONE INHIBIT	01A3		35.18.51.2
22	+U	INHIBIT C-ZONE	01A3		35.15.11.2
23	+U	TRANSFER STAR	01B3		34.31.13.2
24	+U	COMPLEMENT LATCH	01B3		34.31.11.2
25	-T	ADDER CARRY	01B3		34.31.15.2
26	-T	CARRY TRIGGER	01B3		34.31.14.2
27	+U	A-WORD MARK LATCH	01B2		31.06.11.2
28	+U	A-CYCLE ELIMINATE	01B2		31.06.11.2
29	-T	ARITHMETIC A-WORD MARK LATCH	01A3		35.18.61.2
30		A-REGISTER SET B2 C	01A3		35.18.61.2
31		MODIFIER CONTROL PLUS 1	01A8		32.42.11.2
32		MODIFIER CONTROL MINUS 1	01A8		32.42.11.2
33		MODIFIER CONTROL TRANSFER	01A8		32.42.41.2
34		MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
35		DATA ON INHIBIT DRIVE LINES	—		—

CYCLE

T 7 | A | B | A | B | A | B | A | B | B | I OP

3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

908 | 458 | 678 | 458 | 678 | 457 | 677 | 456 | 676 | 675 | 908

C2 | B41 | A42 | B41 | CAB42 | C42 | 1 | A2 | C21 | CA82 | C2

B | B41 | B41 | C42 | A2 | C82 | C82

OP DECODE 1 2 4 8

4 4

B WM | A WM | B WM

6 6

7 9

10

11

12

5 6 9

8 NOT MANUAL ENTRY

8 NOT MANUAL ENTRY | XFER B REG

8 XFER B-REG

NOT MANUAL ENTRY

4 NOT 23

4, 14 NOT 8

458 | 678 | 457 | 677 | 456 | 676 | 455 | 675 | 674 | 909

C2 | B41 | CAB 42 | B41 | AB1 | C42 | C41 | A2 | C82 | B2 | C2

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113130 B	31.7.62	TS 1870 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 4 COMPLEMENT ADD - NO RECOMPLEMENT

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 1-22-62
APPRO			CHECK	

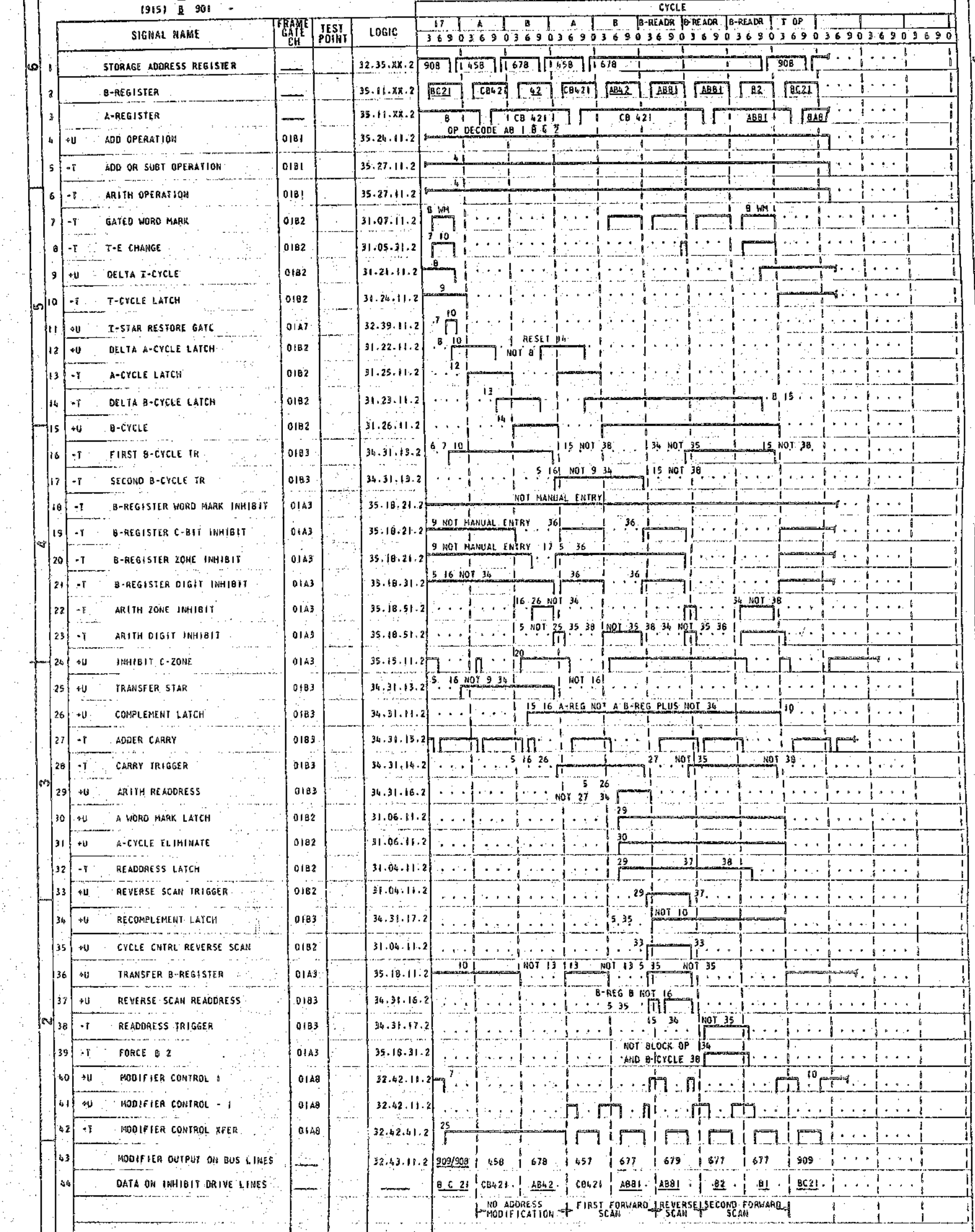
SHEET 1 OF 1 | 723929

(901) A 458 678
(908) L 778 678
(915) B 901 -

ORIGINAL A-FIELD B7 | RESULTANT A-FIELD B7
ORIGINAL B-FIELD 6 | FIRST RESULTANT B-FIELD A B9 | FINAL RESULTANT B-FIELD B9

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.35.XX.2
2	B-REGISTER	—		35.11.XX.2
3	A-REGISTER	—		35.11.XX.2
4	+U ADD OPERATION	01B1		35.24.11.2
5	-T ADD OR SUBT OPERATION	01B1		35.27.11.2
6	-T ARITH OPERATION	01B1		35.27.11.2
7	-T GATED WORD MARK	01B2		31.07.11.2
8	-T T-E CHANGE	01B2		31.05.31.2
9	+U DELTA I-CYCLE	01B2		31.21.11.2
10	-T T-CYCLE LATCH	01B2		31.24.11.2
11	+U I-STAR RESTORE GATE	01A7		32.39.11.2
12	+U DELTA A-CYCLE LATCH	01B2		31.22.11.2
13	-T A-CYCLE LATCH	01B2		31.25.11.2
14	-T DELTA B-CYCLE LATCH	01B2		31.23.11.2
15	+U B-CYCLE	01B2		31.26.11.2
16	-T FIRST B-CYCLE TR	01B3		34.31.13.2
17	-T SECOND B-CYCLE TR	01B3		34.31.13.2
18	-T B-REGISTER WORD MARK INHIBIT	01A3		35.18.21.2
19	-T B-REGISTER C-BIT INHIBIT	01A3		35.18.21.2
20	-T B-REGISTER ZONE INHIBIT	01A3		35.18.21.2
21	-T B-REGISTER DIGIT INHIBIT	01A3		35.18.31.2
22	-T ARITH ZONE INHIBIT	01A3		35.18.51.2
23	-T ARITH DIGIT INHIBIT	01A3		35.18.51.2
24	+U INHIBIT C-ZONE	01A3		35.15.11.2
25	+U TRANSFER STAR	01B3		34.31.13.2
26	+U COMPLEMENT LATCH	01B3		34.31.11.2
27	-T ADDER CARRY	01B3		34.31.15.2
28	-T CARRY TRIGGER	01B3		34.31.14.2
29	+U ARITH READDRESS	01B3		34.31.16.2
30	+U A WORD MARK LATCH	01B2		31.06.11.2
31	+U A-CYCLE ELIMINATE	01B2		31.06.11.2
32	-T READDRESS LATCH	01B2		31.04.11.2
33	+U REVERSE SCAN TRIGGER	01B2		31.04.11.2
34	+U RECOMPLEMENT LATCH	01B3		34.31.17.2
35	+U CYCLE CNTRL REVERSE SCAN	01B2		31.04.11.2
36	+U TRANSFER B-REGISTER	01A3		35.18.11.2
37	+U REVERSE SCAN READDRESS	01B3		34.31.16.2
38	-T READDRESS TRIGGER	01B3		34.31.17.2
39	-T FORCE B 2	01A3		35.16.31.2
40	+U MODIFIER CONTROL 0	01A8		32.42.11.2
41	+U MODIFIER CONTROL - 1	01A8		32.42.11.2
42	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
43	MODIFIER OUTPUT ON BUS LINES	—		32.43.11.2
44	DATA ON INHIBIT DRIVE LINES	—		—

CYCLE: I7 | A | B | A | B | B-READR | B-READR | B-READR | T OP



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113939 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 5 COMPLEMENT ADD-ONE CHARACTER FIELD

DESIGN | DETAIL | CHECK | APPRD | TYPE | SCALE NONE | DRAW VE 9-16-62 | CHECK

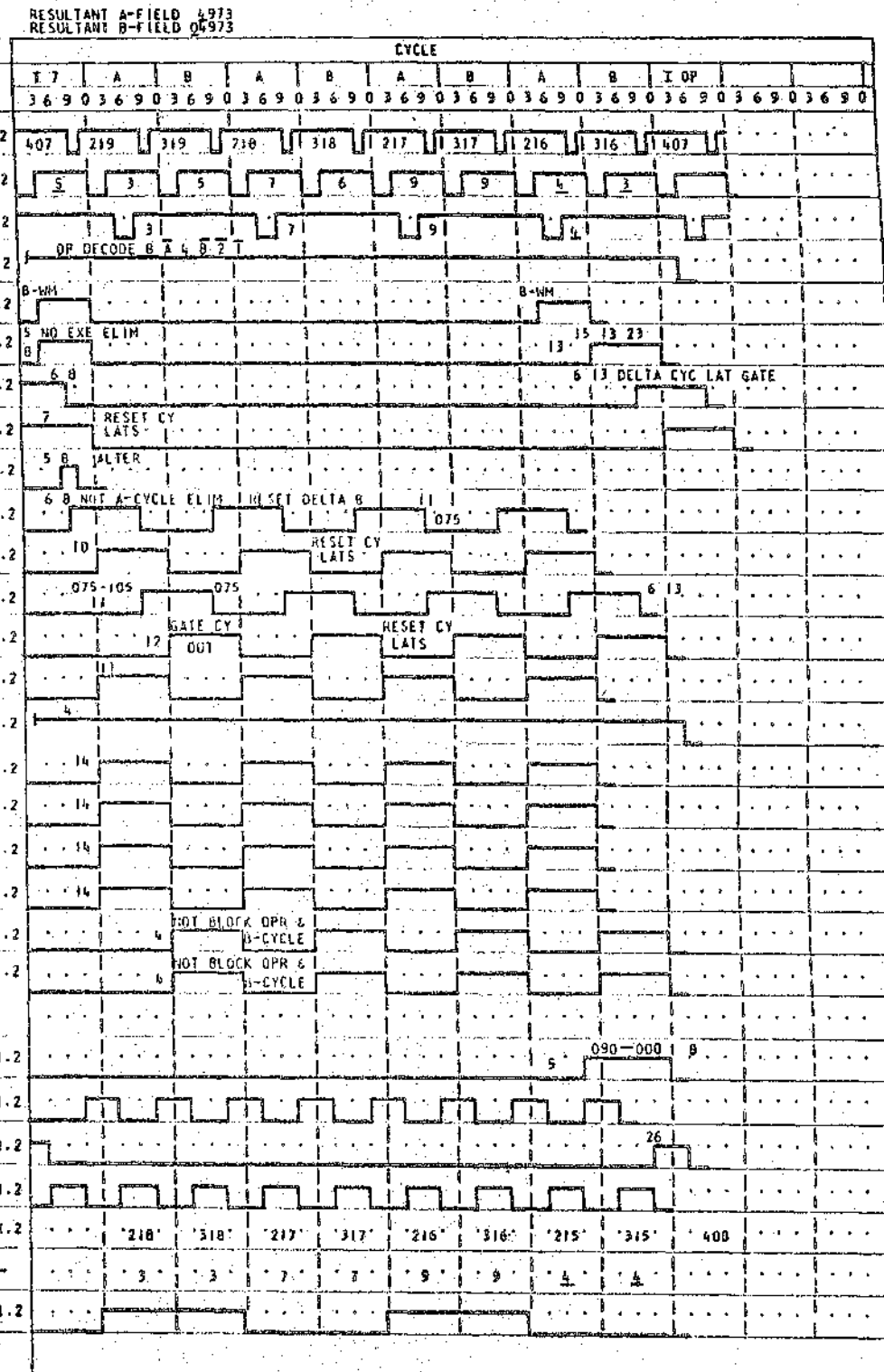
SHEET 1 OF 1 | 723930

299 A
400 M [219] [319]
407 S

ORIG A-FIELD DATA 4973
ORIG B-FIELD DATA 03965

RESULTANT A-FIELD 4973
RESULTANT B-FIELD 04973

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2	B-REGISTER LATCHES	—		35.XX.XX.2
3	A-REGISTER LATCHES	—		35.XX.XX.2
4	+U MOVE OPERATION	01B1		35.25.11.2
5	-T GATED WORD MARK	01B2		31.07.11.2
6	-T T/E CHANGE	01B2		31.05.31.2
7	+U DELTA I-CYCLE	01B2		31.21.11.2
8	-T I-CYCLE LATCH	01B2		31.24.11.2
9	+U T-STAR RESTORE GATE	01A7		32.39.11.2
10	+U DELTA A-CYCLE	01B2		31.22.11.2
11	-T A-CYCLE LATCH	01B2		31.25.11.2
12	-T DELTA B-CYCLE LATCH	01B2		31.23.11.2
13	+U B-CYCLE	01B2		31.26.11.2
14	+U TRANSFER B-REGISTER	01A3		35.18.11.2
15	+U T/E CONTROL 1	01B2		31.05.21.2
16	-T B-REG ZONE INHIBIT	01A3		35.18.21.2
17	-T B-REG DIGIT INHIBIT	01A3		35.18.31.2
18	-T B-REG C-BIT INHIBIT	01A3		35.18.21.2
19	-T B-REG WM INHIBIT	01A3		35.18.21.2
20	-T A-REG ZONE INHIBIT	01A3		35.18.41.2
21	-T A-REG DIGIT INHIBIT	01A3		35.18.41.2
22	+U A-REG DIGIT AND ZONE C BIT GEN TAKES OVER			
23	+U A-REG WM LATCH	01B2		31.06.11.2
24	+U MODIFIER CONTROL-1	01A8		32.42.11.2
25	+U MODIFIER CONTROL 1	01A8		32.42.11.2
26	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
27	MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
28	DATA ON INHIBIT DRIVE LINES	—		——
29	+U INHIBIT DRIVE C	01A3		35.17.11.2



DATE	CHANGE NO.	DATE	CHANGE NO.
5-10-62	113350 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

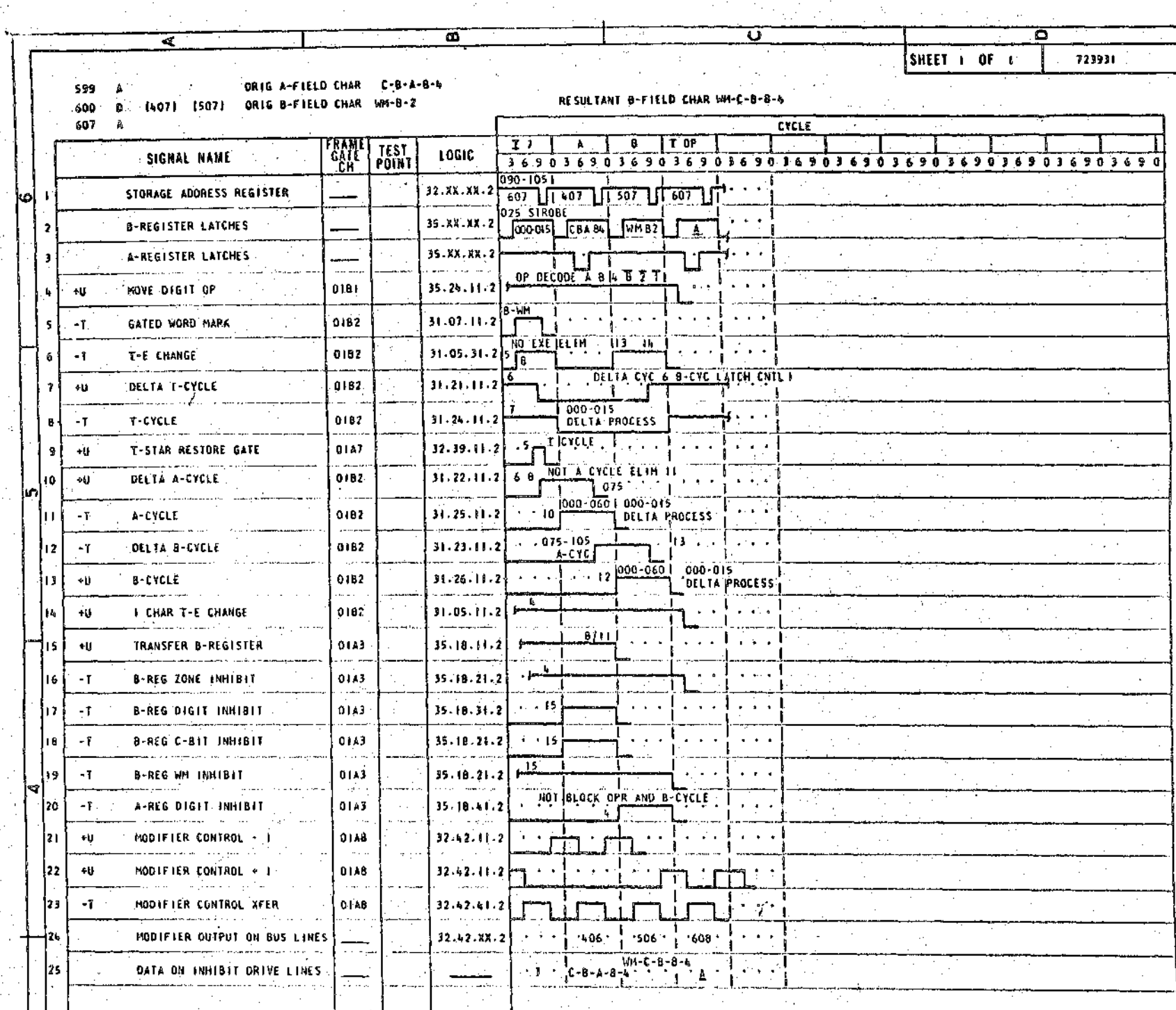
NAME FIG 6 MOVE M (AAA) (BBB)

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 1-25-63
APPRO			CHECK	

SHEET 1 OF 1 | 723931

599 A ORIG A-FIELD CHAR C-B-A-8-4
600 B (407) (507) ORIG B-FIELD CHAR WM-8-2
607 A
RESULTANT B-FIELD CHAR WM-C-B-8-4

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	——		32.XX.XX.2
2		B-REGISTER LATCHES	——		35.XX.XX.2
3		A-REGISTER LATCHES	——		35.XX.XX.2
4	+U	MOVE DIGIT OP	0181		35.24.11.2
5	-T	GATED WORD MARK	0182		31.07.11.2
6	-T	T-E CHANGE	0182		31.05.31.2
7	+U	DELTA I-CYCLE	0182		31.21.11.2
8	-T	T-CYCLE	0182		31.24.11.2
9	+U	T-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	DELTA A-CYCLE	0182		31.22.11.2
11	-T	A-CYCLE	0182		31.25.11.2
12	-T	DELTA B-CYCLE	0182		31.23.11.2
13	+U	B-CYCLE	0182		31.26.11.2
14	+U	I CHAR T-E CHANGE	0182		31.05.11.2
15	+U	TRANSFER B-REGISTER	01A3		35.18.11.2
16	-T	B-REG ZONE INHIBIT	01A3		35.18.21.2
17	-T	B-REG DIGIT INHIBIT	01A3		35.18.31.2
18	-T	B-REG C-BIT INHIBIT	01A3		35.18.28.2
19	-T	B-REG WM INHIBIT	01A3		35.18.21.2
20	-T	A-REG DIGIT INHIBIT	01A3		35.18.41.2
21	+U	MODIFIER CONTROL - 1	01A8		32.42.11.2
22	+U	MODIFIER CONTROL - 1	01A8		32.42.11.2
23	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
24		MODIFIER OUTPUT ON BUS LINES	——		32.42.XX.2
25		DATA ON INHIBIT DRIVE LINES	——		——



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113630 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 7 MOVE DIGIT D
(AAA)(BBB)

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-12-62
APPRO			CHECK		

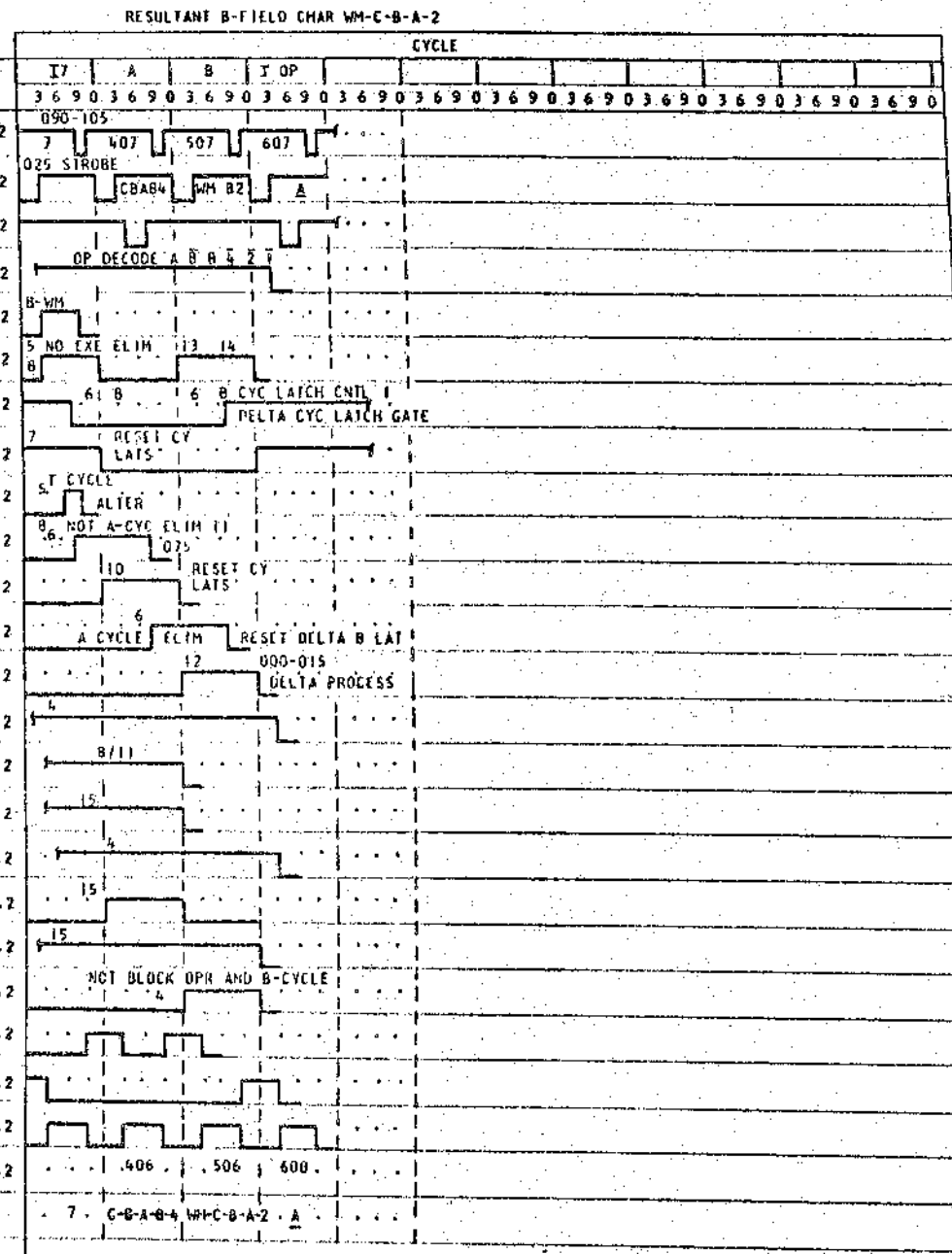
SHEET 1 OF 1 | 723932

599 A
600 Y (607) (507)
607 A

ORIG A-FIELD CHAR C-B-A-8-4
ORIG B-FIELD CHAR WM-B-2

RESULTANT B-FIELD CHAR WM-C-B-A-2

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2		B-REGISTER LATCHES	—		35.XX.XX.2
3		A-REGISTER LATCHES	—		35.XX.XX.2
4	+U	MOVE ZONE OP	01B1		35.26.11.2
5	-T	GATED WORD MARK	01B2		31.07.11.2
6	-T	T-E CHANGE	01B2		31.05.31.2
7	+U	DELTA I-CYCLE	01B2		31.21.11.2
8	-T	I-CYCLE	01B2		31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	DELTA A-CYCLE	01B2		31.22.11.2
11	-T	A-CYCLE	01B2		31.25.11.2
12	-T	DELTA B-CYCLE	01B2		31.23.11.2
13	+U	B-CYCLE	01B2		31.26.11.2
14	+U	I CHAR T-E CHANGE	01B2		31.05.11.2
15	+U	TRANSFER B-REGISTER	01A3		35.18.11.2
16	-T	B-REG ZONE INHIBIT	01A3		35.18.21.2
17	-T	B-REG DIGIT INHIBIT	01A3		35.18.31.2
18	-T	B-REG C-BIT INHIBIT	01A3		35.18.21.2
19	-T	B-REG WM INHIBIT	01A3		35.18.21.2
20	-T	A-REG ZONE INHIBIT	01A3		35.18.41.2
21	+U	MODIFIER CONTROL - 1	01A8		32.42.11.2
22	+U	MODIFIER CONTROL + 1	01A8		32.42.11.2
23	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
24		MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
25		DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
9-10-64	1123730 D	31.7.82	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME	FIGURE 8 MOVE ZONE Y				
	(AAA) (888)				
DESIGN		TYPE			
DETAIL		SCALE			NONE
CHECK		DRAW	VE		11-67
APPRO		CHECK			

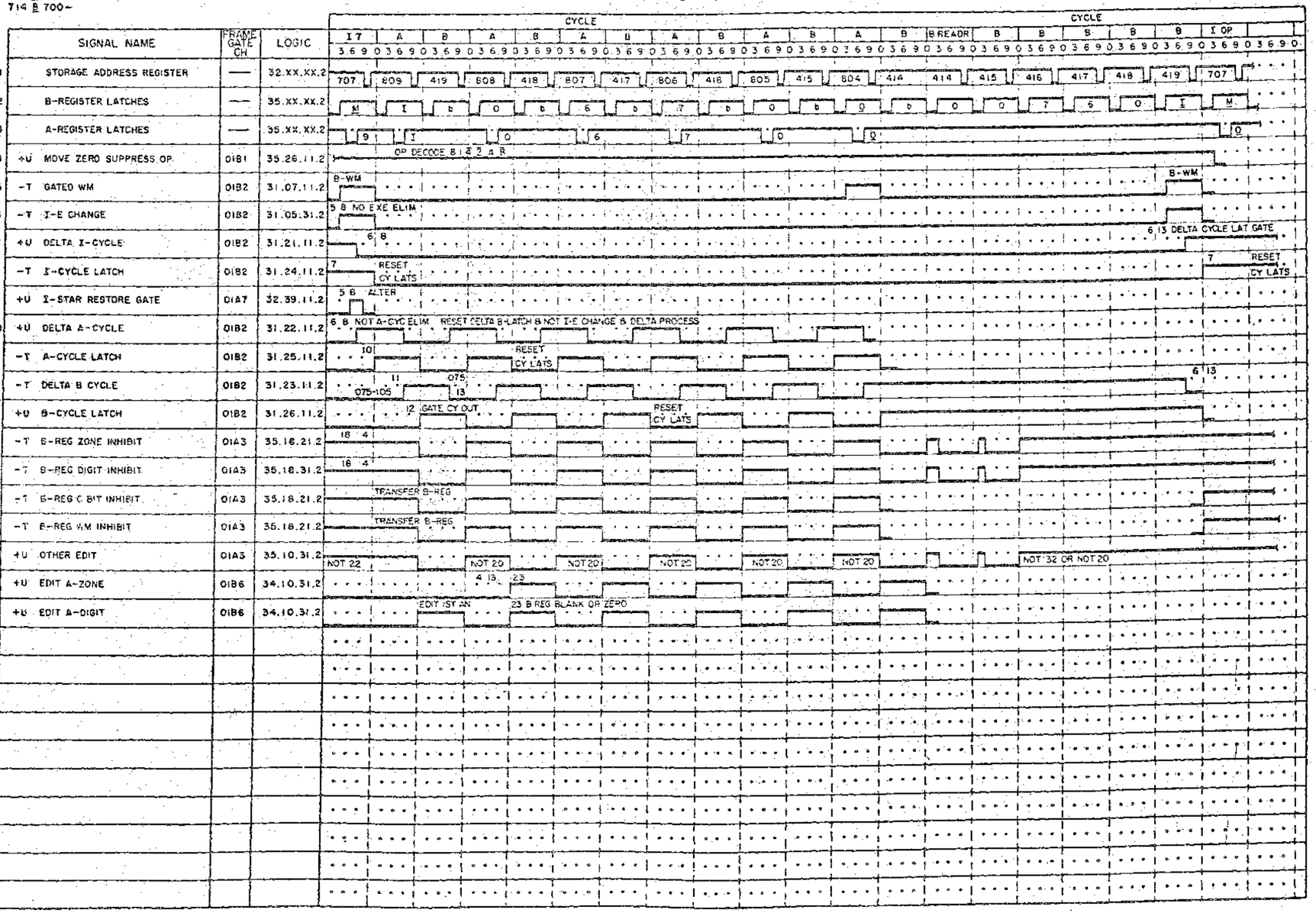
700 Z 609 419
707 M 519 419
714 B 700–

A-FIELD DATA 007601
B-FIELD DATA bbbbbb

RESULTANT A-FIELD (BEFORE ZERO SUPP–AFTER MOVE) 007601
RESULTANT B-FIELD (BEFORE ZERO SUPP–AFTER MOVE) 007601

RESULTANT B FIELD (AFTER ZERO SUPP) bb7601

	SIGNAL NAME	FRAME GATE CH	LOGIC
1	STORAGE ADDRESS REGISTER	—	32.XX.XX.2
2	B-REGISTER LATCHES	—	35.XX.XX.2
3	A-REGISTER LATCHES	—	35.XX.XX.2
4	+U MOVE ZERO SUPPRESS OP	0181	35.26.11.2
5	–T GATED WM	0182	31.07.11.2
6	–T I-E CHANGE	0182	31.05.31.2
7	+U DELTA I-CYCLE	0182	31.21.11.2
8	–T Σ-CYCLE LATCH	0182	31.24.11.2
9	+U Σ-STAR RESTORE GATE	01A7	32.39.11.2
10	+U DELTA A-CYCLE	0182	31.22.11.2
11	–T A-CYCLE LATCH	0182	31.25.11.2
12	–T DELTA B CYCLE	0182	31.23.11.2
13	+U B-CYCLE LATCH	0182	31.26.11.2
14	–T B-REG ZONE INHIBIT	01A3	35.18.21.2
15	–T B-REG DIGIT INHIBIT	01A3	35.18.31.2
16	–T B-REG C BIT INHIBIT	01A3	35.18.21.2
17	–T B-REG WM INHIBIT	01A3	35.18.21.2
18	+U OTHER EDIT	01A3	35.10.31.2
19	+U EDIT A-ZONE	01B6	34.10.31.2
20	+U EDIT A-DIGIT	01B6	34.10.31.2



DATE	CHANGE NO.
4-10-62	
31-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

DRAWN E. FIGUER 9-MOVE ZERO SUPPRESS Z 1AA1(BB6)

DESIGN
DETAIL
CHECK
APPRO

SIZE A
SCALE NONE
DATE 3-28-62

SHEET 1 OF 2

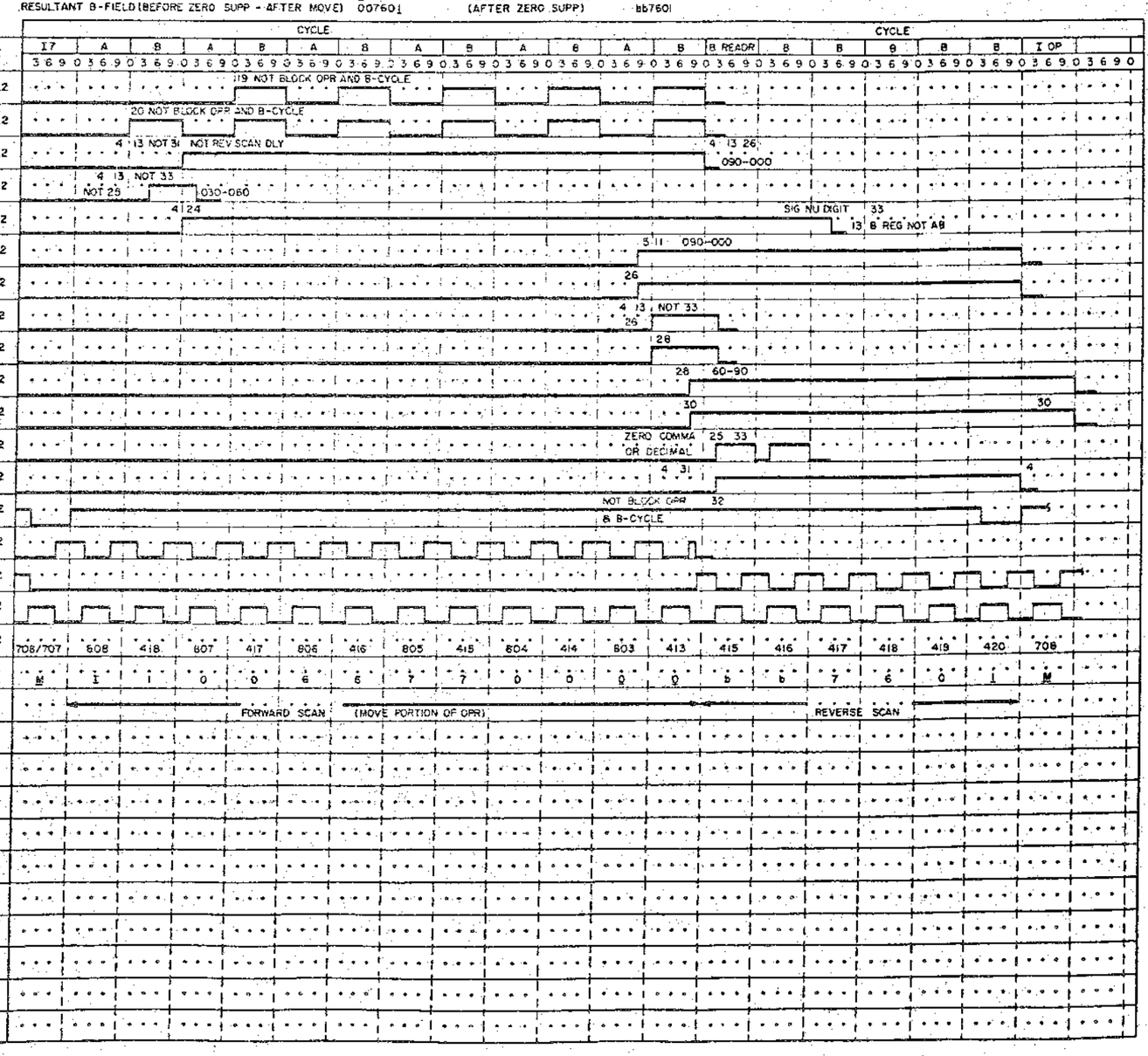
723933

700 Z 809 419 A-FIELD DATA 007601
707 M 519 419 B-FIELD DATA bbbbbb
714 § 700 -

RESULTANT A-FIELD(BEFORE ZERO SUPP - AFTER MOVE) 007601
RESULTANT B-FIELD(BEFORE ZERO SUPP - AFTER MOVE) 007601

RESULTANT B-FIELD (AFTER ZERO SUPP) bb7601

	SIGNAL NAME	FRAME GATE CH	LOGIC
21	−T A-REG ZONE INHIBIT	01A3	35.18.41.2
22	−T A-REG DIGIT INHIBIT	01A3	35.18.41.2
23	−T BODY TRIGGER	01B6	34.10.41.2
24	−T EDIT WM SET	01B6	34.10.51.2
25	−T ZERO SUPPRESS LATCH	01B6	34.10.51.2
26	+U A-WM LATCH	01B2	31.06.11.2
27	+U A-CYCLE ELIMINATE	01B2	31.06.11.2
28	+U 1ST EDIT READDRESS	01B6	34.10.61.2
29	−T READDRESS LATCH	01B2	31.04.11.2
30	+U REVERSE SCAN TRIGGER	01B2	31.04.11.2
31	+U CYCLE CONTROL REV SCAN	01B2	31.04.11.2
32	+U EDIT REGEN C-BIT	01B6	34.10.61.2
33	+U REVERSE SCAN DELAY LATCH	01B6	34.10.51.2
34	+U INHIBIT C-ZONE	01A3	35.15.11.2
35	+U MODIFIER CONTROL-1	01A6	32.42.11.2
36	+U MODIFIER CONTROL +1	01A8	32.42.11.2
37	−T MODIFIER CONTROL TRANSFER	01A8	32.42.41.2
38	MODIFIER OUTPUT ON BUS LINES	—	32.43.XX.2
39	DATA ON INHIBIT DR LINES	—	———
40			



DATE	CHANGE NO.
4-10-62	113330 D
31-7-62	TA 1870K

INTERNATIONAL BUSINESS MACHINES CORP

NAME SUPPRESS 7 (AAA1088)

TYPE FIGURE 9 MOVE ZERO

SCALE NONE

DRAW VE 3-28-62

CHECK

DESIGN

DETAIL

CHECK

APPRD

SHEET 2 OF 2

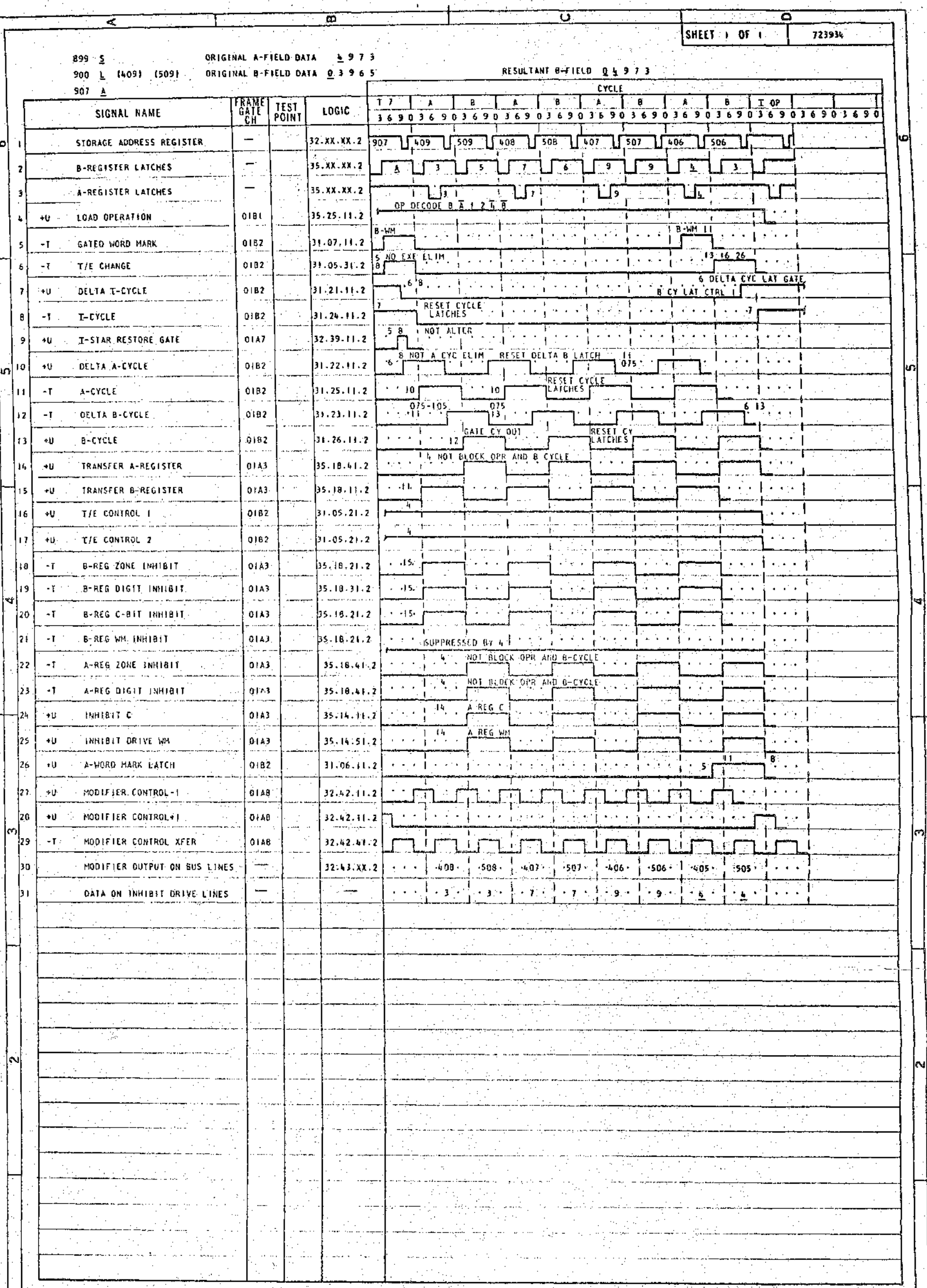
72193

SHEET 1 OF 1 | 723934

899 S
900 L (409) (509)
907 A

ORIGINAL A-FIELD DATA 4 9 7 3
ORIGINAL B-FIELD DATA 0 3 9 6 5
RESULTANT B-FIELD 0 4 9 7 3

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2	B-REGISTER LATCHES	—		35.XX.XX.2
3	A-REGISTER LATCHES	—		35.XX.XX.2
4	+U LOAD OPERATION	01B1		35.25.11.2
5	-T GATED WORD MARK	01B2		31.07.11.2
6	-T T/E CHANGE	01B2		31.05.31.2
7	+U DELTA T-CYCLE	01B2		31.21.11.2
8	-T T-CYCLE	01B2		31.24.11.2
9	+U T-STAR RESTORE GATE	01A7		32.39.11.2
10	+U DELTA A-CYCLE	01B2		31.22.11.2
11	-T A-CYCLE	01B2		31.25.11.2
12	-T DELTA B-CYCLE	01B2		31.23.11.2
13	+U B-CYCLE	01B2		31.26.11.2
14	+U TRANSFER A-REGISTER	01A3		35.18.41.2
15	+U TRANSFER B-REGISTER	01A3		35.18.11.2
16	+U T/E CONTROL 1	01B2		31.05.21.2
17	+U T/E CONTROL 2	01B2		31.05.21.2
18	-T B-REG ZONE INHIBIT	01A3		35.18.21.2
19	-T B-REG DIGIT INHIBIT	01A3		35.18.31.2
20	-T B-REG C-BIT INHIBIT	01A3		35.18.21.2
21	-T B-REG WM INHIBIT	01A3		35.18.21.2
22	-T A-REG ZONE INHIBIT	01A3		35.18.41.2
23	-T A-REG DIGIT INHIBIT	01A3		35.18.41.2
24	+U INHIBIT C	01A3		35.14.11.2
25	+U INHIBIT DRIVE WM	01A3		35.14.51.2
26	+U A-WORD MARK LATCH	01B2		31.06.11.2
27	+U MODIFIER CONTROL-1	01A8		32.42.11.2
28	+U MODIFIER CONTROL+1	01A8		32.42.11.2
29	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
30	MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
31	DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113830 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

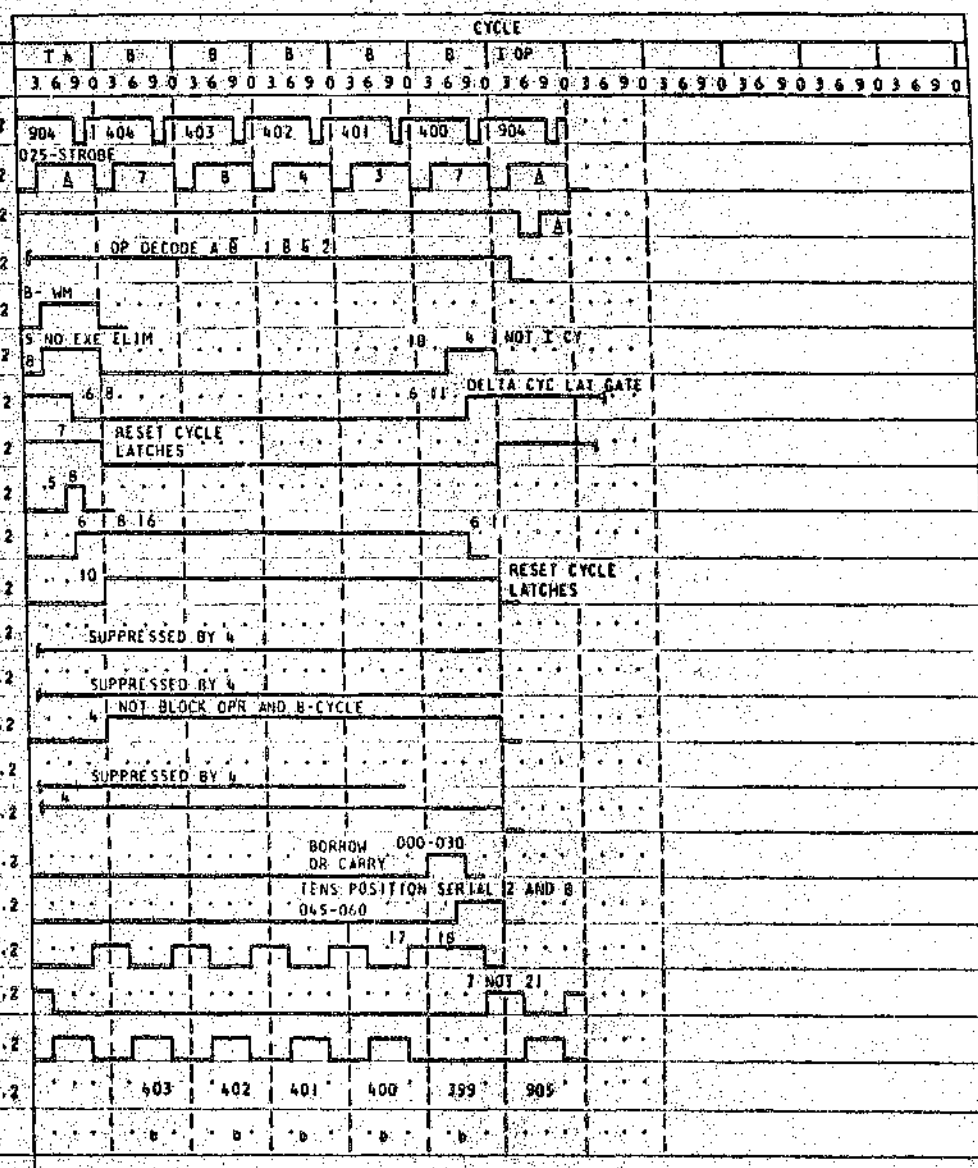
NAME FIG 10 LOAD L (AAA) (BBB)

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-24-62
APPRO			CHECK		

SHEET 1 OF 1 | 723935

899 2 ORIG B- FIELD 7 3 4 8 7
900 1 (404) RESULTANT B-FIELD b b b e b
904 A

	SIGNAL NAME		FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2		B-REGISTER LATCHES	—		35.XX.XX.2
3		A-REGISTER LATCHES	—		35.XX.XX.2
4	+U	CLEAR OPERATION	01B1		35.26.11.2
5	-T	GATED WORD MARK	01B2		31.07.11.2
6	-T	I-E CHANGE	01B2		31.05.31.2
7	+U	DELTA T-CYCLE	01B2		31.21.11.2
8	-T	I-CYCLE	01B2		31.24.11.2
9	+U	T-STAR RESTORE GATE	01A7		32.39.11.2
10	-T	DELTA B-CYCLE	01B2		31.23.11.2
11	+U	B-CYCLE	01B2		31.26.11.2
12	-T	B-REG ZONE INHIBIT	01A3		35.18.21.2
13	-T	B-REG DIGIT INHIBIT	01A3		35.18.31.2
14	-T	FIRST ROW	01A3		35.15.11.2
15	-T	B-REG WM INHIBIT	01A3		35.18.21.2
16	+U	A-CYCLE ELIM	01B2		31.06.11.2
17	+U	UNITS BORROW-CARRY	01A8		32.42.31.2
18	+U	TENS BORROW-CARRY	01A8		32.42.31.2
19	+U	MODIFIER CONTROL + 1	01A8		32.42.11.2
20	+U	MODIFIER CONTROL + 1	01A8		32.42.11.2
21	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
22		MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
23		DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113430 B	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 11 CLEAR OP / (AAA)

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-12-62
APPRD			CHECK		

SHEET 1 OF 1 | 723936

899 S ORIG A-FIELD B RESULTANT A-FIELD B
900 ⊕ (409) (509) ORIG B-FIELD B RESULTANT B-FIELD B
907 A

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	——		32.XX.XX.2
2		B-REGISTER LATCHES	——		35.XX.XX.2
3		A-REGISTER LATCHES	——		35.XX.XX.2
4	+U	WORD MARK CLEAR	0181		35.24.11.2
5	-T	GATED WORD MARK	0182		31.07.11.2
6	-T	I-E CHANGE	0182		31.05.31.2
7	+U	DELTA I-CYCLE	0182		31.21.11.2
8	-T	I-CYCLE	0182		31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	DELTA A-CYCLE	0182		31.22.11.2
11	-T	A-CYCLE	0182		31.25.11.2
12	-T	DELTA B-CYCLE	0182		31.23.11.2
13	+U	B-CYCLE	0182		31.26.11.2
14	+U	B-REG TRANSFER DIGIT AND ZONE	01A3		35.18.11.2
15	+U	I CHAR I-E CHANGE	0182		31.05.11.2
16	-T	B-REG ZONE INHIBIT	01A3		35.18.21.2
17	-T	B-REG DIGIT INHIBIT	01A3		35.18.31.2
18	-T	B-REG WM INHIBIT	01A3		35.18.21.2
19	+U	MODIFIER CONTROL -1	01A8		32.42.11.2
20	+U	MODIFIER CONTROL +1	01A8		32.42.11.2
21	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
22		MODIFIER OUTPUT ON BUS LINES	——		32.43.XX.2
23		DATA ON INHIBIT DRIVE LINES	——		——

DATE	CHANGE NO.	DATE	CHANGE NO.
7-10-62	[illegible] D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 12 WORD MARK CLEAR

(AAA) (BBB)

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 11-11-62
APPRO			CHECK	

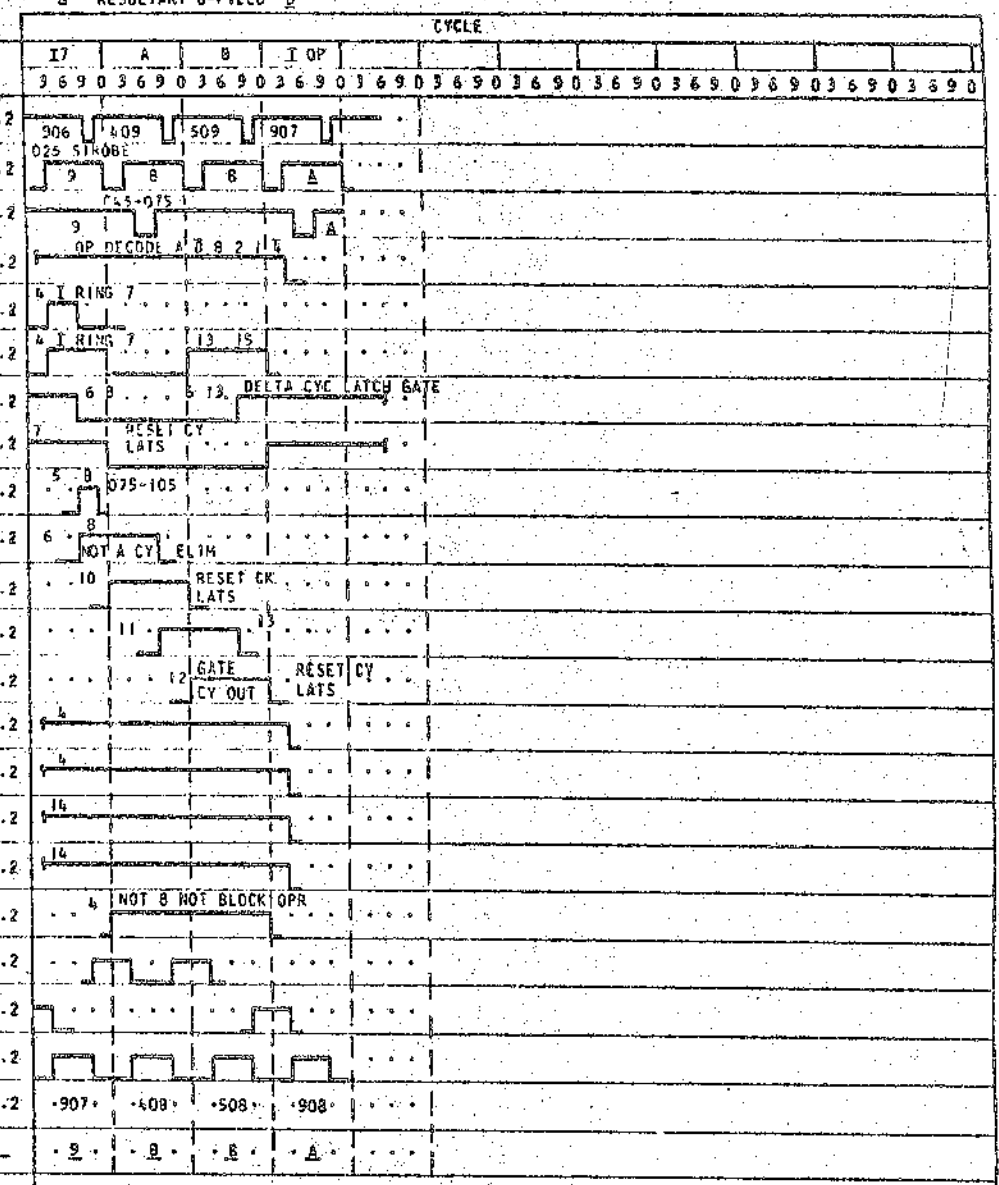
SHEET 1 OF 1 | 723937

899 S
900 ± [409] [509]
907 A

ORIG A-FIELD DATA
ORIG B-FIELD DATA

B RESULTANT A-FIELD B
B RESULTANT B-FIELD B

	SIGNAL NAME	FRAME GATE CW	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2	B-REGISTER LATCHES	—		35.XX.XX.2
3	A-REGISTER LATCHES	—		35.XX.XX.2
4	+U WORD MARK SET	01B1		35.26.11.2
5	-T GATED WORD MARK	01B2		31.07.11.2
6	-T I-E CHANGE	01B2		31.05.31.2
7	+U DELTA I-CYCLE	01B2		31.21.11.2
8	-T T-CYCLE	01B2		31.24.11.2
9	+U I-STAR RESTORE GATE	01A7		32.39.11.2
10	+U DELTA A-CYCLE	01B2		31.22.11.2
11	-T A-CYCLE	01B2		31.25.11.2
12	-T DELTA B-CYCLE	01B2		31.23.11.2
13	+U B-CYCLE	01B2		31.26.11.2
14	+U B-REG TRANSFER DIGIT AND ZONE	01A3		35.18.11.2
15	+U I CHAR I-E CHANGE	01B2		31.05.11.2
16	-T B-REG ZONE INHIBIT	01A3		35.18.21.2
17	-T B-REG DIGIT INHIBIT	01A3		35.18.31.2
18	+U INHIBIT DRIVE WORD MARK	01A3		35.14.51.2
19	+U MODIFIER CONTROL + 1	01A3		32.42.11.2
20	+U MODIFIER CONTROL + 1	01A8		32.42.11.2
21	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
22	MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
23	DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	1155500	8-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 13 WORD MARK SET
(AAA) (88B)

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-24-62
APPRO			CHECK		

SHEET 1 OF 1 | 723938

899 A
900 C [458] [378]
907 S

ORIG A-FIELD AB2
ORIG B-FIELD B9 7

C6 3
CAB3 3

RESULTANT B-FIELD (SAME AS ORIG)

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	——		32.XX.XX.2
2		B-REGISTER LATCHES	——		35.XX.XX.2
3		A-REGISTER LATCHES	——		35.XX.XX.2
4	+U	COMPARE OPERATION	01B1		35.24.11.2
5	-T	GATED WORD MARK	01B2		31.07.11.2
6	-T	T-E CHANGE	01B2		31.05.31.2
7	+U	DELTA T-CYCLE	01B2		31.21.11.2
8	-T	T-CYCLE	01B2		31.24.11.2
9	+U	T-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	DELTA A-CYC E	01B2		31.22.11.2
11	-T	A-CYCLE	01B2		31.25.11.2
12	-T	DELTA B-CYCLE	01B2		31.23.11.2
13	+U	B-CYCLE	01B2		31.26.11.2
14	-T	B-REG ZONE INHIBIT	01A3		35.18.21.2
15	-T	B-REG DIGIT INHIBIT	01A3		35.18.31.2
16	-T	B-REG C-BIT INHIBIT	01A3		35.18.21.2
17	-T	B-REG WM INHIBIT	01A3		35.18.21.2
18	+U	TRANSFER B-REG	01A3		35.18.11.2
19	+U	T-E CONTROL 1	01B2		31.05.21.2
20	+U	(COMPARE) EQUAL LATCH	01B6		34.21.21.2
21	-T	EQUAL CHAR	01B6		34.21.11.2
22	+U	UNEQUAL CHAR	01B6		34.21.21.2
23	-T	(COMPARE) UNEQUAL LATCH	01B6		34.21.21.2
24	+U	A-REG WM LATCH	01B2		31.06.11.2
25	U	MODIFIER CONTROL - 1	01A8		32.42.11.2
26	+U	MODIFIER CONTROL + 1	01A8		32.42.11.2
27	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
28		MODIFIER OUTPUT ON BUS LINES	——		32.43.XX.2
29		DATA ON INHIBIT DRIVE LINES	——		——

CYCLE: I7 | A | B | A | B | A | B | T OP

907 | 458 | 378 | 457 | 377 | 456 | 376 | 907

S | 3 | 3 | C6 | CAB 3 | AB 2 | 7 | S

3 | C6 | AB2

OP DECODE A B 2 1 B 4

B-WM | B-WM

S 8 NO EXE ELIM | 13.19 | 24

-6 8 | 8 13 DELTA CYC LATCH GATE

7 RESET CYCLE LATCHES

5 8 NOT ALTER

6-8 NO A-CYC ELIM RESET DELTA B | 075

10 | RESET CYCLE LATCHES

11 075-105 | 075 13 | 6 13

12 GATE CY OUT | RESET CY LATS

18

18

18

18

4 | 8

4

4 T RING 2 | 4 13 22 B-CYCLE 060-000

COMPARE A-REG = B-REG

NOT 21

4 13 22

5, 11 | 8

457 | 377 | 456 | 376 | 455 | 375 | 908

3 | 3 | C6 | CAB 3 | AB 2 | 7

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	1178300 D	31 7 62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

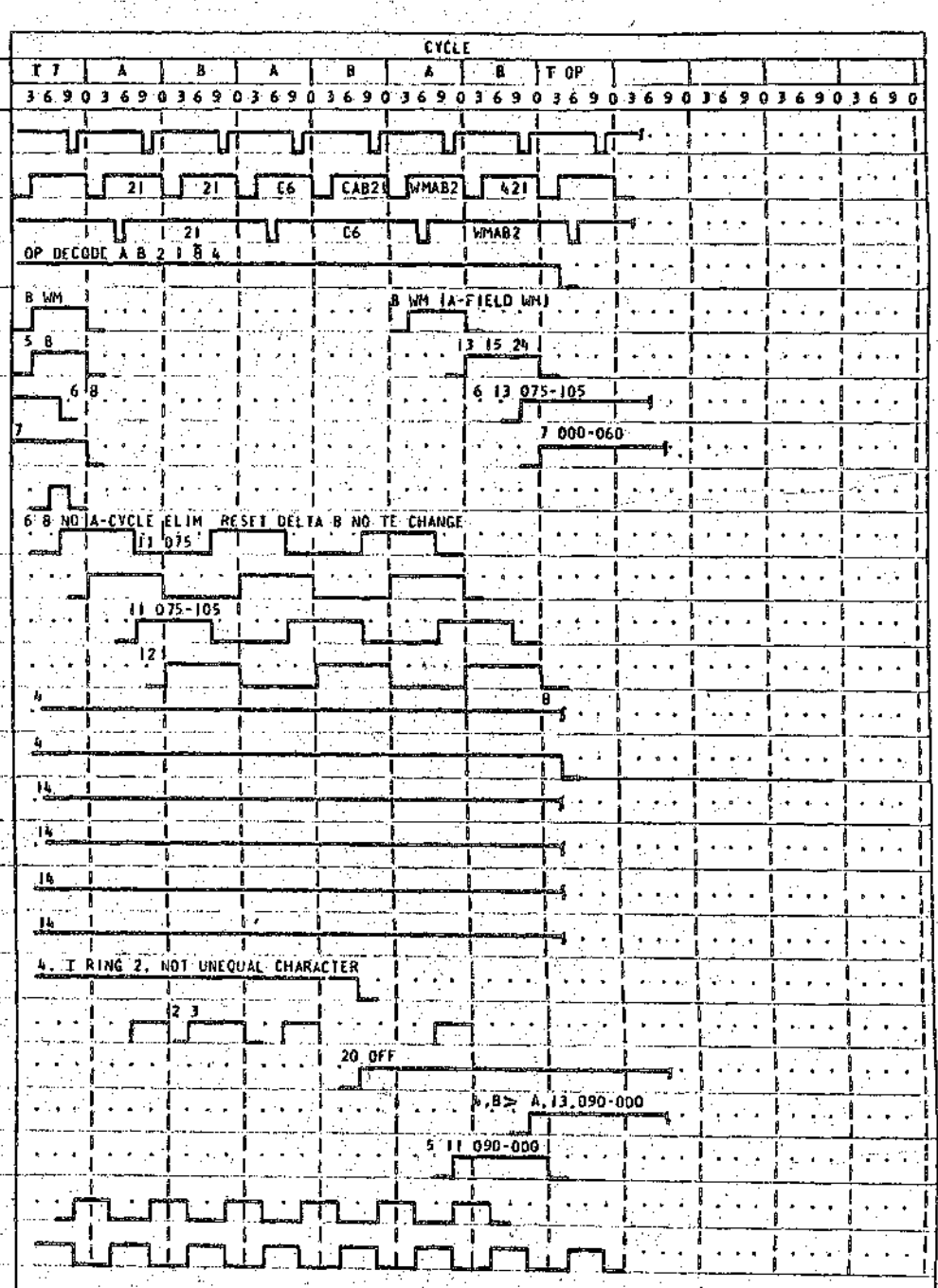
NAME: FIGURE 14 COMPARE C (AAA) (BBB)

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 1-10-62
APPVD			CHECK	

SHEET 1 OF 1 | 723939

ORIGINAL A FIELD "B63" WM AB2 C42 21
OR
ORIGINAL B FIELD "7C3" WM 421 CAB21 21

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.35.XX 32.36.XX
2	B-REGISTER	—		35.11.XX
3	A-REGISTER	—		35.16.XX
4	+U COMPARE OPERATION	01B1		35.24.11
5	-T GATED WORD MARK	01B2		31.07.11
6	-T I/E CHANGE	01B2		31.05.31
7	+U DELTA T CYCLE	01B2		31.21.11
8	-T T CYCLE	01B2		31.24.11
9	+U T STAR RESTORE	01A8		32.39.11
10	-T DELTA A CYCLE	01B2		31.22.11
11	-T A CYCLE	01B2		31.25.11
12	-T DELTA B CYCLE	01B2		31.23.11
13	+U B CYCLE	01B2		31.26.11
14	+U TRANSFER B REGISTER	01A3		35.18.11
15	+U I/E CONTROL 1	01B2		31.05.21
16	-T B REG ZONE INHIBIT	01B4		36.13.21
17	-T B REG DIGIT INHIBIT	01B4		36.13.21
18	-T B REG C BIT INHIBIT	01A3		35.18.21
19	-T B REG WM INHIBIT	01A3		35.40.21
20	+U COMPARE EQ LATCH OUTPUT	01B6		34.21.21
21	-T EQUAL CHARACTER	01B6		34.21.11
22	-T COMPARE UNEQUAL LAT OUTPUT	01B6		34.21.21
23	+U HIGH LATCH	02A6		44.34.21
24	+U A REG WM LATCH	01B2		37.06.11
25	-T MODIFIER CONTROL - 1	01A8		32.42.21
26	-T MODIFIER CONTROL TRANSFER	01A8		32.42.41



4. I RING 2, NOT UNEQUAL CHARACTER

DATE	CHANGE NO.	DATE	CHANGE NO.
1-10-62	113439 Q	31.7.62	PA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

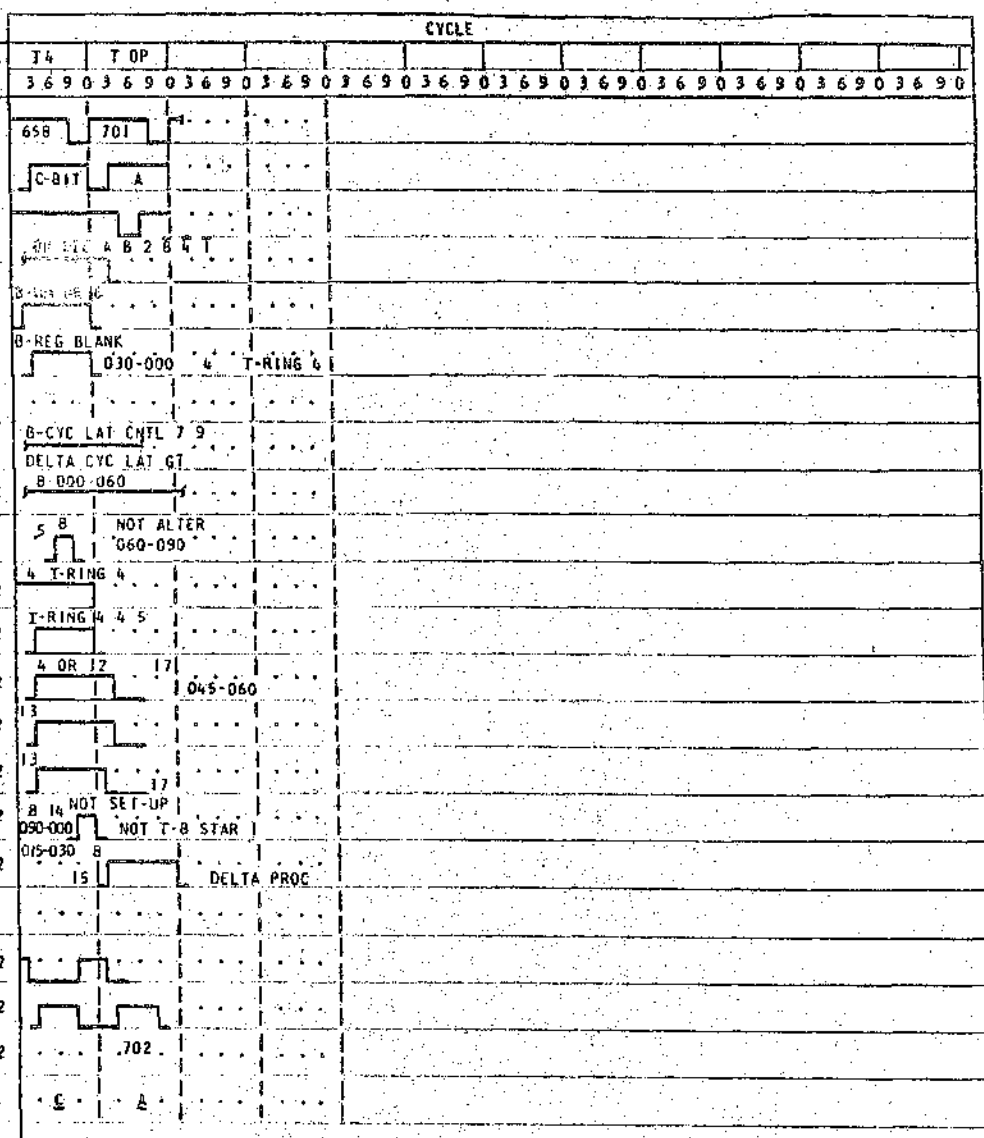
NAME FIGURE IS HIGH OR EQUAL
COMPARE SEQUENCE C (AAA) (BBB)

DESIGN			TYPE		
DETAIL			SCALE	NAME	
CHECK			DRAW	VE	1-12-62
APPRO			CHECK		

SHEET 1 OF 1 | 723940

653 A JOI A
654 B (701)
658 BLANK

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2		B-REGISTER LATCHES	—		35.XX.XX.2
3		A-REGISTER LATCHES	—		35.XX.XX.2
4	-T	BRANCH OPR	01B1		35.26.11.2
5	-T	GATED WORD MARK	01B2		31.07.11.2
6	+U	UNCOND TRANSFER	01B2		31.08.11.2
7					
8	+U	DELTA T-CYCLE LATCH	01B2		31.21.11.2
9	-T	T-CYCLE LATCH	01B2		31.24.11.2
10	+U	T-STAR RESTORE GATE	01A7		32.39.11.2
11	+U	EXECUTE ELIMINATE	01B2		31.05.11.2
12	+U	TRANSFER PROGRAM SKIP	01B6		34.21.41.2
13	-T	PROGRAM SKIP LATCH	01B2		31.08.11.2
14	+U	T-A STAR GATE	01B2		31.08.11.2
15	+U	SET TO T-RING OP	01B2		31.30.11.2
16	-T	A-STAR GATE OUT	01A7		32.32.21.2
17	-T	T-RING OP TRG	01B2		31.31.31.2
18					
19	+U	MODIFIER CONTROL +1	01AB		32.42.11.2
20	-T	MODIFIER CONTROL XFER	01AB		32.42.41.2
21		MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
22		DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113439 D	8-7-62	[illegible] 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 16 BRANCH B (III).
UNCONDITIONAL BRANCH

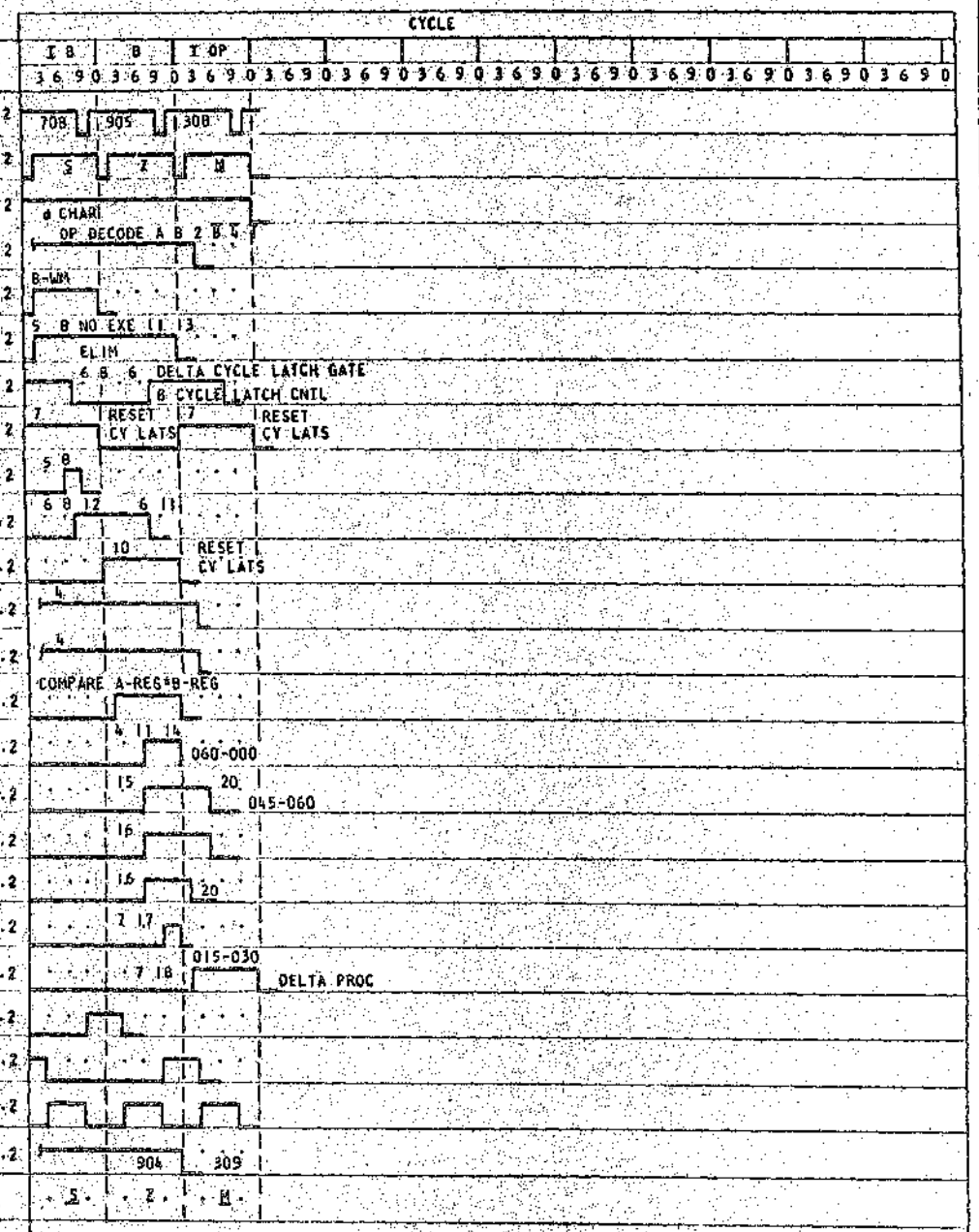
DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DRAW	VE 7-11-62
APPRO		CHECK	

SHEET 1 OF 1 | 723942

699 A
700 B (308) (905) d
708 S

ORIG B-FIELD DATA Z = 1 BRANCH ON OVERFLOW
ORIG A-FIELD DATA M

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	——		32.XX.XX.2
2	B-REGISTER LATCHES	——		35.XX.XX.2
3	A-REGISTER LATCHES	——		35.XX.XX.2
4	-T BRANCH OPR	01B1		35.26.11.2
5	-T GATED WORD MARK	01B2		31.07.11.2
6	-T I-E CHANGE	01B2		31.05.31.2
7	+U DELTA I-CYCLE	01B2		31.21.11.2
8	-T T-CYCLE	01B2		31.24.11.2
9	+U I-STAR RESTORE GATE	01A7		32.39.11.2
10	-T DELTA B-CYCLE	01B2		31.23.11.2
11	+U B-CYCLE	01B2		31.26.11.2
12	+U A-CYCLE ELIM	01B2		31.06.11.2
13	+U 1 CHAR I-E CHANGE	01B2		31.05.11.2
14	-T EQUAL CHARACTER	01B6		34.21.11.2
15	+U TRANSFER PROG SKIP	01B6		34.21.41.2
16	-T PROGRAM SKIP LATCH	01B2		31.08.11.2
17	+U I-A STAR GATE	01B2		31.08.11.2
18	+U SET TO I-RING OP	01B2		31.30.11.2
19	-T A-STAR GATE OUT	01A7		32.32.21.2
20	-T I-RING OP TRG	01B2		31.31.31.2
21	+U MODIFIER CONTROL + 1	01A8		32.42.11.2
22	+U MODIFIER CONTROL + 1	01A8		32.42.11.2
23	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
24	MODIFIER OUTPUT ON BUS LINES	——		32.43.XX.2
25	DATA ON INHIBIT DRIVE LINES	——		——



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113330 D	81.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIG 1B TEST CHAR AND BRANCH B (11B) (888) d (ANY ONE OF NINE CHARACTERS)

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-18-63
APPRO			CHECK		

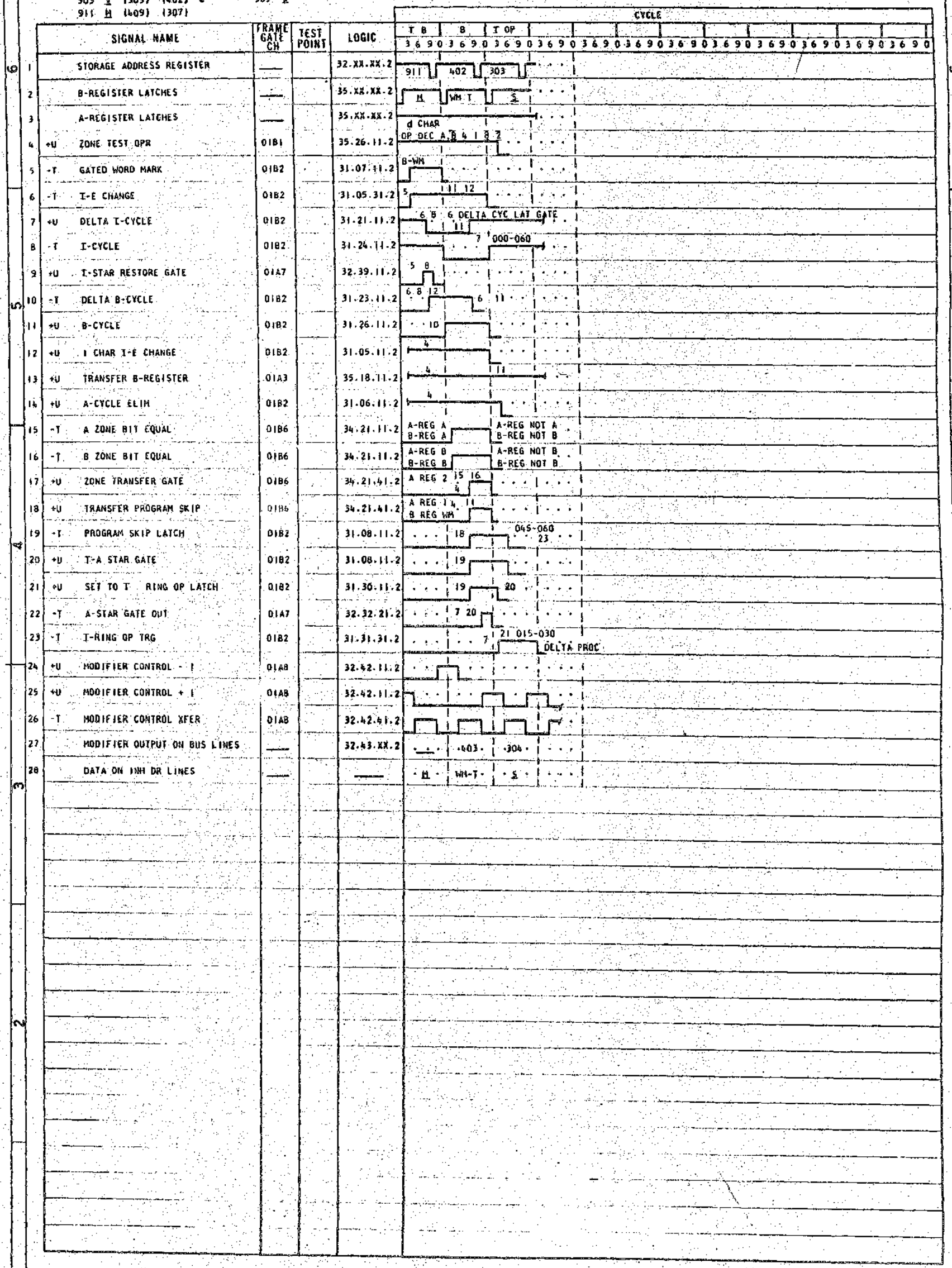
SHEET 1 OF 1 | 723943

902 S
903 V (303) (402) C
911 H (409) (307)

402 T (WM-C-A-2-1)
303 S

TEST BOTH ZONE AND WM AND BRANCH

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	——		32.XX.XX.2
2		B-REGISTER LATCHES	——		35.XX.XX.2
3		A-REGISTER LATCHES	——		35.XX.XX.2
4	+U	ZONE TEST OPR	01B1		35.26.11.2
5	-T	GATED WORD MARK	01B2		31.07.11.2
6	-T	I-E CHANGE	01B2		31.05.31.2
7	+U	DELTA I-CYCLE	01B2		31.21.11.2
8	-T	I-CYCLE	01B2		31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7		32.39.11.2
10	-T	DELTA B-CYCLE	01B2		31.23.11.2
11	+U	B-CYCLE	01B2		31.26.11.2
12	+U	I CHAR I-E CHANGE	01B2		31.05.11.2
13	+U	TRANSFER B-REGISTER	01A3		35.18.11.2
14	+U	A-CYCLE ELIM	01B2		31.06.11.2
15	-T	A ZONE BIT EQUAL	01B6		34.21.11.2
16	-T	B ZONE BIT EQUAL	01B6		34.21.11.2
17	+U	ZONE TRANSFER GATE	01B6		34.21.41.2
18	+U	TRANSFER PROGRAM SKIP	01B6		34.21.41.2
19	-T	PROGRAM SKIP LATCH	01B2		31.08.11.2
20	+U	T-A STAR GATE	01B2		31.08.11.2
21	+U	SET TO T RING OP LATCH	01B2		31.30.11.2
22	-T	A-STAR GATE OUT	01A7		32.32.21.2
23	-T	T-RING OP TRG	01B2		31.31.31.2
24	+U	MODIFIER CONTROL - I	01A8		32.42.11.2
25	+U	MODIFIER CONTROL + I	01A8		32.42.11.2
26	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
27		MODIFIER OUTPUT ON BUS LINES	——		32.43.XX.2
28		DATA ON INH DR LINES	——		——



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113130	8-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

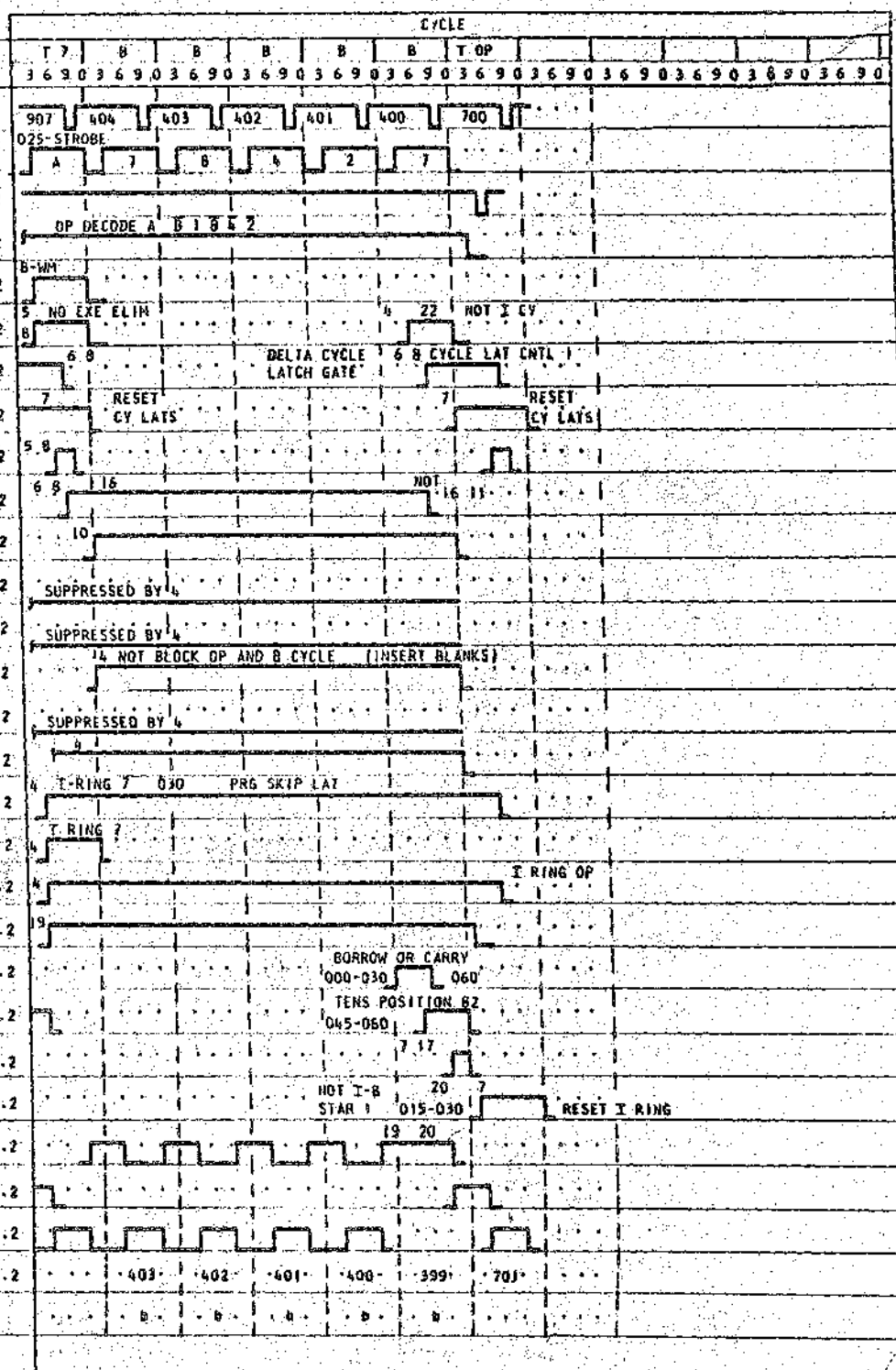
NAME: FIG 19 TEST ZONE OR WORD MARK OR BOTH & BRANCH V (WM) (BBB) J

DESIGN | TYPE
DETAIL | SCALE | DONE
CHECK | DRAW | VE | 1-15-63
APPD | DATE

SHEET 1 OF 1 | 723944

899 2 ORIG B-FIELD 1 2 4 8 7
900 1 (700)(404) RESULTANT B-FIELD 0 0 0 0 0
907 A

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2	B-REGISTER LATCHES	—		35.XX.XX.2
3	A-REGISTER LATCHES	—		35.XX.XX.2
4	+U CLEAR OPERATION	01B1		35.26.11.2
5	-T GATED WORD MARK	01B2		31.07.11.2
6	-T T/E CHANGE	01B2		31.05.31.2
7	+U DELTA T-CYCLE	01B2		31.21.11.2
8	-T T-CYCLE	01B2		31.24.11.2
9	+U T-STAR RESTORE GATE	01A7		32.19.11.2
10	-T DELTA B-CYCLE	01B2		31.23.11.2
11	+U B-CYCLE	01B2		31.26.11.2
12	-T B-REG ZONE INHIBIT	01A3		35.18.21.2
13	-T B-REG DIGIT INHIBIT	01A3		35.18.31.2
14	-T FIRST ROW	01A3		35.15.11.2
15	-T B-REG WM INHIBIT	01A3		35.18.21.2
16	+U A-CYCLE ELIM	01B2		31.06.11.2
17	+U T-A STAR GATE	01B2		31.08.11.2
18	+U UNCOND TRANSFER	01B2		31.08.11.2
19	-T PROGRAM SKIP LATCH	01B2		31.08.11.2
20	+U SET TO T-RING OP	01B2		31.30.11.2
21	+U UNITS BORROW-CARRY	01A8		32.42.31.2
22	+U TENS BORROW-CARRY	01A8		32.42.31.2
23	-T A-STAR GATE OUT	01A7		32.32.21.2
24	+U T-RING OP TRG	01B6		31.31.31.2
25	+U MODIFIER CONTROL-1	01A8		32.42.11.2
26	+U MODIFIER CONTROL+1	01A8		32.42.11.2
27	-T MODIFIER CONTROL XFER	01A8		32.42.41.2
28	MODIFIER OUTPUT ON BUS LINES	—		32.42.XX.2
29	DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113139 D	31.7.32	1220 X

INTERNATIONAL BUSINESS MACHINES CORP

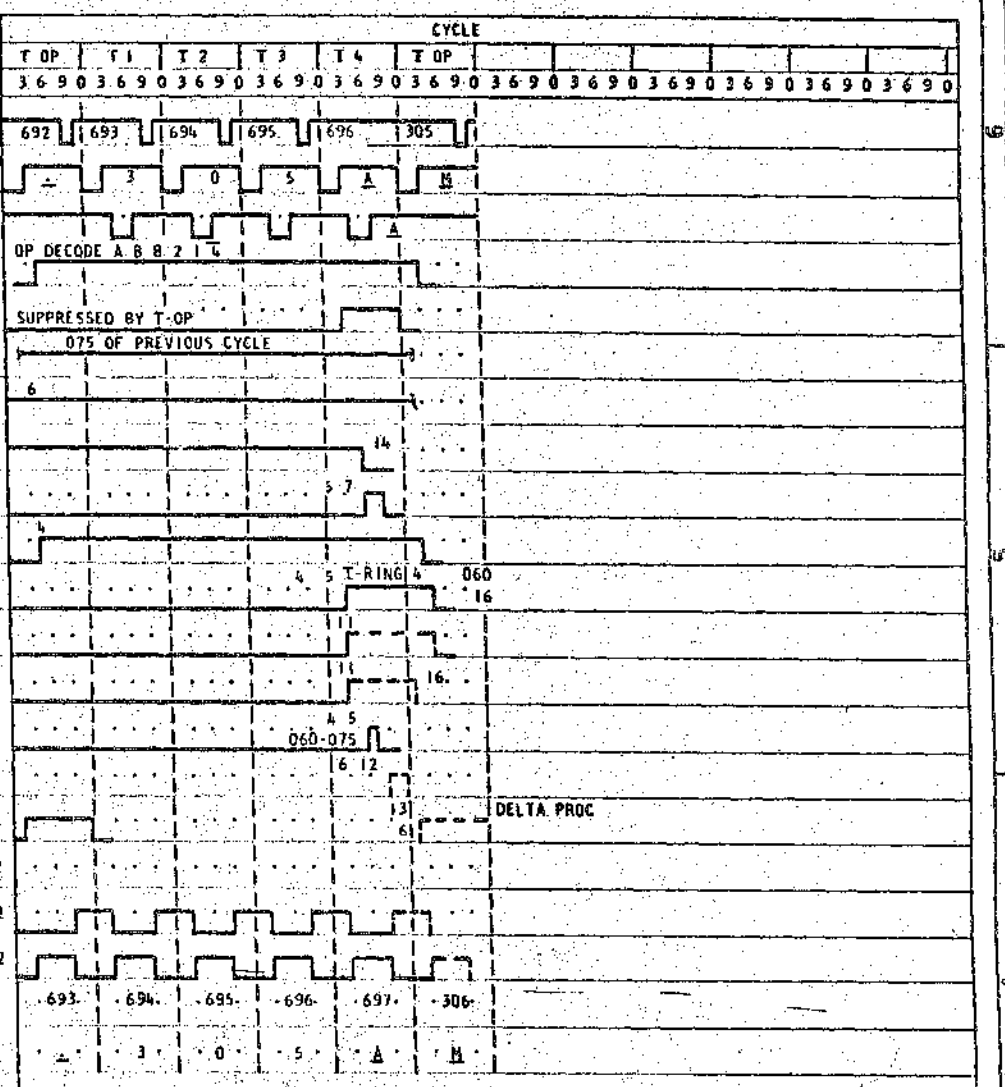
NAME FIG 20 CLEAR AND BRANCH (SLD.) 1886

DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DRAW	VE 7-24-62
APPRO		CHECK	

SHEET 1 OF 1 | 723945

691 S 305 M
692 _ (305)
696 A

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2		B-REGISTER LATCHES	—		35.XX.XX.2
3		A-REGISTER LATCHES	—		35.XX.XX.2
4	+U	STOP OPR	01B1		35.24.11.2
5	-T	GATED WORD MARK	01B2		31.07.11.2
6	+U	DELTA T-CYCLE LATCH	01B2		31.21.11.2
7	-T	T-CYCLE LATCH	01B2		31.24.11.2
8	+U	DELTA PROCESS LATCH	01B2		31.02.11.2
9	+U	T-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	EXECUTE ELIM	01B2		31.05.11.2
11	-T	PROGRAM SKIP LATCH	01B2		31.08.11.2
12	+U	I-A STAR GATE	01B2		31.08.11.2
13	+U	SET TO T-RING OP LATCH	01B2		31.30.11.2
14	+U	DELTA PROCESS RESET	01B2		31.02.31.2
15	-T	A-STAR GATE OUT	01A7		32.32.21.2
16	-T	T-RING OP TRG	0186		31.31.31.2
17	+U	MODIFIER CONTROL - 1	01A8		32.42.11.2
18	+U	MODIFIER CONTROL + 1	01A8		32.42.31.2
19	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
20		MODIFIER OUTPUT ON BUS LINES	—	—	
21		DATA ON INH DRIVE LINES	—	—	



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113830 B	31.7.62	TA 1370 K

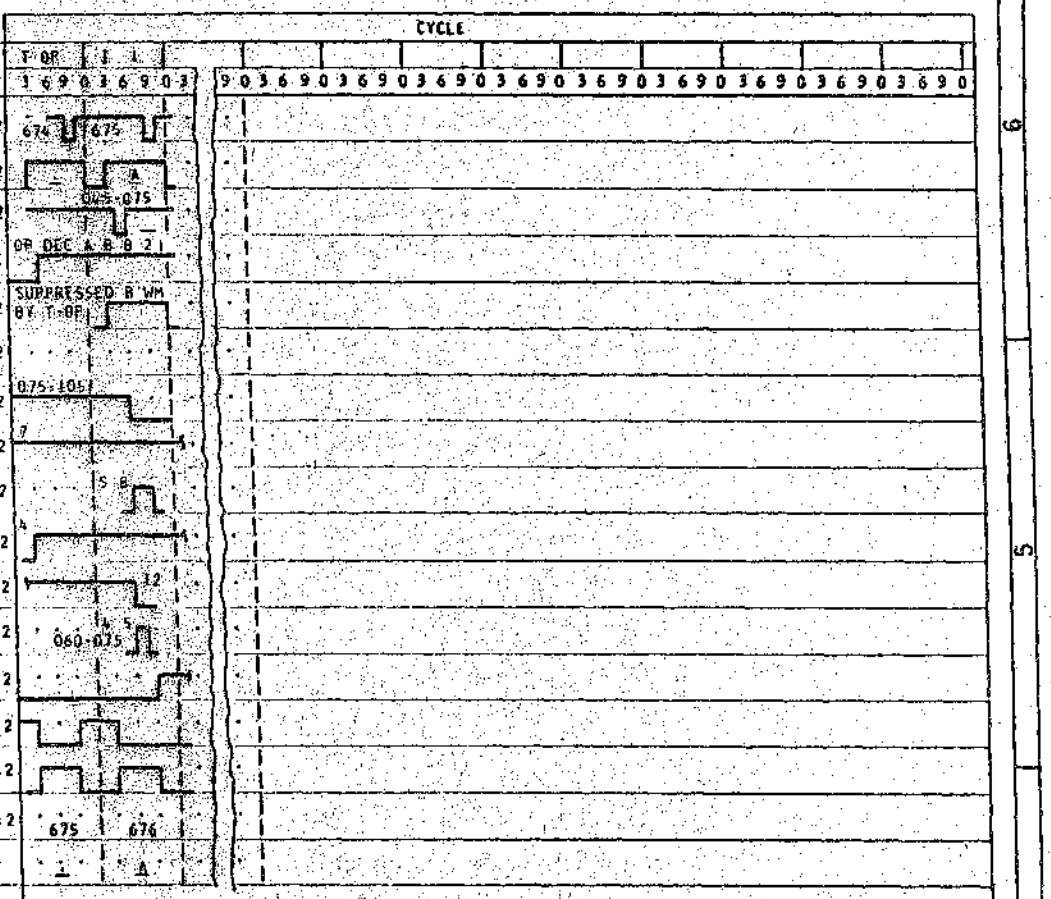
INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 21 STOP AND BRANCH

DESIGN | TYPE
DETAIL | SCALE NONE
CHECK | DRAW VE 4-12-62
APPROVED

673 9
674 ÷
675 A

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	——		32.XX.XX.2
2		B-REGISTER LATCHES	——		35.XX.XX.2
3		A-REGISTER LATCHES	——		35.XX.XX.2
4	+U	STOP OPR	0181		35.24.11.2
5	-T	GATED WORD MARK	0182		31.07.11.2
6	+U	UNCOND TRANSFER	0182		31.08.11.2
7	+U	DELTA T-CYCLE	0182		31.23.11.2
8	-T	T-CYCLE LATCH	0182		31.24.11.2
9	+U	T-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	EXECUTE ELIM	0182		31.05.11.2
11	+U	DELTA PROCESS LATCH	0182		31.02.11.2
12	+U	DELTA PROCESS RESET	0182		31.02.31.2
13	+U	MODIFIER CONTROL - 1	01A8		32.42.11.2
14	+U	MODIFIER CONTROL + 1	01A8		32.42.11.2
15	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
16		MODIFIER OUTPUT ON BUS LINES	——		32.43.XX.2
17		DATA OR INHIBIT DRIVE LINES	——		——



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-63	113886	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

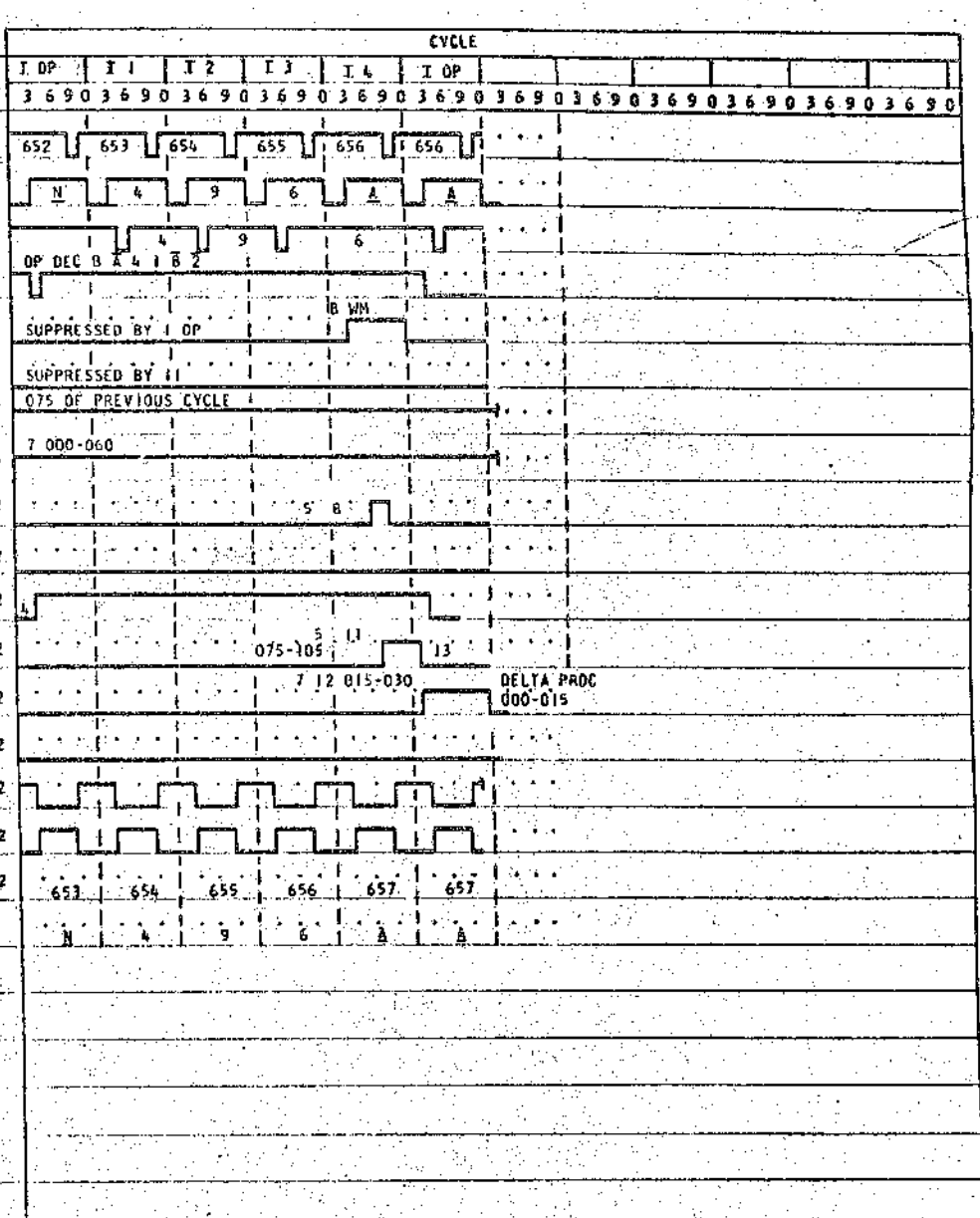
NAME FIGURE 22 STOP (.)

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-11-62
APPRO			CHECK		

SHEET 1 OF 1 | 723947

651 S
652 N (496)
656 A

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.XX.XX.2
2		B-REGISTER LATCHES	—		35.XX.XX.2
3		A-REGISTER LATCHES	—		35.XX.XX.2
4	+U	NO-OP OPR	0181		35.25.11.2
5	-T	GATED WORD MARK	0182		31.07.11.2
6	-T	T-E CHANGE	0182		31.05.31.2
7	+U	DELTA I-CYCLE	0182		31.21.11.2
8	-T	I-CYCLE LATCH	0182		31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7		32.39.11.2
10	+U	UNCOND TRANSFER	0182		31.08.11.2
11	+U	EXECUTE ELIMINATE	0182		31.05.11.2
12	+U	SET TO T-RING OP LATCH	0182		31.30.11.2
13	-T	I-RING OP TRG	0182		31.31.31.2
14	+U	MODIFIER CONTROL - 1	01A8		32.42.11.2
15	+U	MODIFIER CONTROL + 1	01A8		32.42.11.2
16	-T	MODIFIER CONTROL XFER	01A8		32.42.41.2
17		MODIFIER OUTPUT ON BUS LINES	—		32.43.XX.2
18		DATA ON INHIBIT DRIVE LINES	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113330	5-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 23 NO-OP (N)

DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DRAW	VE 1-12-62
APPRO		CHECK	

A-FIELD 000504 501 E 410 510 RESULTANT A-FIELD
B-FIELD $b,bbb.bb- 608 L 710 510 RESULTANT B-FIELD
615 8 601

(AFTER EDIT) 000504 RESULTANT B-FIELD
$0,005.04- (AFTER ZERO SUPP) $bbbb.b[illegible]

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
				32.35.XX
				32.36.XX
1	STORAGE ADDRESS REGISTER	—	—	
2	B-REGISTER	—	—	35.11.XX
3	A-REGISTER	—	—	35.16.XX
4	+U EDIT	01B1	J21A	35.24.11
5	-T GATED WM	01B2	C25B	31.07.11
6	-T I-E CHANGE	01B2	J13H	31.05.31
7	+U DELTA I-CYCLE	01B2	E07N	31.21.11
8	-T I-CYCLE LATCH	01B2	E19N	31.24.11
9	+U I-STAR RESTORE	01A8	J17H	32.39.11
10	+U DELTA A-CYCLE LATCH	01B2	E09N	31.22.11
11	-T A-CYCLE LATCH	01B2	B20N	31.25.11
12	-T DELTA B-CYCLE LATCH	01B2	E09E	31.23.11
13	+U B-CYCLE LATCH	01B2	E24H	31.26.11
14	-T B-REG ZONE INHIBIT	01A3	D18C	35.18.21
15	-T B-REG DIGIT INHIBIT	01A3	D16A	35.18.31
16	-T B-REG C-BIT INHIBIT	01A3	C11H	35.18.21
17	-T B REG WM INHIBIT	01A3	C19C	35.18.21
18	-T A-REG DIGIT INHIBIT	01A3	J11G	35.18.41
19	-T A-REG ZONE INHIBIT	01A3	F20N	35.18.41
20	+U INHIBIT C-ZONE	01A3	E14A	35.16.11
21	+U OTHER EDIT	01A3	C16N	35.10.31
22	+U EDIT A-DIGIT	01B6	D25C	34.10.31
23	+U EDIT A-ZONE	01B6	D25G	34.10.31
24	-T NOT A-CYCLE ELIM	01B2	D18C	31.06.11
25	-T EDIT 1ST A CYCLE	01B6	D15N	34.10.41
26	-T BODY TRIGGER	01B6	J21N	34.10.41
27	+U SET WM LATCH	01B6	D06A	34.10.51
28	-T EDIT WM SET	01B6	D22P	34.10.51
29	-T ZERO SUPPRESS LATCH	01B6	D22C	34.10.51
30	-T A-FIELD WM LATCH	01A3	C10G	35.14.51
31	+U 1ST EDIT READDRESS	01B6	E14H	34.10.61
32	-T NOT READDRESS	01B2	C09P	31.04.11
33	-T REV SCAN TRIGGER	01B2	F02H	31.04.11
34	+U CYCLE CONTROL REV SCAN	01B2	C08A	31.04.11
35	-T REV SCAN DELAY	01B6	D22A	34.10.51
36	+U EDIT REGEN C-BIT	01B6	E16N	34.10.61
37	+U MZS OR E-IE CHANGE	01B6	E15H	34.10.61
38	+U MODIFIER CONTROL -1	01A8	C04G	32.42.11
39	+U MODIFIER CONTROL +1	01A8	C04H	32.42.11
40	-T MODIFIER CONTROL XFER	01A8	C01E	32.42.41
41	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX
42	DATA ON INHIBIT DRIVE LINES	—	—	—
43	(BEFORE ZERO B-FIELD AFTER EDIT SUPPRESSION)	—	—	—
44	B-FIELD AFTER ZERO SUPPRESSION	—	—	—

CYCLE CYCLE

I 7 A S B D B A B B A S A B A B B B B READR B B B B B I OP

OP DECODE 14 8 9 A 8

8 WM

5 8 NO EXE ELIM

6 8

7

5 8

6 3 NOT A CYC ELIM

10

RESET DELTA A

12 24 24

21 MZS OR E EX

21 MZS OR E EX

21

22

23

25

NOT 27 OR NOT Jo

B REG BLANK 26 OR ZERO

B-REG BLANK 26 OR ZERO

4 NOT B-REG BLANK OR ZERO

B-REG BLANK (LOW ORDER BLANK IN CONTROL WORD)

000

B-FIELD ZERO 4 NOT 29 NOT 35

27

MZS OR E EX

28

NOT 25 4 13 29 B WM

31

37

33

34

NOT BLOCK OPR 36 & B-CYCLE

DECIMAL 35 ZERO OR COMMA

NOT DECIMAL NOT DOLLAR 35 13

6 13

6 13 DELTA CYC LAT GATE

UNITS BORROW

609/608 409 507 508 408 507 407 506 505 406 504 405 503 404 502 501 500 502 503 504 505 506 507 609

FORWARD SCAN REVERSE SCAN

E (AAA) (888)

FIGURE 24. EDIT OPERATION - ZERO SUPPRESS

SHEET 1 OF 2 | 723948

A-FIELD 000504 601 E 410 510 RESULTANT A-FIELD (AFTER EDIT) $0,005.04* RESULTANT B-FIELD (AFTER ZERO SUPP) $bbbb
B-FIELD $b,bb0.bb* 608 L 710 510 RESULTANT B-FIELD
615 B 601

	SIGNAL NAME	TRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.35.XX 32.36.XX
2	B-REGISTER	—		35.11.XX
3	A-REGISTER	—		35.16.XX
4	+U EDIT	01B1		35.24.11
5	+T GATED WM	01B2		31.07.11
6	-T I-E CHANGE	01B2		31.05.31
7	+U DELTA I-CYCLE	01B2		31.21.11
8	-T I-CYCLE LATCH	01B2		31.24.11
9	+U I-STAR RESTORE	01A8		32.39.11
10	+U DELTA A-CYCLE LATCH	01B2		31.22.11
11	-T A-CYCLE LATCH	01B2		31.25.11
12	-T DELTA B-CYCLE LATCH	01B2		31.23.11
13	+U B-CYCLE LATCH	01B2		31.26.11
14	-T B-REG ZONE INHIBIT	01A3		35.18.31
15	-T B-REG DIGIT INHIBIT	01A3		35.18.31
16	-T B-REG C-BIT INHIBIT	01A3		35.18.21
17	-T B REG WM INHIBIT	01A3		35.18.21
18	-T A-REG DIGIT INHIBIT	01A3		35.18.41
19	-T A-REG ZONE INHIBIT	01A3		35.18.41
20	+U INHIBIT C-ZONE	01A3		35.15.11
21	+U OTHER EDIT	01A3		35.10.31
22	+U EDIT A-DIGIT	01B6		34.10.31
23	+U EDIT A-ZONE	01B6		34.10.31
24	-T NOT A-CYCLE ELIM	01B2		31.06.11
25	-T EDIT 1ST A CYCLE	01B6		34.10.41
26	-T BODY TRIGGER	01B6		34.10.41
27	+U SET WM LATCH	01B6		34.10.51
28	-T EDIT WM SET	01B6		34.10.51
29	-T ZERO SUPPRESS LATCH	01B6		34.10.51
30	-T A-FIELD WM LATCH	01A3		35.14.51
31	+U 1ST EDIT READDRESS	01B6		34.10.61
32	-T NOT READDRESS	01B7		31.04.11
33	-T REV SCAN TRIGGER	01B2		31.04.11
34	+U CYCLE CONTROL REV SCAN	01B2		31.04.11
35	-T REV SCAN DLLAY	01B6		34.10.51
36	+U EDIT REGEN C-BIT	01B6		34.10.61
37	+U MZS OR E-TE CHANGE	01B6		34.10.61
38	+U MODIFIER CONTROL - 1	01A8		32.42.11
39	+U MODIFIER CONTROL + 1	01A8		32.42.11
40	-T MODIFIER CONTROL XFER	01A8		32.42.41
41	MODIFIER OUTPUT ON BUS LINES	—		32.43.XX
42	DATA ON INHIBIT DRIVE LINES	—		
43	B-FIELD AFTER EDIT (BEFORE ZERO SUPPRESSION)	—		
44	B-FIELD AFTER ZERO SUPPRESSION	—		

CYCLE: 17 A B B A B B A
3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

608 410 510 509 409 508 408 507 506 407 505 406

OP DECODE 14 8 2 A B
B WM
5 B NO EXE ELIM
6 B
7
5 B
6 8 NOT A CYC ELIM
10
RESET DELTA A
1 2 24
21 MZS OR E EX
21 MZS OR E EX
21
22
23
25
NOT 22 OR NOT 36
B REG BLANK 26 OR ZERO
B REG BLANK 26 OR ZERO
4 NOT B REG BLANK OR ZERO
B REG BLANK (LOW ORDER BLANK IN CONTROL WORD) 000
B FIELD ZERO & NOT 29 NOT 35
127
MZS OR E EX 28
UNITS BORROW

609/608 409 509 508 408 507 407 506 505 406 504 405

FORWARD SCAN

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113130 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP
NAME FIGURE 24 EDIT OPERATION
ZERO SUPPRESS

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 3-26-62
APPRO			CHECK	

SHEET 2 OF 2 | 723948

A-FIELD 0 0 0 5 0 4 601 E 410 510 RESULTANT A-FIELD
B-FIELD $ b, bb 0 . b b * 608 L 710 510 RESULTANT B-FIELD
615 B 601

(AFTER EDIT) 0 0 0 5 0 4 $ 0 . 0 0 5 . 0 4 *

RESULTANT B-FIELD (AFTER ZERO SUPPR) $ bbbb

	SIGNAL NAME		FRAME GATE CH	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.35.XX 32.36.XX
2		B-REGISTER	—		35.11.XX
3		A-REGISTER	—		35.16.XX
4	+U	EDIT	0161		35.24.11
5	-T	GATED WM	0182		31.07.11
6	-T	T-E CHANGE	0182		31.05.31
7	+U	DELTA E-CYCLE	0182		31.21.11
8	-T	T-CYCLE LATCH	0182		31.24.11
10	+U	DELTA A-CYCLE LATCH	0182		31.22.11
11	-T	A-CYCLE LATCH	0182		31.25.11
12	-T	DELTA B-CYCLE LATCH	0182		31.23.11
13	+U	B-CYCLE LATCH	0182		31.26.11
14	-T	B-REG ZONE INHIBIT	01A3		35.18.21
15	-T	B-REG DIGIT INHIBIT	01A3		35.18.31
16	-T	B-REG C-BIT INHIBIT	01A3		35.18.21
17	-T	B REG WM INHIBIT	01A3		35.18.21
18	-T	A-REG DIGIT INHIBIT	01A3		35.18.41
19	-T	A-REG ZONE INHIBIT	01A3		35.18.41
20	+U	INHIBIT C-ZONE	01A3		35.15.11
21	+U	OTHER EDIT	01A3		35.10.31
22	+U	EDIT A-DIGIT	0186		34.10.31
23	+U	EDIT A ZONE	0186		34.10.31
24	-T	NOT A CYCLE ELIM	0182		31.06.11
26	-T	BODY TRIGGER	0186		34.10.41
29	-T	ZERO SUPPRESS LATCH	0186		34.10.51
30	-T	A-FIELD WM LATCH	01A3		35.14.51
31	+U	1ST EDIT READDRESS	0186		34.10.61
32	-T	NOT READDRESS	0182		31.04.11
33	-T	REV SCAN TRIGGER	0182		31.04.11
34	+U	CYCLE CONTROL REV SCAN	0182		31.04.11
35	-T	REV SCAN DELAY	0186		34.10.51
36	+U	EDIT REGEN C-BIT	0136		34.10.61
37	+U	MZS OR E-TE CHANGE	0186		34.10.61
38	+U	MODIFIER CONTROL + 1	01A8		32.42.11
39	+U	MODIFIER CONTROL + 1	01A8		32.42.11
40	-T	MODIFIER CONTROL XFER	01A8		32.42.41
41		MODIFIER OUTPUT ON BUS LINES	—		32.43.XX
42		DATA ON INHIBIT DRIVE LINES	—		
43		B-FIELD AFTER EDIT (BEFORE ZERO SUPPRESSION)	—		
44		B-FIELD AFTER ZERO SUPPRESSION	—		

CYCLE: B | A | B | B | B | B READR | B | B | B | B | B | I OP

NOT BLOCK OPR 36 AND B CYCLE

NOT 25 29 B WM

DECIMAL 35 ZERO OR COMMA

NOT DECIMAL

NOT 35 13 DOLLAR

B WM

13 DELTA CYC LAT GATE

FORWARD SCAN

REVERSE SCAN

E[AAA][BBB].

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113830 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

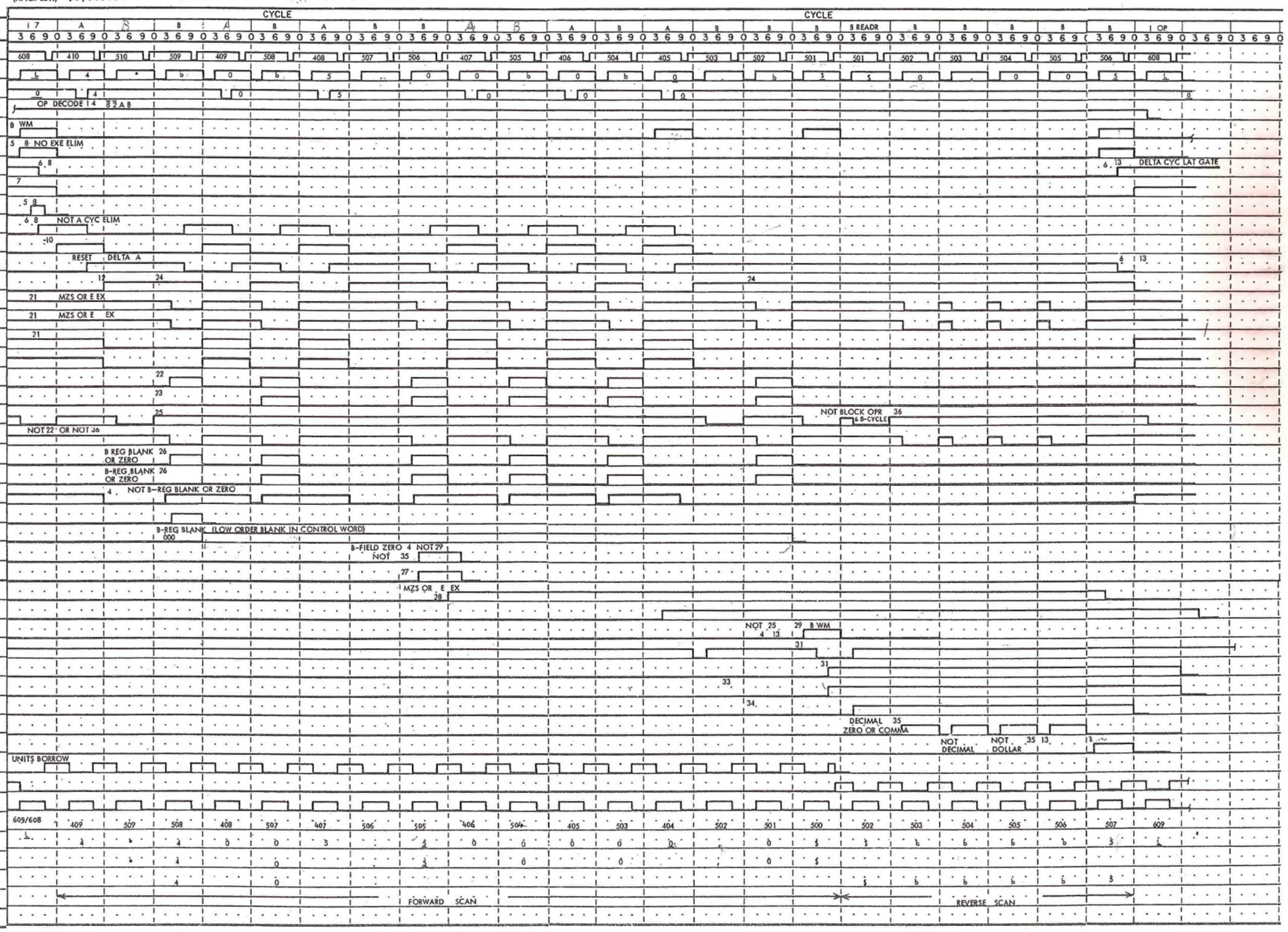
NAME FIGURE 24 EDIT OPERATION ZERO SUPPRESS

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	3-26-62
APPRO			CHECK		

A-FIELD 000504 601 E 410 510 RESULTANT A-FIELD
B-FIELD $b,b50.bb* 608 L 710 510 RESULTANT B-FIELD
615 8 601

(AFTER EDIT) 000504 $0,005.04* RESULTANT B-FIELD (AFTER ZERO SUPP) $bbbb.50H*

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX 32.36.XX
2		B-REGISTER	—	—	35.11.XX
3		A-REGISTER	—	—	35.16.XX
4	+U	EDIT	01B1	B21A	35.24.11
5	-T	GATED WM	01B2	C25B	31.07.11
6	-T	I-E CHANGE	01B2	B13H	31.05.31
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11
8	-T	I-CYCLE LATCH	01B2	E19N	31.24.11
9	+U	I-STAR RESTORE	01A8	B17H	32.39.11
10	+U	DELTA A-CYCLE LATCH	01B2	E09N	31.22.11
11	-T	A-CYCLE LATCH	01B2	B20H	31.25.11
12	-T	DELTA B-CYCLE LATCH	01B2	E09E	31.23.11
13	+U	B-CYCLE LATCH	01B2	E24H	31.26.11
14	-T	B-REG ZONE INHIBIT	01A3	D18C	35.18.21
15	-T	B-REG DIGIT INHIBIT	01A3	D16A	35.18.31
16	-T	B-REG C-BIT INHIBIT	01A3	C11H	35.18.21
17	-T	B REG WM INHBIT	01A3	C19C	35.18.21
18	-T	A-REG DIGIT INHIBIT	01A3	B11G	35.18.41
19	-T	A-REG ZONE INHIBIT	01A3	F20N	35.18.41
20	+U	INHIBIT C-ZONE	01A3	E14A	35.15.11
21	+U	OTHER EDIT	01A3	C16N	35.10.31
22	+U	EDIT A-DIGIT	01B6	D25C	34.10.31
23	+U	EDIT A-ZONE	01B6	D25G	34.10.31
24	-T	NOT A-CYCLE ELIM	01B2	D18C	31.06.11
25	-T	EDIT 1ST A CYCLE	01B6	D15N	34.10.41
26	-T	BODY TRIGGER	01B6	D21N	34.10.41
27	+U	SET WM LATCH	01B6	D06A	34.10.51
28	-T	EDIT WM SET	01B6	D22P	34.10.51
29	-T	ZERO SUPPRESS LATCH	01B6	D22C	34.10.51
30	-T	A-FIELD WM LATCH	01A3	C10G	35.14.51
31	+U	1ST EDIT READDRESS	01B6	E14H	34.10.61
32	-T	NOT READDRESS	01B2	C09P	31.04.11
33	-T	REV SCAN TRIGGER	01B2	F07N	31.04.11
34	+U	CYCLE CONTROL REV SCAN	01B2	C08A	31.04.11
35	-T	REV SCAN DELAY	01B6	D22A	34.10.51
36	+U	EDIT REGEN C-BIT	01B6	E16N	34.10.61
37	+U	MZS OR E-IE CHANGE	01B6	E15H	34.10.61
38	+U	MODIFIER CONTROL -1	01A8	C04G	32.42.11
39	+U	MODIFIER CONTROL +1	01A8	C04H	32.42.11
40	-T	MODIFIER CONTROL XFER	01A8	C01E	32.42.41
41		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX
42		DATA ON INHIBIT DRIVE LINES	—	—	—
43		(BEFORE ZERO B-FIELD AFTER EDIT SUPPRESSION)	—	—	—
44		B-FIELD AFTER ZERO SUPPRESSION	—	—	—


CYCLE
CYCLE
I 7 A A B A B A B

701 A (ATW) (4C2) A-TAG = VO = RESULTANT A-STAR = 63F
708 S —— —— AB-TAG = 106 B-STAR = 538

	SIGNAL NAME	FRAME GATE CH	LOGIC
1	STORAGE ADDRESS REGISTER	——	32 3X XX.2
2	B-REGISTER LATCHES	——	35 1X XX.2
3	A-REGISTER LATCHES	——	35 1X XX.2
4	-T A-TAG LATCH	0286	41 50.01.2
5	-T B-TAG LATCH	0286	41 50.01.2
6	-T PREVENT I-STAR RO	0286	41 50.11.2
7	+U NOT INDEX	0286	41 51 31.2
8	-T STORE CYCLE 1	0286	41 50.21.2
9	-T STORE CYCLE 2	0286	41.50.21.2
10	-T STORE CYCLE 3	0286	41.50.21.2
11	-T STORE CYCLE 4	0286	41.50.21.2
12	-T BLOCK I-RING	0286	41.51.31.2
13	-T INDEX 1	0286	41.51.61.2
14	-T GATED WORD MARK	0182	31.07 11.2
15	-T I-E CHANGE	0182	31.05.31.2
16	-T DELTA I-CYCLE LATCH	0182	31.21.11.2
17	-T I-CYCLE LATCH	0182	31.24 11.2
18	-T I-STAR GATE CUT	0147	32.34 21.2
19	+U INDEX ADDRESS GENERATOR	0286	31.50 41.2
20	+U TRANSFER B-REGISTER	0143	35 18 11.2

CYCLE: I OP | I1 | I2 | I3 | I3/1 X 1 | I3/1 X 2 | I3/1 X 3 | I3/1 X 4 | I4 | I5 | I6 | I6/1 X 1 | I6/1 X 2 | I6/1 X 3 | I7

DATE	CHANGE NO.
4-10-62	TA 1329 D
31-7-62	TA 1320 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME

FIGURE 25 INSTRUCTION CYCLE WITH INDEXING

DESIGN | DETAIL | CHECK | APPRO

TYPE | SCALE | NONE | DRAW | VE 3-28-62 | CHECK

SHEET 1 OF 2

723949

701 A (ATW) (4C2) A-TAG = V O = RESULTANT A-STAR = 63F
708 S — — AB-TAG = 106 B-STAR = 538

	SIGNAL NAME	FRAME GATE CH	LOGIC
21	+U STORE-INDEX A-REG RESET	0286	41.51.41.2
22	+U INDEX A-STAR GATE	0286	41.50.81.2
23	+U INDEX B-STAR GATE	0286	41.50.81.2
24	-T INDEX ARITHMETIC GATE	0286	41.51.21.2
25	+U INDEX ZONE ADDER GATE	0286	41.51.61.2
26	+U A-STAR RI UNITS	0286	41.50.51.2
27	+U A-STAR RI TENS	0286	41.50.51.2
28	+U A-STAR RI HUNDREDS	0286	41.50.51.2
29	+U B-STAR RI UNITS	0286	41.50.61.2
30	+U B-STAR RI TENS	0286	41.50.61.2
31	+U B-STAR RI HUNDREDS	0286	41.50.61.2
32	-T NOT INDEX BLOCK NU CARRY	0286	41.50.21.2
33	+U ZONE CARRY TRIGGER	0286	41.50.71.2
34	+U B-REG RESET INDEX	0286	41.50.71.2
35	-T B-REG SET A (FOR CARRY)	0286	41.50.71.2
36	+T PREVENT ACT STORAGE	0286	41.50.71.2
37	+U END INDEX OP	0286	41.50.01.2
38	-T MODIFIER CONTROL + 1	01A8	32.42.11.2
39	-T MODIFIER CONTROL XFER	01A8	32.42.41.2
40	MODIFIER OUTPUT ON BUS	—	32.43.XX.2
41	DATA ON INHIBIT DRIVE	—	35.1X.XX.2

CYCLE: OP | I1 | I2 | I3 | I3/1 X 1 | I3/1 X 2 | I3/1 X 3 | I3/1 X 4 | I4 | I5 | I6 | I6/1 X 1 | I6/1 X 2 | I6/1 X 3 | I7

ZONE ADD CARRY

NO CARRY CARRY

U-T CARRY NO CARRY

MODIFIER OUTPUT ON BUS: 702 703 704 705 909/0 089/3 088/6 08-/F 706 707 708 100/ 099/ 098/ 709

DATA ON INHIBIT DRIVE: WM AB1 AB1 A21 A42 A82 82 A41 A 4 AB2! 2 42 82 1 WMA2

DATE	CHANGE NO.
4-10-62	113330
3-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 25 INSTRUCTION CYCLE WITH INDEXING

DESIGN | DETAIL | CHECK | APPRO

TYPE | SCALE: NONE | DRAW: VE 3-28-62 | CHECK

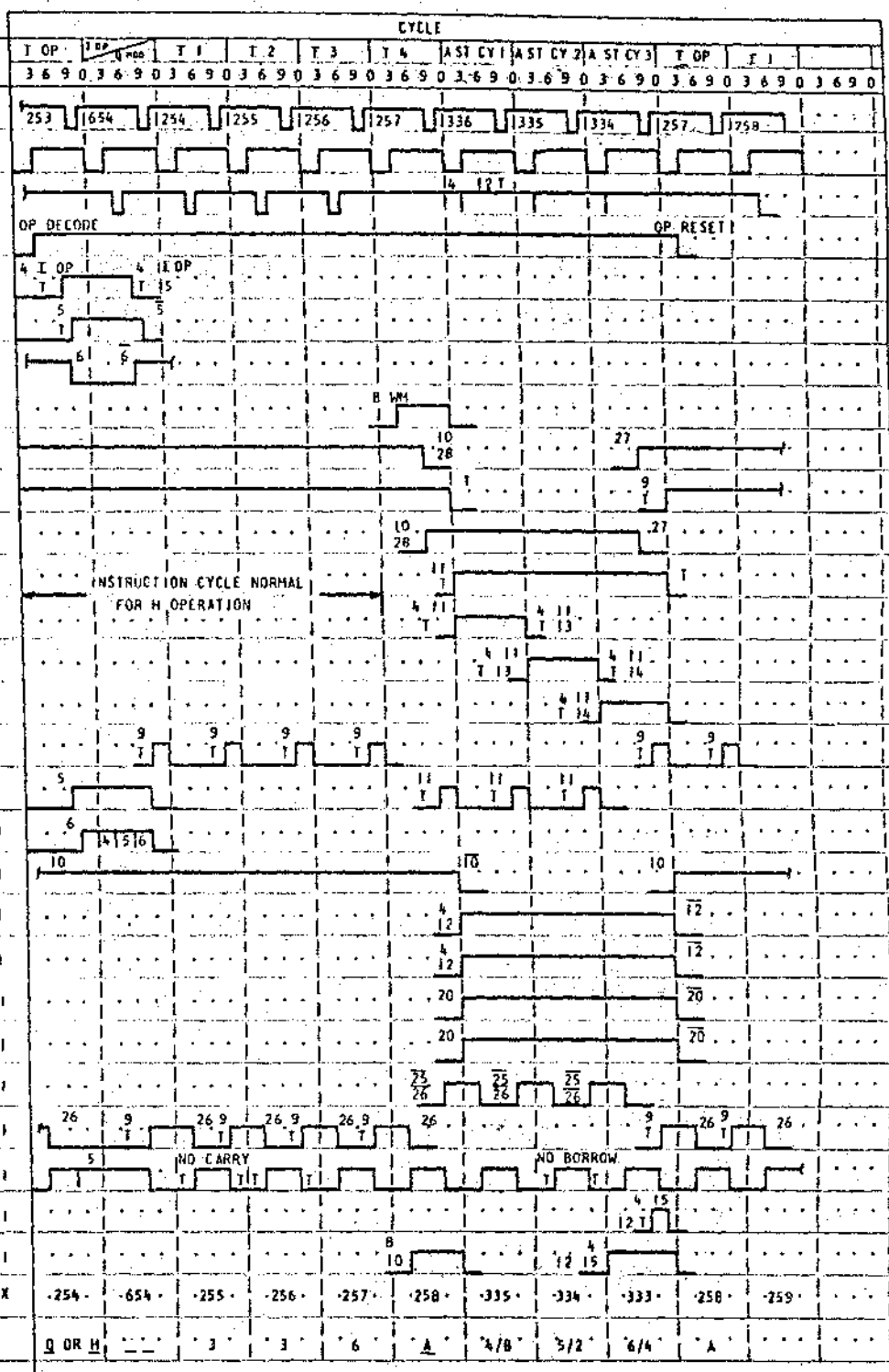
SHEET 2 OF 2

723949

SHEET 1 OF 1 | 726850

253 Q/H (336) PREVIOUS A-STAR 654
257 A — — ADDRESSES B-STAR 824
STORE Q OPR 654

	SIGNAL NAME	FRAME CAIL CH.	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32.35.XX
2	B-REGISTER LATCHES	—		35.11.XX
3	A-REGISTER LATCHES	—		36.16.XX
4	+U H OPR (STORE B-STAR) Q OPR (STORE A-STAR)	0181		41.52.31
5	+U Q TRIGGER ON	0285		41.51.31
6	+U Q MODIFY	0286		41.51.31
7	-T NOT INDEX	0286		41.51.31
8	-T GATED WORD MARK	0182		31.07.11
9	-T DELTA T-CYCLE LATCH	0182		31.21.11
10	-T T-CYCLE LATCH	0182		31.24.11
11	-T DELTA A-CYCLE LATCH	0182		31.22.11
12	-T A-CYCLE LATCH	0182		31.25.11
13	+U STORE CYCLE 1	0286		41.50.11
14	+U STORE CYCLE 2	0286		41.50.11
15	+U STORE CYCLE 3	0286		41.50.11
16	-T T-STAR GATE OUT	01A7		32.34.21
17	-T A-STAR GATE OUT	01A7		32.32.21
18	-T B-STAR RT GATE	0286		41.50.31
19	+U TRANSFER B-REGISTER	01A3		35.18.11
20	-T A-REG STORE INHIBIT	0286		41.51.71
21	-T STORE OPR Q H AND A CYCLE	0286		41.51.31
22	-T A-REG ZONE INHIBIT	01B4		36.13.21
23	-T A-REG DIGIT INHIBIT	01B4		36.13.21
24	+U MODIFIER CONTROL - 1	01A8		32.42.11
25	+U MODIFIER CONTROL + 1	01A8		32.42.11
26	-T MODIFIER CONTROL XFER	01A8		32.42.41
27	-T DELTA T SET Q-H	0286		41.51.51
28	+T T/E CHANGE	01B2		31.05.31
29	MODIFIER OUTPUT ON BUS	—		32.43.XX
30	DATA ON INHIBIT DRIVE	—		—



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113630 D	31.7.62	TA 1870 K

INTERNATIONAL BUSINESS MACHINES CORP
NAME - FIGURE 26 STORE A STAR Q (AAA) STORE B STAR H (AAA)
DESIGN | TYPE
DETAIL | SCALE NONE
CHECK | DRAW VE 1-16-62
APPRO | CHECK

T-STAR A-STAR B-STAR

654 B (701) BEFORE XFER 658 701 XXX
658 A — — AFTER XFER 658 701 658
701 M (336)

CYCLE: I 4 | I-B STAR | I OP | I 1

	SIGNAL NAME		TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER		32.35.XX / 32.36.XX
2		B-REGISTER LATCHES		35.11.XX
3		A-REGISTER LATCHES		36.16.XX
4	-T	BRANCH OPERATION	0181	35.26.11
5	-T	GATED WORD MARK	0182	31.07.11
6	-T	T/E CHANGE	0182	31.05.31
7	-T	DELTA T-CYCLE LATCH	0182	31.21.11
8	-T	T-CYCLE LATCH	0182	31.24.11
9	+U	T-STAR RESTORE	01A8	32.39.11
10	+U	EXECUTE ELIMINATION	01A2	31.05.11
11	+U	TRANSFER PROGRAM SKIP	0186	34.21.41
12	-T	PROGRAM SKIP LATCH	0182	31.08.11
13	+U	T-A STAR GATE	0182	31.08.11
14	+U	SET TO 1 RING OP	0182	31.30.11
15	-T	T-B STAR 1	0286	41.51.51
16	+U	T-B STAR TRIGGER	0286	41.51.51
17	+U	T STAR PD	0286	41.51.51
18	-T	T-B STAR 2 (B-STAR RI)	0286	41.51.51
19	+U	T RING OP	0182	31.31.11
20	-T	A-STAR GATE OUT	01A7	32.32.31
21	-T	B-STAR GATE OUT	01A7	32.34.21
22	+U	MODIFIER CONTROL + 1	01A8	32.42.41
23	-T	MODIFIER CONTROL XFER	01A8	32.42.41
24		MODIFIER OUTPUT ON BUS		32.43.XX
25		DATA ON INHIBIT DRIVE		

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113330	1-1-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIG 27 BRANCH B (1/1) ADVANCED PROGRAMMING (T-B STAR TRANSFER)

DESIGN | TYPE
DRAWN | SCALE: NONE
CHECK | DRAWN | SIZE
APPRO | CHECK

523 P (398) (437) A-FIELD ORIG 1 2 3 4 6 6 RM 7 RESULT 1 2 3 4 6 6 RM 7
529 S — — B-FIELD ORIG A B C D E F GH RESULT 1 2 3 4 5 6 RM H

	SIGNAL NAME	FRAME GATE CH	LOGIC
1	STORAGE ADDRESS REGISTER	—	32.36.XX 32.35.XX
2	B-REGISTER LATCHES	—	39.41.XX
3	A-REGISTER LATCHES	—	38.16.XX
4	+U F OPR (MOVE RECORD)	0181	41.52.31
5	-T GATED WORD MARK	0182	31.07.11
6	+U I/E CONTROL 2	0182	31.05.81
7	-T DELTA I-CYCLE LATCH	0182	31.21.11
8	-T I-CYCLE LATCH	0182	31.24.11
9	-T DELTA A-CYCLE	0182	31.22.11
10	-T A-CYCLE LATCH	0182	31.23.11
11	-T DELTA B-CYCLE LATCH	0182	31.25.11
12	-T B-CYCLE LATCH	0182	31.26.11
13	-T I-STAR GATE OUT	01A7	32.32.81
14	-T A-STAR GATE OUT	01A7	32.32.41
15	-T B-STAR GATE OUT	01A7	32.32.21
16	+U TRANSFER B-REGISTER	01A5	35.18.11
17	-T B-REG ZONE INHIBIT	01A3	
18	-T B-REG DIGIT INHIBIT	01A3	
19	-T B-REG WM INHIBIT	01A3	35.16.21
20	+U A-REG ST INH	0285	41.51.71
21	-T A-REG ZONE INHIBIT	01A3	36.13.21
22	-T A-REG DIGIT INHIBIT	01A3	36.13.21
23	+U MODIFIER CONTROL 4	01AF	32.42.21
24	-T MODIFIER CONTROL XFER	01A6	32.42.41
25	-T I/C CHANGE	0182	31.05.21
26	MODIFIER OUTPUT ON BUS	—	32.XX.XX
27	DATA ON INHIBIT DRIVE	—	———

CYCLE I7 A B A B A E A C A D A B A B I OP

OP DECODE A B C H 21

OP RESET

B WM B WM B WM B WM B WM

NO CARRY D CARRY D CARRY D CARRY

RECORD MARK

MODIFIER BUS 523 398 436 400 405 401 440 402 441 435 442 404 443 405 444 550

NOT PREVENTED

DATE	CHANGE NO.
4-10-64	1373435 M
21.7.63	TA 1371.K

	DATE	CHANGE NO.
CHKD		
DRAWN		
DESIGN		

CARD 1 (1626) MODE 28 MOVE RECORD 2

CHECK	
DRAW	
KEY	1-28-62
MODEL	
TYPE	NONE

SHEET 1 OF 1

1224454

	SIGNAL NAME		FRAME GATE CK	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—		32.35.XX 32.36.XX
2		B-REGISTER	—		35.11.XX
3		A-REGISTER	—		35.15.XX
4	-T	GATED WORD MARK	0182		31.07.61
5	-T	I-E CHANGE	0182		31.05.31
6	+U	DELTA E-CYCLE	0182		31.21.11
7	-T	I-CYCLE	0182		31.20.11
8	+U	I-STAR RESTORE	0147		32.39.61
9	+U	READ OPR	0181		35.27.11
10	+U	I/O OPS	0182		31.09.21
11	-T	PROCESS FEED	0184		36.10.61
12	-T	READ FEED TRIGGER	0184		36.10.11
13	-T	READ CLUTCH	0184		36.10.11
14	+U	A-CYCLE ELIMINATE	0182		31.06.11
15	+U	DELTA B LATCH	0182		31.25.11
16	+U	DELTA PROCESS CONTROL	0182		31.02.21
17	+U	DELTA PROCESS RESET	0187		31.02.31
18	-T	DELTA PROCESS	0182		31.02.41
19	-T	PROCESS LATCH	0182		31.02.61
20	-T	ADR INP CB LATCH	0184		36.10.21
21	+U	INP CB TRIGGER	0184		36.10.71
22	-T	READ SCAN GATE (TRIGGER)	0184		36.11.61
23	-T	R-P SCAN GATE	0184		36.12.11
24	+U	RD SCAN CMTL	0184		36.12.11
25	-U	ACTIVATE STORAGE	0182		31.02.41
26	+U	GATE CYCLE OUTPUT	0182		36.34.61
27	+U	DELTA B-CYCLE	0182		31.23.11
28	+U	B-CYCLE LATCH	0182		31.26.21
29	+U	B-CYCLE	0182		31.26.61
30	-T	000 SET TIME	0143		32.31.11
31	-T	SENS B-2-C	0143		32.31.21
32	-T	RD PCM FORCE 82	0184		36.10.41
33	+U	SET COMPLEMENT	0184		36.11.61
34	+U	RESET A-REG ENCODE	0164		36.12.31
35	+U	INHIBIT C DIGIT	0143		36.13.31
36	-T	RD-PCM ARITH DIGIT INH	0184		36.12.11
37	-T	READ TRANSFER TRIGGER	0184		36.11.11
38	+U	TRANSFER 000	0184		36.11.21
39	+U	A-REG ENCODE SET	0184		36.12.21
40	-T	B-REG TRANSFER	0184		36.11.11
47	+U	READ SCAN COMPLETE	0184		36.01.31
49	+U	MODIFIER CONTROL +1	0148		32.42.11
50	-T	MODIFIER CONTROL XFER	0148		32.42.41

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	115620	31.7.02	TA 1370 K

SHEET 2 OF 5 — 724243

909 [1]
904 8

A-REG SET-UP FOR READ
SCAN 2-9
READ SCAN 1

CYCLE

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	——		32.36.XX 32.36.XX
2	B-REGISTER	——		35.11.XX
3	A-REGISTER	——		35.16.XX
9	+U READ OPR	0181		35.27.11
10	+U I/O OPS	0182		31.09.21
14	+U A-CYCLE ELIMINATE	0183		31.06.11
15	+U DELTA B LATCH	0182		31.23.11
20	-T RDR IMP CB LATCH	0184		36.10.21
21	+U IMP CB TRIGGER	0184		36.10.21
22	-T READ SCAN GATE (TRIGGER)	0184		36.11.11
23	-T R-P SCAN GATE	0184		36.11.11
24	+U RD SCAN ENTL	0184		36.11.61
25	-U ACTIVATE STORAGE	0182		31.02.41
26	+U GATE CYCLE OUTPUT	0182		31.24.11
27	+U DELTA B-CYCLE	0182		31.23.11
28	+U B-CYCLE LATCH	0182		31.26.11
29	+U B-CYCLE	0182		31.26.11
30	-T 000 SET TIME	0187		32.31.11
31	-T TENS 8-2-C	0187		32.31.21
33	+U SET COMPLEMENT	0184		36.19.11
34	+U RESET A-REG ENCODE	0184		36.22.21
35	+U INHIBIT C DIGIT	0183		35.15.11
36	-T RD-PCH ARITH DIGIT INH	0184		36.17.31
37	-T READ TRANSFER TRIGGER	0186		36.11.11
38	+U TRANSFER 000	0184		36.17.11
39	+U A-REG ENCODE SET	0184		36.22.31
40	-T B-REG TRANSFER	0184		36.11.11
41	+U AFTER ONE TRIGGER	0186		36.12.11
49	+U MODIFIER CONTROL +1	01		32.42.11
50	-T MODIFIER CONTROL XFER	0188		32.42.41

1ADI TAKES READ SCAN OP TO ROW BIT CORES FOLLOWING EACH DIGIT TIME ON THE READ TESTS

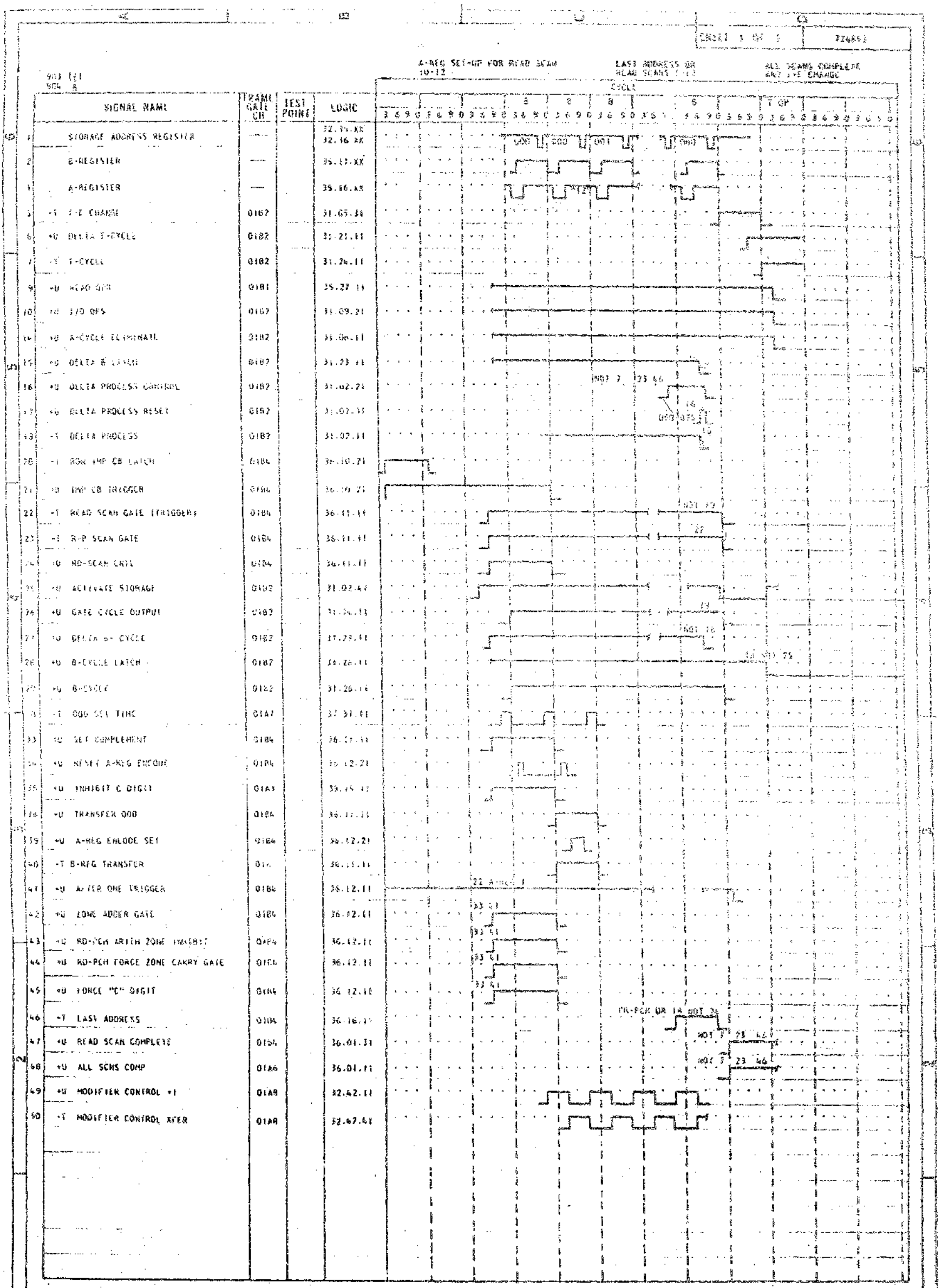
000 000 001

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113130 D	11-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP
FIGURE 29 READ

TYPE
SCALE NONE
SHEET 5 OF 5
DRAWN 1-24-62
CHECKED

	SIGNAL NAME	FRAME GATE CB	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	----		32.99.XX 32.16.XX
2	C-REGISTER	----		35.13.XX
3	A-REGISTER	----		35.80.XX
4	-T F-E CHANGE	0167		31.05.31
5	+U DELTA T-CYCLE	0182		31.21.11
6	-T T-CYCLE	0182		31.24.11
7	+U READ GATE	0181		35.27.11
8	+U I/O OPS	0187		31.09.21
9	+U A-CYCLE ELIMINATE	0182		35.06.11
10	+U DELTA B CYCLE	0187		31.23.11
11	+U DELTA PROCESS CONTROL	0182		31.02.21
12	+U DELTA PROCESS RESET	0182		31.02.31
13	-T DELTA PROCESS	0182		31.02.31
14	-T RGM AMP GB LATCH	0184		36.30.21
15	+U RMP GB TRIGGER	0184		36.09.21
16	-T READ SCAN GATE (TRIGGERS	0184		36.11.11
17	-T R-P SCAN GATE	0184		36.11.31
18	+U NO-SCAN CNTL	0184		36.41.11
19	+U ACTIVATE STORAGE	0182		31.02.41
20	+U GATE CYCLE OUTPUT	0182		31.24.31
21	+U DELTA B- CYCLE	0182		31.23.11
22	+U B-CYCLE LATCH	0187		31.26.11
23	+U B-CYCLE	0182		31.26.11
24	-T ODD SET TIME	0187		37.31.11
25	+U SET COMPLEMENT	0184		36.11.11
26	+U RESET A-REG ENCODE	0184		36.12.21
27	+U INHIBIT C DIGIT	0185		35.45.11
28	+U TRANSFER ODD	0184		36.11.31
29	+U A-REG ENCODE SET	0184		36.12.21
30	-T B-REG TRANSFER	0184		36.11.11
31	+U AFTER ONE TRIGGER	0184		36.12.11
32	+U ZONE ADDER GATE	0184		36.02.11
33	+U RD-PCH ARITH ZONE INHIBIT	0184		36.42.11
34	+U RD-PCH FORCE ZONE CARRY GATE	0184		36.42.11
35	+U FORCE "C" DIGIT	0184		36.42.11
36	-T LAST ADDRESS	0184		36.16.31
37	+U READ SCAN COMPLETE	0184		36.01.31
38	+U ALL SCNS COMP	0184		36.01.11
39	+U MODIFIER CONTROL +1	0188		32.42.11
40	-T MODIFIER CONTROL XFER	0188		32.47.41



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	[illegible]	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP
CARD FIGURE 29 READ
SCALE NONE
DATE 5-16-62

SHEET 1 OF 2 | 724854

SET A-REG TO 12 DIGIT FIRE

903 ≤
904 ≥

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	-		32,35,XX 32,36,XX
2	B-REGISTER	-		35,18,XX
3	A-REGISTER	-		35,46,XX
4	-T GATED WM	01D2		31,07,14
5	-T 3-2 ENABLE	01H2		31,05,31
6	+U DELTA T-CYCLE	01H2		31,24,31
7	-E T-CYCLE	01H2		31,24,11
8	+U 1-STAR RESTORE	01A7		32,39,11
9	+U PUNCH OPR	01B1		36,27,11
10	+U 7&9 OPS	01B2		31,05,21
11	-T PUNCH PUNCH	01B4		36,24,11
12	+U PUNCH FEED TRIGGER	01B4		36,24,11
13	-E PUNCH ELECTRO MAGNET	01B4		36,24,11
14	+U A-CY 1 ELIMINATE	01B2		31,06,11
15	+U DELTA G-LATCH	01B2		31,23,11
16	+U DELTA PROCESS RESET	01B2		31,02,31
17	-T DELTA PROCESS	01B2		31,02,11
18	-T PROCESS	01B2		31,02,41
19	-T PUNCH SCAN GATE TRIGGER	01B4		36,2 ,41
20	+U PUNCH SCAN GATE	01B4		36,22,11
21	-E R-P SCAN GATE	01B4		36,11,11
22	+U PUNCH SCAN GATE	01B4		36,22,11
23	+U GATE CYCLE OUTPUT	01B2		31,24,11
24	+U ACTIVATE STORAGE	01B2		31,02,41
25	+U DELTA B-CYCLE	01B2		31,23,11
26	+U B-CYCLE LATCH	01B2		31,26,11
27	+U B-CYCLE	01B2		31,26,11
28	-T 100 SET TIME	01A7		32,31,11
29	-T ITEMS 2-8-C	01A7		32,31,21
30	+U NOT SET-UP	01A7		32,31,21
31	+U PUNCH FEED RST GATE	01B4		36,18,11
32	-T RD PCH FORCE H2	01B4		36,13 11
33	+U ADD TO 100	01B4		36,22,11
34	-E A-REG SET B RD-PCH	01B4		36 12,21
35	+U ZONE ADDER GATE	01B4		36,12,11
36	+U RD-PCH FORCE ZONE CARRY	01B4		36,12 11
37	-U RD PCH BRICH ZONE TRIG	01B4		36,12,11
38	+U DOUBLE D DIGIT	01B4		36,12,11
39	+U PUNCH TRANSFER	01B4		36,22,11
40	+U RESET & RD PCH ENCODE	01B4		36,12,21
41	+U A REG ENABLE SET	01B4		36,12,21
42	-T C-REG TRANSFER	01B4		36,22,11
43	-T PCH DECODE SCAN	01B7		36,23,31
44	+U MODIFIER CONTROL #1	01A8		32,42,11
45	+T MODIFIER CONTROL #FER	01A8		32,42,41

CYCLE: I OP | I 1 | 0 | 0 | B | B | B | B

903 | 904 | 100 | 100 | 100 | 101

A | A | "ABC" | B-BIT | B-BIT

B-WM

4 NOT EXE ELIM

5 7 076-105

4 7

1401 IS INTERLOCKED UNTIL 1402 PUNCH CAN DO IS MADE

OP DECODE L

PUNCHING INDEX 0°

9

.9 337.5° 22.5°

PUNCH UNIT INDEX 0° 120° 240°

5 7 RD-PCH OF NOT FR 0

32° PA1 142° PA2 55° 135°

31 NOT LAST ADDR

TCH SC GATE CONES ON AT FIRST TIME 16 FOLLOWING THE TURN ON OF THE PCH SC CH TRIGGER

19 19 19 18 17 17 25 33 36 27 090-000 22 090-000 22 PREVENTS B-ADDR REG FR READING 20 27 12,3 NOT 12 19 20 27

22 AFTER 0 TRIGGER OFF

33 AFTER 0 TRIGGER OFF

33 AFTER 0 TRIGGER OFF

33 AFTER 0 TRIGGER OFF

39 OFF

22

39 045-075

19 OFF 20

NOT LOC DIR CTRL, 12-2 DECODE OR 3-8 DECODE, 000-090

20

31

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	TA 1370 D	31-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME | FIGURE 30 PUNCH

DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DRAW	VE 3-26-62
APPRD		CHECK	

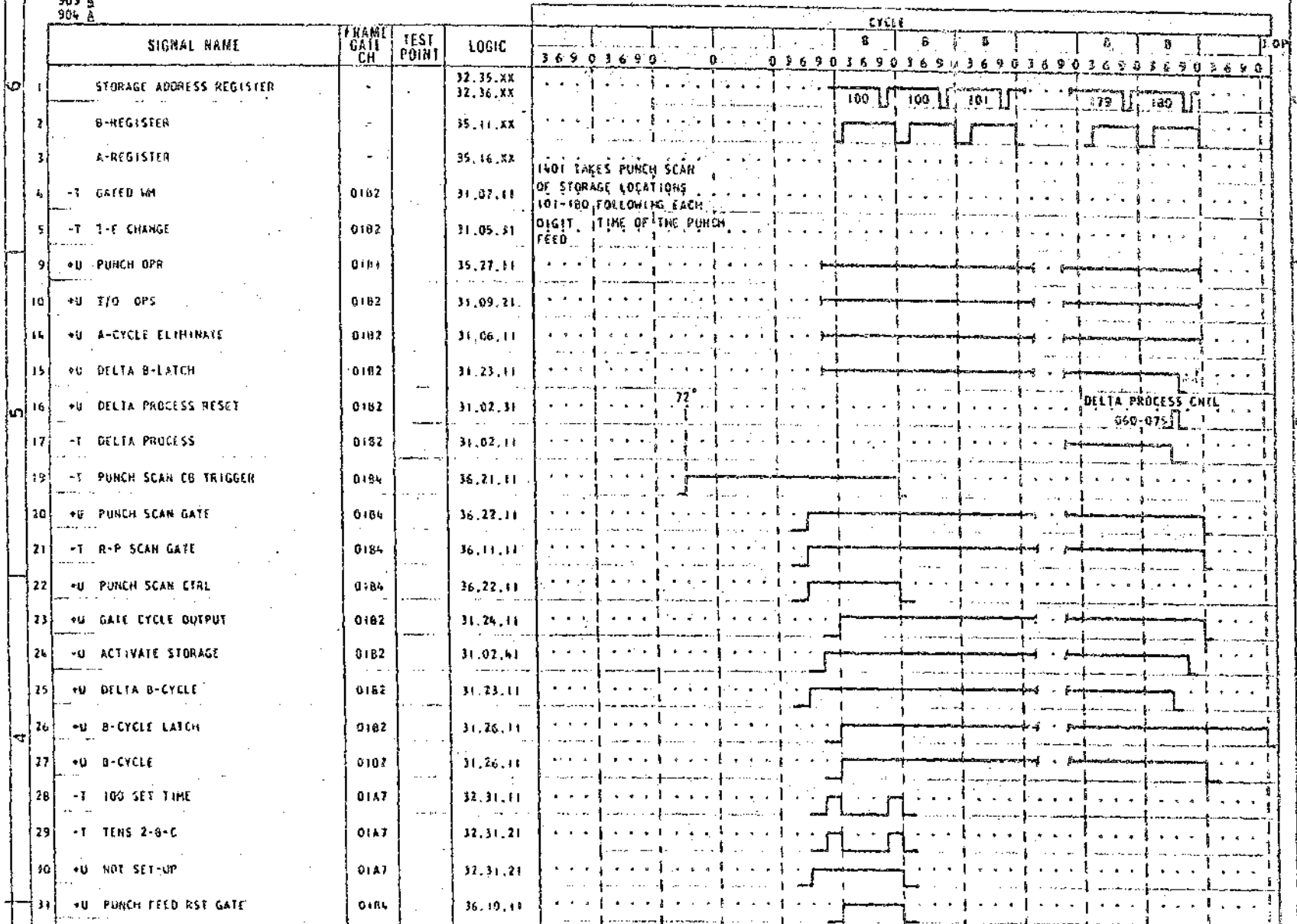
SHEET 2 OF 2 | 724854

903 A
904 A

A-REG SET-UP FOR PUNCH SCANS 1-9

LAST ADDRESS OF PCH SCANS 12,11,0,1-9, 13

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	-		32.35.XX 32.36.XX
2	B-REGISTER	-		35.11.XX
3	A-REGISTER	-		35.16.XX
4	-T GATED WM	0182		31.07.11
5	-T 1-F CHANGE	0182		31.05.31
9	+U PUNCH OPR	0184		35.27.11
10	+U I/O OPS	0182		31.09.21
14	+U A-CYCLE ELIMINATE	0182		31.06.11
15	+U DELTA B-LATCH	0182		31.23.11
16	+U DELTA PROCESS RESET	0182		31.02.31
17	-T DELTA PROCESS	0182		31.02.11
19	-T PUNCH SCAN CB TRIGGER	0184		36.21.11
20	+U PUNCH SCAN GATE	0184		36.22.11
21	-T R-P SCAN GATE	0184		36.11.11
22	+U PUNCH SCAN CTRL	0184		36.22.61
23	+U GATE CYCLE OUTPUT	0182		31.24.11
24	+U ACTIVATE STORAGE	0182		31.02.41
25	+U DELTA B-CYCLE	0182		31.23.11
26	+U B-CYCLE LATCH	0182		31.26.11
27	+U B-CYCLE	0182		31.26.11
28	-T 100 SET TIME	01A7		32.31.11
29	-T TENS 2-8-C	01A7		32.31.21
30	+U NOT SET-UP	01A7		32.31.21
31	+U PUNCH FEED RST GATE	0184		36.10.11
32	-T RD PCH FORCE B2	0184		36.10.31
33	+U ADD TO 100	0184		36.22.11
39	+U PUNCH TRANSFER	0184		36.22.11
40	+U RESET A REG ENCODE	0184		36.12.21
41	+U A-REG ENCODE SET	0184		36.12.21
42	-T B-REG TRANSFER	0184		36.22.11
43	+U AFTER ZERO TRIGGER	0184		36.12.11
44	+U FORCE DIGIT CARRY	0184		36.12.11
45	-T FORCE C DIGIT	0184		36.12.11
46	-T RD-PCH ARITH DIGIT ENH	0184		36.12.11
47	-T PCH DECODE SCAN	0187		36.23.31
48	-T LAST ADDRESS	0184		36.16.11
49	+U DELTA PROC CNTL	0182		31.02.21
50	+U PUNCH SCAN COMPLETE	0184		36.01.21
51	-T ALL SCANS COMPLETE	01A6		36.01.11
52	+U MODIFIER CONTROL +1	01A8		32.42.11
53	-T MODIFIER CONTROL XFER	01A8		32.42.41



DATE	CHANGE NO	DATE	CHANGE NO
4-10-62	[illegible] D	31.7.62	TA 1379 K

INTERNATIONAL BUSINESS MACHINES CORP

PART | FIGURE 10 PUNCH

DES ENG | SCALE | SIZE

DRAWN | CHECK | NONE

CHECK | APPRD | VE | 1-26-62

COLUMN BINARY = (1, 4)

	SIGNAL NAME	SHEET NO.	LOGIC	CYCLE: S OP, 11, 12, 0, 1, 2
1	STORAGE ADDRESS REGISTER	—	29.35.33	
2	B-REGISTER	—	31.11.33	
3	A-REGISTER	—	29.16.33	
4	+ T GATE WM	0182	31.07.11	
5	- T I/E CHANGE	0182	31.05.31	
6	+ U DELTA E CYCLE	0182	31.21.11	
7	+ U E - CYCLE	0182	31.24.11	
8	+ U E STAT RESTORE	0127	30.38.11	
9	+ U READ OPR	0181	29.27.11	
10	+ U E/O OPR	0182	31.09.31	
11	+ T READ FEED TRIGGER	0184	36.10.11	
12	+ T READ CLUTCH	0134	36.10.11	
13	+ U E CYCLE ELIMINATE	0182	31.05.11	
14	+ U DELTA D LATCH	0182	31.23.11	
15	+ U DELTA PROCESS RESET	0182	31.02.31	
16	- T DELTA PROCESS	0182	31.02.11	
17	- T PROCESS LATCH	0182	31.02.41	
18	+ T NOR IMP OP LATCH	0184	36.10.21	
19	+ U IMP OP TRIGGER	0184	36.10.21	
20	- T READ SCAN GATE (TRIGGER)	0184	36.11.11	
21	- T RP SCAN GATE	0184	36.11.11	
22	+ U RD SCAN CTRL	0184	36.11.11	
23	- U ACTIVATE STORAGE	0182	31.02.41	
24	+ U GATE CYCLE OUTPUT	0182	31.24.11	
25	+ U DELTA B CYCLE	0182	31.23.11	
26	+ U B CYCLE LATCH	0182	31.26.11	
27	+ U B CYCLE	0182	31.26.11	
28	- T ODD SET TIME	0127	32.31.11	
29	- T TENS B,2,C	0127	32.31.21	
30	- T RD PCH FORCE 62	0184	36.10.11	

CYCLE: B, B, 2 UP

DATE	CHANGE NO.
11-15-62	
11-23-62	
12-5-62	TA 1270 K

	NAME	DESIGN
DRAWN		
CHECK		
APPRD		

INTERNATIONAL BUSINESS MACHINES CORP

FIGURE 12 COLUMN BINARY READ SEQUENCE

SCALE NONE

SIZE

DRAWING NO. 224955

SHEET 1 OF 2

COLUMN BINARY - READ

	SIGNAL NAME	PAGE OF CH	LOGIC
31	+U SET COMPLEMENT	0184	36 1 11
32	+U RESET A REG ENCODE	0184	36 2 21
33			
34	-T PO-PCH 8TH DIGIT INHIBIT	0184	36 12 11
35	-T READ TRANSFER TRIGGER	0184	36 11 11
36	+U TRANSFER 000	0184	36 11 11
37	+U A REG ENCODE SET	0184	36 12 21
38	-T B REG TRANSFER	0184	36 11 11
39	-T CONTENTS OF STOR LOC 000	—	—
40	+U COL BIN CTRL	0288	41 11 21
41	+U COL BIN OPR	0288	41 11 21
42	-T NORMAL MODE	0288	41 11 11
43	+U COL BIN MODE	0288	41 11 11
44	+U RD PCH TRANSFER	0288	41 11 11
45	-T COL BIN TRANSFER STOP	0288	41 11 31
46	-T MOD CTRL FF	0148	32 42 41
47	-T COL BIN MODE PLUS 1	0288	41 11 61
48	-T MODIFIER CTRL PLUS 1	0148	32 42 11
49	+U RD PCH SCAN NORMAL	0288	41 11 11
50	COL BIN 4 COL BIN 1 COL BIN C "9"	—	41 11 31
51	COL BIN 8 COL BIN 2 COL BIN C "0"	—	41 11 31
52	-T SENSE RD 2	0141	42 58 11
53	+U COL BIN RD 2 LATCH	0288	41 11 11
54	INH COL BIN - B OR A OR B OR A OR 2 OR 1 OR C	—	41 23 31
55	-T LAST ADDRESS	0184	36 16 11
56	+U DELTA PROCESS CONTROL	0182	51 02 21
57	+U AFTER ONE TRIGGER	0154	36 12 11
58	+U RD SCN COMP	0184	36 01 31
59	-T ALL SCAN COMP	0148	36 01 11

CYCLE

CYCLE

DATE 3-7-62 CHANGE NO. 31,742 TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP.

NAME FIGURE 32 COLUMN BINARY

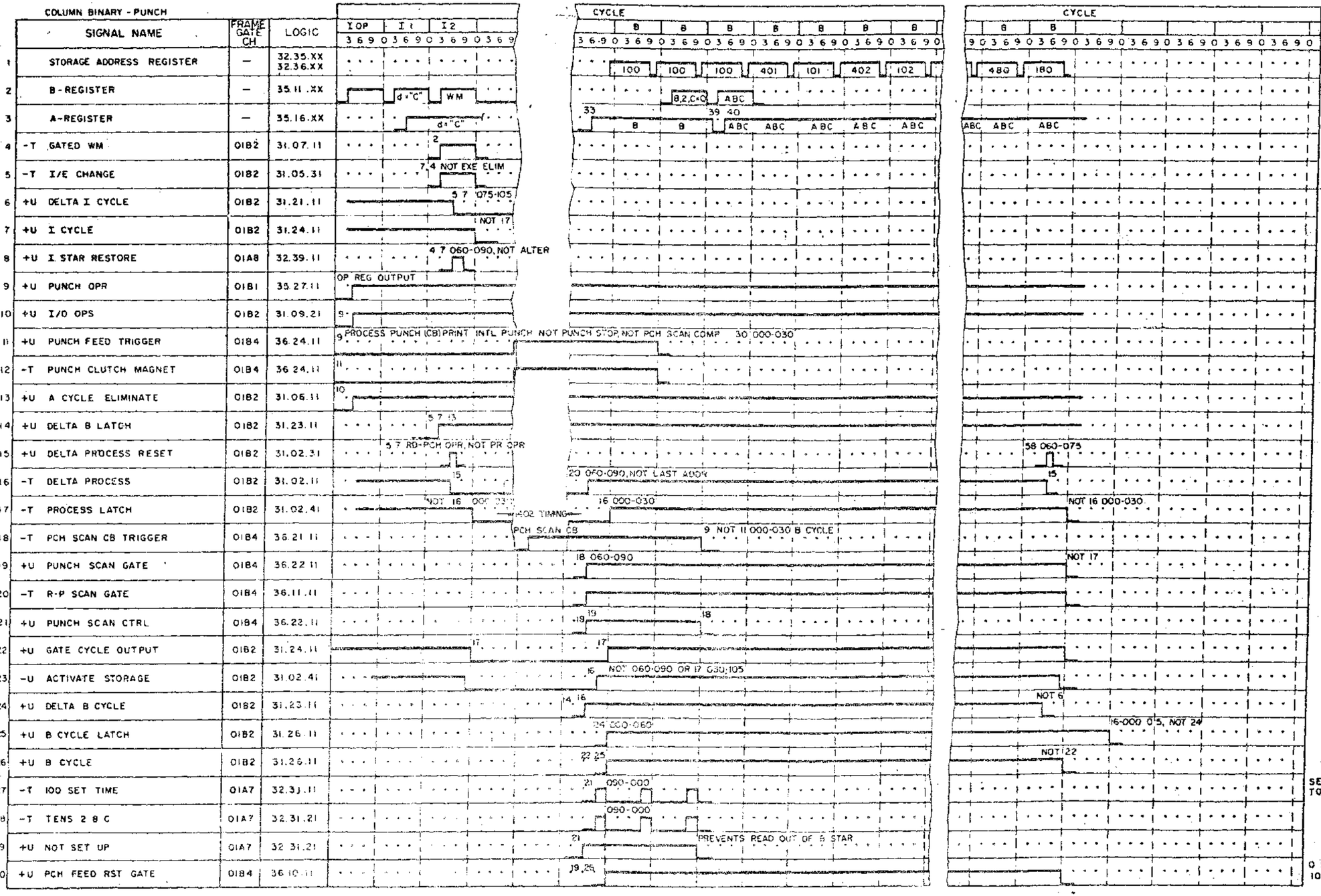
HEAD SEQUENCE

SHEET 2 OF 2

724855

COLUMN BINARY - PUNCH

	SIGNAL NAME	FRAME GATE CH	LOGIC
1	STORAGE ADDRESS REGISTER	—	32.35.XX 32.36.XX
2	B-REGISTER	—	35.11.XX
3	A-REGISTER	—	35.16.XX
4	-T GATED WM	01B2	31.07.11
5	-T I/E CHANGE	01B2	31.05.31
6	+U DELTA I CYCLE	01B2	31.21.11
7	+U I CYCLE	01B2	31.24.11
8	+U I STAR RESTORE	01A8	32.39.11
9	+U PUNCH OPR	01B1	35.27.11
10	+U I/O OPS	01B2	31.09.21
11	+U PUNCH FEED TRIGGER	01B4	36.24.11
12	-T PUNCH CLUTCH MAGNET	01B4	36.24.11
13	+U A CYCLE ELIMINATE	01B2	31.06.11
14	+U DELTA B LATCH	01B2	31.23.11
15	+U DELTA PROCESS RESET	01B2	31.02.31
16	-T DELTA PROCESS	01B2	31.02.11
17	-T PROCESS LATCH	01B2	31.02.41
18	-T PCH SCAN CB TRIGGER	01B4	36.21.11
19	+U PUNCH SCAN GATE	01B4	36.22.11
20	-T R-P SCAN GATE	01B4	36.11.41
21	+U PUNCH SCAN CTRL	01B4	36.23.11
22	+U GATE CYCLE OUTPUT	01B2	31.24.11
23	-U ACTIVATE STORAGE	01B2	31.02.41
24	+U DELTA B CYCLE	01B2	31.23.11
25	+U B CYCLE LATCH	01B2	31.26.11
26	+U B CYCLE	01B2	31.26.11
27	-T 100 SET TIME	01A7	32.31.11
28	-T TENS 2 8 C	01A7	32.31.21
29	+U NOT SET UP	01A7	32.31.21
30	+U PCH FEED RST GATE	01B4	36.10.11



	DATE	CHANGE NO.
	4-10-62	113536 R
	31-7-62	TA 1370 K

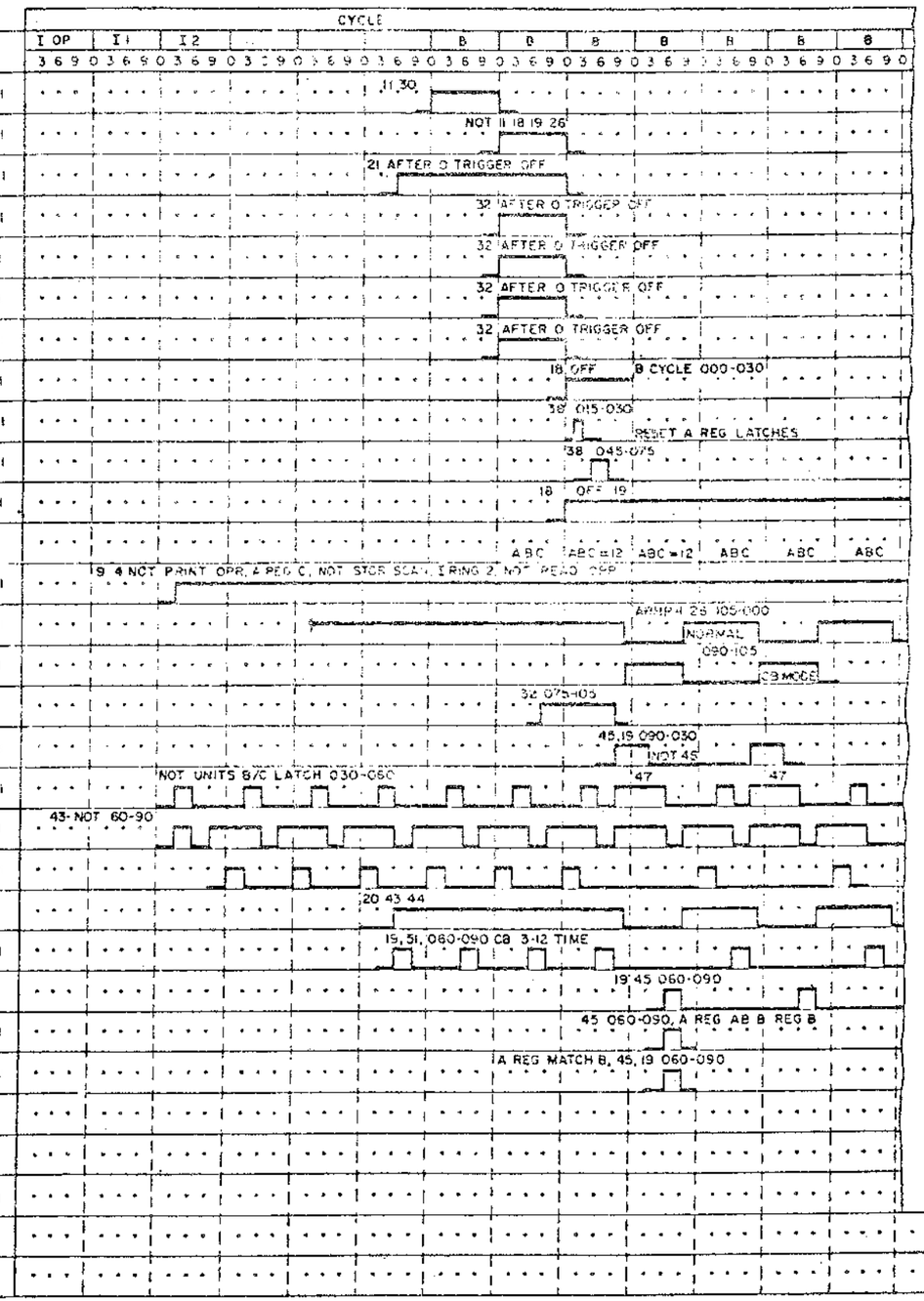
APPRO			
CHECK			
DETAIL		DESIGN	
			PUNCH SEQUENCE
		TYPE	
		SCALE	NONE
CHECK	DRAW	VE	3-28-62

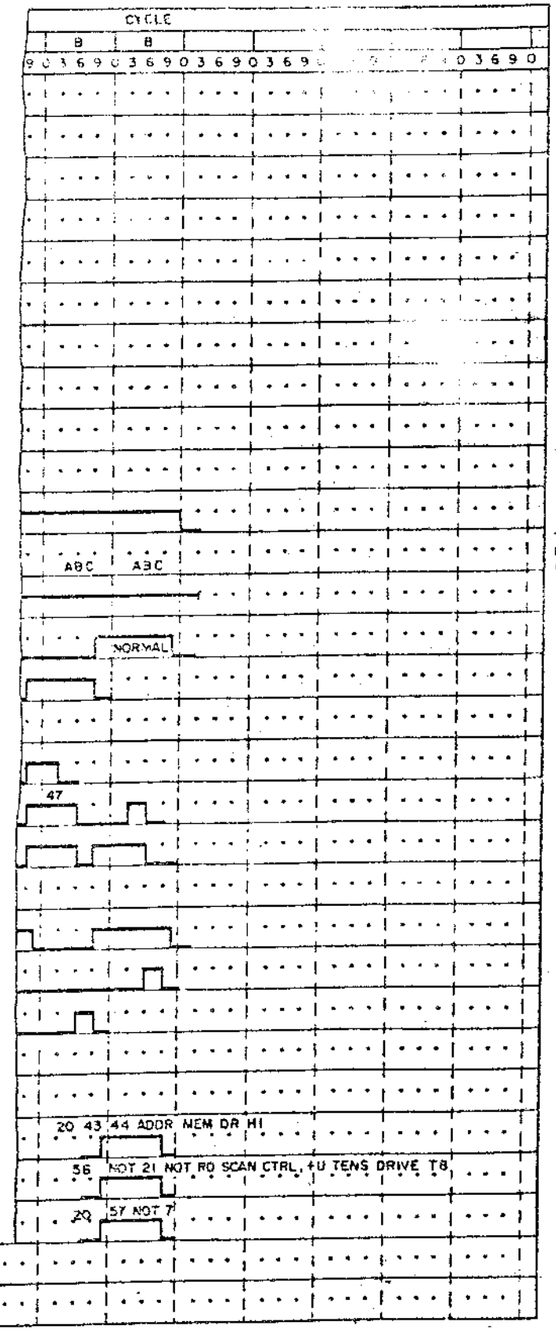
INTERNATIONAL BUSINESS MACHINES CORP.
NAME FIGURE 33 COLUMN BINARY

SHEET 1 OF 2
724856

COLUMN BINARY - PUNCH

	SIGNAL NAME	FRAME GATE CH	LOGIC
31	-T RD PCH FORCE B2	0184	36.10.11
32	+U ADD TO 100	0184	36.22.11
33	-T A REG SET B RD PCH	0184	36.12.21
34	+U ZONE ADDER GATE	0184	36.12.11
35	+U RD PCH FORCE ZONE CARRY	0184	36.12.11
36	+U RD PCH ARITH ZONE INH	0184	36.12.11
37	+U FORCE C DIGIT	0184	36.12.11
38	+U PUNCH TRANS	0184	36.22.11
39	+U RESET A REG ENCODE	0184	36.12.21
40	+U A REG ENCODE SET	0184	36.12.21
41	-T B REG TRANSFER	0184	36.22.11
42	CONTENTS OF STORAGE LOC 100	—	—
43	+U COLUMN BINARY OPERATION	0288	41.11.21
44	-T NORMAL MODE	0288	41.11.11
45	+U COLUMN BINARY MODE	0288	41.11.11
46	+U RD PCH TRANSFER	0288	41.11.11
47	-T COL BIN TRANSFER STAR	0288	41.11.31
48	-T MOD CTRL TFR	01A8	32.42.41
49	-T COL BIN MODE PLUS 1	0288	41.11.51
50	-T MODIFIER CTRL PLUS 1	01A8	32.42.11
51	+U RD PCH SCAN NORMAL	0288	41.11.11
52	COL BINARY "4"	—	41.11.31
53	COL BINARY "1"	—	41.11.31
54	-T COL BIN PCH DECODE	0288	41.23.21
55	+U COL BIN PCH CHECK DECODE	0288	41.23.21
56	+U COL BIN LAST ADDRESS	02A8	41.11.11
57	-T LAST ADDRESS	0184	36.16.11
58	+U DELTA PROCESS CONTROL	0182	31.02.21
59			
60			





COND ZONE ADDR TO PROD ABC AT 12 PCH TIME

A REG SET TO SAME CHAR AS IN B REG

TRANS B REG CHAR LOC 100 ON B CYCLE

	DATE	CHANGE NO.
	4-10-62	31.7.62 TA 1370 K

	DATE	CHANGE NO.

APPRO	CHECK	
	DETAIL	
	DESIGN	

PUNCH SEQUENCE

CHECK	DRAW	VE 3-28-62
	SCALE	NONE
	TYPE	

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIGURE 33 COLUMN BINARY

SHEET 2 OF 2

726858

	SIGNAL NAME	BOARD LOC.	LOGIC	CYCLE
1	STORAGE ADDRESS REGISTER	—	32.25.XX	
2	B-REGISTER LATCHES	—	32.11.XX	
3	A-REGISTER LATCHES	—	32.12.XX	
4	+U MOVE OPERATION	0183	35.25.11	
5	−T GATED WORD MARK	0182	31.07.11	
6	−T I/E CHARGE	0182	31.06.51	
7	+U DELTA I CYCLE	0182	31.21.11	
8	−T I CYCLE	0182	31.24.11	
9	+U I STAR RESTORE	0187	32.39.11	
10	+U DELTA A CYCLE	0182	31.22.11	
11	−T A CYCLE	0182	31.25.11	
12	−T DELTA B CYCLE	0182	31.23.11	
13	+U B CYCLE	0182	31.26.11	
14	+U TRANSFER B REGISTER	0185	35.16.11	
15	−T B REG ZONE INHIBIT	0184	36.13.21	
16	−T B REG DIGIT INHIBIT	0184	36.13.21	
17	−T B REG C BIT INHIBIT	0183	36.13.21	
18	−T B REG WM INHIBIT	0183	35.16.21	
19	−T A REG DIGIT INHIBIT	0184	36.13.21	
20	−T A REG ZONE INHIBIT	0184	36.13.21	
21	+U A REG WM LATCH	0182	31.06.11	
22	+U I/E CONTROL I	0182	31.06.21	
23	−T UNSCRAMBLE LATCH	0288	41.11.41	
24	−T CB MOVE TRIGGER	0288	41.11.41	
25	−T COL BIN PLUS I	0288	41.11.51	
26	−T COL BIN MINUS I	0288	41.11.61	
27	−T COL BIN TRANSFER STAR	0288	41.11.31	
28	−T MOD CTRL TRANSFER	0183	32.42.41	
29	+U MOD CTRL MINUS I	0183	32.42.11	
30				

A STAR CONTENTS 505 405 502 402 501 401
B STAR CONTENTS 909 909 908 907 906 905 904

	DATE	CHANGE NO.
	4-10-62	1322-62 R
	31 JUL 62	TA 1326 R

DRAWN	DESIGN	
CHECK	DETAIL	
APPRO	CHECK	

SCALE	NONE
SIZE	E 10-62

INTERNATIONAL BUSINESS MACHINES CORP.

FIGURE 24. MOVE AND UNSCRAMBLE COLUMN BINARY SEQUENCE

SHEET 1 OF 1

724857

M 909 303 B

	SIGNAL NAME	FRAME GATE CH	LOGIC	CYCLE
1	STORAGE ADDRESS REGISTER	—	32.35.XX	
2	B-REGISTER LATCHES	—	35.11.XX	
3	A-REGISTER LATCHES	—	35.12.XX	
4	+U MOVE OPERATION	01B1	35.25.11	
5	-T GATED WORD MARK	01B2	31.07.11	
6	-T I/E CHANGE	01B2	31.05.31	
7	+U DELTA I CYCLE	01B2	31.21.11	
8	-T I CYCLE	01B2	31.24.11	
9	+U I STAR RESTORE	01A7	32.39.11	
10	+U DELTA A CYCLE	01B2	31.22.11	
11	-T A CYCLE	01B2	31.25.11	
12	-T DELTA B CYCLE	01B2	31.23.11	
13	+U B CYCLE	01B2	31.26.11	
14	+U TRANSFER B REGISTER	01A3	35.18.11	
15	-T B REG ZONE INHIBIT	01B4	36.13.21	
16	-T B REG DIGIT INHIBIT	01B4	36.13.21	
17	-T B REG C BIT INHIBIT	01A3	35.16.21	
18	-T B REG M BIT INHIBIT	01A3	35.16.21	
19	-T A REG DIGIT INHIBIT	01B4	36.13.21	
20	-T A REG ZONE INHIBIT	01B4	36.13.21	
21	+U I/E CONTROL 1	01B2	31.05.21	
22	-T SCRAMBLE LATCH	0288	41.11.41	
23	-T CB MOVE TRIGGER	0288	41.11.41	
24	-T COL BIN PLUS 1	0288	41.11.51	
25	-T COL BIN MINUS 1	0288	41.11.51	
26	-T COL BIN TRANS STAR	0288	41.11.31	
27	-T MOD CTRL TRANSFER	01A8	32.42.41	
28	+U MOD CTRL MINUS 1	01A8	32.42.11	
29				
30				

A STAR CONTENTS 909 503 508 403 507 903 504 902 501 901

B STAR CONTENTS 503 503 508 403 507 903 504 902 501 901

CHANGE NO.	DATE	CHANGE NO.	DATE
4-10-62	03-7-62	FA X30 X	

MAINTENANCE DIAGNOSTIC SEQUENCE CHART

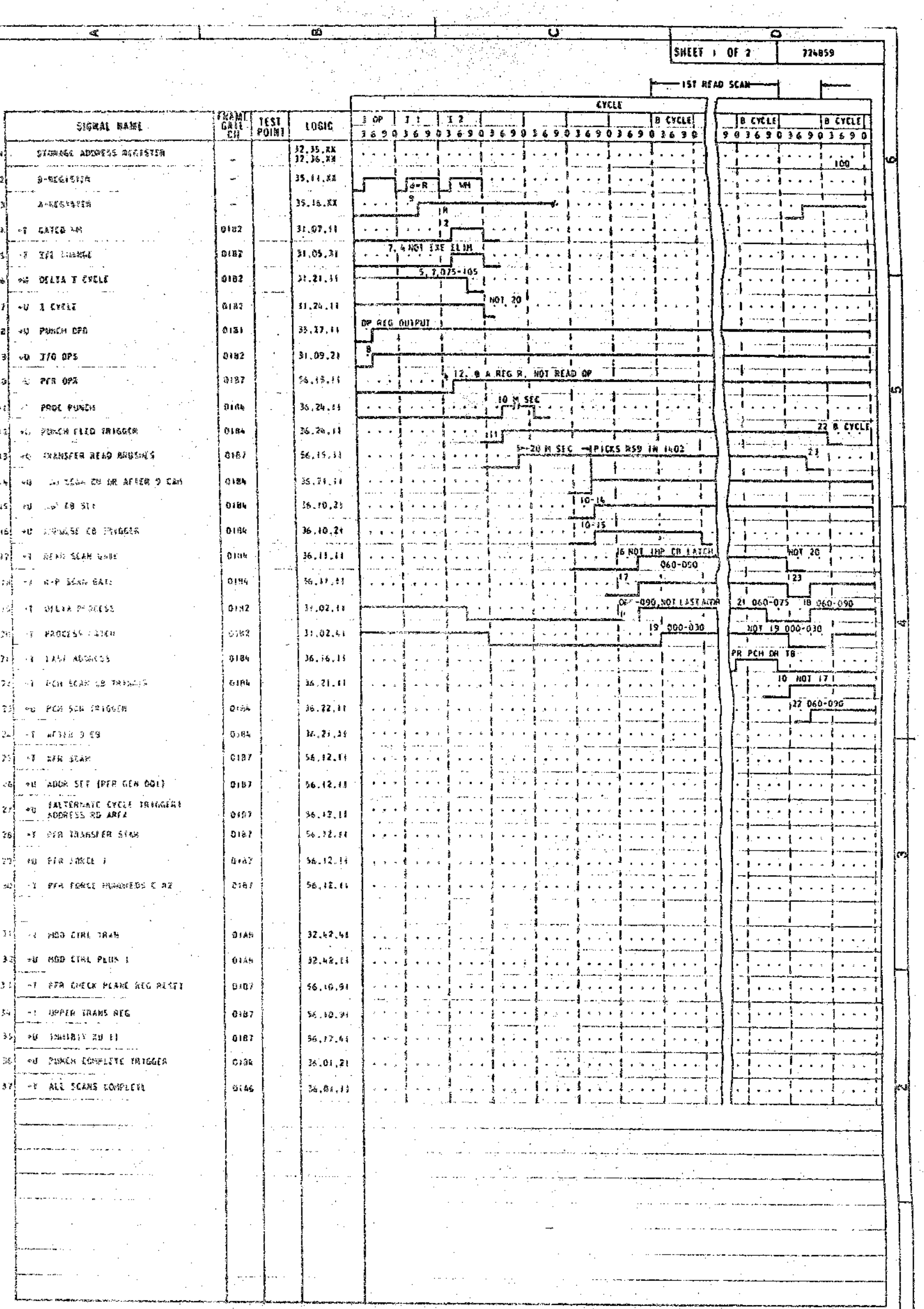
SEQUENCE NO. 1 FIGURE 35 PAGE 4 OF 5 SHEETS

SHEET 1 OF 1

7926B

SHEET 1 OF 2 | 224859

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	–		32,35,XX 32,36,XX
2	B-REGISTER	–		35,11,XX
3	A-REGISTER	–		35,16,XX
4	+T GATED MH	0182		31,07,11
5	+T XFI CHANNEL	0182		31,05,31
6	+U DELTA T CYCLE	0182		31,21,11
7	+U 1 CYCLE	0182		31,24,11
8	+U PUNCH OPS	0181		35,17,11
9	+U I/O OPS	0182		31,09,21
10	+T PCH OPS	0187		56,15,11
11	+T PCH PUNCH	0184		36,24,11
12	+U PUNCH FEED TRIGGER	0184		36,24,11
13	+U TRANSFER READ BRUSHES	0187		56,15,11
14	+U [illegible] ON OR AFTER 9 CAM	0184		36,21,11
15	+U [illegible] EB STB	0184		36,10,21
16	+U [illegible] EB TRIGGER	0184		36,10,21
17	+T READ SCAN GATE	0184		36,11,11
18	+T R-P SCAN GATE	0184		36,17,11
19	+T DELTA PROCESS	0182		31,02,11
20	+T PROCESS 1 CYCLE	0182		31,02,41
21	+T LAST ADDRESS	0184		36,16,11
22	+T PCH SCAN GO TRIGGER	0184		36,21,11
23	+U PCH SCN TRIGGER	0184		36,22,11
24	+T [illegible] 9 CH	0184		36,21,31
25	+T PFR SCAN	0187		56,12,11
26	+U ADDR SEL (PFR GEN DEL)	0187		56,12,11
27	+U ALTERNATE CYCLE TRIGGER/ ADDRESS RD AREA	0187		56,12,11
28	+T PFR TRANSFER SCAN	0187		56,12,11
29	+U PFR FORCE 1	0187		56,12,11
30	+T PFR FORCE PROGRESS C 02	0187		56,12,11
31	+T MOD CTRL TRAN	0185		32,42,41
32	+U MOD CTRL PLUS 1	0185		32,42,11
33	+T PFR CHECK PLANE REG RESET	0187		56,10,91
34	+T UPPER TRANS REG	0187		56,10,91
35	+U [illegible] RD E1	0187		56,17,41
36	+U PUNCH COMPLETE TRIGGER	0186		36,01,21
37	+T ALL SCANS COMPLETE	0186		36,01,11



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113830 D	31.7.62	PA 1370 K

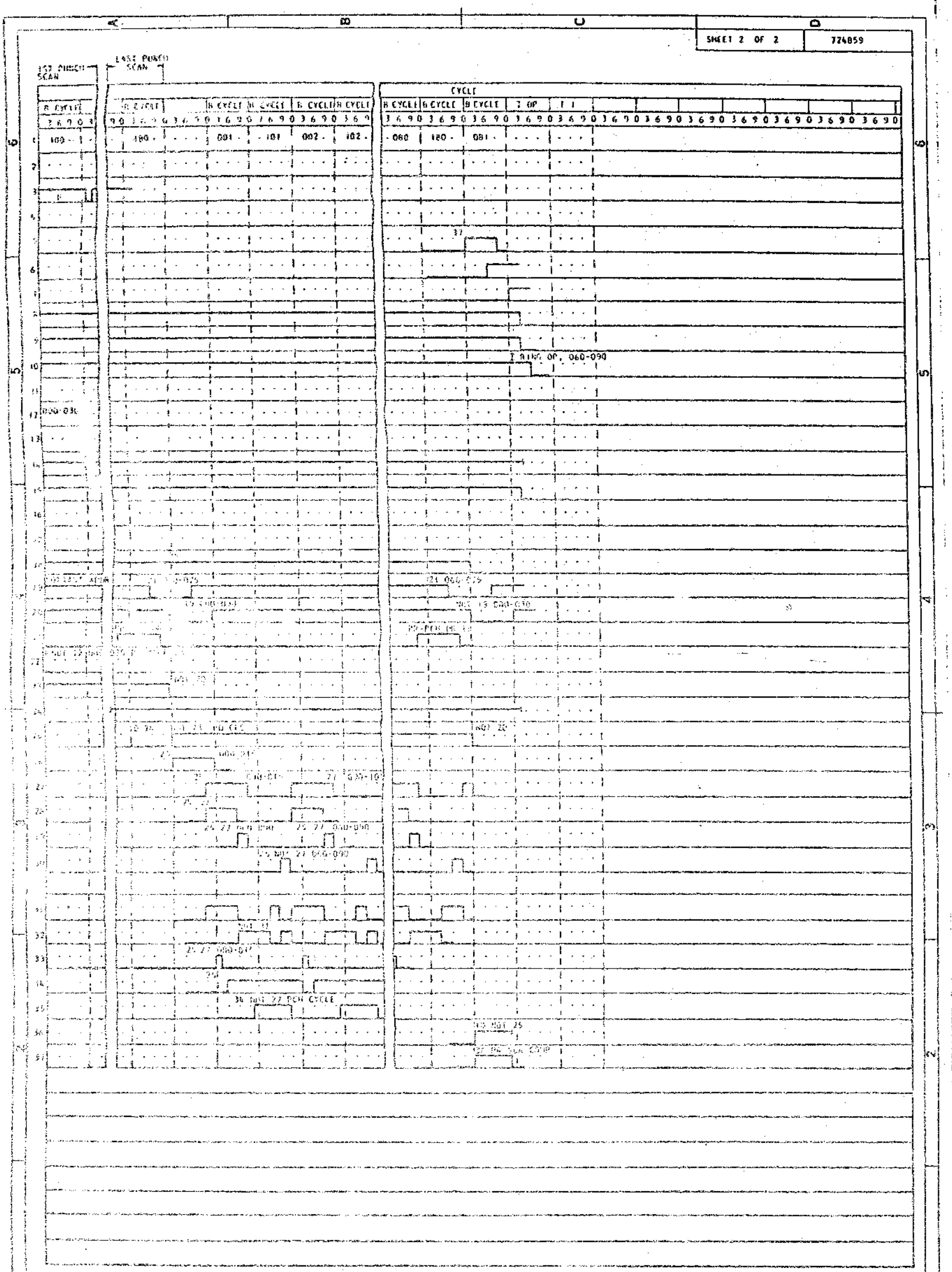
INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIG 36- PUNCH FEED READ

SEQUENCE

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			ARMY		
APPROV			CHECK		

SHEET 2 OF 2 | 724859



DATE	CHANGE NO.	DATE	CHANGE NO.
5-10-62	TA 1330 D	31-7-62	TA 1970 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIG 36- PUNCH FEED HEAD

SEQUENCE

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 1-26-62
APPRO			CHECK	

SHEET 1 OF 1 | 736350

903 A 1&1 | 903 E (701)c | 701 A
905 A | 906 E

	SIGNAL NAME		SYNAMIC GATE SW	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	____		32.35.XX 33.36.XX
2		D-REGISTER	____		35.11.XX
3		A-REGISTER	____		35.10.XX
4	+U	STACK SEL OPR	0181		35.25.11
5	-T	GATED WM	0182		31.07.11
6	-T	XFR CHARGE	0182		31.05.31
7	+U	DELTA T-CYCLE	0182		31.25.11
8	-T	T-CYCLE	0182		31.24.12
9	+U	T-STAR RESTORE	0187		32.19.11
10	+U	END ELIM	0182		31.05.11
11	-T	PROGRAM SKIP	0182		31.08.11
12	+U	T-A STAR GATE	0182		31.08.11
13	+U	SET T-RING OP	0182		31.30.11
14	-T	A-STAR GATE OUT	0187		32.33.21
15	-T	T-RING OP	0185		31.31.31
16	+U	STACKER SELECT 4 CHAR	1- 0184 2- 0184 4- 0185 8- 0184		35.50.11
17	+U	MODIFIER CONTROL + 1	0188		32.42.11
18	-T	MODIFIER CONTROL XFER	0188		32.42.11
19		MODIFIER OUTPUT ON BUS LINES	____		32.53.XX
20		DATA ON INH DRIVE LINES	____		____
21		T-STAR AT END OF CYCLE			

CYCLE

I S | T OP

NOTE: 13 7 015-030 I-B MARK

NOTE: 7 13 015-030 I-B MARK

A-REG 1 OR 2 OR 4 OR 8

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113350 B	31.7.62	TA 1870 K

DISTRIBUTION RESTRICTIONS MARKINGS CODE

NAME: FIGURE 21 STACKER SELECT K AND STACKER SELECT BRANCH

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-21-62
APPROV			CHECK		

SHEET 1 OF 1 — 729955

903 S 904 S 905 S 906 S 701 S

	SIGNAL NAME	ENABLE GATE SW	TEST POINT	LOGIC	CYCLE: I P / T OP	CYCLE: I S / OP
1	STORAGE ADDRESS REGISTER	——		32.35.XX 32.36.XX	905 906	906 701
2	B-REGISTER	——		35.11.XX	2 2	2 2
3	A-REGISTER	——		35.10.XX	4	4
4	+U STACK SEL OPR	0181		35.09.11	OP DECODE 8 4 2 9 C 0	8 4 2 9 C 0
5	-E GATED MM	0182		31.07.11	8 M M SUPPRESSED BY T-OP	DMM
6	-T T/E CHANGE	0182		31.05.31	SUPPRESSED BY 40	
7	-U DELTA T-CYCLE	0182		31.26.11	6	6
8	-T T-CYCLE	0183		31.24.11	7	7
9	+U T-STAR RESTORE	0187		32.19.11	5 8	
10	+U SKE ELIM	0182		31.04.11	4	4 T-RING 4
11	-T PROGRAM SKIP	0182		31.08.11		5
12	+E T-A STAR GATE	0182		31.08.11		11
13	+U SET T-RING OP	0182		31.30.11		12
14	-T A-STAR GATE OUT	0187		32.32.21		NOT SET 12
15	-T T-RING OP	0186		31.21.31	NOT 03 / 016-030 I-B MARK	NOT E-B MARK 016-030
16	-U STACKER SELECT — 6 CHAR (1- 0184, 2- 0184, 4- 0184, 6- 0184)			36.50.16	A-REG 1 OR 2 OR 4 8 OR 8	
17	+U MODIFIER CONTROL + 1	0188		32.42.11		
18	-T MODIFIER CONTROL MEM	0188		32.42.41		
19	MODIFIER OUTPUT ON BUS LINES	——		32.43.XX	906 906	903 702
20	DATA ON INH DRIVE LINES	——		——	5 5	5 11
21	T-STAR AT END OF CYCLE				905 906	906 702

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113830 0	21 2 62	TA 1370 K

BRANCH FORCE MARKS FOR: FIGURE AT STACKER SELECT K AND STACKER SELECT CHANGE

DESIGNED — TYPE —
DETAILED — SCALE NONE
CHECKED — DWG NO. 1-729955
APPROVED — CHECK

SHEET 1 OF 1 | 724861

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	J-REGISTER (MH) BY (MH)	-		35,21,11
2				
3	=U MOVE OPERATION	0181		35,25,11
4	B REGISTER (MH) (BIT) (L)	—		35,21,11
5				
6	=U LOAD OPERATION	0181		35,25,11
7	A REGISTER A04 (K)	—		70,11,21
8	=U UNIT SELECT LATCH, UNIT SELECT	02A2		70,11,21
9	=T TAPE =1 MODE	02A2		70,11,21
10				
11	=U [illegible] BPS	0182		31,09,21
12	=U A [illegible] ELIMINATION	0182		31,06,11
13	A [illegible] BA 2 (M) (E- REDUNDANCY)	-		70,61,31
14	=T RED. CHANGE LATCH	02A2		70,61,31
15	=U UNIT SELECT GATE	02A2		70,11,21
16	A REGISTER 1,2,3,4,5, OR 6	-		71,11,31 71,11,31
17	=U RELEASE TAPE UNIT STATE UNIT 1A? 1,2,3,4,5, OR 6?	02A1		71,11,11 71,61,31
18				
19	=U B REGISTER [illegible]	0182		31,07,11
20	=U GATED WORD [illegible]	0182		31,07,11
21	=U I CYCLE	0182		31,24,11
22				
23	=T T/S CHANGE	0182		31,06,31
24				
25				
26	=U DELTA I CYCLE	0182		31,33,11
27				
28	T B CYCLE	0182		31,25,11
29	A REGISTER E A? (M)	—		70,11,29
30	=U READ TAIL	02A2		70,11,29
31	=U BLOCK START CONTROL	02A1		71,31,21
32	=T BASE CLOCK	02A1		71,31,21
33	=U [illegible] CHARACTER	02A1		71,31,21
34	=T GROUP MARK	02A1		71,31,21
35	=T FORCED GROUP MARK	02A2		70,61,31
36	FORCE GROUP MARK INTO A REGISTER	02A3		70,61,31
37	=T FORCED T/S CHANGE	02A2		70,11,61
38	=U [illegible]	0182		31,30,11
39				
40	=T DELTA I CYCLE	0182		31,21,11
41	=U DELTA PROCESS	0182		31,02,11 71,21,21
42	=U UNIT RESET	0282		70,11,21

I CYCLE									B CYCLE		
I RING 0P	I RING 1	I RING 2	I RING 3	I RING 4	I RING 5	I RING 6	I RING 7	I RING 8	FIRST	LAST	I RING 0P
3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0

(SET WORK IN ODD REDUNDANCY)

NOTE 1
(GATED BY RC 7 FROM TAU

NOTE 2

NOTE 1 THERE IS NO TAPE TIMING RELATIONSHIP WITH THE TURN ON OF THIS LATCH.

NOTE 2? BETWEEN I RING 0 AND THE START OF THE START B CYCLE SEVERAL MICROSECONDS ELAPSE DURING WHICH TIME THE TAPE CLOCK DOES NOT RUN.

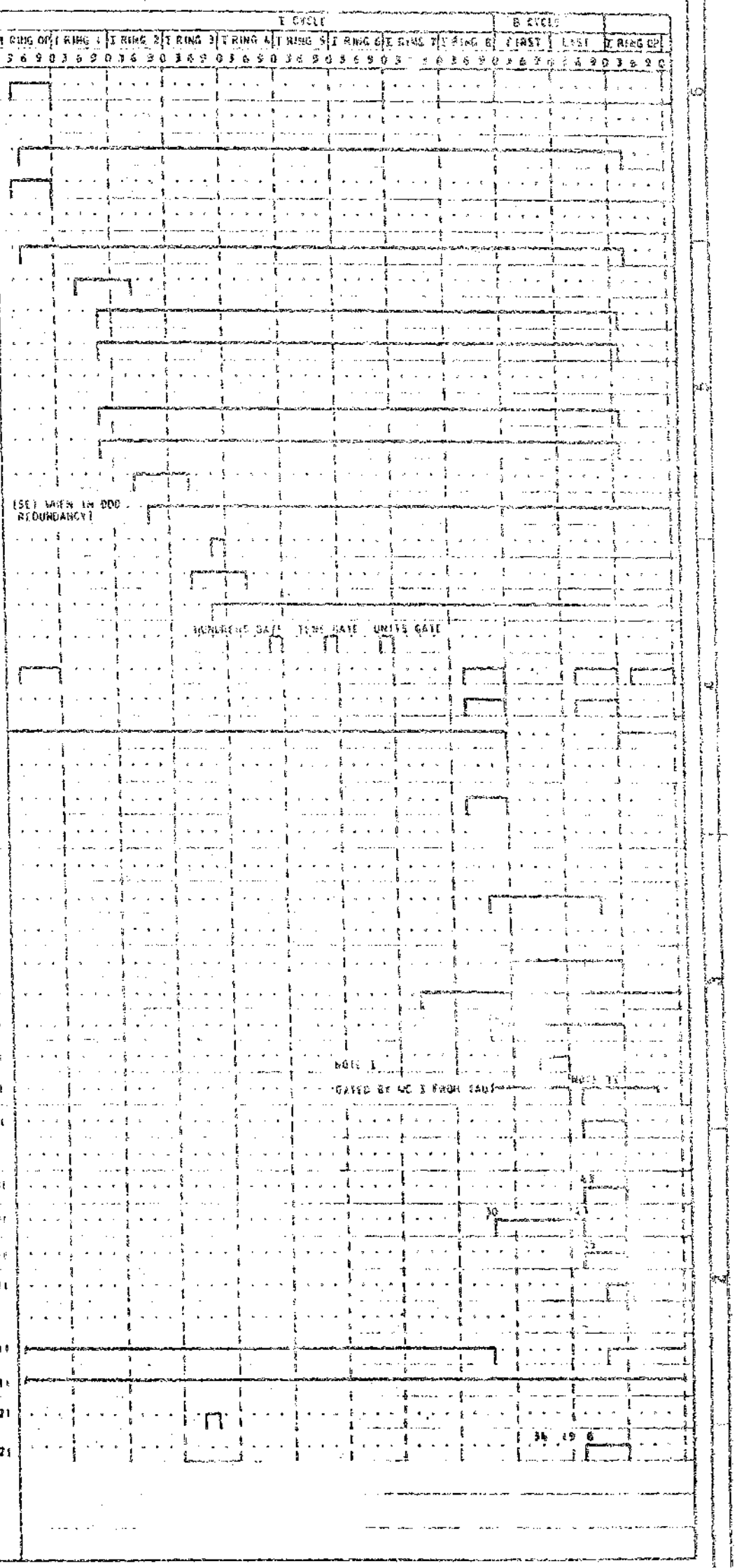
DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113560 D	31,7,62	TA 1320 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIG 3B TIMING FOR MOVE (LOAD) TAPE READ OPERATION

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VC	1-23-62
APPRD			CHECK		

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	B-REGISTER (WHI B4 (N)	–		35,21,11
2				
3	+U MOVE OPERATION	0184		35,25,11
4	B REGISTER (WM) C 821 (L)	–		35,21,11
5				
6	+U LOAD OPERATION	0151		35,25,11
7	A REGISTER AB4 (W)	–		70,11,21
8	+U -T (UNIT SELECT LATCH, UNIT SELECT)	02A7		70,11,31
9	-T TAPE +T MODE	02A2		70,11,21
10				
11	+U T/P OPS	0182		31,09,21
12	+U A CYCLE ELIMINATION	0182		31,06,11
13	A REGISTER BA2 (W) (ODD REDUNDANCY)	–		70,61,31
14	+T REDUNDANCY LATCH	02A2		70,61,31
15	+U UNIT SELECT GATE	02A2		70,11,21
16	A REGISTER 1,2,3,4,5, OR 6	–		71,11,11 71,11,31
17	+U SELECT TAPE UNIT (TAPE UNIT LATCH 1,2,3,4,5, OR 6)	02A1		71,11,11 71,11,31
18	GATE B REGISTER CONTENTS INTO +U THE B ADDRESS REGISTER	–		–
19	+U B REGISTER WORD MARK	0182		31,09,11
20	+U GATED WORD MARK	0182		31,07,11
21	+U B CYCLE	0182		31,05,31
22				
23	-T I-F CHANGE	0182		31,09,31
24				
25				
26	+U DELTA B CYCLE	0182		31,23,11
27				
28	-T B CYCLE	0182		31,20,31
29	A REGISTER AA2 (W)	–		70,51,21
30	+U WRITE CALL	02A2		70,61,21
31	-T CLOCK START CONTROL LATCH	02A1		71,31,21
32	-T TAPE CLOCK	02A1		71,31,21
33	+U CHECK CHARACTER (FROM TAU)	02A1		71,31,21
34				
35	+T FORCED GROUP MARK	02A2		70,61,31
36	+T UNIT WRITE GATE	02A2		70,51,21
37	+T FORCED T/P CHANGE	02A2		70,11,21
38	+U SET TO I RING 09	0182		31,20,11
39				
40	+U DELTA T CYCLE	0182		31,30,11
41	+U DELTA PROCESS	0182		31,42,11
42	+U UNIT RESET	02A2		70,11,21
43	+U DISCONNECT +P DISCONNECT CALL TO TAU	02A2 02A2		70,51,21



NOTE 1 THERE IS NO FIXED TIMING RELATIONSHIP WITH THE TURN ON OF THIS LATCH.

NOTE 17 BETWEEN THE FIRST AND SECOND B CYCLE SEVERAL MILLISECONDS ELAPSE DURING WHICH TIME THE FAST CLOCK DOES NOT RUN.

DATE	CHANGE NO	DATE	CHANGE NO
4-10-62	115420 D	31,7,62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP
FIG 25 TIMING FOR MOVE
(LOAD) TAPE WRITE OPERATION
DRAWN 4-25-62

SHEET 1 OF 1 | 724863

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	-T DELAY B CYCLE LATCH	01B2		31,23,11
2	-U DELAY B CYCLE	01B2		31,23,61
3	-T B CYCLE	01B2		31,26,11
4	-U LOAD OPERATION	01B1		35,25,61
5	DATA FROM TAPE	–		70,61,21
6	C REGISTER A&B1 (WS CHAR)	–		70,61,21
7	-T WS READ	02A2		70,61,31
8	-U TAPE READDRESS	02A2		70,51,31
9	-T READDRESS LATCH (CY CONTROL)	01B2		31,04,61
10	-T [illegible] READDRESS LATCH	02A2		70,51,31
11	-U [illegible] WORD MARK	01A2		70,61,31
12		–		
13		–		
14	B(S&1) D ADDRESS REGISTER	–		32,33,11 32,33,21
15	GATE [illegible] B ADDRESS REGISTER STORAGE ADDRESS	–		32,39,11 32,33,21
16	GATE [illegible] THE B ADDRESS REGISTER	04A2		32,33,31
17	-T BOT ADDRESS REGISTER RESET	01B2		31,04,11
18	GATE ADDRESS REG CONTENTS INTO MCR	–		32,39,21

CYCLE

A	B	B	B	B	B	B	B	B	B	B	B
3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0
CHAR 1	WS CHAR	CHAR 2	CHAR 3	CHAR 4	CHAR 5	CHAR 6	CHAR 7	WS CHAR	CHAR 8	CHAR 9	
								BLOCKED			
	BLOCKED							BLOCKED			

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	TS 320 D	11.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIG 4D TIMING FOR LOAD TAPE AND READ A WORD SEPARATOR CHARACTER

DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DATE	VE 1-24-62
APPRO			

SHEET 1 OF 1 | 724864

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	-T	DELTA B CYCLE LATCH	01B2		31.23.11
2	+D	DELTA B CYCLE	01B2		31.23.11
3	-T	B CYCLE	01B2		31.26.11
4		DATA READ FROM STORAGE	----		70.51.21
5	+U	LOAD OPERATION	01B1		35.25.11
6	-T	WRITE CALL	02A2		70.51.21
7	-T	B REGISTER WORD MARK	02A2		70.51.21
8	-T	READDRESS LATCH	02A2		70.51.31
9	+T	NOT READDRESS LATCH	02A2		70.51.31
10	+D	TAPE READDRESS	02A2		70.51.31
11	-T	READDRESS LATCH (CY CONTROL)	01B2		31.04.11
12	T	WS ON TAPE	02A2		70.51.31
13		FORCE LINES A,B,C, F TO TAU	----		70.51.21
15		RESET B ADDRESS REGISTER	----		32.33.11
16		GATE INTO B ADDRESS REGISTER FROM MODIFIER	----		32.23.11
17	-T	GATE OUT THE B ADDRESS REGISTER	01A2		32.33.31
18	-T	NOT ADDRESS REGISTER RESET	01B2		31.04.11
20		GATE ADDRESS REG CONTENTS INTO MQU AND INTO STORAGE	----		----

CYCLE

B 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

CHAR 1 | CHAR 2 AND WM | CHAR 2 AND WM | CHAR 3 | CHAR 4 | CHAR 5 | CHAR 6 | CHAR 7 | CHAR 8 AND WM | CHAR 8 AND WM | CHAR 9

U T H U I H

BLOCKED BLOCKED BLOCKED BLOCKED

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	353330 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 4E TIMING FOR LOAD TAPE AND WRITE A WORD SEPARATOR CHARACTER

DESIGN | TYPE
DETAIL | SCALE: NONE
CHECK | DRAW: VE 1-12-62
APPRD | CHECK

SHEET 1 OF 1 | 724865

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	-T DELTA T CYCLE	0192		31.21.11
2	B-REGISTER (WM) AR 101	———		35.21.41
3	OP DECODE (WM) AR 101	———		35.26.11
4	-U U OP CODE	0182		35.26.11
5	-U EXECUTE ELIMINATE	0182		31.05.11
6	A REGISTER A BA 141	———		70.11.21
7	-F [illegible] SELECT CATCH FAST SELECT	02A2		70.11.21
8	-U CARD + 5 MODE	02A2		70.11.21
9	-U I/O CHECKS	0182		31.09.21
10	-U A CYCLE ELIMINATION	0182		31.06.11
11				
12				
13	-U [illegible]	0262		70.11.23
14	A REGISTER [illegible]	———		21.11.11
15	-U SELECT TAPE (WM) TAPE UNIT CATCH 11	———		71.11.11
16	-U B REGISTER WORD MARK	0182		31.07.11
17	-U [illegible]	0241		71.11.21
18	A REGISTER [illegible]	———		21.11.21
19	-U [illegible]	0241		71.11.21
20	-U [illegible]	[illegible]		31.07.11
21	-U [illegible]	0182		31.10.11
22	-T TAPE [illegible]	0241		71 31.21
23				
24	-U [illegible]	0282		30.11.21

CYCLE

E RING OP	E RING 1	E RING 2	E RING 3	E RING 4	E RING 5	E RING OP	E RING 1	E RING 2	E RING 3	E RING 4
3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0	3 6 9 0

(GATED BY T01 00ST)

DATE	CHANGE NO	DATE	CHANGE NO
1-10-62	[illegible]	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

FIGURE 42 TIMING FOR BACK-SPACE TAPE OPERATION

DESIGN			TYPE	
DETAIL			SCALE	NONE
CHECK			DRAW	VE 1-11-62
APPRO			CHECK	

SHEET 1 OF 1 | 724065

		SIGNAL NAME	FRAME DATA SH	TEST POINT	LOGIC
1	-I	DELTA I CYCLE	0182		31.21.11
2		B-REGISTER (UNIT A4 (2)	——		35.21.11
3		OP DECODE (WM) A4 (01)	——		35.26.11
4	+U	U OP CODE	0182		35.26.11
5	+U	EXECUTE ELIMINATE	0182		31.09.11
6		A REGISTER A SA (X)	——		70.11.21
7		[illegible] SELECT LATCH. [illegible] SELECT	02A2		70.11.21
8	+J	TAPE A 5 MODE	0282		70.11.21
9	+U	[illegible] ELIMINATE	0182		31.09.21
10	+U	A CYCLE ELIMINATION	0182		31.06.11
11					
12					
13	+U	UNIT SELECT BASE	0282		70.11.21
14		A REGISTER (2) 2	——		21.11.11
15	+U	SELECT TAPE UNIT TAPE UNIT LATCH 2A	——		21.11.11
16	+J	B REGISTER HOLD MASK	0182		31.07.11
17	+J	B OP CODE DATA	0282		21.11.21
18		A REGISTER (A 2 (2)	——		21.11.21
19	+P	CARRIAGE (C TAB)	02A1		21.11.21
20	+J	SAVE HOLD MASK	0182		31.07.11
21	+J	[illegible]	0182		31.10.11
22	-I	[illegible]	0282		21.31.21
23					
24	+U	[illegible]	0282		70.11.21

CYCLE

3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

(GATED BY [illegible])

DATE	CHANGE NO	DATE	CHANGE NO.
[illegible]	[illegible]	31.7.62	TA 1070 K

INTERNATIONAL BUSINESS MACHINES CORP

FIGURE 42 TIMING FOR BACK-SPACE TAPE OPERATION

DESIGN			TAPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	9-11-62
APPRD			CHECK		

SHEET 4 OF 4 — 724B67

U % U I M B

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	-I	DELTA I-CYCLE	01B2		31.21.11
2		B-REGISTER (WM) A4 (0)	—		35.21.81
3		OP DECODE (WM) A4 (0)	—		35.26.11
4	+U	U OP CODE	01B2		35.26.11
5	+U	EXECUTE ELIMINATE	01B2		31.05.11
6		A REGISTER AB4 (1)	—		70.11.81
7	-I	UNIT SELECT LATCH, UNIT SELECT	02A2		70.11.21
8	-I	TAPE + I MODE	02A2		70.11.21
9	+U	I/O OPS	01B2		31.09.21
10	+U	A CYCLE ELIMINATION	01B2		31.06.11
11			—		
12					
13	+U	UNIT SELECT GATE	02A2		70.11.21
14		A REGISTER 1	—		71.51.11
15	-T	SELECT TAPE UNIT (TAPE UNIT LATCH 1)	02A1		71.31.11
16	+U	B-REGISTER WORD MARK	01B2		31.07.11
17	+U	U OP CODE GATE	02A2		70.11.21
18		A-REGISTER CHK (M)	—		71.14.21
19	-T	WRITE TAPE MARK CALL	02A2		70.11.41
20	+U	GATED WORD MARK	01B2		31.07.11
21	+U	SET T OP LATCH	01B2		31.30.11
22	-T	TAPE CLOCK	02A1		71.24.21
23					
24	+U	UNIT RESET	02A2		70.11.21

CYCLE

I RING UP | I RING 1 | I RING 2 | I RING 3 | I RING 4 | I RING 5 | I RING 6P | I RING 1 | I RING 2 | I RING 3 | I RING 4 | I RING 5

3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

37

(GATED BY TAU BUSY)

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113630 D	31.7.62	TA 1870 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 44 TIMING FOR WRITE TAPE MARK OPERATION

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	1-12-62
APPRD			CHECK		

SHEET 1 OF 1 | 726846

		SIGNAL NAME	FRAME GATE CM	TEST POINT	LOGIC
1	-T	DELTA T CYCLE	01B2		31.21.11
2		B-REGISTER (WM) A4 (U)	—		35.21.11
3		OP DECODE (WM) A4 (U)	—		35.26.11
4	+U	U OP CODE	01B2		35.26.11
5	+U	EXECUTE ELIMINATE	01B2		31.05.11
6		A REGISTER A84 (X)	—		70.11.21
7	-T	UNIT SELECT LATCH, UNIT SELECT	02A2		70.11.21
8	-T	TAPE + 1 MODE	02A2		70.11.21
9	+U	T/O OPS	01B2		31.09.21
10	+U	A CYCLE ELIMINATION	01B2		31.06.11
11			—		
12					
13	+U	UNIT SELECT GATE	02A2		70.11.21
14		A-REGISTER 1	—		71.11.11
15	-T	SELECT TAPE UNIT (TAPE UNIT SELECT 1)	02A1		71.11.11
16	+U	B REGISTER WORD MARK	01B2		70.11.21 31.07.11
17	+U	U OP CODE GATE	02A2		70.11.21
18		A REGISTER B81 (R)	—		71.11.21
19	-T	REWIND	02A1		71.11.21
20	+U	GATED WORD MARK	01B2		31.07.11
21	+U	SET T OP LATCH	01B2		31.30.11
22	-T	TAPE CLOCK	02A1		71.31.21
23					
24	+U	UNIT RESET	02A2		70.11.21

CYCLE

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113830 D	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 45 TIMING FOR REWIND TAPE OPERATION

DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DATE	VE 1-12-62
APPRD		CHECK	

SHEET 1 OF 1 | 724870

d = K (END OF FILE) OR L (TAPE ERROR)

B (AAA) (a) B AAA - 5

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	-T	DELTA T CYCLE	01B2		31.21.11
2		B REGISTER	——		35.21.11
3		OP DECODE (WM) CBA 2 (B)	——		35.26.11
4	-T	BRANCH OPERATION	02A1		70.11.41
5		GATE B REGISTER CONTENTS INTO A ADDRESS REG (DIGIT BY DIGIT)	——		32.42.11
6	+U	EXECUTE ELIMINATE	01B2		31.05.11
7		A REGISTER CB2 (K) OR A REGISTER B21 (L)	——		70.11.41 / 71.11.11
8					
9	-T	B REGISTER WORD MARK	02A2		70.51.31
10	+U	GATED WORD MARK	01B2		31.07.11
11	+U	TAU ERROR OR	02A2		70.11.41
12	+U	SEL + TT ON	02A2		70.11.41
13					
14	+U	TAPE PROGRAM SKIP	02A2		70.11.41
15	-T	PROGRAM SKIP LATCH	01B2		31.08.11
16	+U	SET TO I RING OP LATCH	01B2		31.30.11
17	-T	A ADDRESS REGISTER GATE OUT	01A7		32.32.21

CYCLE

I RING OP | I RING 1 | I RING 2 | I RING 3 | I RING 4 | I RING 5 | I RING OP

3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0

CBA2 WM | (A1) | (A2) | (A3) | (d) | CBA2 WM | A2 WM

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113630 B	31.7.62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 47 TIMING FOR TAPE END-OF-FILE INDICATOR TEST AND TAPE TRANSMISSION ERROR TEST

DESIGN | TYPE

DETAIL | SCALE: NONE

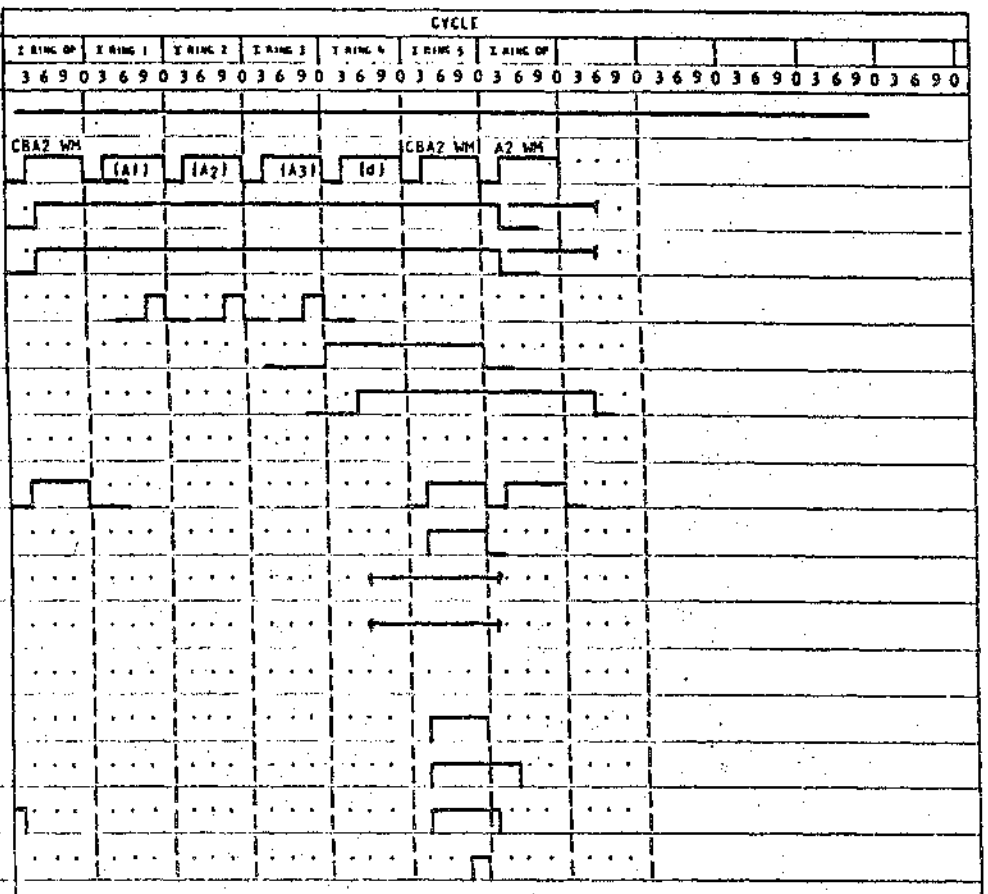
CHECK | DRAW: VE 1-12-62

APPRO | CHECK

d = K (END OF FILE) OR L (TAPE ERROR)

B (AAA) (a) B AAA - 5

		SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	-T	DELTA T CYCLE	01B2		31.21.11
2		B REGISTER	——		35.21.11
3		OP DECODE (WM) CBA 2 (8)	——		35.26.11
4	-T	BRANCH OPERATION	02A1		70.11.41
5		GATE B REGISTER CONTENTS INTO A ADDRESS REG (DIGIT BY DIGIT)	——		32.42.11
6	+U	EXECUTE ELIMINATE	01B2		31.05.11
7		A REGISTER C82 (K) OR A REGISTER B21 (L)	——		70.11.41 / 71.11.11
8					
9	-T	B REGISTER WORD MARK	02A2		70.51.31
10	+U	GATED WORD MARK	01B2		31.07.11
11	+U	TAU ERROR OR	02A2		70.11.41
12	+U	SEL + TT ON	02A2		70.11.41
13					
14	+U	TAPE PROGRAM SKIP	02A2		70.11.41
15	-T	PROGRAM SKIP LATCH	01B2		31.08.11
16	+U	SET TO I RING OP LATCH	01B2		31.30.11
17	-T	A ADDRESS REGISTER GATE OUT	01A7		32.32.21



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113139 B	31-7-62	TA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME: FIGURE 47 TIMING FOR TAPE END-OF-FILE INDICATOR TEST AND TAPE TRANSMISSION ERROR TEST

DESIGN			TYPE		
DETAIL			SCALE	NONE	
CHECK			DRAW	VE	9-12-62
APPRO			CHECK		

	SIGNAL NAME	PRINTED CIRCUIT CARD	LOGIC
1	P REG (UNITS 4 (M)	—	35.21.11
2			
3	4U MODE OPERATION	0182	35.03.11
4	3 REG A EX (C)	—	70.11.21
5	4U UNIT SEL UNIT SEL LATCH	02A2	70.11.21
6	-T TAPE + MODE	02A2	70.11.21
7			
8	+U I/O OPS	0182	31.03.21
9	4U A CYCLE ELIMINATE	0182	31.08.11
10	3 REG BA 3 (C)	—	44.70.21
11	-T COMPRESSED WORD LATCH	02A6	44.70.21
12	-T REDUNDANCY LATCH(EVEN)	02A2	70.01.31
13	4U UNIT SELECT GATE	02A2	70.11.21
14	A REG 1,2,3,4,5,OR 6	—	71.11.31
15	4U SELECT TAPE UNIT (TAPE UNIT LATCH) 1,2,3,4,5,OR 6	0254	71.11.31 71.01.31
16			
17	4U B REG WORD MARK	0182	31.07.11
18	4U GATED WORD MARK	0182	31.07.11
19	4U Z CYCLE	0182	31.24.11
20			
21	-T I/E CHANGE	0182	31.05.31

M % C X B 8 4 K NEX

1 CYCLE

A B RING 1 RING 2 RING 3 RING 4 E

CYCLE

A B RING 1 RING 2 RING 3 RING 4

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	113550	8-7-62	TA 13705	FIGURE 48 MOVE COMPRESSED

APPRD	CHECK	DETAIL CHECK	WORK TAPE REQ.	DESIGN OPERATION	TYPE	SCALE	DRAW	VE	MADE 3-28-62	CHECK

SHEET 1 OF 2 | 724871

	SIGNAL NAME	FROM GATE OUT	LOGIC
22			
23			
24	+U DELTA D CYCLE	0150 0152	51.23.11
25			
26	-T D CYCLE	0182	31.26.11
27	+U READ WRITE GATE	0282	70.11.21
28	A REG D BIT (A)		70.11.21
29	+U READ CALL	0282	70.11.21
30	+U CLOCK START CONTROL LATCH	0281	71.31.21
31	-T TAPE CLOCK	0281	71.31.21
32	+U TAPE MODE CHANGE (INHIBIT D 1249)	0286	64.70.31
33	-T NUMERIC MODE TRIGGER	0286	64.70.31
34	+U CHECK CHARACTER	0281	71.71.21
35	-T GROUP MARK	0281	71.71.21
36	-T FORCED GROUP MARK	0282	70.61.31
37	FORCE GROUP MARK INTO A POS	0282	70.61.21
38	-T TRANSFER STAR TO B STAR	0282	44.10.21
39	-T FORCED I/E CHANGE	0282	70.11.41
40	+U SET TO E RING OF	0182	31.30.11
41			
42			
43			
44	-U UNIT RESET	0282	70.11.21
45			

	DATE	CHANGE NO.
	4-10-64	1172450 PJ
	7-7-62	FA 1370 K

INTERNATIONAL BUSINESS MACHINES CORP.

TAPE READ OPERATION

FIGURE 46 MOVE COMPRESSED

	DESIGN	SCALE
ENGRG	INITIAL	TYPE
	CHECK	NONE
	DRAW	VE 9-28-62
	CHECK	

SHEET 2 OF 2

724871

SIGNAL NAME	PAGE COORD	LOGIC
SEQUENCE MONITOR REGISTER	—	44.70.21 55.16.41
A-REGISTER	—	55.16.41
B-REGISTER	—	55.16.41
~T MEMORY REFRESH CYCLE REQ	0216	44.70.21
ADVANCE M (A-B)	0181	44.70.11
~T GATE 0 REQ	0182	34.07.11
~T SYS CHANGE	0182	34.07.31
+U DELTA F-CYCLE	0182	34.07.11
~T F-CYCLE	0182	34.07.11
+U DELTA A-CYCLE	0182	34.07.11
~T A-CYCLE	0182	34.07.11
~T DELTA B-CYCLE	0182	34.07.11
+U B-CYCLE	0182	34.07.11
~T B-REG ZONE INHIBIT	0183	55.16.21
~T B-REG DIGIT INHIBIT	0183	55.16.21
~T B-REG C-BIT INHIBIT	0183	55.16.21
J U INHIBIT WM	0183	55.16.51
+U XFER A REG DIGIT ZONE	0286	44.70.21
~T A-REG ZONE INHIBIT	0183	55.16.41
~T A-REG DIGIT INHIBIT	0183	55.16.41
+U DELTA CHARACTER	0286	44.70.31
~T NUMERIC MODE	0286	44.70.31
+U FIRST B BIT	0286	44.70.41
2 ND A-REG B BIT	0286	44.70.41
+U 2 ND B-BIT TRIGGER	0286	44.70.41
+U A-CYCLE ELIMINATE	0286	44.70.21
~T INHIBIT 82 CD 62	0286	44.70.21
~T STORE X-E CHANGE	0286	44.70.31
WRITE PULSE AND DATA ON INHIBIT DRIVE LINES	0181	55.38.11

NO.	DATE	CHANGE NO.
1	5-15-62	TA 1870 K

DRAWN	DESIGN	INSPECTION	FIGURE 4.5 MOVE WITH ZERO
10-28-61			

INTERNATIONAL BUSINESS MACHINES CORP.

FORWARD SCAN

SHEET 1 OF 1

724672

SHEET 1 OF 3 | 725073

[807] [816] $\frac{A}{B}$ [8096] [2573] ORIG A-FIELD ORIG B-FIELD NZX=[65271] CHK=$7836 = A-TAG]

RESULTANT B-FIELD CHG= [16363 = A-TAG]

	SIGNAL NAME	FRAME GATE CH	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—		32,3X,XX,2
2	B-REGISTER	—		35,1X,XX,2
3	A-REGISTER	—		35,1X,XX,2
4	MODIFY (#) OP	0183		46,62,02,2
5	DELTA Y CYCLE LATCH	0182		31,21,11,2
6	Y CYCLE LATCH	0182		31,21,11,2
7	DELTA A CYCLE LATCH	0182		31,22,11,2
8	A CYCLE LATCH	0684		42,65,01,2
9	DELTA B CYCLE LATCH	0684		42,65,01,2
10	B CYCLE LATCH	0182		31,21,11,2
11	CYCLE OR 1	0684		42,65,01,2
12	CYCLE OR 2	0684		42,65,01,2
13	CYCLE OR 3	0684		42,65,01,2
14	A CYCLE ELIMINATE	0685		42,65,01,2
15	TRANSFER B-REGISTER	0680		42,65,02,2
16	ARITH ZONE	0684		42,65,02,2
17	ARITH DIGIT	0684		42,65,02,2
18	MOD OP BLOCK AU CARRY	0684		42,65,02,2
19	B-REG ZONE INHIBIT	0684		42,65,02,2
20	RESET A-REGISTER	0684		42,65,02,2
21	[illegible]	0684		42,65,02,2
22	[illegible] CARRY	0684		42,65,02,2
23	ZONE ADDER CARRY	0684		42,65,02,2
24	ADDRESS MOD I-E CHANGE	0685		42,65,02,2
25	MODIFIER CONTROL +1	0686		32,42,61,2
26	MODIFIER CONTROL +3	0685		42,69,02,2
27	MODIFIER CONTROL AFER	0686		32,42,61,2
28	MODIFIER OUTPUT ON BUS	—		32,43,XX,2
29	DATA ON INHIBIT DRIVE	—		35,1X,XX,2

CYCLE

	DATE	CHANGE NO	DATE	CHANGE NO.
	4-10-62	1123130 D	31.7.62	TA 1372 K

INTERNATIONAL BUSINESS MACHINES CORP

NAME FIG 50 ADDRESS MODIFY

TIMING 6(AAA) [880]

DESIGN			TYPE		
METAL			SCALE	NONE	
CHECK			ORIGN	VE	4-23-62
APPRD			CHECK		

MULTIPLY OPERATION

A – FIELD ADDRESS			457	458
A – FIELD BEFORE OPERATION			3	B_6
A – FIELD AFTER OPERATION			3	B_6

INSTRUKTIONS: (900) 1 723 678
(907) 2 458 678
(914) B 900

B – FIELD ADDRESS			673	674	676	676	677	678
B – FIELD BEFORE OPERATION			2	0	3	3	2	1
B – FIELD AFTER CLEAR OPER.					1	0	0	0
B – FIELD AFTER ADD 2A OPER.					0	0	7	B_2
B – FIELD AFTER ADD A OPER.			0	0	0	1	0	B_8
B – FIELD AFTER ADD 2A OPER.			0	0	7	3	0	B_8

	SCOPE POINT	LEVEL	I	A	B	A	B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	B	AUX B	B	AUX A	AUX B	A	B	B	B	I
M-STAR			914	458	678	458	678	457	677	676	675	458	678	457	677	676	675	458	678	457	677	676	675	678	674	677	673	458	676	457	675	674	673	914
A-STAR			458	458		457		456				457		456				457		456								457		456				
B-STAR			678		678		677		676	675	674		677		676	675	674		677		676	675	674		673		672		675		674	673	672	
A-AUX-STAR				458								458						458																
B-AUX-STAR					678							458	678					458	678					677		676			676					
B-REGISTER			2	B_6	1	B_6	0	3	2	3	3	B_6	0	3	0	0	1	B_8	B_2	3	7	0	0	B_8	0	0	2	B_6	1	3	0	0	0	B_8
A-REGISTER			8	B_6		B_6		3		C	C	B_6		3		C	C	B_6		3		C	C	C	C	C	C	B_6		3		C	C	0
79 INHIBIT			2	B_6	0	B_6	0	3	0	0	1	B_6	B_2	3	7	0	0	B_6	B_8	3	0	1	0	B_8	0	0	0	B_6	3	3	7	0	0	B_8
B-CYCLE	44.14.01 02B 7B16 G	7																																
B-AUX STAR RI UNITS	44.16.11 02A 7C09 H	36																																
AUX STAR SET LATCH	44.11.01 02B 7B17 N	7																																
B-AUX STAR GATE OUT	44.16.01 02A 7C10 B	13																																
TRANSFER B-REG.	35.40.11 01A 3B01 H	14																																
CLEAR B-FIELD LATCH	44.11.41 02B 7D21 G	7																																
FORCE B2C	44.11.41 02B 7A16 N	15																																
SIGN TRIGGER	44.11.31 02B 7A05 P	17																																
SET PROD. SIGN LATCH	44.11.41 02B 7B11 H	17																																
X-POSITION LATCH	44.11.21 02B 7C17 B	11																																
MULTIPLIER LATCH	44.11.21 02B 7C17 H	17																																
A-CYCLE ELEMINATE LATCH	44.11.11 02B 7C17 A	17																																
2A LATCH	44.12.11 02B 7A20 H	17																																
A LATCH	44.12.11 02B 7A20 N	17																																
A-AUX LATCH	44.14.11 02B 7B07 H	14																																
B-AUX LATCH	44.14.31 02B 7B06 H	16																																
ARITH. DIGIT GATE	44.13.21 02B 7C09 A	17																																
COMPLEMENT FROM CALC.	44.13.11 02B 7C01 A	14																																
DOUBLER CARRY TRIG.	44.18.21 02A 7C12 A	18																																
ADDER CARRY	34.33.11 01A 3C24 C	17																																
CARRY TRIGGER	34.38.11 01B 3E16 N	17																																
A REG BIT 1 FROM CALC		17																																
A REG 00 CALC		16																																
A REG 02 CALC		18																																
I/E CHANGE	44.13.01 02B 7A24 N	17																																
			I	A	B	A	B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	B	AUX B	B	AUX A	AUX B	A	B	B	B	I

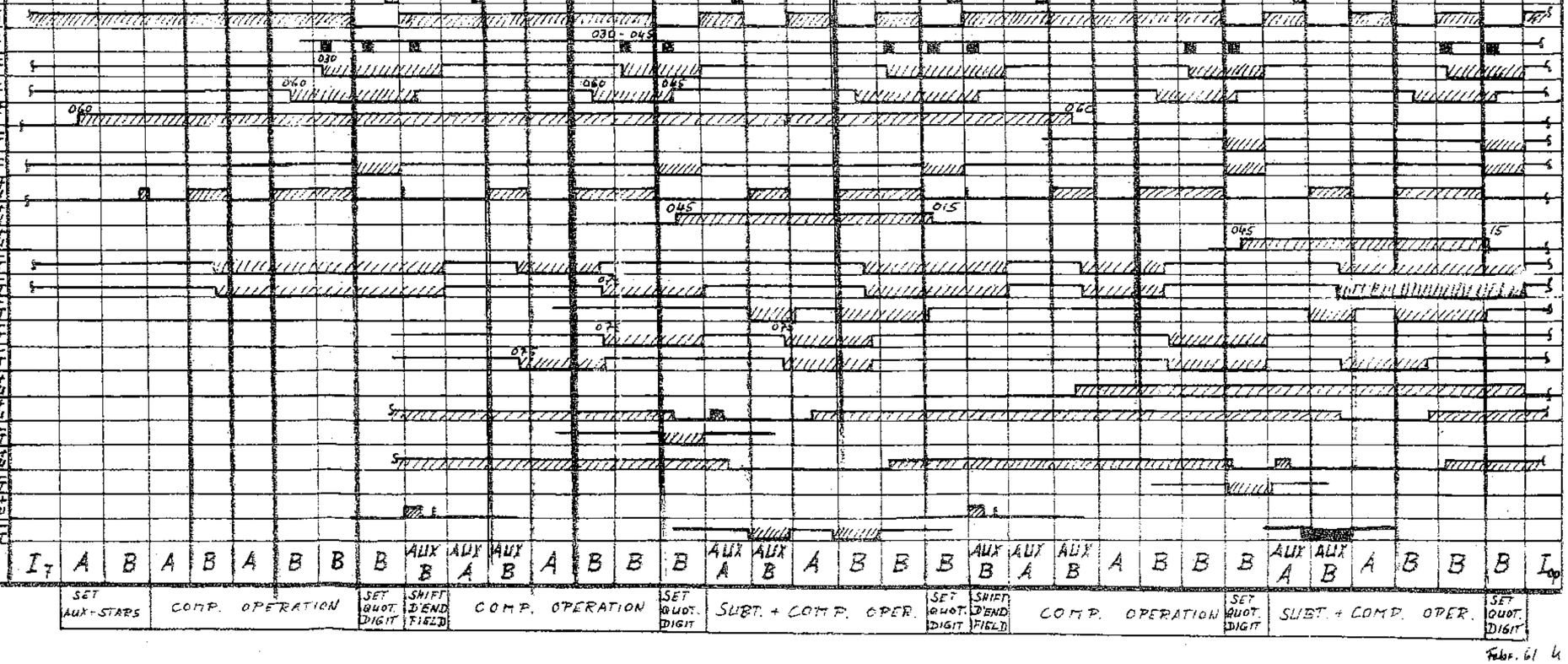
SET — TEST UNITS — TEST UNITS — TEST UNITS — SHIFT — TEST TENS — SHIFT — TEST HUNDS — TEST HUNDS — E/E

A-FIELD BEFORE OPERATION		2	7^B
A-FIELD AFTER OPERATION		2	7^B

INSTRUCTIONS: (900) 10 T83 678
(907) 2 458 676
(914) 2 900

B-FIELD BEFORE OPERATION			0	0	3	4	0^B
b-F. AFTER DIVIDE - COMPARE			0	1	3	4	0^B
B-F. AFTER DIVIDE - COMPARE			0	1	0	3	4	0^B
B-F. AFTER SUBT. A & DIV. COMP.			0	1	0	0	7	0^B
B-F. AFTER DIVIDE - COMPARE			0	1	2^{AB}	0	7	0^B
B-F. AFTER SUBT. 2A & DIV. COMP.			0	1	2^{AB}	0	1	6^B

SCOPE TRIGGER POINT	02 B7 B17 N AUX STAR SET LATCH		I_T	A	B	A	B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	I_{op}
M - STAR			914	458	676	458	676	457	675	674	673	676	458	677	457	676	675	674	458	677	457	676	675	674	677	458	678	457	677	676	675	458	678	457	677	676	675	914
A - STAR			458	458		457		456					457		456				457		456					457		456				457		456				
B - STAR			676		676		675		674	673	672	677		676		675	674	673		676		675	674	673	678		677		676	675	674		677		676	675	674	
A - AUX - STAR				458																																	
B - AUX - STAR					676							677													678													
B - REGISTER			2	7^B	3	7^B	3	2	0	0	0	3	7^B	4	2	3	0	0	7^B	4	2	3	0	1	7	7^B	0^B	2	7	0	0	7^B	6^B	2	7	0	2^{AB}	B
A - REGISTER			8	7^B	7^B	7^B	$^{-5}$	2	2	C	C	C	7^B		2		C	C	7^B		2		C	C	C	7^B		2		C	C	7^B		2		C	C	0
TO INHIBIT			2	7^B	3	7^B	3	2	0	0	0	3	7^B	4	2	3	0	1	7^B	7	2	0	0	1	7	7^B	0^B	2	7	0	2^{AB}	7^B	6^B	2	1	0	2^{AB}	B
B - CYCLE	44. 11. 01 02 B 7 B16 C	T																																			
B-AUX STAR RL. UNITS	44. 16. 01 02 A 7 C09 H	U																																			
AUX STAR SET LATCH	44. 11. 01. 02 B7 B17 N	T																																			
B-AUX-STAR GATE OUT	44. 16. 01 02 A 7C10 B	T																																			
TRANSFER B-REG	35. 40. 11 01 A 3 B 01 H	U																																			
SET A-REG C-BIT	44. 11. 11. 02 B7 D03 A	T																																			
X POS. LATCH	44. 11. 21. 02 B 7 C17 B	T																																			
A ⩒ ELIM. LATCH	44. 11. 11. 02 B 7 C17 A	T																																			
SIGN TRIGGER	44. 11. 31. 02 B 7 A05 P	T																																			
SET SIGN GATE	44. 13. 01 02 B 7 D08 D	T																																			
QUOT. TRIGGER	44. 12. 01 02 B 7 A 13 N	T																																			
COMPARE GATE	44. 13. 01 02 B 7 A 22 N	T																																			
A LATCH	44. 12. 11 02 B 7 C08 P	U																																			
2A LATCH	44. 12. 11 02 B 7 C08 A	U																																			
B<A LATCH	44. 19. 21. 02 A 7 E12 N	T																																			
B< 2A LATCH	44. 19. 31. 02 A 7 E15 N	T																																			
COMPLEMENT GATE	44. 13. 11. 02 B 7 B03 N	T																																			
SUBT. A LATCH	44. 18. 21. 02 A 7 E11 H	T																																			
SUBT. 2 A LATCH	44. 18. 31. 02 A 7 E15 H	T																																			
END DIVIDE LATCH	44. 12. 01. 02 B 7 B11 F	U																																			
FORCE B 0	44. 18. 31 02 A 7 D03 H	U																																			
FORCE B 1	44. 18. 31 02 A 7 C24 D	T																																			
FORCE Q 0	44. 18. 31 02 A 7 D03 N	U																																			
FORCE Q 2	44. 18. 31. 02 A 7 D10 P	T																																			
MOD. CONTR. +1	32. 44. 11. 01 A 8 F 20 N	U																																			
CARRY	34. 38. 11. 01 E 3 E 16 N	T																																			



Febr. 61 4

1401 TIMING CHARTS

ARITHMETIC OPERATIONS

1 RESET ADD 0 (AAA)(BBB)
2 TRUE ADD
3 COMPLEMENT ADD-RECOMPLEMENT A (AAA)(BBB)
4 COMPLEMENT ADD-NO RECOMPLEMENT
5 COMPLEMENT ADD-ONE CHARACTER FIELD

MOVE, LOAD, COMPARE AND LOGIC OPERATIONS

6 MOVE M (AAA)(BBB)
7 MOVE DIGIT D (AAA)(BBB)
8 MOVE ZONE Y (AAA)(BBB)
9 MOVE ZERO SUPPRESS Z (AAA)(BBB)
10 LOAD L (AAA)(BBB)
11 CLEAR OP / (AAA)
12 WORD MARK CLEAR (AAA)(BBB)
13 WORD MARK SET (AAA)(BBB)
14 COMPARE C (AAA)(BBB)
15 HIGH-LOW-EQUAL COMPARE SEQUENCE C (AAA)(BBB)
16 BRANCH B (III), UNCONDITIONAL BRANCH
17 TEST AND BRANCH B (III) d (TEST ANY ONE OF TEN CHARACTER)
18 TEST CHARACTER AND BRANCH B (III)(BBB) d (ANY ONE OF NINE CHARACTERS)
19 TEST ZONE OR WORD MARK OR BOTH AND BRANCH V (III)(BBB) d
20 CLEAR AND BRANCH / (III)(BBB)
21 STOP AND BRANCH . (III)
22 STOP (.)
23 NO-OP (NO
24 EDIT OPERATION - ZERO SUPPRESS

ADVANCE PROGRAMMING

25 INSTRUCTION CYCLE WITH INDEXING
26 STORE A STAR Q (AAA) STORE B STAR H (AAA)
27 BRANCH B (III) ADVANCED PROGRAMMING (1-B STAR TRANSFER)
28 MOVE RECORD P (AAA)(BBB)

INPUT OUTPUT

29 READ
30 PUNCH

32 COLUMN BINARY READ SEQUENCE
33 COLUMN BINARY PUNCH SEQUENCE
34 MOVE AND UNSCRAMBLE COLUMN BINARY SEQUENCE
35 MOVE AND SCRAMBLE COLUMN BINARY SEQUENCE
36 PUNCH FEED READ SEQUENCE
37 STACKER SELECT K AND STACKER SELECT BRANCH

MAGNETIC TAPE

38 MOVE (LOAD) TAPE READ OPERATION
39 MOVE (LOAD) WRITE OPERATION
40 LOAD TAPE AND READ A WORD SEPARATOR CHARACTER
41 LOAD TAPE AND WRITE A WORD SEPARATOR CHARACTER
42 BACKSPACE TAPE OPERATION
43 ERASE TAPE OPERATION
44 WRITE TAPE MARK
45 REWIND TAPE OPERATION
46 REWIND AND UNLOAD TAPE
47 TAPE END OF FILE INDICATOR TEST AND TAPE TRANSMISSION ERROR TEST
48 MOVE COMPRESSED TAPE READ OPERATION
49 MOVE WITH ZERO INSERTION X (AAA)(BBB)

EXPANDED STORAGE

50 ADDRESS MODIFY TIMING # (AAA)(BBB)

Multiply
Divide

(900) =
(901) 0 (458) (678) ORIG B-FIELD
(908) 3

ORIG A-FIELD

ABS 4 A2/3 6 2 5 B1 RESULTANT A-FIELD
FINAL RESULTANT B-FIELD 0 0 A2/2 6 6 5 ABS

CYCLE: 17 | A | B | A | B | A | B | B | B | I OP

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC	3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0
1		STORAGE ADDRESS REGISTER			32.35.XX.2	908 | 456 | 678 | 457 | 677 | 456 | 676 | 675 | 674 | 908
2		B-REGISTER	—	—	35.11.XX.2	WMC2 | C41 | CB1 | C42 | 2 | WMA2 | C21 | 4 | WM AB41 | WM2 C
3		A-REGISTER	—	—	35.11.XX.2	B | 045-075 C141 | C142 | WMA2 | C82 | C B2 | C82
4	-T	RESET ADD OP	01B1	A06A	35.24.11.2	OP DECODE A B 8 2 4 1
5	-T	ARITH OPERATION	01B1	B23A	35.27.11.2	4 … 4
6	-T	GATED WORD MARK	01B2	C20C	31.07.11.2	B WM … A WM … B WM
7	-T	I-E CHANGE	01B2	C22N	31.05.31.2	6 … 6
8	+U	DELTA I CYCLE	01B2	E07N	31.21.11.2	7 9 … 7 14 DELTA CYC LATCH GATE
9	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2	8 … 8
10	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2	6 9
11	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2	7 9 … RESET 13 NOT 7 … 24
12	-T	A-CYCLE LATCH	01B2	E23N	31.25.11.2	11 … 12
13	-T	DELTA B-CYCLE LATCH	01B2	E13C	31.23.11.2	12 … 7 14
14	+U	B-CYCLE	01B2	D23N	31.26.11.2	13
15	-T	FIRST B-CYCLE TRIGGER	01B3	E13N	34.31.13.2	5 6 9 … 14
16	-T	B-REGISTER ZONE INHIBIT	01A3	D18C	35.18.21.2	9 … 12 … 12 … 12 … 9
17	-T	B-REGISTER DIGIT INHIBIT	01A3	D16A	35.18.31.2	9 NOT MANUAL ENTRY 12 … 12 … 12 … 9
18	-T	B-REGISTER C-BIT INHIBIT	01A3	C11H	35.18.21.2	9 NOT MANUAL ENTRY 12 … 12 … 12 … 9
19	-T	B-REGISTER WORD MARK INHIBIT	01A3	C19C	35.18.21.2	NOT MANUAL ENTRY
20	-T	A-REGISTER DIGIT INHIBIT	01A3	B11G	35.18.41.2	4 NOT BLOCK OPR AND B-CYCLE
21	-T	ARITHMETIC ZONE INHIBIT	01A3	C05B	35.18.51.2	4 15 NOT BLOCK OPR AND B-CYCLE
22	+U	INHIBIT C-ZONE	01A3	C13H	35.15.11.2	4 14 NOT 15
23	+U	A-WORD MARK LATCH	01B2	D15H	31.06.11.2	11 -5
24	+U	A-CYCLE ELIMINATE	01B2	C16 G	31.06.11.2	23 -
25	-T	ARITHMETIC A-WORD MARK LATCH	01A3	B19H	35.18.61.2	14 5 NOT 15 … 9
26	+U	A-REG SET 8-2-C	01A3	A18N	35.18.61.2	NOT RECOMP 14 25 28
27	+U	MODIFIER CONTROL / 1	01A8	D06N	32.42.11.2	
28	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2	
29	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2	
30	+U	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2	909/908 | 457 | 677 | 456 | 676 | 455 | 675 | 674 | 673 | 909
31		DATA ON INHIBIT DRIVE LINES	—	—	—	WM2C | CAB41 | CB41 | C24 | C24 | WMA2 | C2 | C82 | WM82 | WMC2

FIGURE 1. RESET ADD 0 (AAA) (BBB)

(900) 4
(901) 5 458 678
(908) 2

ORIGINAL A-FIELD A0 2 6 B5
ORIGINAL B-FIELD A1 9 8 A4

RESULTANT A-FIELD A0 2 6 B5
FINAL RESULTANT B-FIELD B2 2 4 A9

		SIGNAL NAME	FRAME	GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	—	32 35 XX 2
2		B-REGISTER	—	—	—	35.11.XX.2
3		A-REGISTER	—	—	—	35.11.XX.2
4	-T	SUBTRACT OP	01B1		B24P	35.26.11.2
5	-T	ARITH OPERATION	01B1		B23A	35.27 11 2
6	-T	GATED WM	01B2		C20C	31 07.11.2
7	-T	I-E CHANGE	01B2		C22N	31.05.31.2
8	+U	DELTA I CYCLE	01B2		E07N	31.21 11.2
9	-T	I-CYCLE LATCH	01B2		E23A	31.24.11 2
10	+U	I-STAR RESTORE GATE	01A7		A20N	32.39.11 2
11	+U	DELTA A - CYCLE	01B2		E07A	31.22 11 2
12	-T	A-CYCLE LATCH	01B2		E23N	31.25 11 2
13	-T	DELTA B-CYCLE LATCH	01B2		E13C	31.23 11 2
14	+U	B-CYCLE	01B2		D23N	31 26.11 2
15	-T	FIRST B-CYCLE TRIGGER	01B3		E13N	34.31 13.2
16	-T	SECOND B-CYCLE TRIGGER	01B3		D13N	34.31.13 2
17	-T	B-REGISTER ZONE INHIBIT	01A3		D18C	35.18.21.2
18	-T	B-REGISTER DIGIT INHIBIT	01A3		F17P	35.18.31.2
19	-T	B-REGISTER C-BIT INHIBIT	01A3		C11H	35.18.21.2
20	-T	B-REGISTER WORD MARK INHIBIT	01A3		C19C	35.18 21.2
21	-T	ARITHMETIC ZONE INHIBIT	01A3		C05B	35.18.51.2
22	-T	ARITHMETIC DIGIT INHIBIT	01A3		D16B	35.18 51.2
23	+U	INHIBIT C-ZONE	01A3		C13H	35.15.11.2
24	+U	TRANSFER STAR	01B3		C20H	34.31 13.2
25	-T	ADDER CARRY	01B3		B09A	34 31.15 2
26	-T	CARRY TRIGGER	01B3		D26N	34.31.14.2
27	+U	ZONE ADDER GATE	01B3		F12A	34.33.11 2
28	+U	MODIFIER CONTROL PLUS 1	01A8		D06N	32.42.11.2
29	+U	MODIFIER CONTROL MINUS 1	01A8		B04H	32.42 11.2
30	-T	MODIFIER CONTROL XFER	01A8		C10A	32.42.41.2
31	+U	MODIFIER OUTPUT ON BUS LINES	—	—	—	32 43 XX 2
32		DATA ON INHIBIT DRIVE LINES	—	—	—	—

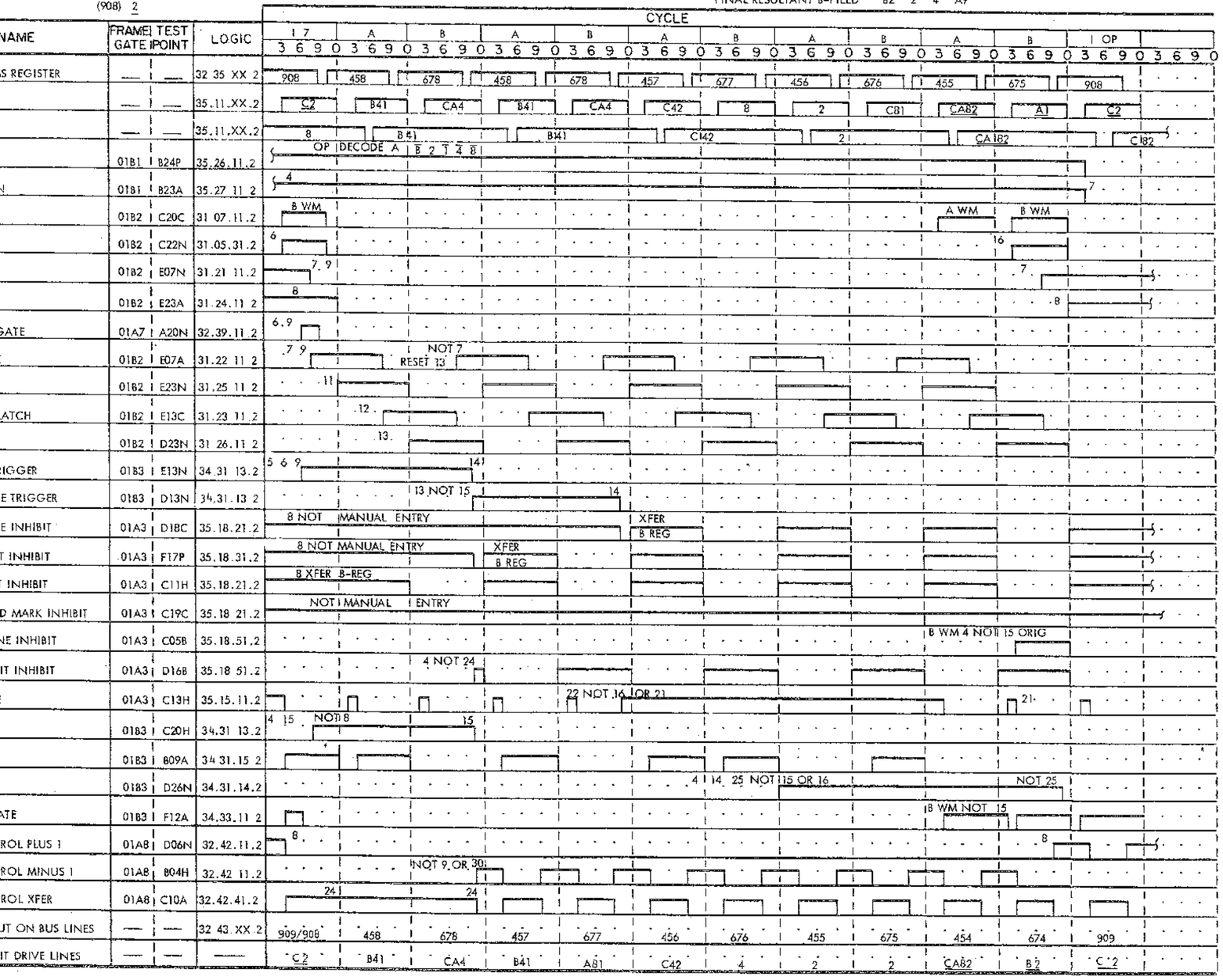


FIGURE 2. TRUE ADD

900 4
90[illegible] A (458) (678) ORIG A-FIELD B2 A2 6 B5 RESULTANT A-FIELD A2 6 B5 C B
908 2 ORIG B-FIELD A 0 1 6 RESULTANT B-FIELD 7 5 A81 2 4 9 (C2 4 B 8 1)
AD 1 6

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX.2
2		B-REGISTER	—	—	35.11.XX.2
3		A-REGISTER	—	—	35.11.XX.2
4	+U	ADD OPR	01B1	B21P	35.24.11.2
5	-T	ADD OR SUBT OPR	01B1	B22HP	35.27.11.2
6	-T	ARITH OPR	01B1	B23A	35.27.11.2
7	-T	GATED WM	01B2	C20C	31.07.11.2
8	-T	I-E CHANGE	01B2	C22N	31.05.31.2
9	+U	DELTA I-CYCLE LATCH	01B2	E07N	31.21.11.2
10	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2
11	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
12	+U	DELTA A-CYCLE LATCH	01B2	E07A	31.22.11.2
13	-T	A-CYCLE LATCH	01B2	E23N	31.25.11.2
14	-T	DELTA B-CYCLE LATCH	01B2	E13C	31.23.11.2
15	+U	B-CYCLE	01B2	D23N	31.26.11.2
16	-T	First B-CYCLE TRIGGER	01B3	E13N	34.31.13.2
17	-T	SECOND B CYCLE TRIGGER	01B3	D13N	34.31.13.2
18	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
19	-T	B-REG C BIT INHIBIT	01A3	C11H	35.18.21.2
20	-T	B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
21	-T	B-REG DIGIT INHIBIT	01A3	B16A	35.18.31.2
22	-T	ARITHMETIC ZONE INHIBIT	01A3	C05B	35.18.51.2
23	-T	ARITHMETIC DIGIT INHIBIT	01A3	D16B	35.18.51.2
24	+U	INHIBIT C ZONE	01A3	C13H	35.15.11.2
25	+U	TRANSFER STAR	01B3	C20H	34.31.13.2
26	-T	COMPLEMENT LATCH	01B3	D22N	34.31.11.2
27	-T	ADDER CARRY	0183	B09A	34.31.15.2
28	-T	CARRY TRIGGER	0183	D26N	34.31.14.2
29	+U	ARITHMETIC READDRESS	01B3	D20N	34.31.16.2
30	+U	A WM LATCH	01B2	D15H	31.06.11.2
31	+U	A CYCLE ELIMINATE	0182	C16GN	31.06.11.2
32	-T	READDRESS LATCH	01B2	C09P	31.04.11.2
33	+U	REVERSE SCAN TRIGGER	01B2	F07E	31.04.11.2
34	+U	RECOMPLEMENT LATCH	0183	D05A	34.31.17.2
35	+U	CYCLE CNTL REV SCAN	01B2	F07E	31.04.11.2
36	+U	TRANSFER B REGISTER	01A3	D12C	35.18.11.2
37	+U	REVERSE SCAN READDRESS	01B3	C21N	34.31.16.2
38	-T	READDRESS TRIGGER	0183	D17N	34.31.17.2
39	-T	FORCE B - 2	01A3	F10H	35.18.31.2
40	+U	MODIFIER CONTROL 1	01A8	D06N	32.42.11.2
41	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
42	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
43		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.11.2
44		DATA ON INK DRIVE LINES	—	—	—

CYCLE I 7 | A | B | A | B | A | B | A | B | B READR | B | B | B READR | B READR | B | B READR | B | B READR | I OP

CYCLE

NO ADDRESS MODIFICATION — FIRST FORWARD SCAN — REVERSE SCAN — SECOND FORWARD SCAN

FIGURE 3. COMPLEMENT ADD-RECOMPLEMENT A (AAA) (BBB)

(900) 4
(901) A 458 678
(908) 2

ORIGINAL A-FIELD A2 6 B5
ORIGINAL B-FIELD A0 3 1 A6

RESULTANT A-FIELD A2 6 B5
FINAL RESULTANT B-FIELD 0 0 5 AB1

		SIGNAL NAME	FRAME	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX.2
2		B-REGISTER	—	—	35.11.XX.2
3		A-REGISTER	—	—	35.11.XX.2
4	-T	ADD OPERATION	01B1	B21P	35.24.11.2
5	-T	ARITH OPERATION	01B1	B23A	35.27.11.2
6	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
7	-T	I-E CHANGE	01B2	C22N	31.05.31.2
8	+U	DELTA I CYCLE LATCH	01B2	E07N	31.21.11.2
9	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2
10	+U	DELTA A-CYCLE LATCH	01B2	E07A	31.22.11.2
11	-T	A-CYCLE LATCH	01B2	E23N	31.25.11.2
12	-T	DELTA B-CYCLE LATCH	01B2	E13C	31.23.11.2
13	+U	B-CYCLE	01B2	D23N	31.26.11.2
14	-T	FIRST B-CYCLE LATCH	01B3	E13N	34.31.13.2
15	-T	SECOND B-CYCLE LATCH	01B3	D13N	35.31.13.2
16	-T	B-REGISTER ZONE INHIBIT	01A3	D18C	35.18.21.2
17	-T	B-REGISTER DIGIT INHIBIT	01A3	F17P	35.18.31.2
18	-T	B-REGISTER C-BIT INHIBIT	01A3	C11H	35.18.21.2
19	-T	B-REGISTER WORD MARK INHIBIT	01A3	C19C	35.18.21.2
20	-T	ARITHMETIC DIGIT INHIBIT	01A3	D16B	35.18.51.2
21	-T	ARITHMETIC ZONE INHIBIT	01A3	C05B	35.18.51.2
22	+U	INHIBIT C-ZONE	01A3	C13H	35.15.11.2
23	+U	TRANSFER STAR	01B3	C20H	34.31.13.2
24	+U	COMPLEMENT LATCH	01B3	D22H	34.31.11.2
25	-T	ADDER CARRY	01B3	B09A	34.31.15.2
26	-T	CARRY TRIGGER	01B3	D26N	34.31.14.2
27	+U	A-WORD MARK LATCH	01B2	D15H	31.06.11.2
28	+U	A-CYCLE ELIMINATE	01B2	C16GN	31.06.11.2
29	-T	ARITHMETIC A-WORD MARK LATCH	01A3	B19H	35.18.61.2
30		A-REGISTER SET B2 C	01A3	A18N	35.18.61.2
31		MODIFIER CONTROL PLUS 1	01A8	D06N	32.42.11.2
32		MODIFIER CONTROL MINUS 1	01A8	B04H	32.42.11.2
33		MODIFIER CONTROL TRANSFER	01A8	C10A	32.42.41.2
34		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
35		DATA ON INHIBIT DRIVE LINES	—	—	—

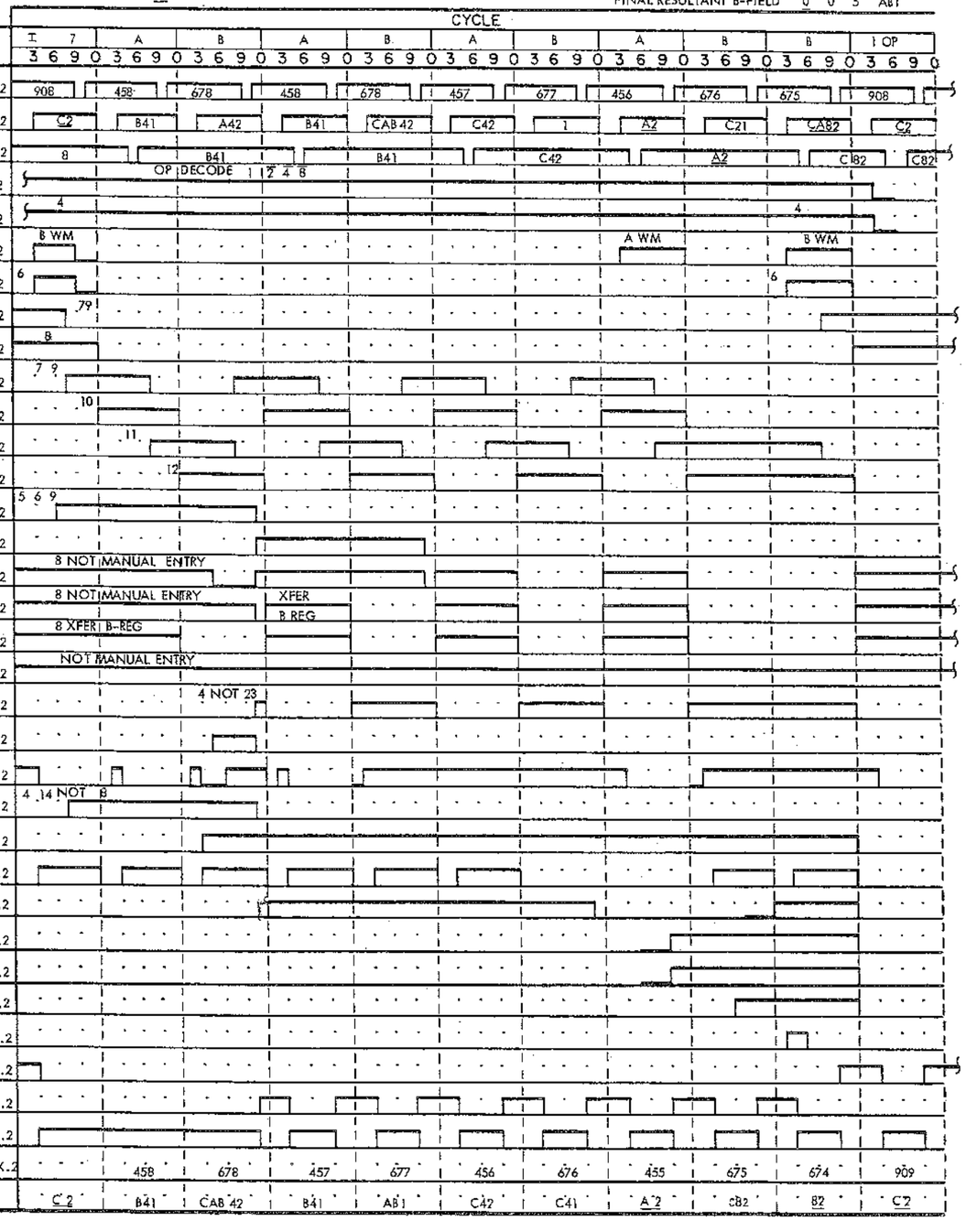


FIGURE 4, COMPLEMENT ADD-NO RECOMPLEMENT

(901) A 458 678
(908) L 278 678
(915) B 901 –

ORIGINAL A-FIELD B7
ORIGINAL B-FIELD 6

RESULTANT A-FIELD B7
FIRST RESULTANT B-FIELD A B9

FINAL RESULTANT B-FIELD 31

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.35.XX 2
2	B-REGISTER	—	—	35.11.XX.2
3	A-REGISTER	—	—	35.11.XX.2
4	+U ADD OPERATION	01B1	B21P	35.24.11.2
5	-T ADD OR SUBT OPERATION	01B1	B22HP	35.27.11.2
6	-T ARITH OPERATION	01B1	B23A	35.27.11.2
7	-T GATED WORD MARK	01B2	C20C	31.07.11.2
8	-T I-E CHANGE	01B2	C22N	31.05.31.2
9	+U DELTA I-CYCLE	01B2	E07N	31.21.11.2
10	-T I-CYCLE LATCH	01B2	E23A	31.24.11.2
11	+U I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
12	+U DELTA A-CYCLE LATCH	01B2	E07A	31.22.11.2
13	-T A-CYCLE LATCH	01B2	E23N	31.25.11.2
14	-T DELTA B-CYCLE LATCH	01B2	E13C	31.23.11.2
15	+U B-CYCLE	01B2	D23N	31.26.11.2
16	-T FIRST B-CYCLE TR	01B3	E13N	34.31.13.2
17	-T SECOND B-CYCLE TR	01B3	D13N	34.31.13.2
18	-T B-REGISTER WORD MARK INHIBIT	01A3	C19C	35.18.21.2
19	-T B-REGISTER C-BIT INHIBIT	01A3	C11H	35.18.21.2
20	-T B-REGISTER ZONE INHIBIT	01A3	D18C	35.18.21.2
21	-T B-REGISTER DIGIT INHIBIT	01A3	F17P	35.18.31.2
22	-T ARITH ZONE INHIBIT	01A3	C05B	35.18.51.2
23	-T ARITH DIGIT INHIBIT	01A3	D16B	35.18.51.2
24	+U INHIBIT C-ZONE	01A3	C13H	35.15.11.2
25	+U TRANSFER STAR	01B3	C20H	34.31.13.2
26	+U COMPLEMENT LATCH	01B3	D22H	34.31.11.2
27	-T ADDER CARRY	01B3	B09A	34.31.15.2
28	-T CARRY TRIGGER	01B3	D26N	34.31.14.2
29	+U ARITH READDRESS	01B3	D20N	34.31.16.2
30	+U A WORD MARK LATCH	01B2	D15H	31.06.11.2
31	+U A-CYCLE ELIMINATE	01B2	C16GN	31.06.11.2
32	-T READDRESS LATCH	01B2	C09N	31.04.11.2
33	+U REVERSE SCAN TRIGGER	01B2	F07E	31.04.11.2
34	+U RECOMPLEMENT LATCH	01B3	A10A	34.31.17.2
35	+U CYCLE CNTRL REVERSE SCAN	01B2	F07E	31.04.11.2
36	+U TRANSFER B-REGISTER	01A3	D12C	35.18.11.2
37	+U REVERSE SCAN READDRESS	01B3	C21N	34.31.16.2
38	-T READDRESS TRIGGER	01B3	D17N	34.31.17.2
39	-T FORCE 8 2	01A3	F10H	35.18.31.2
40	+U MODIFIER CONTROL 1	01A8	D06N	32.42.11.2
41	+U MODIFIER CONTROL -1	01A8	B04H	32.42.11.2
42	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
43	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.11.2
44	DATA ON INHIBIT DRIVE LINES	—	—	—

CYCLE: I7 | A | B | A | B | B-READR | B-READR | B-READR | I OP

NO ADDRESS MODIFICATION | FIRST FORWARD SCAN | REVERSE SCAN | SECOND FORWARD SCAN

FIGURE 5. COMPLEMENT ADD-ONE CHARACTER FIELD

299 A
400 M (219) (319)
407 S

ORIG A-FIELD DATA 4973
ORIG B-FIELD DATA 03965

RESULTANT A-FIELD 4973
RESULTANT B-FIELD 04973

	SIGNAL NAME	FRAME	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2	B-REGISTER LATCHES	—	—	35.XX.XX.2
3	A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U MOVE OPERATION	01B1	B12N	35.25.11.2
5	-T GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T I-E CHANGE	01B2	C22N	31.05.31.2
7	+U DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T I-CYCLE LATCH	01B2	E23A	31.24.11.2
9	+U I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T A-CYCLE LATCH	01B2	E23N	31.25.11.2
12	-T DELTA B-CYCLE LATCH	01B2	E13C	31.23.11.2
13	+U B-CYCLE	01B2	D23N	31.26.11.2
14	+U TRANSFER B-REGISTER	01A3	E18H	35.18.11.2
15	+U I-E CONTROL 1	01B2	C16A	31.05.21.2
16	-T B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
17	-T B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
18	-T B-REG C-BIT INHIBIT	01A3	C11H	35.18.21.2
19	-T B REG WM INHIBIT	01A3	C19C	35.18.21.2
20	-T A-REG ZONE INHIBIT	01A3	F20H	35.18.41.2
21	-T A-REG DIGIT INHIBIT	01A3	B11G	35.18.41.2
22	+U A-REG DIGIT AND ZONE C BIT GEN TAKES OVER			
23	+U A-REG WM LATCH	01B2	D15H	31.06.11.2
24	+U MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
25	+U MODIFIER CONTROL 1	01A8	D06N	32.42.11.2
26	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
27	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
28	DATA ON INHIBIT DRIVE LINES	—	—	—
	+U INHIBIT DRIVE C	01A3	E15B	35.17.11.2

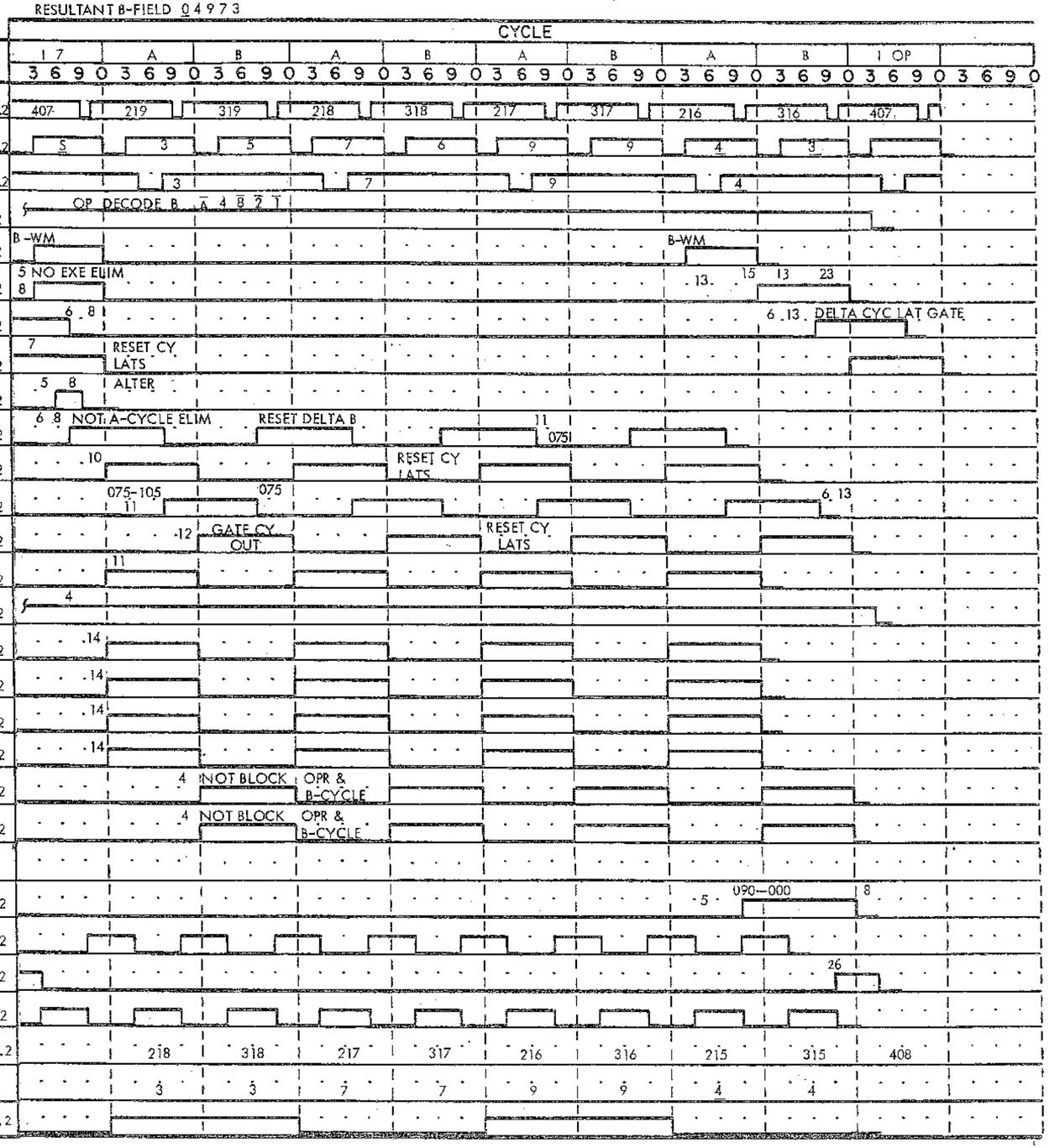


FIGURE 6. MOVE M (AAA) (BBB)

599 A
600 D (407) (507) ORIG B-FIELD CHAR WM-B-2
607 A

ORIG A-FIELD CHAR C-B-A-8-4

RESULTANT B-FIELD CHAR WM-C-B-8-4

		SIGNAL NAME	FRAME TEST GATE	POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	MOVE DIGIT OP	01B1	A12N	35.24.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	B13H	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T	A-CYCLE	01B2	E17F	31.25.11.2
12	-T	DELTA B-CYCLE	01B2	E15H	31.23.11.2
13	+U	B-CYCLE	01B2	D23N	31.26.11.2
14	+U	1 CHAR I-E CHANGE	01B2	C08G	31.05.11.2
15	+U	TRANSFER B-REGISTER	01A3	E18H	35.18.11.2
16	-T	B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
17	-T	B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
18	-T	B-REG C-BIT INHIBIT	01A3	C11H	35.18.21.2
19	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
20	-T	A-REG DIGIT INHIBIT	01A3	B11G	35.18.41.2
21	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
22	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
23	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
24		MODIFIER OUTPUT ON BUS LINES	—	—	32.42.XX.2
25		DATA ON INHIBIT DRIVE LINES	—	—	—

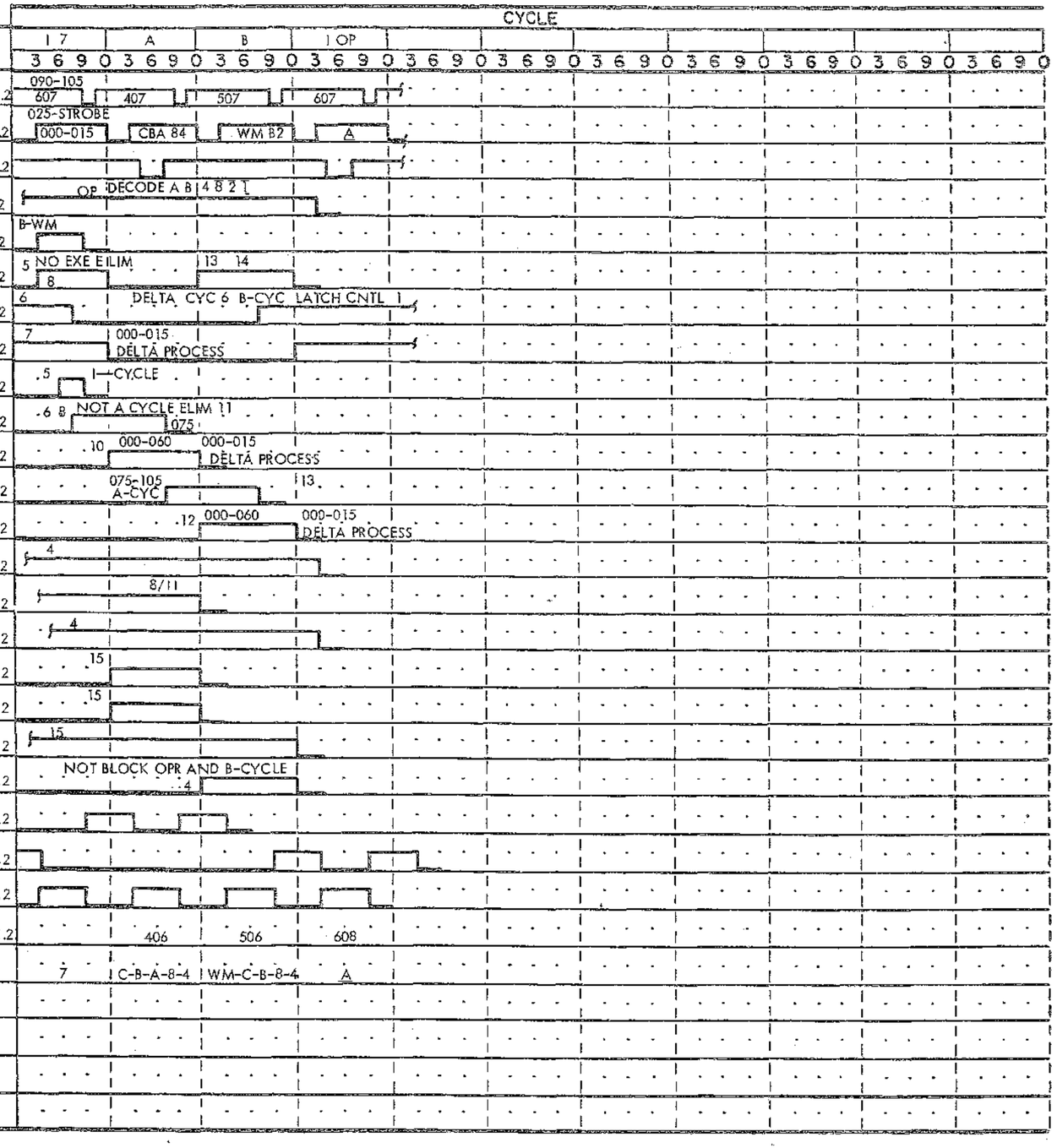


FIGURE 7. MOVE DIGIT D (AAA) (BBB)

599 A
600 Y (407) (507) ORIG A-FIELD CHAR C-B-A-8-4
607 A ORIG B-FIELD CHAR WM-B-2

RESULTANT B-FIELD CHAR WM-C-B-A-2

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2	B-REGISTER LATCHES	—	—	35.XX.XX.2
3	A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U MOVE ZONE OP	01B1	C12N	35.26.11.2
5	-T GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T I-E CHANGE	01B2	B13H	31.05.31.2
7	+U DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T I-CYCLE	01B2	A23F	31.24.11.2
9	+U I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T A-CYCLE	01B2	E17F	31.25.11.2
12	-T DELTA B-CYCLE	01B2	EJ5H	31.23.11.2
13	+U B-CYCLE	01B2	D23N	31.26.11.2
14	+U 1 CHAR I-E CHANGE	01B2	C08G	31.05.11.2
15	+U TRANSFER B-REGISTER	01A3	E18H	35.18.11.2
16	-T B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
17	-T B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
18	-T B-REG C-BIT INHIBIT	01A3	C11H	35.18.21.2
19	-T B-REG WM INHIBIT	01A3	C19C	35.18.21.2
20	-T A-REG ZONE INHIBIT	01A3	F20H	35.18.41.2
21	+U MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
22	+U MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
23	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
24	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
25	DATA ON INHIBIT DRIVE LINES	—	—	——

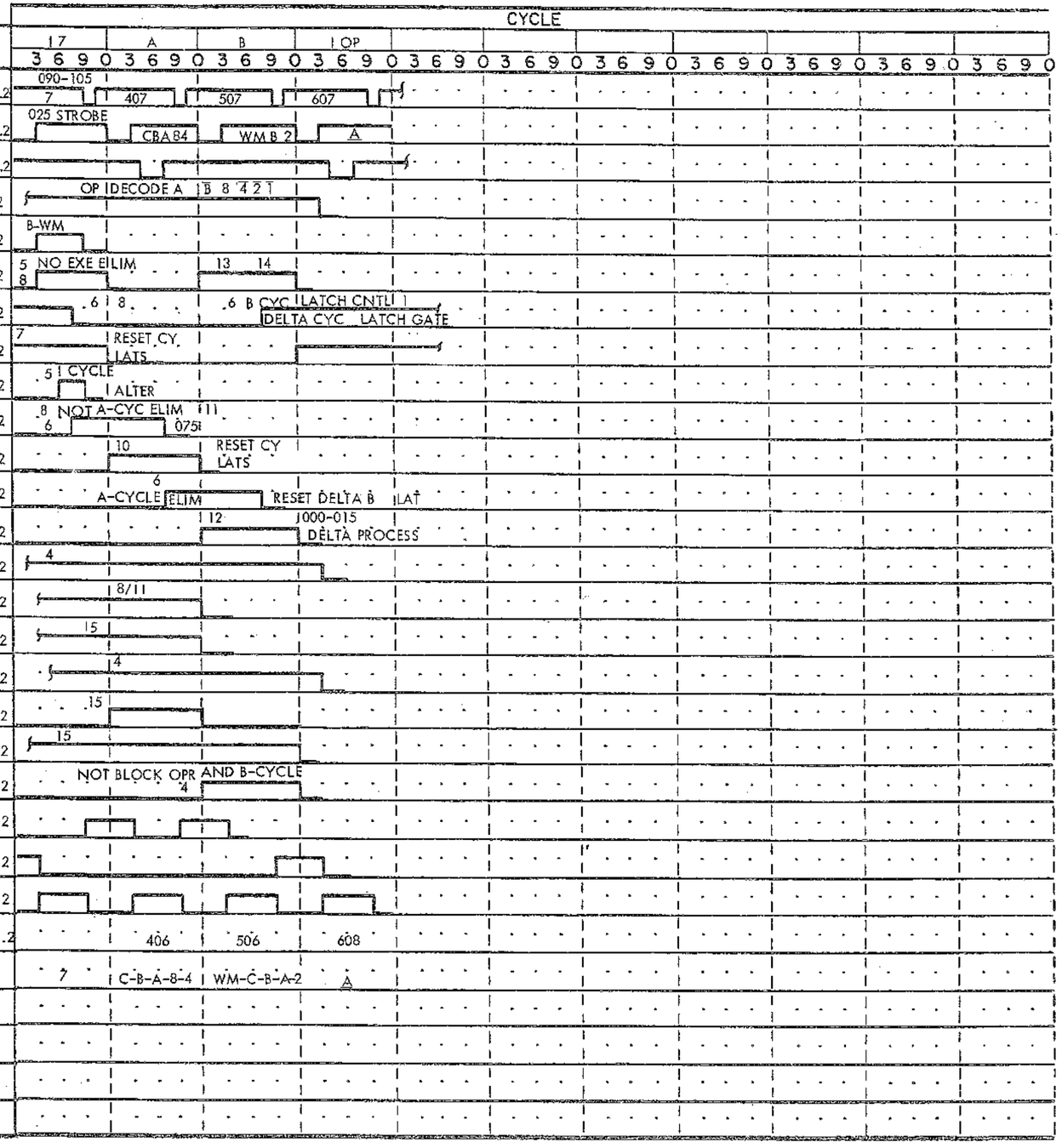


FIGURE 8. MOVE ZONE Y (AAA) (BBB)

700 E B09 419
707 A 519 419
714 B 700 -

A-FIELD DATA 007601
B-FIELD DATA bbbbbb

RESULTANT A-FIELD (BEFORE ZERO SUPP - AFTER MOVE) 007601
RESULTANT B-FIELD (BEFORE ZERO SUPP - AFTER MOVE) 007601

RESULTANT B-FIELD (AFTER ZERO SUPP) bb7601

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	MOVE ZERO SUPPRESS OP	01B1	C11F	35.26.11.2
5	-T	GATED WM	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T	A-CYCLE LATCH	01B2	E23N	31.25.11.2
12	-T	DELTA B CYCLE	01B2	E13C	31.23.11.2
13	+U	B-CYCLE LATCH	01B2	D23N	31.26.11.2
14	-T	B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
15	-T	B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
16	-T	B-REG C BIT INHIBIT	01A3	C11H	35.18.21.2
17	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
18	+U	OTHER EDIT	01A3	C16N	35.10.31.2
19	+U	EDIT A-ZONE	01B6	D25G	34.10.31.2
20	+U	EDIT A-DIGIT	01B6	D25P	34.10.31.2
21	-T	A-REG ZONE INHIBIT	01A3	F20H	35.18.41.2
22	-T	A-REG DIGIT INHIBIT	01A3	B11G	35.18.41.2
23	-T	BODY TRIGGER	01B6	D21N	34.10.41.2
24	-T	EDIT WM SET	01B6	D22P	34.10.51.2
25	-T	ZERO SUPPRESS LATCH	01B6	E12A	34.10.51.2
26	+U	A-WM LATCH	01B2	D15H	31.06.11.2
27	+U	A-CYCLE ELIMINATE	01B2	C16G	31.06.11.2
28	+U	1ST EDIT READDRESS	01B6	E05H	34.10.61.2
29	-T	READDRESS LATCH	01B2	C09N	31.04.11.2
30	+U	REVERSE SCAN TRIGGER	01B2	F07E	31.04.11.2
31	+U	CYCLE CONTROL REV SCAN	01B2	C08A	31.04.11.2
32	+U	EDIT REGEN C-BIT	01B6	E15N	34.10.61.2
33	+U	REVERSE SCAN DELAY LATCH	01B6	D06N	34.10.51.2
34	+U	INHIBIT C-ZONE	01A3	E14P	35.15.11.2
35	+U	MODIFIER CONTROL -1	01A8	B04H	32.42.11.2
36	+U	MODIFIER CONTROL +1	01A8	D06N	32.42.11.2
37	-T	MODIFIER CONTROL TRANSFER	01A8	C10A	32.42.11.2
38		MODIFIER OUTPUT ON BUS LINES			32.43.XX.2
39		DATA ON INHIBIT DR LINES			
40					

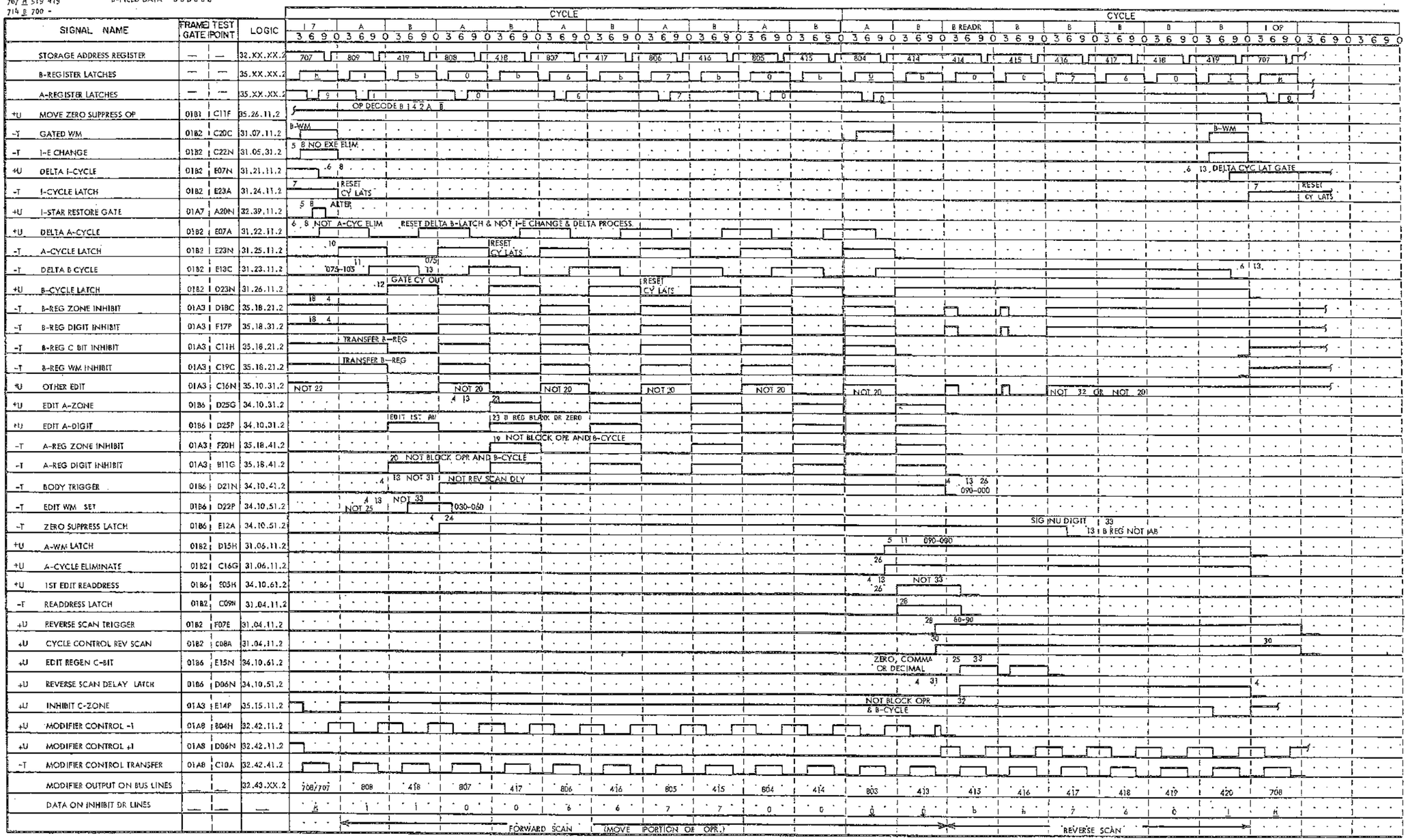


FIGURE 9. MOVE ZERO SUPPRESS Z (AAA) (BBB)

899 S
900 L (409) (509) ORIGINAL A-FIELD DATA 4 9 7 3
907 A ORIGINAL B-FIELD DATA 0 3 9 6 5

RESULTANT B-FIELD 0 4 9 7 3

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	LOAD OPERATION	01B1	B11F	35.25.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T	A-CYCLE	01B2	E21P	31.25.11.2
12	-T	DELTA B-CYCLE	01B2	E15H	31.23.11.2
13	+U	B-CYCLE	01B2	D23N	31.26.11.2
14	+U	TRANSFER A-REGISTER	01A3	D12G	35.18.41.2
15	+U	TRANSFER B-REGISTER	01A3	E18H	35.18.11.2
16	+U	I-E CONTROL 1	01B2	C16A	31.05.21.2
17	+U	I-E CONTROL 2	01B2	C16B	31.05.21.2
18	-T	B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
19	-T	B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
20	-T	B-REG C-BIT INHIBIT	01A3	C11H	35.18.21.2
21	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
22	-T	A-REG ZONE INHIBIT	01A3	F20H	35.18.41.2
23	-T	A-REG DIGIT INHIBIT	01A3	B11G	35.18.41.2
24	+U	INHIBIT C	01A3	E12C	35.14.11.2
25	+U	INHIBIT DRIVE WM	01A3	E13C	35.14.51.2
26	+U	A-WORD MARK LATCH	01B2	D15H	31.06.11.2
27	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
28	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
29	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
30		MODIFIER OUTPUT ON BUS LINES			32.43.XX.2
31		DATA ON INHIBIT DRIVE LINES			

FIGURE 10. LOAD L (AAA) (BBB)

899 2
900 7 (404) ORIG B-FIELD 73487
904 A RESULTANT B-FIELD bbbbb

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	CLEAR OPERATION	01B1	C13N	35.26.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	-T	DELTA B-CYCLE	01B2	E15H	31.23.11.2
11	+U	B-CYCLE	01B2	D23N	31.26.11.2
12	-T	B-REG ZONE INHIBIT	01A3	D18P	35.18.21.2
13	-T	B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
14	-T	FIRST ROW	01A3	E16H	35.15.11.2
15	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
16	+U	A-CYCLE ELIM	01B2	D16D	31.06.11.2
17	+U	UNITS BORROW-CARRY	01A8	D03P	32.42.31.2
18	+U	TENS BORROW-CARRY	01A8	D03C	32.42.31.2
19	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
20	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
21	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
22		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
23		DATA ON INHIBIT DRIVE LINES	—	—	—

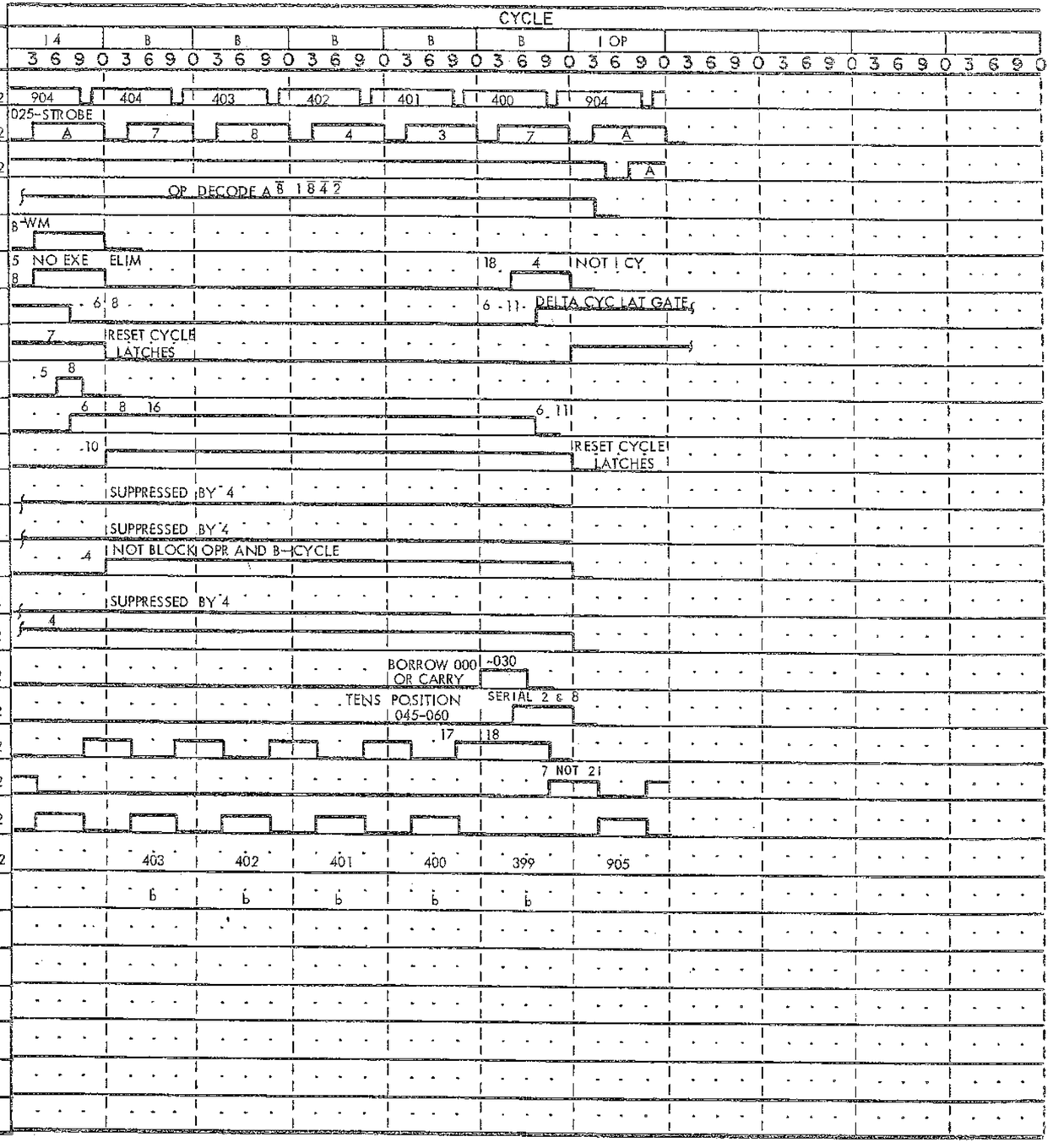


FIGURE 11. CLEAR OP / (AAA)

899 S
900 $\overline{\diamond}$ (409) (509) ORIG A-FIELD 8 RESULTANT A-FIELD 8
907 $\overline{A}$ ORIG B-FIELD $\overline{8}$ RESULTANT B-FIELD 8

		SIGNAL NAME	FRAME	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	WORD MARK CLEAR	01B1	A14N	35.24.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	B13H	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T	A-CYCLE	01B2	E17F	31.25.11.2
12	-T	DELTA B-CYCLE	01B2	E15H	31.23.11.2
13	+U	B-CYCLE	01B2	D23N	31.26.11.2
14	+U	B-REG TRANSFER DIGIT AND ZONE	01A3	D15C	35.18.11.2
15	+U	1 CHAR I-E CHANGE	01B2	C08G	31.05.11.2
16	-T	B-REG ZONE INHIBIT	01A3	D19A	35.18.21.2
17	-T	B-REG DIGIT INHIBIT	01A3	D16A	35.18.31.2
18	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
19	+U	MODIFIER CONTROL -1	01A8	B04H	32.42.11.2
20	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
21	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
22		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
23		DATA ON INHIBIT DRIVE LINES	—	—	——

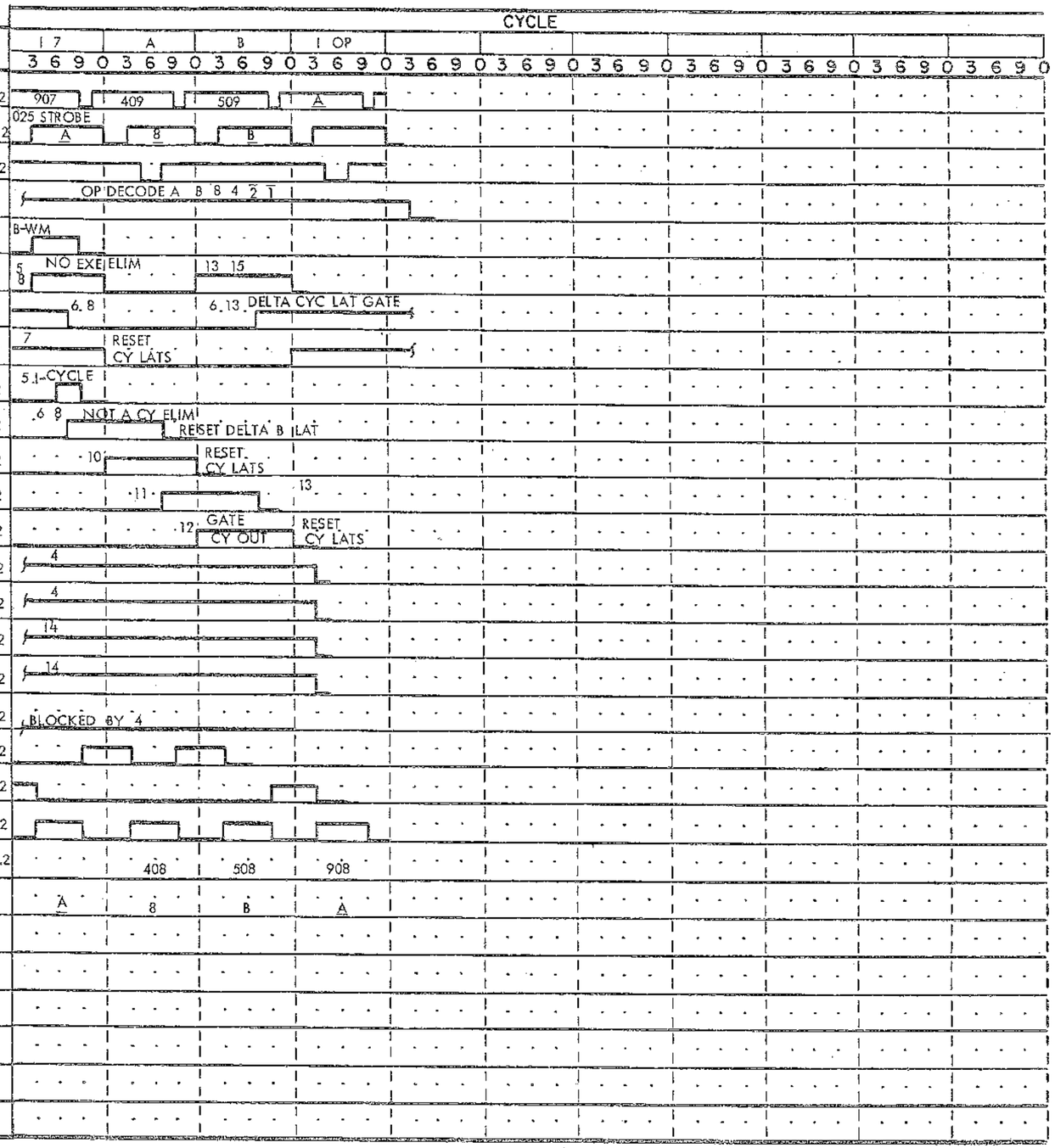


FIGURE 12. WORD MARK CLEAR (AAA) (BBB)

899 S
900 , (409) (509) ORIG A-FIELD DATA
907 A ORIG B-FIELD DATA 8 RESULTANT A-FIELD 8
B RESULTANT B-FIELD B

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	WORD MARK SET	01B1	B14F	35.26.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	B13H	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T	A-CYCLE	01B2	E17F	31.25.11.2
12	-T	DELTA B-CYCLE	01B2	E15H	31.23.11.2
13	+U	B-CYCLE	01B2	D23N	31.26.11.2
14	+U	B-REG TRANSFER DIGIT AND ZONE	01A3	D15C	35.18.11.2
15	+U	1 CHAR I-E CHANGE	01B2	C08G	31.05.11.2
16	-T	B-REG ZONE INHIBIT	01A3	D19A	35.18.21.2
17	-T	B-REG DIGIT INHIBIT	01A3	D16A	35.18.31.2
18	+U	INHIBIT DRIVE WORD MARK	01A3	E15A	35.14.51.2
19	+U	MODIFIER CONTROL - 1	01A3	B04H	32.42.11.2
20	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
21	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
22		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
23		DATA ON INHIBIT DRIVE LINES	—	—	—

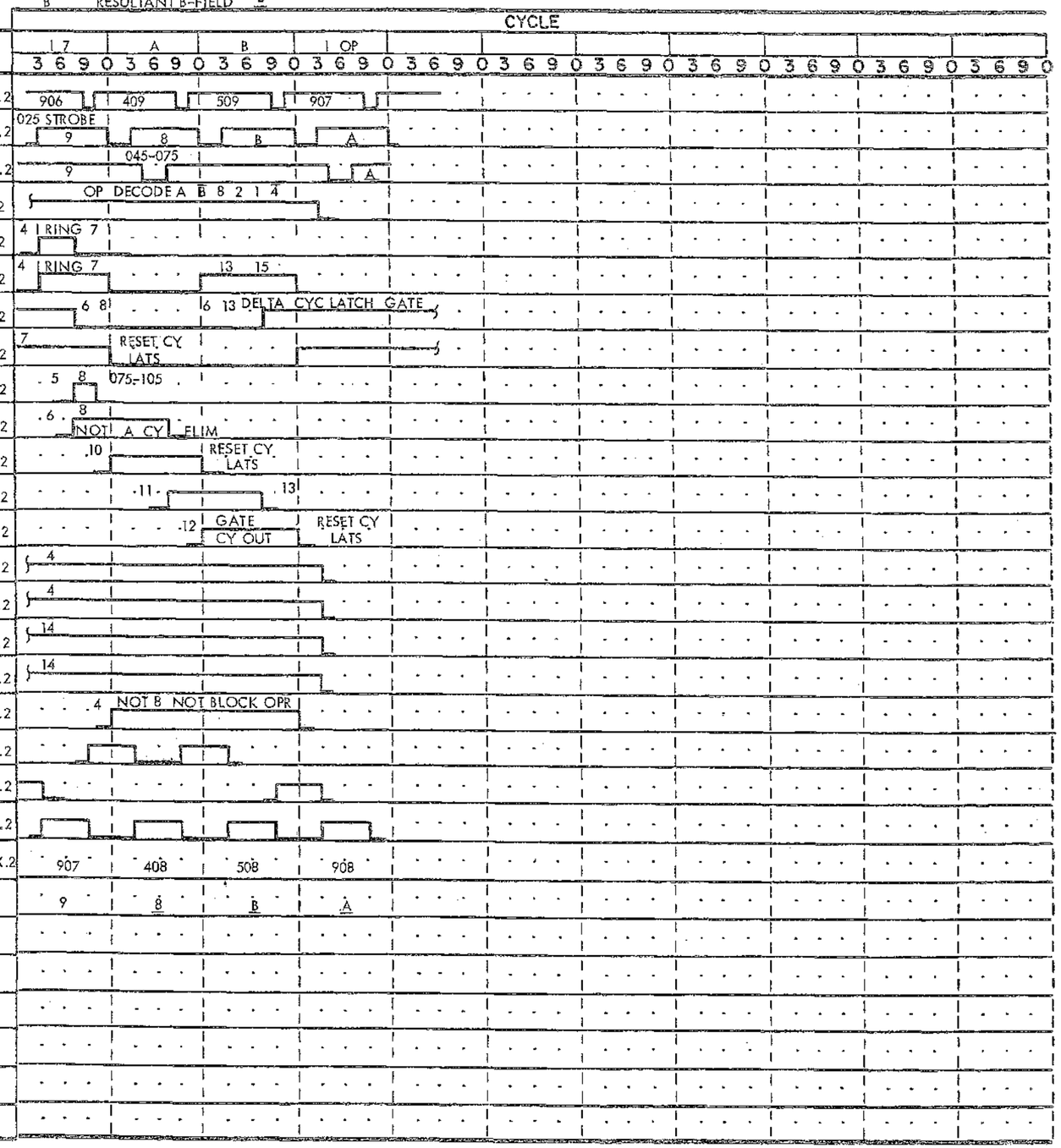


FIGURE 13. WORD MARK SET (AAA) (BBB)

899 A
900 C (458) (378) ORIG A-FIELD B9 AB2 C6 3 RESULTANT B-FIELD (SAME AS ORIG)
907 5 ORIG B-FIELD 7 CAB3 3

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	COMPARE OPERATION	01B1	A11F	35.24.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	DELTA A-CYCLE	01B2	E07A	31.22.11.2
11	-T	A-CYCLE	01B2	E21P	31.25.11.2
12	-T	DELTA B-CYCLE	01B2	E15H	31.23.11.2
13	+U	B-CYCLE	01B2	D23N	31.26.11.2
14	-T	B-REG ZONE INHIBIT	01A3	D18P	35.18.21.2
15	-T	B-REG DIGIT INHIBIT	01A3	F17P	35.18.31.2
16	-T	B-REG C-BIT INHIBIT	01A3	C11H	35.18.21.2
17	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
18	+U	TRANSFER B-REG	01A3	E18H	35.18.11.2
19	+U	I-E CONTROL 1	01B2	C16A	31.05.21.2
20	+U	(COMPARE) EQUAL LATCH	01B6	A16P	34.21.21.2
21	-T	EQUAL CHAR	01B6	B05H	34.21.11.2
22	+U	UNEQUAL CHAR	01B6	B18H	34.21.21.2
23	-T	(COMPARE) UNEQUAL LATCH	01B6	B16P	34.21.21.2
24	+U	A-REG WM LATCH	01B2	D15H	31.06.11.2
25	U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
26	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
27	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
28		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
29		DATA ON INHIBIT DRIVE LINES	—	—	—

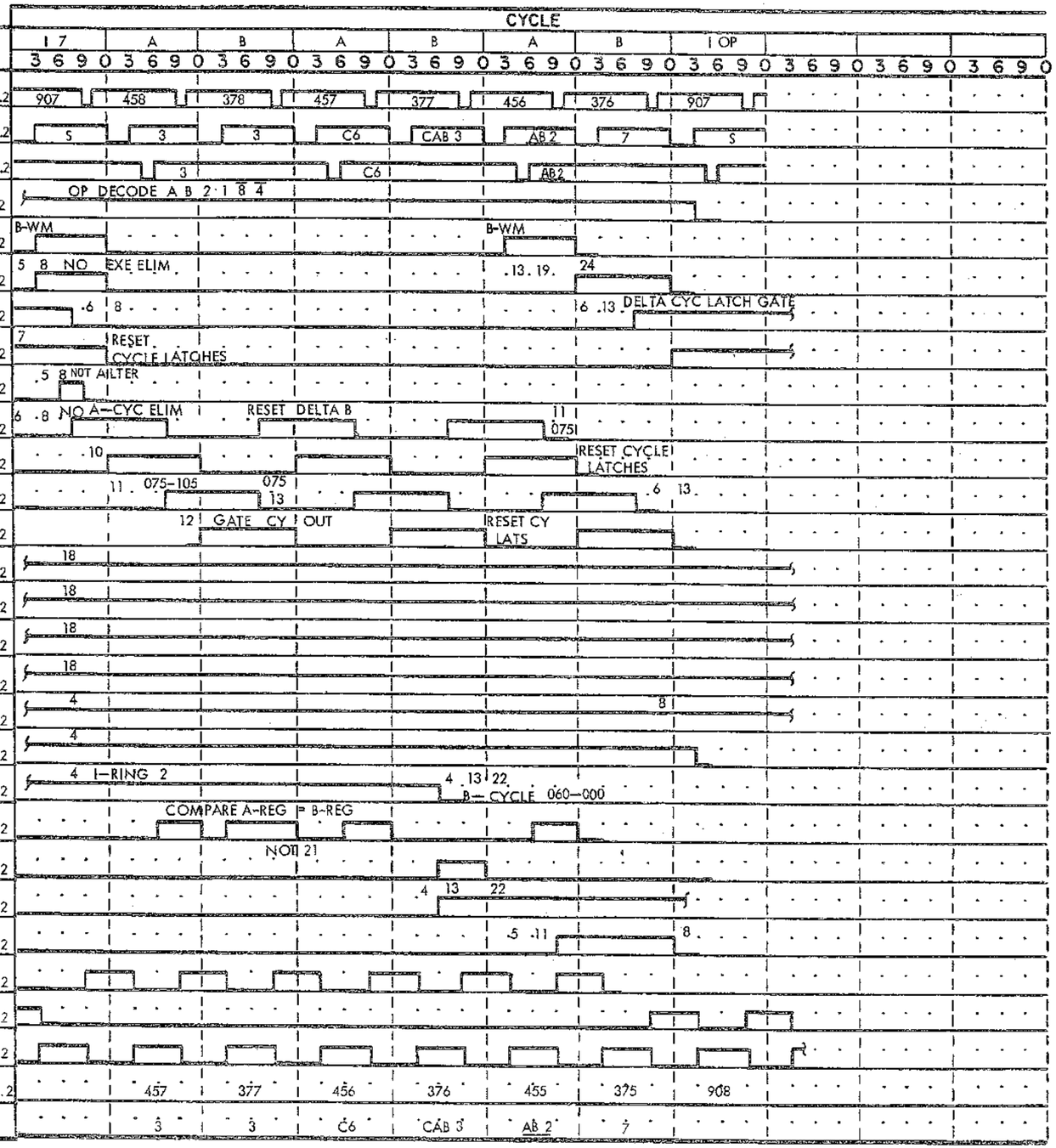


FIGURE 14. COMPARE C (AAA) (BBB)

ORIGINAL A FIELD "863" OR $\frac{WM}{AB2}$ C42 21

ORIGINAL B FIELD "7C3" $\frac{WM}{421}$ CAB21 21

		SIGNAL NAME	FRAME TEST GATE	POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX 32.36.XX
2		B-REGISTER	—	—	35.11.XX
3		A-REGISTER	—	—	35.16.XX
4	+U	COMPARE OPERATION	01B1	A11F	35.24.11
5	-T	GATED WORD MARK	01B2	C20C	31.07.11
6	-T	I/E CHANGE	01B2	C22N	31.05.31
7	+U	DELTA I CYCLE	01B2	E07N	31.21.11
8	-T	I CYCLE	01B2	A23F	31.24.11
9	+U	I STAR RESTORE	01A8	B17H	32.39.11
10	-T	DELTA A CYCLE	01B2	E07A	31.22.11
11	-T	A CYCLE	01B2	E21P	31.25.11
12	-T	DELTA B CYCLE	01B2	E15H	31.23.11
13	+U	B CYCLE	01B2	D23N	31.26.11
14	+U	TRANSFER B REGISTER	01A3	E18H	35.18.11
15	+U	I/E CONTROL 1	01B2	C16A	31.05.21
16	-T	B REG ZONE INHIBIT	01B4	D18P	36.13.21
17	-T	B REG DIGIT INHIBIT	01B4	F17P	36.13.21
18	-T	B REG C BIT INHIBIT	01A3	C11H	35.18.21
19	-T	B REG WM INHIBIT	01A3	C19C	35.40.21
20	+U	COMPARE EQ LATCH OUTPUT	01B6	A16P	34.21.21
21	-T	EQUAL CHARACTER	01B6	B05H	34.21.11
22	-T	COMPARE UNEQUAL LAT OUTPUT	01B6	B16P	34.21.21
23	+U	HIGH LATCH	02A8	F04A	44.34.21
24	+U	A REG WM LATCH	01B2	D15H	31.06.11
25	-T	MODIFIER CONTROL -1	01A8	B04H	32.42.21
26	-T	MODIFIER CONTROL TRANSFER	01A8	C10A	32.42.41

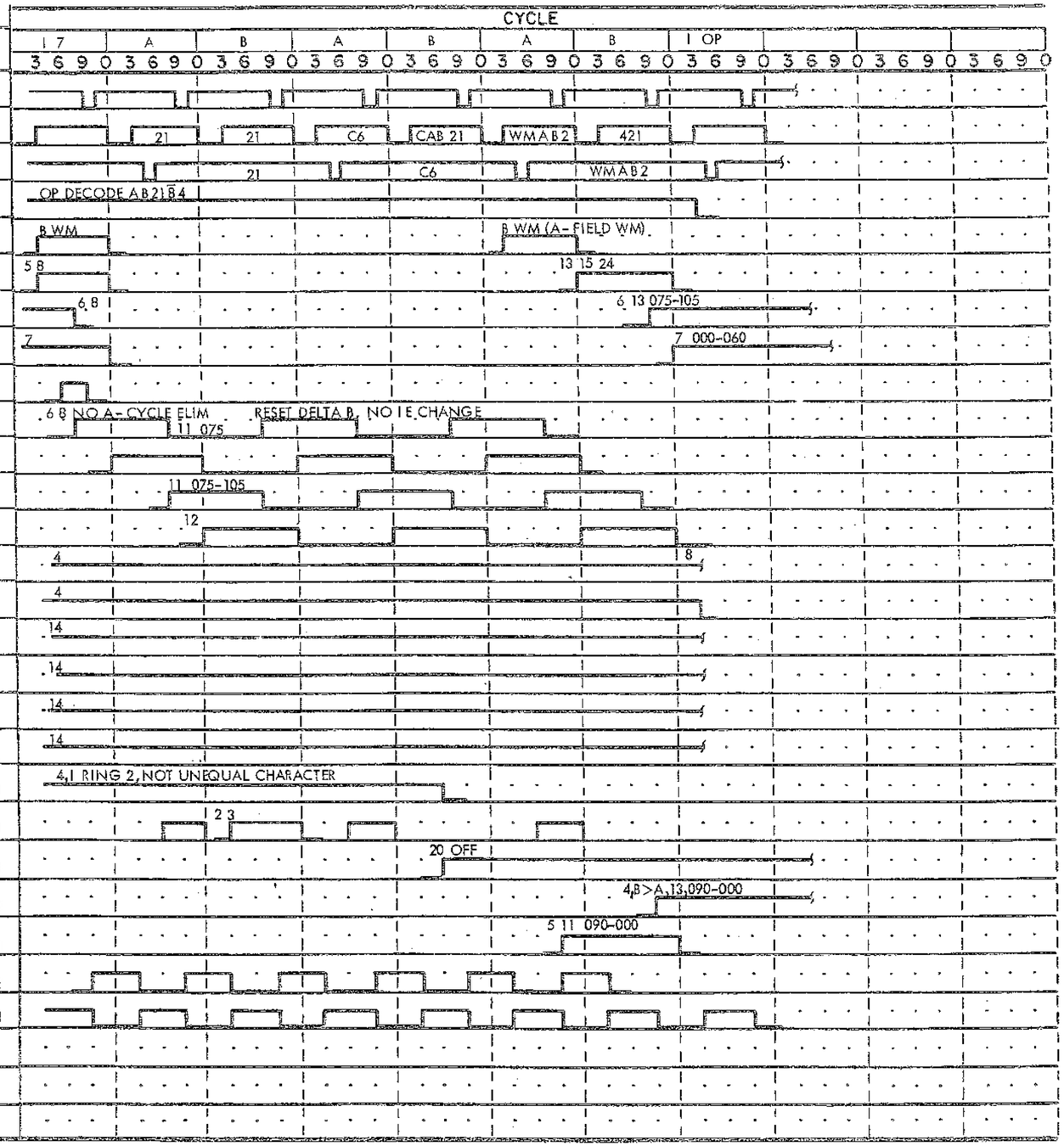


FIGURE 15. HIGH-LOW-EQUAL COMPARE SEQUENCE C (AAA) (BBB)

653 A
654 $\overline{B}$ (701)
658 $\overline{BLANK}$

701 $\underline{A}$

		SIGNAL NAME	FRAME	TEST POINT	LOGIC	CYCLE: I 4 | I OP — 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2	658 701
2		B-REGISTER LATCHES	—	—	35.XX.XX.2	C-BIT A
3		A-REGISTER LATCHES	—	—	35.XX.XX.2	
4	-T	BRANCH OPR	01B1	A09N	35.26.11.2	OP DEC A B 2 8 4 1
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2	B-WM OR 6
6	+U	UNCOND TRANSFER	01B2	D08N	31.08.11.2	B-REG BLANK 030-000 4 I-RING 4
7						
8	+U	DELTA I-CYCLE LATCH	01B2	E07N	31.21.11.2	B-CYC LAT CNTL 7 9 / DELTA CYC LAT GT
9	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2	8 000-060
10	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2	5 8 NOT ALTER 060-090
11	+U	EXECUTE ELIMINATE	01B2	C15C	31.05.11.2	4 I-RING 4
12	+U	TRANSFER PROGRAM SKIP	01B6	A11N	34.21.41.2	I-RING 4 4 5
13	-T	PROGRAM SKIP LATCH	01B2	C23A	31.08.11.2	4 OR 12 17 045-060
14	+U	I-A STAR GATE	01B2	D05C	31.08.11.2	13
15	+U	SET TO I-RING OP	01B2	D21B	31.30.11.2	13 17
16	-T	A-STAR GATE OUT	01A7	A07N	32.32.21.2	8 14 NOT SET-UP 090-000 NOT I-B STAR 1
17	-T	I-RING OP TRG	01B2	E20N	31.31.31.2	015-030 8 15 DELTA PROC
18						
19	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2	
20	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2	
21		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2	702
22		DATA ON INHIBIT DRIVE LINES	—	—	—	C A

FIGURE 16. BRANCH B (III), UNCONDITIONAL BRANCH

653 A
654 B (701) d
659 S

701 M

	SIGNAL NAME		FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	-T	BRANCH OPR	01B1	A09N	35.26.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	A23F	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	EXECUTE ELIMINATE	01B2	C15C	31.05.11.2
11	+U	TEST BRANCH GATE	01B6	A08N	34.21.41.2
12	+U	TRANSFER PROGRAM SKIP	01B6	A10H	34.21.41.2
13	-T	PROGRAM SKIP LATCH	01B2	C23A	31.08.11.2
14	+U	I-A STAR GATE	01B2	D05C	31.08.11.2
15	+U	SET TO I-RING OP	01B2	D21B	31.30.11.2
16	-T	A-STAR GATE OUT	01A7	A07N	32.32.21.2
17	-T	I-RING OP TGR	01B2	E20N	31.31.31.2
18	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
19	+U	MODIFIER CONTROL +1	01A8	D06N	32.42.11.2
20	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
21		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
22		DATA ON INHIBIT DRIVE LINES	—	—	——

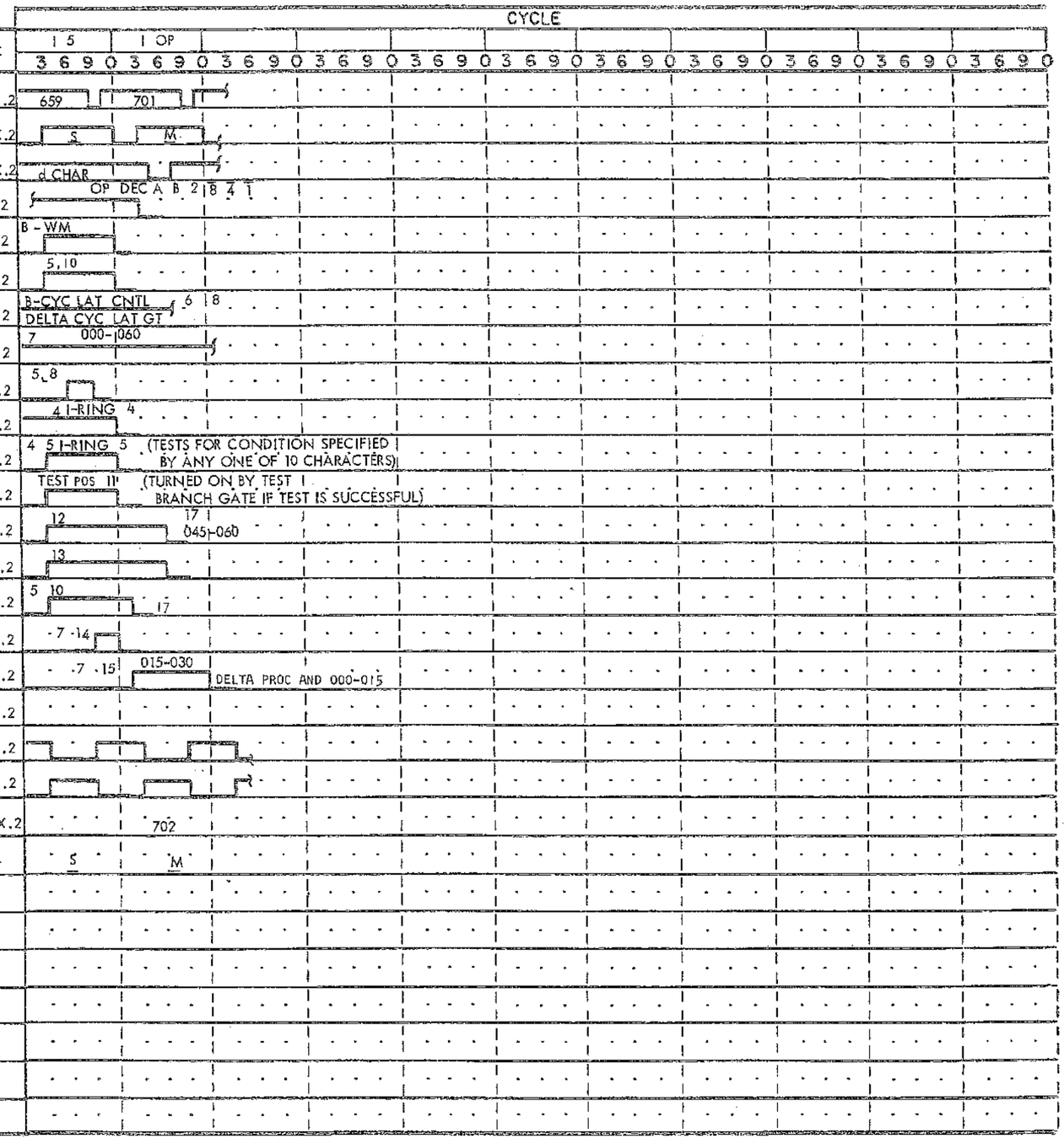


FIGURE 17. TEST AND BRANCH B (III) d (TEST ANY ONE OF TEN CHARACTERS)

699 A
700 B (308) (905) d ORIG B-FIELD DATA Z = 1 BRANCH ON OVERFLOW
708 S d ORIG A-FIELD DATA M

		SIGNAL NAME	FRAME	TEST POINT	LOGIC	CYCLE: I 8 / B / I OP — 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2	708 905 308
2		B-REGISTER LATCHES	—	—	35.XX.XX.2	S Z M
3		A-REGISTER LATCHES	—	—	35.XX.XX.2	d CHAR
4	-T	BRANCH OPR	01B1	A09N	35.26.11.2	OP DECODE A B 2 8 4 1
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2	B-WM
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2	5 8 NO EXE 11 13 ELIM
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2	6 8 6 DELTA CYCLE LATCH GATE B-CYCLE LATCH CNTL
8	-T	I-CYCLE	01B2	A23F	31.24.11.2	7 RESET CY LATS 7 RESET CY LATS
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2	5 8
10	-T	DELTA B-CYCLE	01B2	A21P	31.23.11.2	6 8 12 6 11
11	+U	B-CYCLE	01B2	D23N	31.26.11.2	10 RESET CY LATS
12	+U	A-CYCLE ELIM	01B2	D16D	31.06.11.2	4
13	+U	1 CHAR I-E CHANGE	01B2	C08N	31.05.11.2	4
14	-T	EQUAL CHARACTER	01B6	B05H	34.21.11.2	COMPARE A-REG = B-REG
15	+U	TRANSFER PROG SKIP	01B6	A08H	34.21.41.2	14 11 14 060-000
16	-T	PROGRAM SKIP LATCH	01B2	C23A	31.08.11.2	15 20 045-060
17	+U	I-A STAR GATE	01B2	D05C	31.08.11.2	16
18	+U	SET TO I-RING OP	01B2	E14A	31.30.11.2	16 20
19	-T	A-STAR GATE OUT	01A7	A07N	32.32.21.2	7 17
20	-T	I-RING OP TRG	01B2	E20N	31.31.31.2	7 18 015-030 DELTA PROC
21	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2	
22	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2	
23	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2	
24		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2	904 309
25		DATA ON INHIBIT DRIVE LINES	—	—	—	S Z M

FIGURE 18. TEST CHARACTER AND BRANCH B (11B) (BBB) d (ANY ONE OF NINE CHARACTERS)

902 S
903 V (303) (402) C
911 M (409) (307)

402 T (WM - C-A-2 -1)
303 S

TEST BOTH ZONE AND WM AND BRANCH

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2	B-REGISTER LATCHES	—	—	35.XX.XX.2
3	A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U ZONE TEST OPR	01B1	C11N	35.26.11.2
5	-T GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T I-E CHANGE	01B2	C22N	31.05.31.2
7	+U DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T I-CYCLE	01B2	A23F	31.24.11.2
9	+U I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	-T DELTA B-CYCLE	01B2	E15H	31.23.11.2
11	+U B-CYCLE	01B2	D23N	31.26.11.2
12	+U I CHAR I-E CHANGE	01B2	C08G	31.05.11.2
13	+U TRANSFER B-REGISTER	01A3	E18H	35.18.11.2
14	+U A-CYCLE ELIM	01B2	C16G	31.06.11.2
15	-T A ZONE BIT EQUAL	01B6	A09P	34.21.11.2
16	-T B ZONE BIT EQUAL	01B6	A09A	34.21.11.2
17	+U ZONE TRANSFER GATE	01B6	A07N	34.21.41.2
18	+U TRANSFER PROGRAM SKIP	01B6	A07H	34.21.41.2
19	-T PROGRAM SKIP LATCH	01B2	C23A	31.08.11.2
20	+U I-A STAR GATE	01B2	D05C	31.08.11.2
21	+U SET TO I-RING OP LATCH	01B2	D21B	31.30.11.2
22	-T A-STAR GATE OUT	01A7	A07N	32.32.21.2
23	-T I-RING OP TRG	01B2	E20N	31.31.31.2
24	+U MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
25	+U MODIFIER CONTROL +1	01A8	D06N	32.42.11.2
26	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
27	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
28	DATA ON INH DR LINES	—	—	

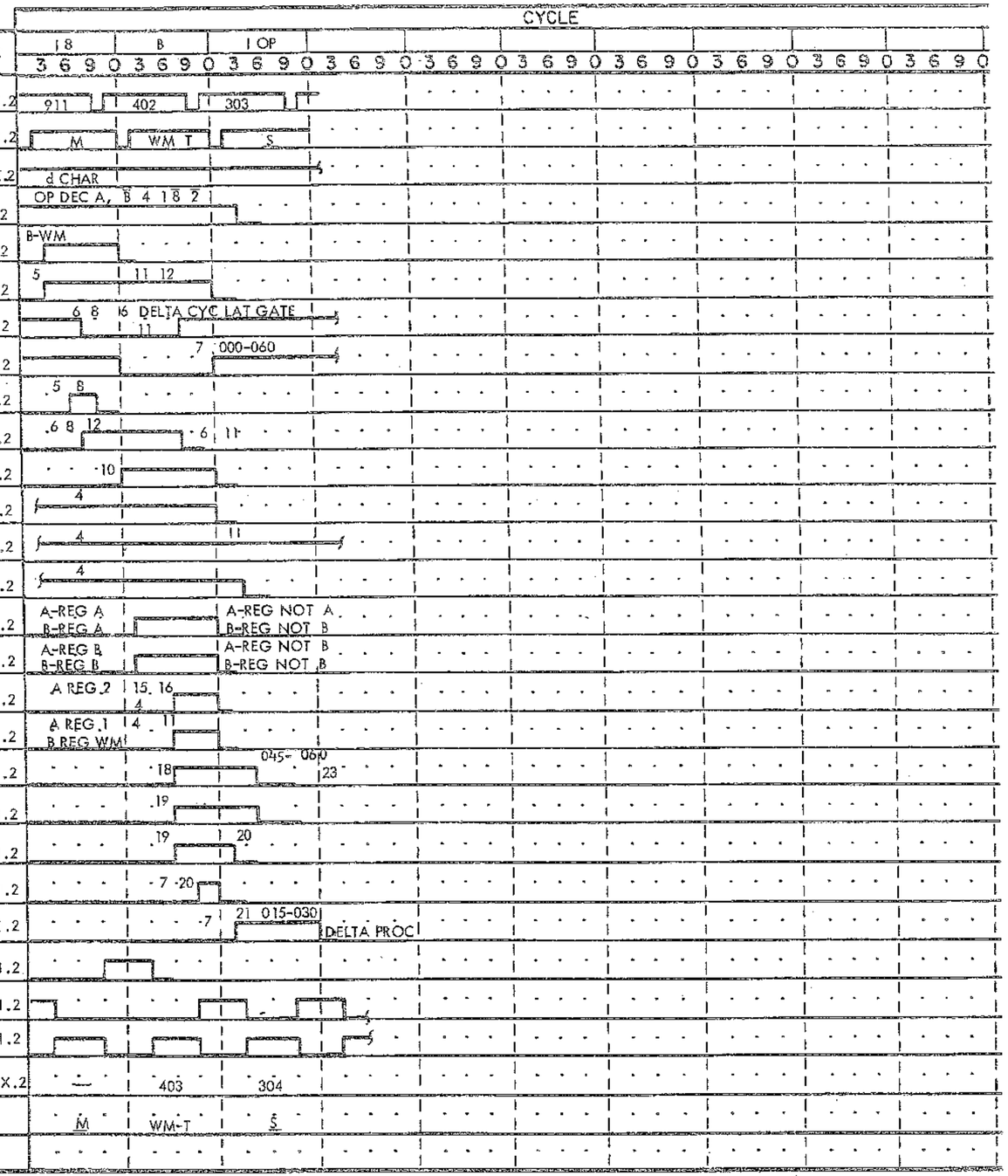


FIGURE 19. TEST ZONE OR WORD MARK OR BOTH AND BRANCH V (III) (BBB) d

899 2
900 Z (700) (404) ORIG B-FIELD 7 2 4 8 7
907 A RESULTANT B-FIELD b b b b b

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	CLEAR OPERATION	01B1	C13N	35.26.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE	01B2	E23A	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	-T	DELTA B-CYCLE	01B2	E11H	31.23.11.2
11	+U	B-CYCLE	01B2	D23N	31.26.11.2
12	-T	B-REG ZONE INHIBIT	01A3	D18C	35.18.21.2
13	-T	B-REG DIGIT INHIBIT	01A3	D16A	35.18.31.2
14	-T	FIRST ROW	01A3	E16H	35.15.11.2
15	-T	B-REG WM INHIBIT	01A3	C19C	35.18.21.2
16	+U	A-CYCLE ELIM	01B2	D16D	31.06.11.2
17	+U	I-A STAR GATE	01B2	D05C	31.08.11.2
18	+U	UNCOND TRANSFER	01B2	D08H	31.08.11.2
19	-T	PROGRAM SKIP LATCH	01B2	C23A	31.08.11.2
20	+U	SET TO I-RING OP	01B2	E14A	31.30.11.2
21	+U	UNITS BORROW-CARRY	01A8	D03P	32.42.31.2
22	+U	TENS BORROW-CARRY	01A8	D03C	32.42.31.2
23	-T	A-STAR GATE OUT	01A7	A07N	32.32.21.2
24	+U	I-RING OP TRG	01B6	E20E	31.31.31.2
25	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
26	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
27	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
28		MODIFIER OUTPUT ON BUS LINES	—	—	32.42.XX.2
29		DATA ON INHIBIT DRIVE LINES	—	—	—

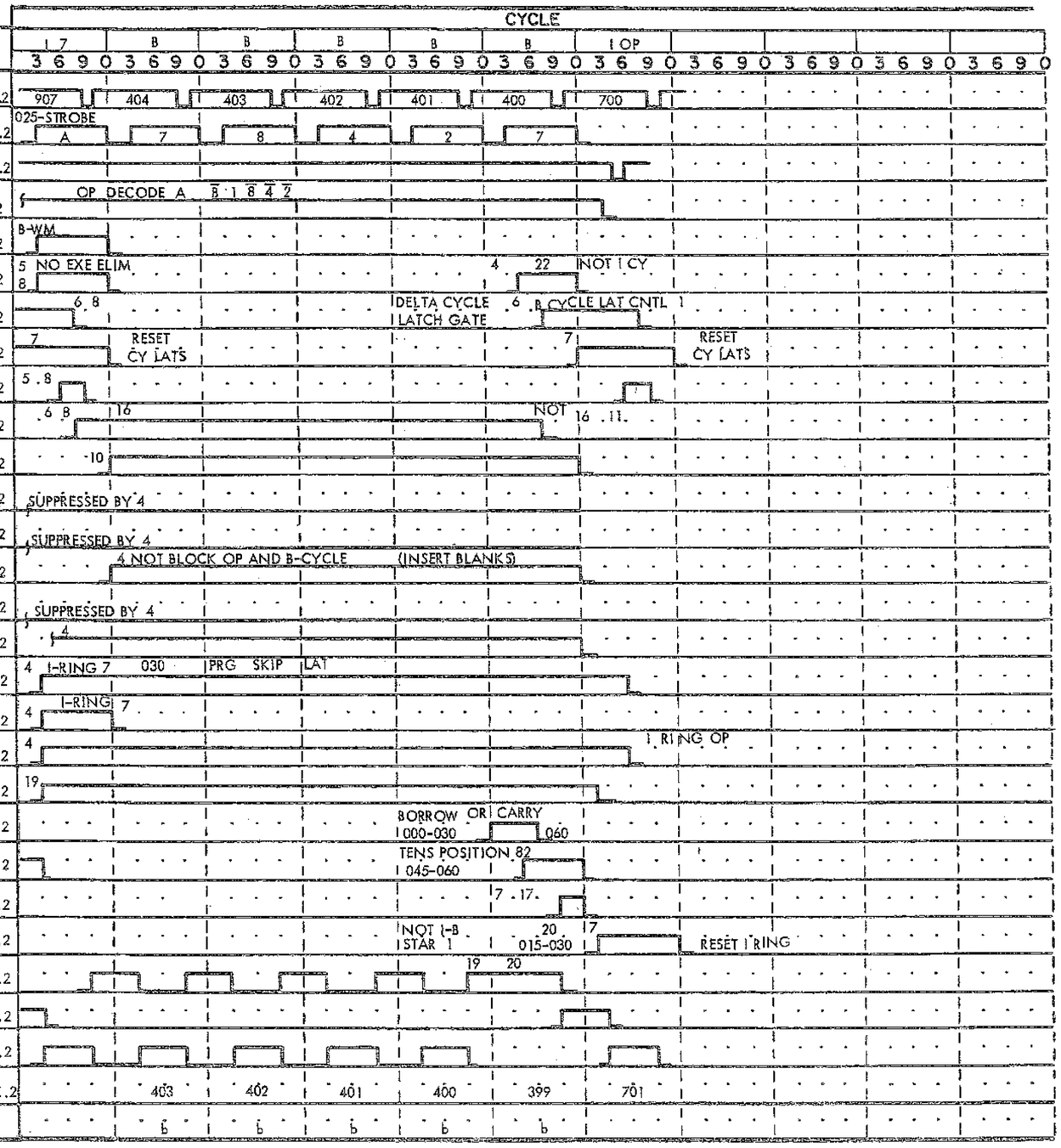


FIGURE 20. CLEAR AND BRANCH / (III) (BBB)

691 S
692 . (305)
696 A

305 M

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	STOP OPR	01B1	A13F	35.24.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	+U	DELTA I-CYCLE LATCH	01B2	E07N	31.21.11.2
7	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2
8	+U	DELTA PROCESS LATCH	01B2	B11N	31.02.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	EXECUTE ELIM	01B2	C12N	31.05.11.2
11	-T	PROGRAM SKIP LATCH	01B2	D12H	31.08.11.2
12	+U	I-A STAR GATE	01B2	D05C	31.08.11.2
13	+U	SET TO I-RING OP LATCH	01B2	D21B	31.30.11.2
14	+U	DELTA PROCESS RESET	01B2	B19A	31.02.31.2
15	-T	A-STAR GATE OUT	01A7	A07N	32.32.21.2
16	-T	I-RING OP TRG	01B6	E20N	31.31.31.2
17	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
18	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
19	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
20		MODIFIER OUTPUT ON BUS LINES	—	—	—
21		DATA ON INH DRIVE LINES	—	—	—

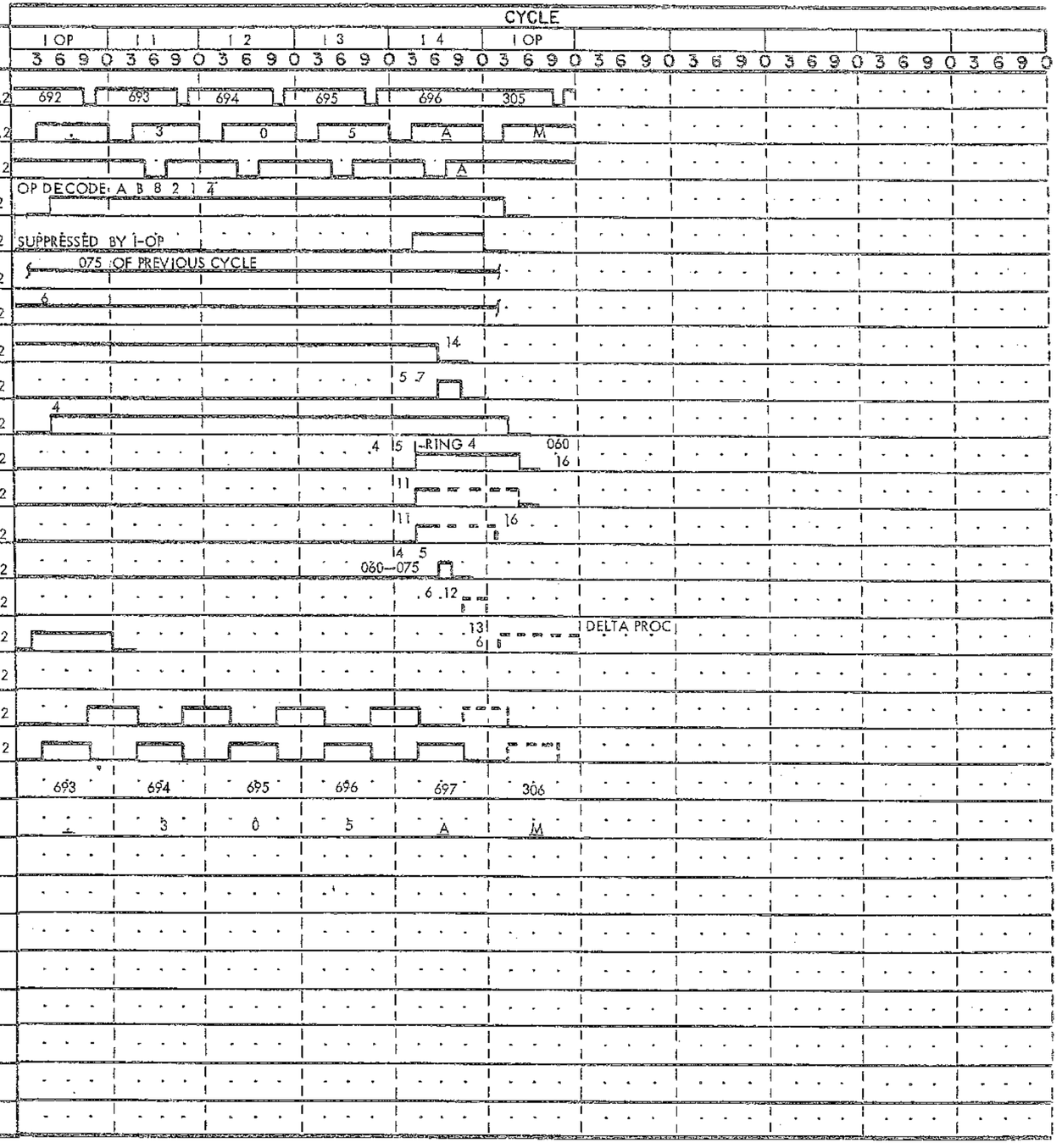


FIGURE 21. -STOP AND BRANCH . (III)

673 9
674 -
675 A

CYCLE

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC	I OP	I 1	3 6 9 0 3 6 9 0 3	9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0 3 6 9 0
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2	674	675		
2		B-REGISTER LATCHES	—	—	35.XX.XX.2		A		
3		A-REGISTER LATCHES	—	—	35.XX.XX.2		045-075		
4	+U	STOP OPR	01B1	A13F	35.24.11.2	OP DEC A B	8 2		
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2	SUPPRESSED BY I-OP	B WM		
6	+U	UNCOND TRANSFER	01B2	D08H	31.08.11.2				
7	+U	DELTA I-CYCLE	01B2	E07N	31.23.11.2	075-105			
8	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2	7			
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2		5 8		
10	+U	EXECUTE ELIM	01B2	C12N	31.05.11.2	4			
11	+U	DELTA PROCESS LATCH	01B2	B11N	31.02.11.2		12		
12	+U	DELTA PROCESS RESET	01B2	B19A	31.02.31.2		4 5 060-075		
13	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2				
14	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2				
15	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2				
16		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2	675	676		
17		DATA ON INHIBIT DRIVE LINES	—	—	—		A		

FIGURE 22. STOP (.)

651 S
652 N (496)
656 A

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2		B-REGISTER LATCHES	—	—	35.XX.XX.2
3		A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U	NO-OP OPR	01B1	B12F	35.25.11.2
5	-T	GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T	I-E CHANGE	01B2	C22N	31.05.31.2
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T	I-CYCLE LATCH	01B2	E23A	31.24.11.2
9	+U	I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U	UNCOND TRANSFER	01B2	D08H	31.08.11.2
11	+U	EXECUTE ELIMINATE	01B2	C12G	31.05.11.2
12	+U	SET TO I-RING OP LATCH	01B2	D21B	31.30.11.2
13	-T	I-RING OP TRG	01B2	E20N	31.31.31.2
14	+U	MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
15	+U	MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
16	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
17		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
18		DATA ON INHIBIT DRIVE LINES	—	—	—

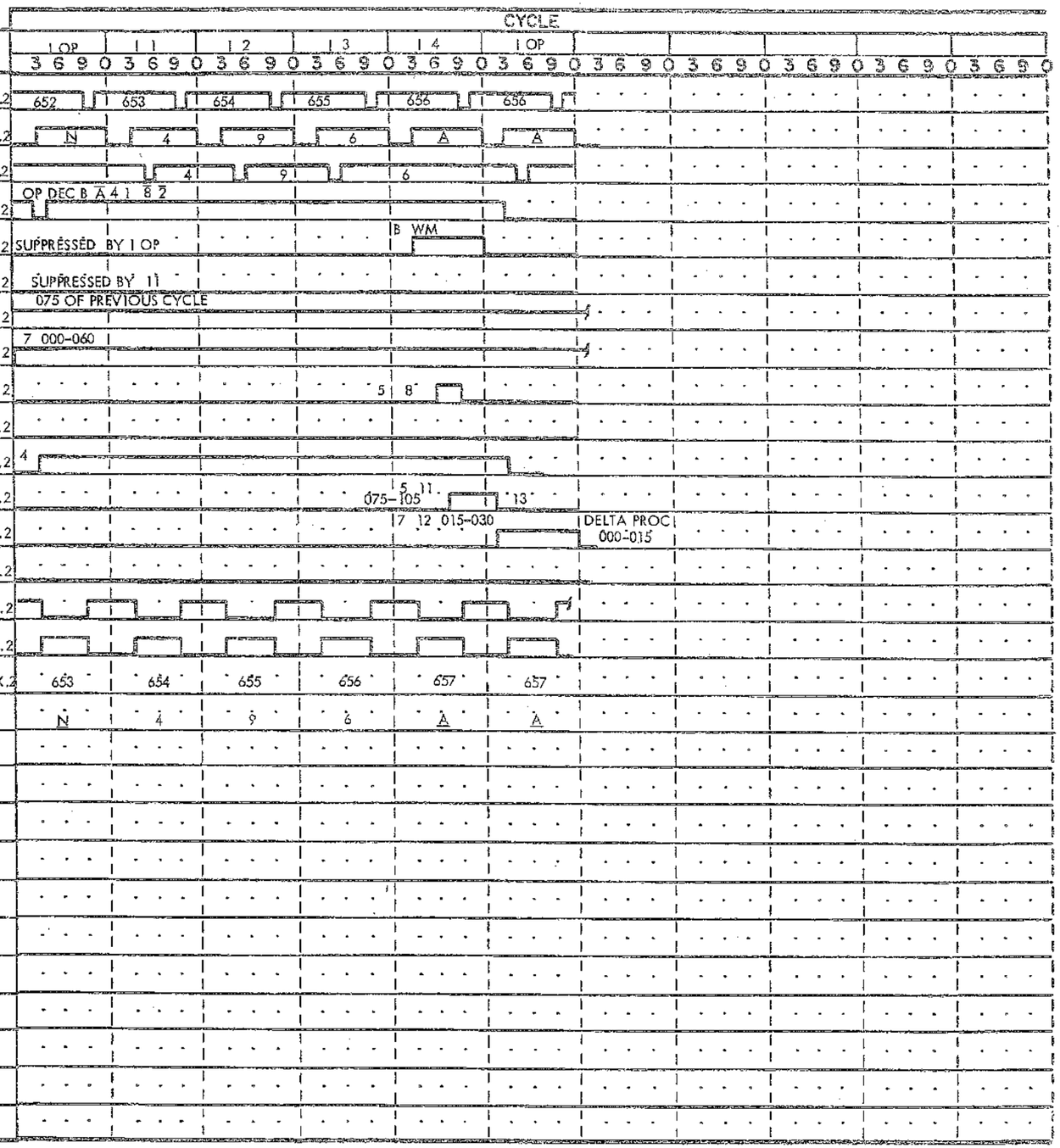


FIGURE 23. NO-OP (N)

651 S
652 N (496)
656 A

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.XX.XX.2
2	B-REGISTER LATCHES	—	—	35.XX.XX.2
3	A-REGISTER LATCHES	—	—	35.XX.XX.2
4	+U NO-OP OPR	01B1	B12F	35.25.11.2
5	-T GATED WORD MARK	01B2	C20C	31.07.11.2
6	-T I-E CHANGE	01B2	C22N	31.05.31.2
7	+U DELTA I-CYCLE	01B2	E07N	31.21.11.2
8	-T I-CYCLE LATCH	01B2	E23A	31.24.11.2
9	+U I-STAR RESTORE GATE	01A7	A20N	32.39.11.2
10	+U UNCOND TRANSFER	01B2	D08H	31.08.11.2
11	+U EXECUTE ELIMINATE	01B2	C12G	31.05.11.2
12	+U SET TO I-RING OP LATCH	01B2	D21B	31.30.11.2
13	-T I-RING OP TRG	01B2	E20N	31.31.31.2
14	+U MODIFIER CONTROL - 1	01A8	B04H	32.42.11.2
15	+U MODIFIER CONTROL + 1	01A8	D06N	32.42.11.2
16	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
17	MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX.2
18	DATA ON INHIBIT DRIVE LINES	—	—	—

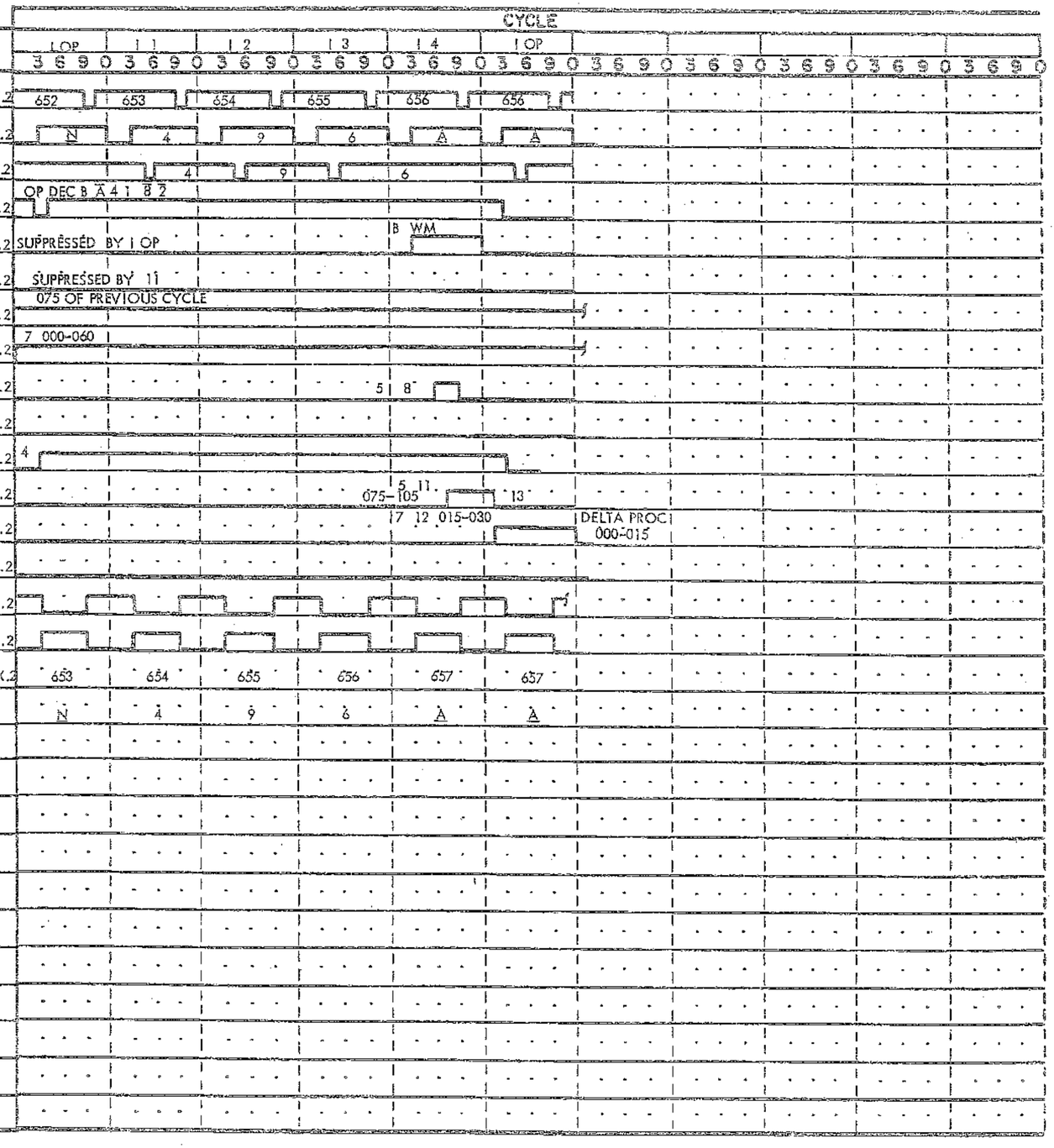


FIGURE 23. NO-OP (N)

A-FIELD 000504 601 E 410 510 RESULTANT A-FIELD
B-FIELD $b,bb0.bb* 608 ≥ 710 510 RESULTANT B-FIELD
615 ≠ 601

(AFTER EDIT) $0,005.04* 000504 RESULTANT B-FIELD (AFTER ZERO SUPP) $bbbb.[illegible]

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
				32.35.XX
1	STORAGE ADDRESS REGISTER	—	—	32.36.XX
2	B-REGISTER	—	—	35.11.XX
3	A-REGISTER	—	—	35.16.XX
4	+U EDIT	01B1	B21A	35.24.11
5	-T GATED WM	01B2	C25B	31.02.11
6	-T I-E CHANGE	01B2	B13H	31.05.31
7	+U DELTA I-CYCLE	01B2	E07N	31.21.11
8	-T I-CYCLE LATCH	01B2	E19N	31.24.11
9	+U I-STAR RESTORE	01A6	B17H	32.39.11
10	+U DELTA A-CYCLE LATCH	01B2	E09N	31.22.11
11	-T A-CYCLE LATCH	01B2	B20N	31.25.11
12	-T DELTA B-CYCLE LATCH	01B2	E09E	31.23.11
13	+U B-CYCLE LATCH	01B2	E24H	31.26.11
14	-T B-REG ZONE INHIBIT	01A3	B18C	35.18.21
15	-T B-REG DIGIT INHIBIT	01A3	B19A	35.18.31
16	-T B-REG C-BIT INHIBIT	01A3	C11H	35.18.21
17	-T B REG WM INHIBIT	01A3	C19C	35.18.21
18	-T A-REG DIGIT INHIBIT	01A3	E11G	35.18.41
19	-T A-REG ZONE INHIBIT	01A3	F20N	35.18.41
20	+U INHIBIT C-ZONE	01A3	E14A	35.18.11
21	+U OTHER EDIT	01A3	C16N	35.10.31
22	+U EDIT A-DIGIT	01B6	D25C	34.10.31
23	+U EDIT A-ZONE	01B6	D25G	34.10.31
24	-T NOT A-CYCLE ELIM	01B2	D18C	31.06.21
25	-T EDIT 1ST A CYCLE	01B6	D15N	34.10.41
26	-T BODY TRIGGER	01B6	D21H	34.10.41
27	+U SET WM LATCH	01B6	D06A	34.10.51
28	-T EDIT WM SET	01B6	D22P	34.10.61
29	-T ZERO SUPPRESS LATCH	01B6	D22C	34.10.51
30	-T A-FIELD WM LATCH	01A3	C10G	35.14.51
31	+U 1ST EDIT READDRESS	01B6	E14H	34.10.61
32	-T NOT READDRESS	01B2	C09P	31.04.11
33	-T REV SCAN TRIGGER	01B2	F07N	31.04.11
34	+U CYCLE CONTROL REV SCAN	01B2	C08A	31.04.11
35	-T REV SCAN DELAY	01B6	D22A	34.10.51
36	+U EDIT REGEN C-BIT	01B6	E16N	34.10.61
37	+U MZS OR E-IE CHANGE	01B6	E15H	34.10.61
38	+U MODIFIER CONTROL -1	01A8	C04G	32.42.11
39	+U MODIFIER CONTROL +1	01A8	C04H	32.42.11
40	-T MODIFIER CONTROL XFER	01A8	C01E	32.42.41
41	MODIFIER OUTPUT ON BUS LINES	—	—	32.45.XX
42	DATA ON INHIBIT DRIVE LINES	—	—	—
43	(BEFORE ZERO B-FIELD AFTER EDIT SUPPRESSION)	—	—	—
44	B-FIELD AFTER ZERO SUPPRESSION	—	—	—

CYCLE CYCLE

I 7 A A B C B A B B A A A A B B B READR B B B B B I OP

3 6 9 0 3 6 9 0 3 6 9 0

701 A (ATW) (4C2) A-TAG = V 0 4 RESULTANT A-STAR = 63F
708 S — — AB-TAG = 106 B-STAR = 538

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.3X.XX.2
2	B-REGISTER LATCHES	—	—	35.1X.XX.2
3	A-REGISTER LATCHES	—	—	35.1X.XX.2
4	-T A-TAG LATCH	02B6	A22N	41.50.01.2
5	-T B-TAG LATCH	02B6	A22A	41.50.01.2
6	-T PREVENT I-STAR RO	02B6	A24N	41.50.11.2
7	+U NOT INDEX	02B6	C14G	41.51.31.2
8	-T STORE CYCLE 1	02B6	B19N	41.50.21.2
9	-T STORE CYCLE 2	02B6	B20N	41.50.21.2
10	-T STORE CYCLE 3	02B6	B21N	41.50.21.2
11	-T STORE CYCLE 4	02B6	B22N	41.50.21.2
12	-T BLOCK I-RING	02B6	D11N	41.51.31.2
13	-T INDEX 1	02B6	D04H	41.51.61.2
14	-T GATED WORD MARK	01B2	C20C	31.07.11.2
15	-T I-E CHANGE	01B2	B13H	31.05.31.2
16	-T DELTA I-CYCLE LATCH	01B2	C11N	31.21.11.2
17	-T I-CYCLE LATCH	01B2	E19N	31.24.11.2
18	-T I-STAR GATE OUT	01A7	A18N	32.34.21.2
19	+U INDEX ADDRESS GENERATOR	02B6	—	31.50.41.2
20	+U TRANSFER B-REGISTER	01A3	D12P	35.18.11.2
21	+U STORE-INDEX A-REG RESET	02B6	C24H	41.51.41.2
22	+U INDEX A-STAR GATE	02B6	C09H	41.50.81.2
23	+U INDEX B-STAR GATE	02B6	C09A	41.50.81.2
24	-T INDEX ARITHMETIC GATE	02B6	C22N	41.51.21.2
25	+U INDEX ZONE ADDER GATE	02B6	D20P	41.51.61.2
26	+U A-STAR RI UNITS	02B6	B09H	41.50.51.2
27	+U A-STAR RI TENS	02B6	B08N	41.50.51.2
28	+U A-STAR RI HUNDREDS	02B6	B08H	41.50.51.2
29	+U B-STAR RI UNITS	02B6	B04A	41.50.61.2
30	+U B-STAR RI TENS	02B6	B05H	41.50.61.2
31	+U B-STAR RI HUNDREDS	02B6	B05N	41.50.61.2
32	-T NOT INDEX BLOCK NU CARRY	02B6	E06A	41.50.21.2
33	+U ZONE CARRY TRIGGER	02B6	D05E	41.50.71.2
34	+U B-REG RESET INDEX	02B6	D10H	41.50.71.2
35	-T B-REG SET A (FOR CARRY)	02B6	D08H	41.50.71.2
36	+T PREVENT ACT STORAGE	02B6	C04E	41.50.71.2
37	+U END INDEX OP	02B6	A23N	41.50.01.2
38	-T MODIFIER CONTROL +1	01A8	D02C	32.42.11.2
39	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
40	MODIFIER OUTPUT ON BUS	—	—	32.43.XX.2
41	DATA ON INHIBIT DRIVE	—	—	35.1X.XX.2

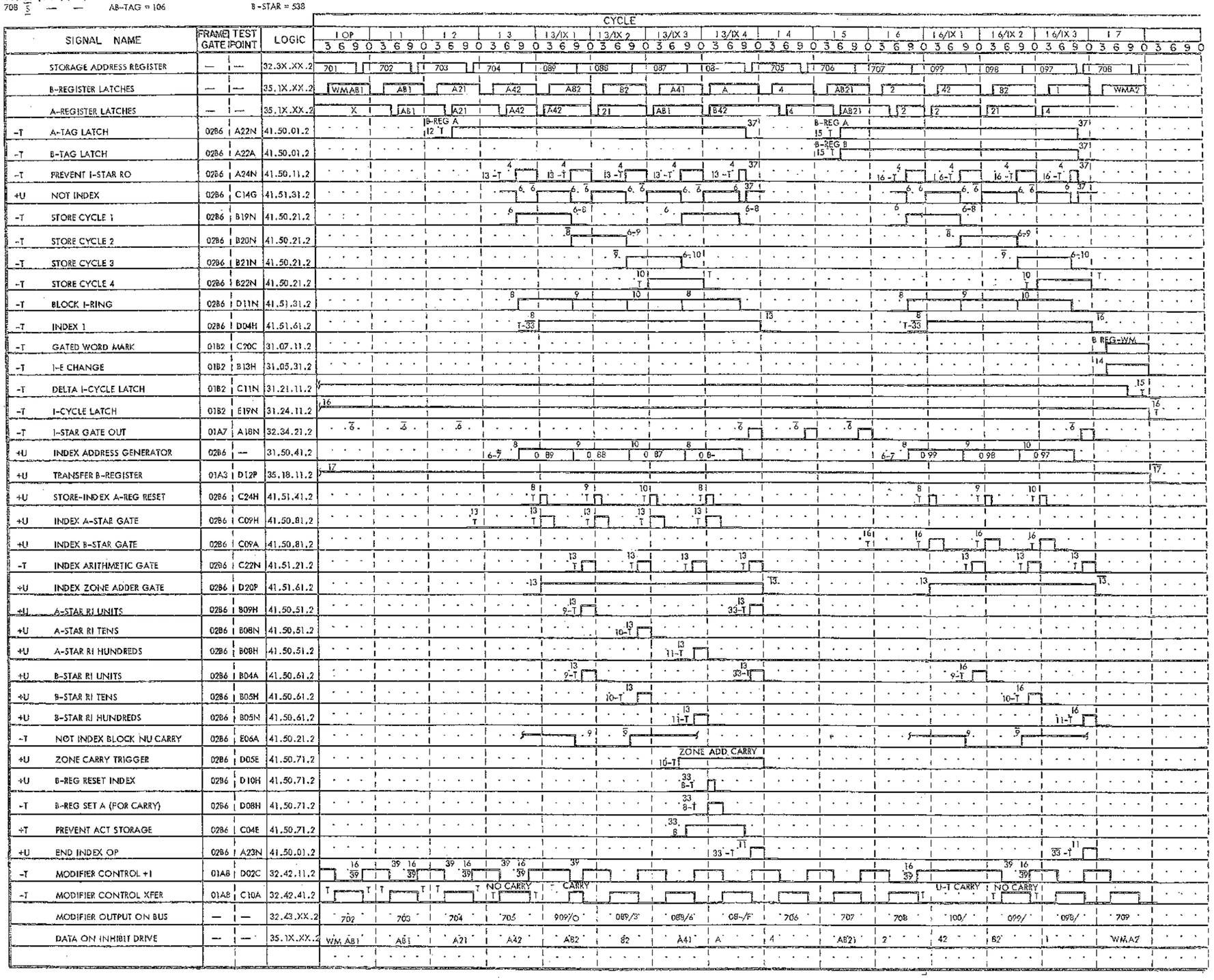


FIGURE 25. INSTRUCTION CYCLE WITH INDEXING

253 Q/H (336) PREVIOUS A-STAR 654 STORE Q OPR 654
257 A — — ADDRESSES B-STAR 824

	SIGNAL NAME		FRAME TEST GATE	POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX
2		B-REGISTER LATCHES	—	—	35.11.XX
3		A-REGISTER LATCHES	—	—	36.16.XX
4	+U	H OPR (STORE B-STAR) Q OPR (STORE A-STAR)	01B1	A25A A25H	41.52.31
5	+U	Q TRIGGER ON	02B5	G17E	41.51.31
6	+U	Q MODIFY	02B6	D04E	41.51.31
7	-T	NOT INDEX	02B6	C13N	41.51.31
8	-T	GATED WORD MARK	01B2	C25B	31.07.11
9	-T	DELTA I-CYCLE LATCH	01B2	E07N	31.21.11
10	-T	I-CYCLE LATCH	01B2	E19N	31.24.11
11	-T	DELTA A-CYCLE LATCH	01B2	E09N	31.22.11
12	-T	A-CYCLE LATCH	01B2	B20N	31.25.11
13	+U	STORE CYCLE 1	02B6	B19N	41.50.11
14	+U	STORE CYCLE 2	02B6	B20N	41.50.11
15	+U	STORE CYCLE 3	02B6	B21N	41.50.11
16	-T	I-STAR GATE OUT	01A7	B16N	32.34.21
17	-T	A-STAR GATE OUT	01A7	B16B	32.32.21
18	-T	B-STAR RI GATE	02B6	C13G	41.50.31
19	+U	TRANSFER B-REGISTER	01A3	D12C	35.18.11
20	-T	A-REG STORE INHIBIT	02B6	D16H	41.51.71
21	-T	STORE OPR Q H AND A CYCLE	02B6	C23A	41.51.31
22	-T	A-REG ZONE INHIBIT	01B4	D09D	36.13.21
23	-T	A-REG DIGIT INHIBIT	01B4	D09A	36.13.21
24	+U	MODIFIER CONTROL -1	01A8	C04G	32.42.11
25	+U	MODIFIER CONTROL +1	01A8	C04H	32.42.11
26	-T	MODIFIER CONTROL XFER	01A8	C01E	32.42.41
27	-T	DELTA I SET Q-H	02B6	A21A	41.51.51
28	-T	I/E CHANGE	01B2	B13H	31.05.31
29		MODIFIER OUTPUT ON BUS	—	—	32.43.XX
30		DATA ON INHIBIT DRIVE	—	—	—

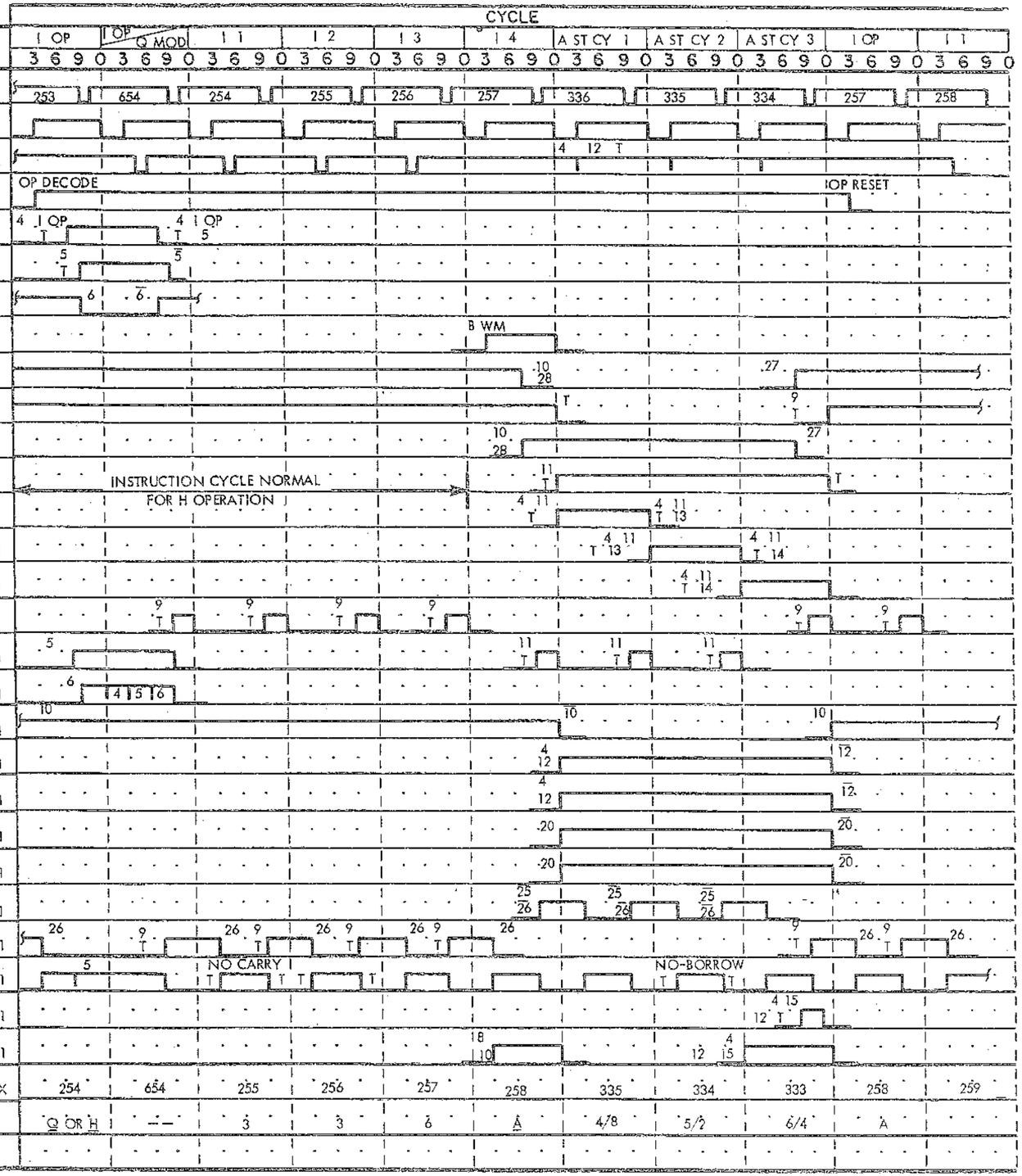


FIGURE 26. STORE A STAR Q (AAA) STORE B STAR H (AAA)

654 B (701) BEFORE XFER
658 $\overline{A}$ — — AFTER XFER
701 $\overline{H}$ (336)

		I-STAR	A-STAR	B-STAR
BEFORE XFER		658	701	xxx
AFTER XFER		658	701	658

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.35.XX 32.36.XX
2	B-REGISTER LATCHES	—	—	35.11.XX
3	A-REGISTER LATCHES	—	—	36.16.XX
4	-T BRANCH OPERATION	01B1	A09N	35.26.11
5	-T GATED WORD MARK	01B2	C25B	31.07.11
6	-T I/E CHANGE	01B2	B13H	31.05.31
7	-T DELTA I-CYCLE LATCH	01B2	E07N	31.21.11
8	-T I-CYCLE LATCH	01B2	E19N	31.24.11
9	+U I-STAR RESTORE	01A8	B17H	32.39.11
10	+U EXECUTE ELIMINATION	01A2	C08H	31.05.11
11	+U TRANSFER PROGRAM SKIP	01B6	A08H	34.21.41
12	-T PROGRAM SKIP LATCH	01B2	D11N	31.08.11
13	+U I-A STAR GATE	01B2	D05C	31.08.11
14	+U SET TO I RING OP	01B2	E20H	31.30.11
15	-T I-B STAR 1	02B6	C06N	41.51.51
16	+U I-B STAR TRIGGER	02B6	C06N	41.51.51
17	+U I STAR RO	02B6	C26A	41.51.51
18	-T I-B STAR 2 (B-STAR RI)	02B6	D26C	41.51.51
19	+U I RING OP	01B2	A16A	31.31.11
20	-T A-STAR GATE OUT	01A7	B16B	32.32.21
21	-T I-STAR GATE OUT	01A7	B16H	32.34.21
22	+U MODIFIER CONTROL +1	01A8	C04H	32.42.41
23	-T MODIFIER CONTROL XFER	01A8	C01E	32.42.41
24	MODIFIER OUTPUT ON BUS	—	—	32.43.XX
25	DATA ON INHIBIT DRIVE	—	—	—

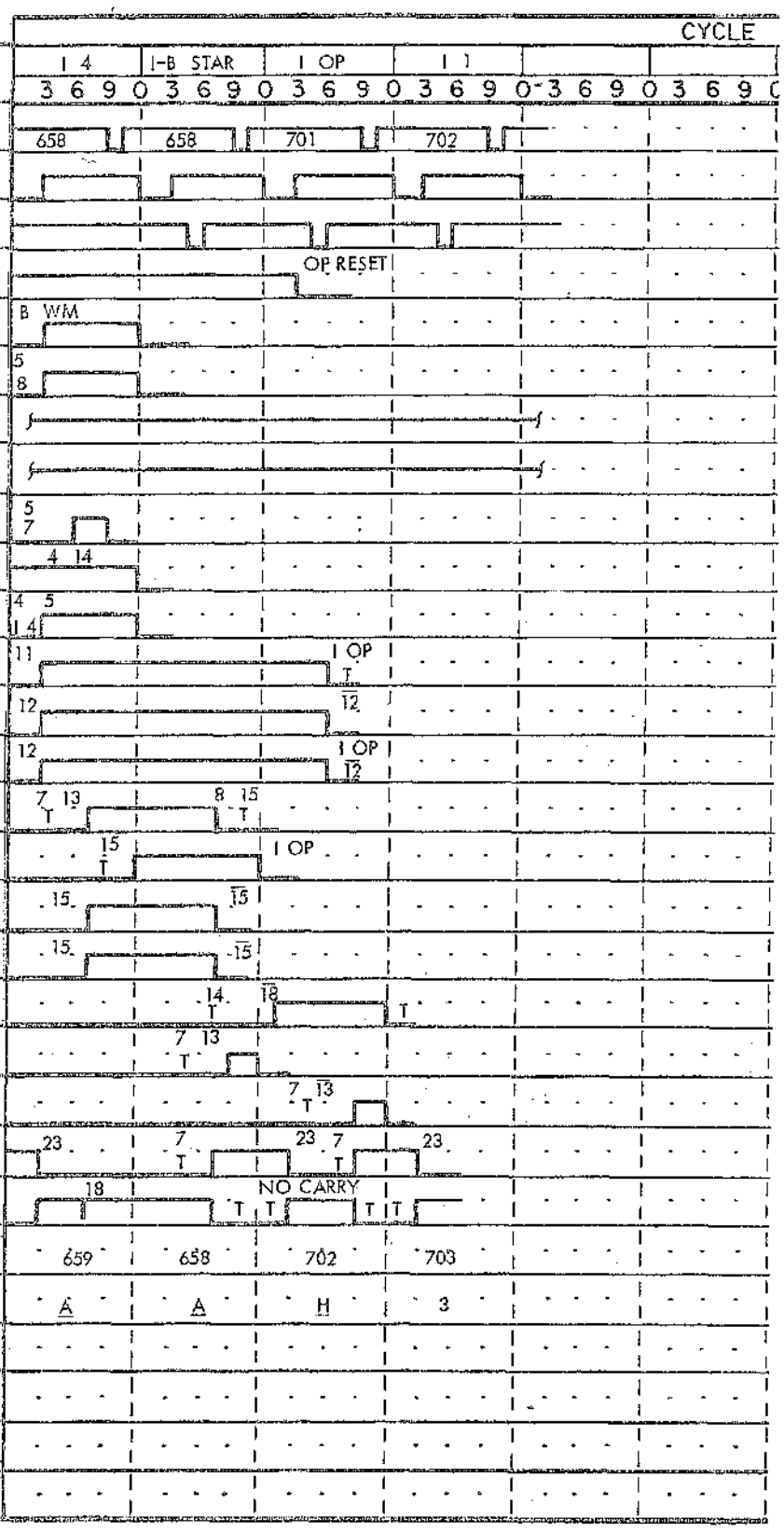


FIGURE 27. BRANCH B (III) ADVANCED PROGRAMMING (I-B STAR TRANSFER)

523 P (398) (437) A-FIELD ORIG 1 2 3 4 5 6 RM 7 RESULT 1 2 3 4 5 6 RM 7
529 S — — B-FIELD ORIG A B C D E F G H RESULT 1 2 3 4 5 6 RM H

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.36.XX 32.35.XX
2	B-REGISTER LATCHES	—	—	35.11.XX
3	A-REGISTER LATCHES	—	—	35.16.XX
4	+U P OPR (MOVE RECORD)	01B1	A25N	41.52.31
5	-T GATED WORD MARK	01B2	C25B	31.07.11
6	+U I/E CONTROL 2	01B2	C16B	31.05.21
7	-T DELTA I-CYCLE LATCH	01B2	E07H	31.21.11
8	-T I-CYCLE LATCH	01B2	E19N	31.24.11
9	-T DELTA A-CYCLE	01B2	E09N	31.22.11
10	-T A-CYCLE LATCH	01B2	B20N	31.25.11
11	-T DELTA B-CYCLE LATCH	01B2	E09E	31.23.11
12	-T B-CYCLE LATCH	01B2	E23H	31.26.11
13	-T I-STAR GATE OUT	01A7	B16H	32.32.81
14	-T A-STAR GATE OUT	01A7	B16B	32.32.81
15	-T B-STAR GATE OUT	01A7	B16A	32.32.81
16	+U TRANSFER B-REGISTER	01A3	D12C	35.18.11
17	-T B-REG ZONE INHIBIT	01A3	C21A	
18	-T B-REG DIGIT INHIBIT	01A3	D09C	
19	-T B-REG WM INHIBIT	01A3	C19C	35.18.21
20	+U A-REG ST INH	02B6	D16H	41.51.71
21	-T A-REG ZONE INHIBIT	01A3	D09P	36.13.21
22	-T A-REG DIGIT INHIBIT	01A3	D09A	36.13.21
23	+U MODIFIER CONTROL +1	01A8	C09H	32.42.21
24	-T MODIFIER CONTROL XFER	01A8	C01E	32.42.41
25	-T I/E CHANGE	01B2	B13H	31.05.31
26	MODIFIER OUTPUT ON BUS	—	—	32.43.XX
27	DATA ON INHIBIT DRIVE	—	—	—

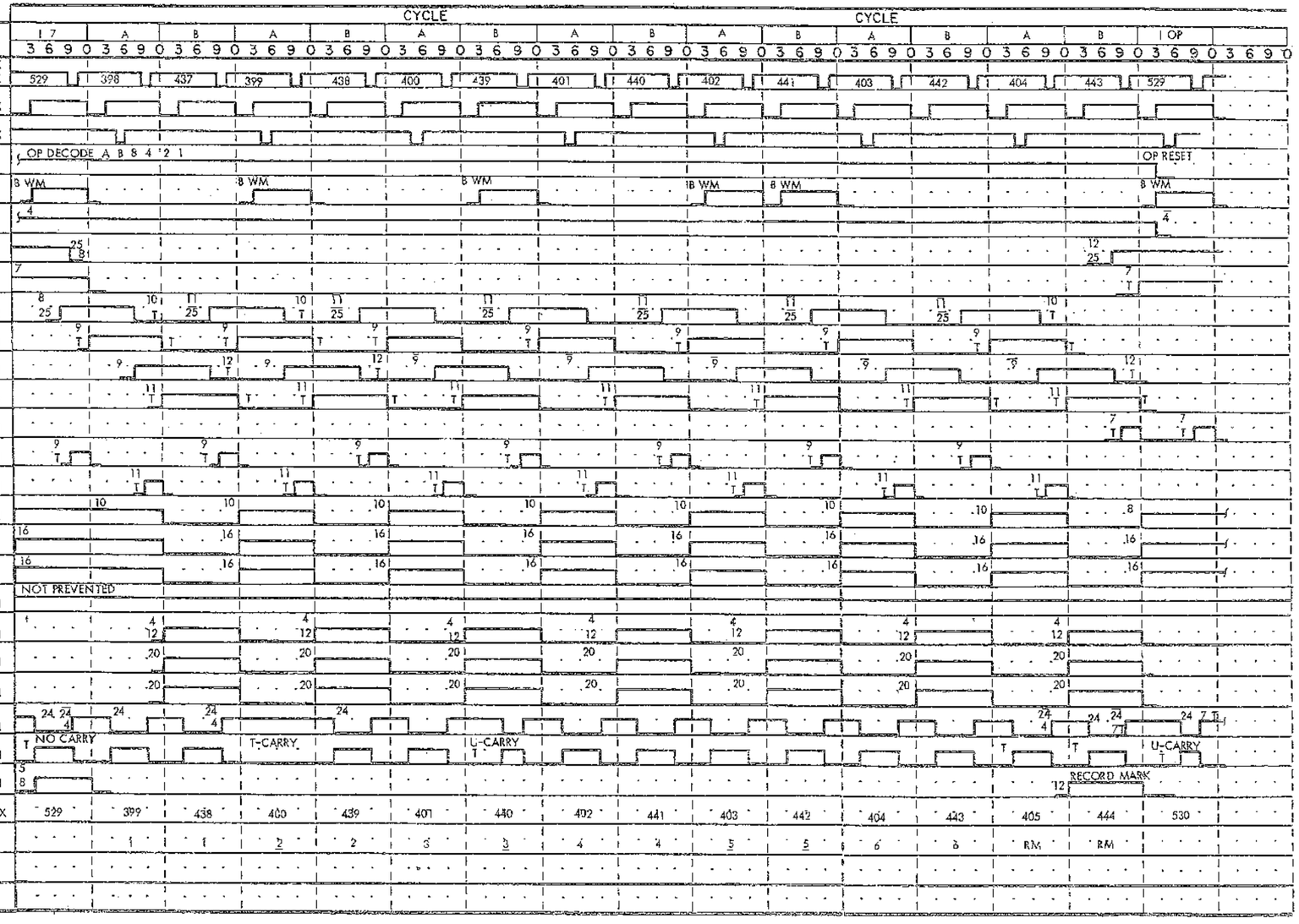


FIGURE 28, MOVE RECORD P (AAA) (BBB)

		SIGNAL NAME	FRAME TEST GATE POINT		LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32,35,XX 32,36,XX
2		B-REGISTER	—	—	35,31,XX
3		A-REGISTER	—	—	36,36,XX
4	-T	GATED WORD MARK	0182	C25S	31,07,11
5	-T	I-E CHANGE	0182	B12N	31,05,21
6	+U	DELTA I-CYCLE	0182	E07N	31,21,11
7	-T	I-CYCLE	0182	E19N	31,24,12
8	+U	I-STAR RESTORE	0167	B17H	32,39,11
9	+U	READ OPR	0181	C12E	35,27,11
10	+U	I/O OPS	0182	B25N	31,09,21
11	-T	PROCESS FEED	0184	C05N	36,10,11
12	-T	READ FEED TRIGGER	0184	A04N	36,10,11
13	-T	READ CLUTCH	0184	A04A	36,10,11
14	+U	A-CYCLE ELIMINATE	0182	C16N	31,06,11
15	+U	DELTA B LATCH	0182	E14G	31,23,11
16	+U	DELTA PROCESS CONTROL	0182	B15H	31,02,21
17	+U	DELTA PROCESS RESET	0182	A25N	31,07,31
18	-T	DELTA PROCESS	0182	B12A	31,09,11
19	-T	PROCESS LATCH	0182	B13S	31,09,41
20	-T	RDR JMP CB LATCH	0184	306A	36,10,21
21	+U	JMP CB TRIGGER	0184	E20S	36,10,21
22	-T	READ SCAN GATE (TRIGGER)	0184	C22N	36,11,11
23	-T	R-P SCAN GATE	0184	B10S	36,11,11
24	+U	RD SCAN CNTL	0184	B49S	36,11,13
25	-U	ACTIVATE STORAGE	0182	A42T	31,02,41
26	+U	GATE CYCLE OUTPUT	0182	E14P	31,24,31
27	+U	DELTA B-CYCLE	0182	E03S	31,22,11
28	+U	B-CYCLE LATCH	0182	E24R	31,26,11
29	+U	I-CYCLE	0182	A16G	31,26,11
30	-T	000 SET TIME	01A7	E05N	32,31,31
31	-T	TERNS 8-2-C	01A7	B12M	32,31,21
32	-T	RD PCH FORCE B2	0184	A08N	36,10,11
33	+U	SET COMPLEMENT	0184	D18N	36,11,11
34	+U	RESET A-REG ENCODE	0154	C10H	36,12,21
35	+U	INHIBIT C DIGIT	0183	C13E	35,15,11
36	-T	RD-PCH ARITH DIGIT INH	0184	A18H	36,12,11
37	-T	READ TRANSFER TRIGGER	0184	C04N	36,11,11
38	+U	TRANSFER 000	0184	C22P	36,11,11
39	+U	A-REG ENCODE SET	0184	C19A	36,12,21
40	-T	B-REG TRANSFER	0154	C21P	36,11,11
41	+U	AFTER ONE TRIGGER	0184	A23S	36,12,11
42	+U	ZONE ADDER GATE	0184	A19C	36,12,31
43	+U	RD-PCH ARITH ZONE INHIBIT	0184	A19G	36,12,11
44	+U	RD-PCH FORCE ZONE CARRY GATE	0184	A19P	36,12,21
45	+U	FORCE "C" DIGIT	0184	A19A	36,12,11
46	-T	LAST ADDRESS	0184	323H	36,16,11
47	+U	READ SCAN COMPLETE	0184	B32S	36,01,21
48	+U	ALL SCNS COMP	0166	E32G	36,01,11
49	+U	MODIFIER CONTROL +1	01A5	D06N	32,42,11
50	-T	MODIFIER CONTROL XFER	01A8	C16A	32,42,41

FIGURE 29, READ

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32,35,XX 32,36,XX
2		B-REGISTER	—	—	35,11,XX
3		A-REGISTER	—	—	35,18,XX
4	–T	GATED WM	01B2	C25B	31,07,11
5	–T	I-E CHANGE	01B2	B13H	31,05,31
6	+U	DELTA I-CYCLE	C1B2	E07N	31,21,11
7	–T	I-CYCLE	01B2	E19N	31,24,11
8	+U	I-STAR RESTORE	01A7	B17H	32,39,11
9	+U	PUNCH OPR	01B1	C14F	35,27,11
10	+U	I/O OP3	01B2	B25N	31,69,21
11	–T	PROC PUNCH	01B4	F07N	36,24,11
12	+U	PUNCH FEED TRIGGER	01B4	E10E	36,24,11
13	–T	PUNCH CLUTCH MAGNET	01B4	A04D	36,24,11
14	+U	A-CYCLE ELIMINATE	01B2	C16N	31,06,11
15	+U	DELTA B-LATCH	01B2	E14G	31,23,11
16	+U	DELTA PROCESS RESET	01B2	A20N	31,02,31
17	–T	DELTA PROCESS	01B2	B12A	31,02,11
18	–T	PROCESS	01B2	B13B	31,02,41
19	–T	PUNCH SCAN CB TRIGGER	01B4	A20N	36,21,11
20	+U	PUNCH SCAN GATE	01B4	A22E	36,22,31
21	–T	R-P SCAN GATE	01B4	B10G	36,31,11
22	+U	PUNCH SCAN CTRL	01B4	B19N	36,22,11
23	–U	GATE CYCLE OUTPUT	01B2	E14P	31,24,11
24	–U	ACTIVATE STORAGE	01B2	A17C	31,02,41
25	+U	DELTA B-CYCLE	01B2	E03B	31,23,11
26	+U	B-CYCLE LATCH	01B2	E24H	31,26,11
27	+U	B-CYCLE	01B2	A16G	31,26,11
28	–T	100 SET TIME	01A7	E01N	32,31,11
29	–T	TENS 2-8-C	01A7	B42H	32,31,21
30	+U	NOT SET-UP	01A7	B18C	32,31,21
31	+U	PUNCH FEED RST GATE	01B4	A05N	36,10,11
32	–T	RD PCH FORCE 82	01B4	A08N	36,10,11
33	+U	ADD TO 100	01B4	A23H	36,22,11
34	–T	A-REG SET B RD-PCH	01B4	B24N	36,12,21
35	+U	ZONE ADDER GATE	01B4	A19C	36,12,11
36	+U	RD-PCH FORCE ZONE CARRY	01B4	A19P	36,12,31
37	+U	RD-PCH ARITH ZONE INH	01B4	A19G	36,12,11
38	+U	FORCE C-DIGIT	01B4	A19A	36,12,11
39	+U	PUNCH TRANSFER	01B4	A24E	36,27,11
40	+U	RESET A REG ENCODE	01B4	C10H	36,12,21
41	+U	A-REG ENCODE SET	01B4	C19A	36,12,21
42	–T	B-REG TRANSFER	01B4	B18A	36,22,11
43	+U	AFTER ZERO TRIGGER	01B4	C26A	36,12,15
44	+U	FORCE DIGIT CARRY	01B4	C19N	36,12,11
45	–T	FORCE C DIGIT	01B4	B20A	36,12,11
46	–T	RD-PCH ARITH DIGIT INH	01B4	A15H	36,12,11
47	–T	PCH DECODE SCAN	01B7	B06A	36,23,31
48	–T	LAST ADDRESS	01B4	B23H	36,16,11
49	+U	DELTA PROC CNTL	01B7	B15H	31,02,21
50	+U	PUNCH SCAN COMPLETE	01B4	A12E	36,01,21
51	–T	ALL SCANS COMPLETE	01A6	F25N	36,01,11
52	+U	MODIFIER CONTROL +1	01A8	D06N	32,42,11
53	–T	MODIFIER CONTROL XFER	01A8	C10A	32,42,41

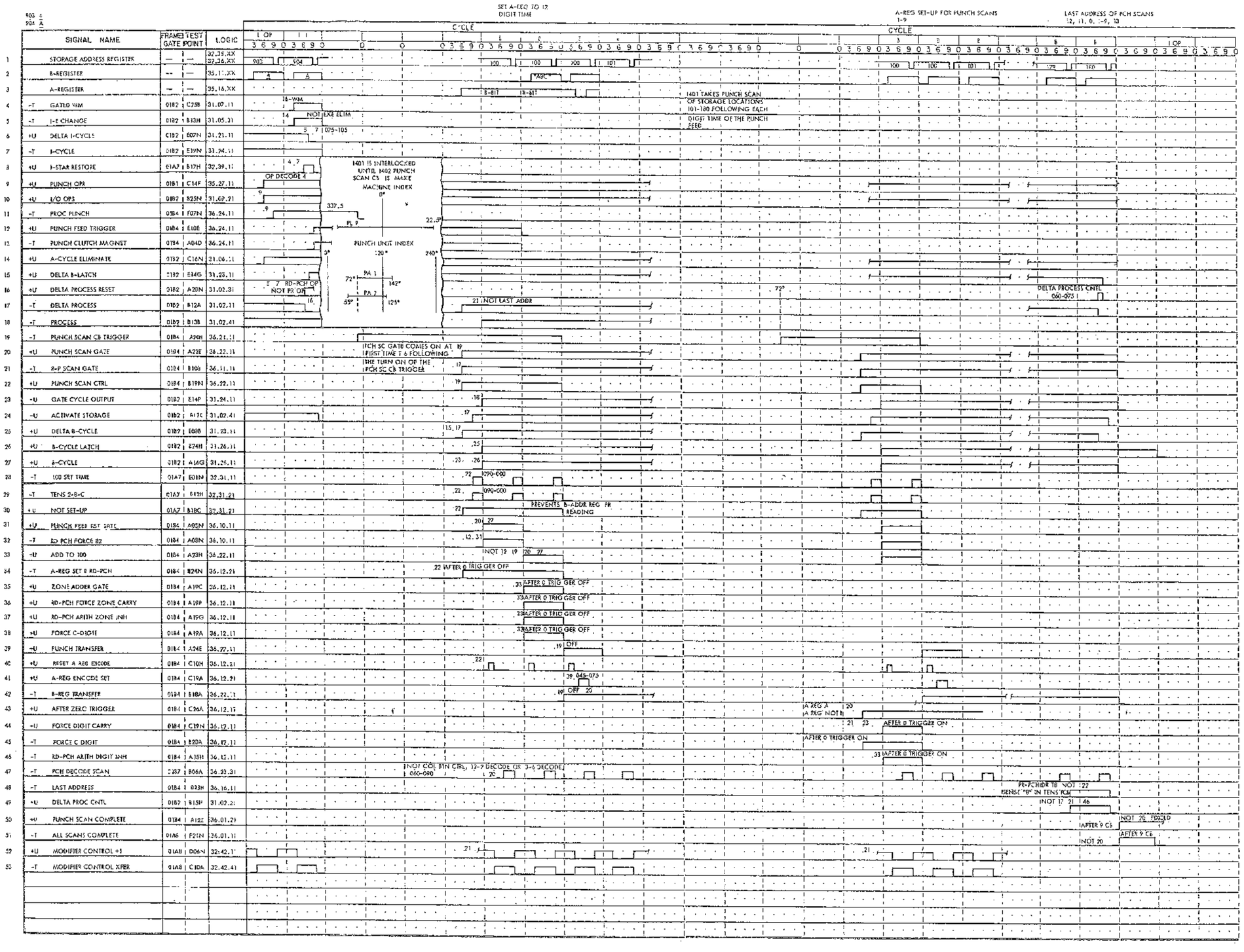


FIGURE 30. PUNCH

COLUMN BINARY - READ

	SIGNAL NAME	FRAME	TEST GATE POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.35.XX
2	B-REGISTER	—	—	35.11.XX
3	A-REGISTER	—	—	35.16.XX
4	–T GATED WM	01B2	C25E	31.07.11
5	–T I/E CHANGE	01B2	B13H	31.05.31
6	+U DELTA I CYCLE	01B2	E07N	31.21.11
7	+U I-CYCLE	01B2	E17N	31.24.11
8	+U I STAR RESTORE	01A7	B17H	32.39.11
9	+U READ OPR	01B1	C13F	35.27.11
10	+U I/O OPS	01B2	F25N	31.02.21
11	–T READ FEED TRIGGER	01B4	A05N	36.10.11
12	–T READ CLUTCH	01B4	A04A	36.10.11
13	+U A CYCLE ELIMINATE	01B2	C16N	31.06.11
14	+U DELTA B LATCH	01B2	E14G	31.23.11
15	+U DELTA PROCESS RESET	01B2	A20N	31.02.31
16	–T DELTA PROCESS	01B2	B12A	31.02.11
17	–T PROCESS LATCH	01B2	B13B	31.02.41
18	–T RDR IMP CB LATCH	01B4	B06A	36.10.21
19	+U IMP CB TRIGGER	01B4	B20E	36.10.21
20	–T READ SCAN GATE (TRIGGER)	01B4	C22N	36.11.11
21	–T R P SCAN GATE	01B4	B10B	36.11.11
22	+U RD SCAN CTRL	01B4	B29B	36.11.11
23	–U ACTIVATE STORAGE	01B7	A17C	31.02.41
24	+U GATE CYCLE OUTPUT	01B2	E14P	31.24.11
25	+U DELTA B CYCLE	01B2	E03B	31.23.11
26	+U B CYCLE LATCH	01B2	B24H	31.26.11
27	+U B CYCLE	01B2	A16G	31.26.11
28	–T 000 SET TIME	01A7	E05N	32.31.11
29	–T TENS 8, 2, C	01A7	B12H	32.31.21
30	–T RD PCH FORCE 82	01B4	A08N	36.10.11
31	+U SET COMPLEMENT	01B4	D18N	36.11.11
32	+U RESET A REG ENCODE	01B4	C10H	36.12.21
33				
34	–T RD-PCH ARITH DIGIT INHIBIT	01B4	A18H	36.10.11
35	–T READ TRANSFER TRIGGER	01B4	C24N	36.11.11
36	+U TRANSFER 000	01B4	C23P	36.11.11
37	+U A REG ENCODE SET	01B4	C19A	36.12.21
38	–T B REG TRANSFER	01B4	C21P	36.11.11
39	–T CONTENTS OF STOR LOC 000	—	—	—
40	+U COL BIN CTRL	02B8	F39N	41.11.21
41	+U COL BIN OPR	02B8	F11N	41.11.21
42	–T NORMAL MODE	02B8	F15A	41.11.11
43	+U COL BIN MODE	02B8	F19A	41.11.11
44	+U RD PCH TRANSFER	02B8	F08B	41.11.11
45	–T COL BIN TRANSFER STAR	02B8	F23N	41.11.31
46	–T MOD CTRL TFR	01A8	C10A	32.42.41
47	–T COL BIN MODE PLUS 1	02B8	E15A	41.11.51
48	–T MODIFIER CTRL PLUS 1	0148	D06N	32.42.11
49	+U RD-PCH SCAN NORMAL	02B8	F07H	41.11.11
50	COL BIN 4 COL BIN 1 COL BIN C "5"	—	—	41.11.31
51	COL BIN 8 COL BIN 2 COL BIN C "0"	—	—	41.11.31
52	–T SENSE RD 2	01A1	D23A	42.59.11
53	+U COL BIN RD 2 LATCH	02B8	F31H	41.11.11
54	INH COL BIN - B OR A OR B OR 4 OR 2 OR 1 OR C	—	—	41.25.31
55	–T LAST ADDRESS	01B4	D23N	36.16.11
56	+U DELTA PROCESS CONTROL	01B2	B16N	31.02.21
57	+U AFTER ONE TRIGGER	01B4	A25E	36.12.11
58	+U RD SCN COMP	01B4	B12E	36.01.31
59	–T ALL SCAN COMP	01A6	F21N	36.01.11

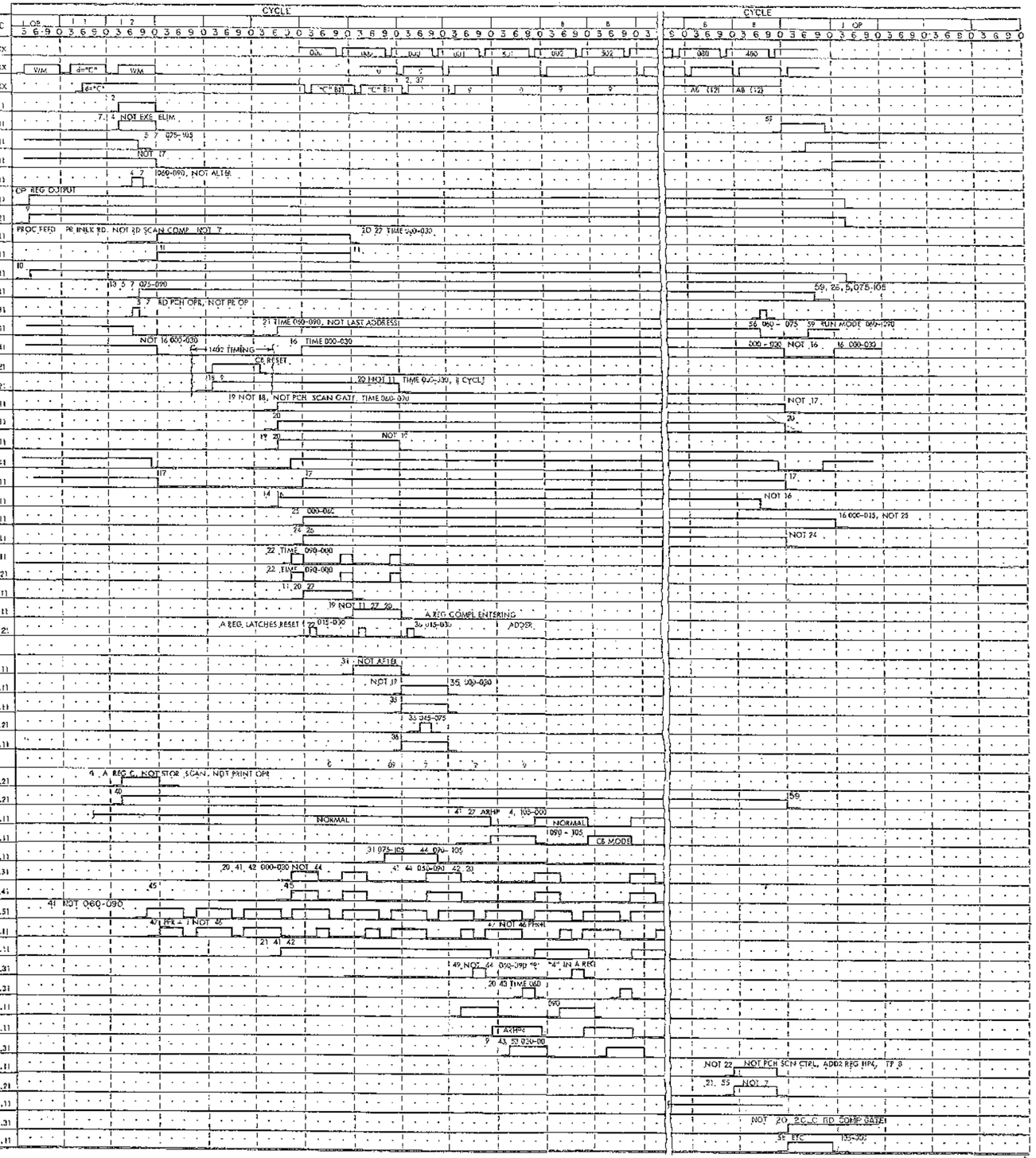


FIGURE 32. COLUMN BINARY READ SEQUENCE

COLUMN BINARY - PUNCH

		SIGNAL NAME	FRAME	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX 32.36.XX
2		B-REGISTER	—	—	35.11.XX
3		A-REGISTER	—	—	35.16.XX
4	-T	GATED WM	0182	C23S	31.07.11
5	-T	I/E CHANGE	0182	B13H	31.05.31
6	+U	DELTA I CYCLE	0182	E07N	31.21.11
7	+U	I CYCLE	0182	E17N	31.24.11
8	+U	I STAR RESTORE	01A8	B17H	32.39.11
9	+U	PUNCH OPR	0181	C14F	35.27.11
10	+U	I/O OPS	0182	B25N	31.09.21
11	+U	PUNCH FEED TRIGGER	0184	E10E	36.24.11
12	-T	PUNCH CLUTCH MAGNET	0184	A04D	36.24.11
13	+U	A CYCLE ELIMINATE	0182	C16N	31.06.11
14	+U	DELTA B LATCH	0182	E14G	31.23.11
15	+U	DELTA PROCESS RESET	0182	A20N	31.02.31
16	-T	DELTA PROCESS	0182	B12A	31.02.11
17	-T	PROCESS LATCH	0182	B13B	31.02.41
18	-T	PCH SCAN CB TRIGGER	0184	A20N	36.21.11
19	+U	PUNCH SCAN GATE	0184	B19H	36.22.11
20	-T	R-P SCAN GATE	0184	B10B	36.11.11
21	+U	PUNCH SCAN CTRL	0184	B19M	36.22.11
22	+U	GATE CYCLE OUTPUT	0182	E14P	31.24.11
23	-U	ACTIVATE STORAGE	0182	A17C	31.02.41
24	+U	DELTA B CYCLE	0182	E05R	31.23.11
25	+U	B CYCLE LATCH	0182	E24H	31.26.11
26	+U	B CYCLE	0182	A16G	31.26.11
SET STAR TO 100	27	-T 100 SET TIME	01A7	E01N	32.31.11
	28	-T TENS 2 & C	01A7	B12H	32.31.21
	29	+U NOT SET UP	01A7	B15C	32.31.23
0 SET IN 100	30	+U PCH FEED RST GATE	0184	A05N	36.10.11
	31	-T RD PCH FORCE 80	0184	A08N	36.10.11
COND ZONE ADDR TO PROD ABC AT 12 PCH TIME	32	+U ADD TO 100	0184	A23H	36.22.11
	33	-T A REG SET B RD PCH	0184	B24N	36.12.21
	34	+U ZONE ADDER GATE	0184	A19C	36.12.11
	35	+U RD PCH FORCE ZONE CARRY	0184	A19F	36.12.13
	36	+U RD PCH ARITH ZONE INH	0184	A19G	36.12.11
	37	+U FORCE C DIGIT	0184	A19A	36.12.11
	38	+U PUNCH TRANS	0184	A24E	36.22.11
A REG SET TO SAME CHAR AS IN B REG	39	+U RESET A REG ENCODE	0184	C10H	36.12.21
	40	+U A REG ENCODE SET	0184	C19A	36.12.21
TRANSFRS B REG CHAR TO LOC 100 ON 3RD I CYCLE	41	-T B REG TRANSFER	0184	B18A	36.22.11
	42	CONTENTS OF STORAGE LOC 100	—	—	—
	43	+U COLUMN BINARY OPERATION	0288	F11N	41.11.21
	44	-T NORMAL MODE	0288	F15A	41.11.31
	45	+U COLUMN BINARY MODE	0288	F13A	41.11.31
	46	+U RD PCH TRANSFER	0288	F08D	41.11.11
	47	-T COL BIN TRANSFER STAR	0286	F23N	41.11.31
	48	-T MOD CTRL TFR	01A8	C10A	32.42.41
	49	-T COL BIN MODE PLUS 1	0288	E15A	41.11.51
	50	-T MODIFIER CTRL PLUS 1	01A8	D08N	32.42.11
	51	+U RD PCH SCAN NORMAL	0288	F07H	41.11.31
	52	COL BINARY "4"	—	—	41.11.31
	53	COL BINARY "1"	—	—	41.11.31
	54	-T COL BIN PCH DECODE	0288	F20H	41.23.21
	55	+U COL BIN PCH CHECK DECODE	0286	F08P	41.23.21
	56	+U COL BIN LAST ADDRESS	02A8	F18P	41.11.11
	57	-T LAST ADDRESS	0184	D23H	36.16.31
	58	+U DELTA PROCESS CONTROL	0182	B16N	31.02.21

FIGURE 33. COLUMN BINARY PUNCH SEQUENCE

M 503 909 A 1 C ASSUME WM IN 401

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.35.XX
2	B-REGISTER LATCHES	—	—	35.11.XX
3	A-REGISTER LATCHES	—	—	35.16.XX
4	+U MOVE OPERATION	01B1	B12N	35.25.11
5	-T GATED WORD MARK	01B2	C25B	31.07.11
6	-T I/E CHANGE	01B2	B13H	31.05.31
7	+U DELTA I CYCLE	01B2	E07N	31.21.11
8	-T I CYCLE	01B2	A23F	31.24.11
9	+U I STAR RESTORE	01A7	B17H	32.39.11
10	+U DELTA A CYCLE	01B2	E08H	31.22.11
11	-T A CYCLE	01B2	B12G	31.25.11
12	-T DELTA B CYCLE	01B2	E15H	31.23.11
13	+U B CYCLE	01B2	D23N	31.26.11
14	+U TRANSFER B REGISTER	01A3	D12C	35.18.11
15	-T B REG ZONE INHIBIT	01B4	C21A	36.13.21
16	-T B REG DIGIT INHIBIT	01B4	D09C	36.13.21
17	-T B REG C BIT INHIBIT	01A3	C11H	35.18.21
18	-T B REG WM INHIBIT	01A3	C19C	35.18.21
19	-T A REG DIGIT INHIBIT	01B4	D09A	36.13.21
20	-T A REG ZONE INHIBIT	01B4	D09P	36.13.21
21	+U A REG WM LATCH	01B2	C16H	31.06.11
22	+U I/E CONTROL 1	01B2	C16A	31.05.21
23	-T UNSCRAMBLE LATCH	02B8	E22N	41.11.41
24	-T CB MOVE TRIGGER	02B8	E20N	41.11.41
25	-T COL BIN PLUS 1	02B8	E16N	41.11.51
26	-T COL BIN MINUS 1	02B8	E16H	41.11.51
27	-T COL BIN TRANSFER STAR	02B8	F23N	41.11.31
28	-T MOD CTRL TRANSFER	01A8	C10A	32.42.41
29	+U MOD CTRL MINUS 1	01A8	B04H	32.42.11

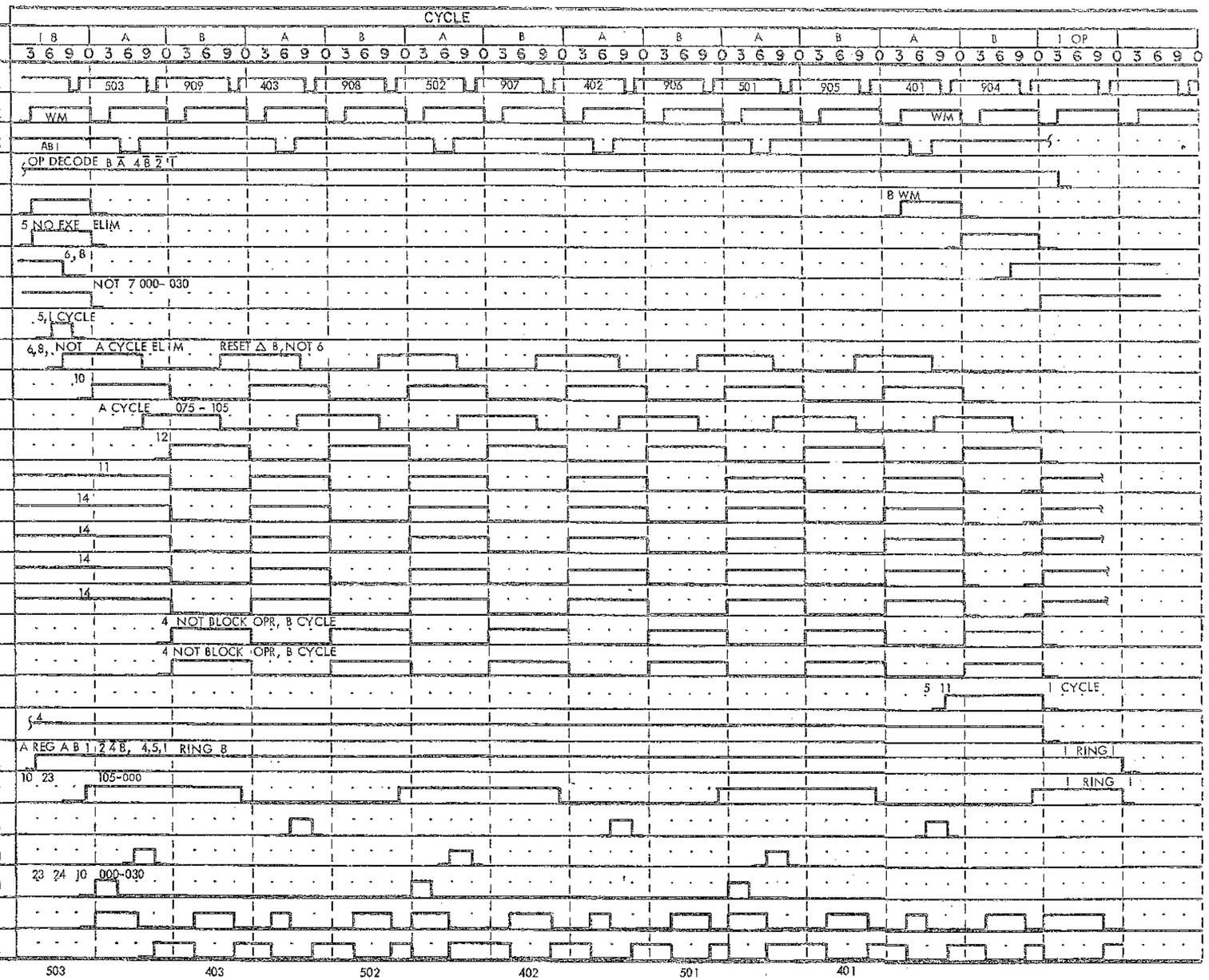


FIGURE 34. MOVE AND UNSCRAMBLE COLUMN BINARY SEQUENCE

M 909 503 B

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX
2		B-REGISTER LATCHES	—	—	35.11.XX
3		A-REGISTER LATCHES	—	—	35.12.XX
4	+U	MOVE OPERATION	01B1	B12N	35.25.11
5	-T	GATED WORD MARK	01B2	C25B	31.07.11
6	-T	I/E CHANGE	01B2	B13H	31.05.31
7	+U	DELTA I CYCLE	01B2	E07N	31.21.11
8	-T	I CYCLE	01B2	A23F	31.24.11
9	+U	I STAR RESTORE	01A7	B17H	32.39.11
10	+U	DELTA A CYCLE	01B2	E08H	31.22.11
11	-T	A CYCLE	01B2	B12G	31.25.11
12	-T	DELTA B CYCLE	01B2	E15H	31.23.11
13	+U	B CYCLE	01B2	D23N	31.26.11
14	+U	TRANSFER B REGISTER	01A3	D12C	35.18.11
15	-T	B REG ZONE INHIBIT	01B4	C21A	36.13.21
16	-T	B REG DIGIT INHIBIT	01B4	D09C	36.13.21
17	-T	B REG C BIT INHIBIT	01A3	C11H	35.18.21
18	-T	B REG WM INHIBIT	01A3	C19C	35.18.21
19	-T	A REG DIGIT INHIBIT	01B4	D09A	36.13.21
20	-T	A REG ZONE INHIBIT	01B4	D09P	36.13.21
21	+U	I/E CONTROL 1	01B2	C16A	31.05.21
22	-T	SCRAMBLE LATCH	02B8	E22P	41.11.41
23	-T	CB MOVE TRIGGER	02B8	E20N	41.11.41
24	-T	COL BIN PLUS 1	02B8	E16N	41.11.51
25	-T	COL BIN MINUS 1	02B8	E16H	41.11.51
26	-T	COL BIN TRANS STAR	02B8	F23N	41.11.31
27	-T	MOD CTRL TRANSFER	01A8	C10A	32.42.41
28	+U	MOD CTRL MINUS 1	01A8	B04H	32.42.11

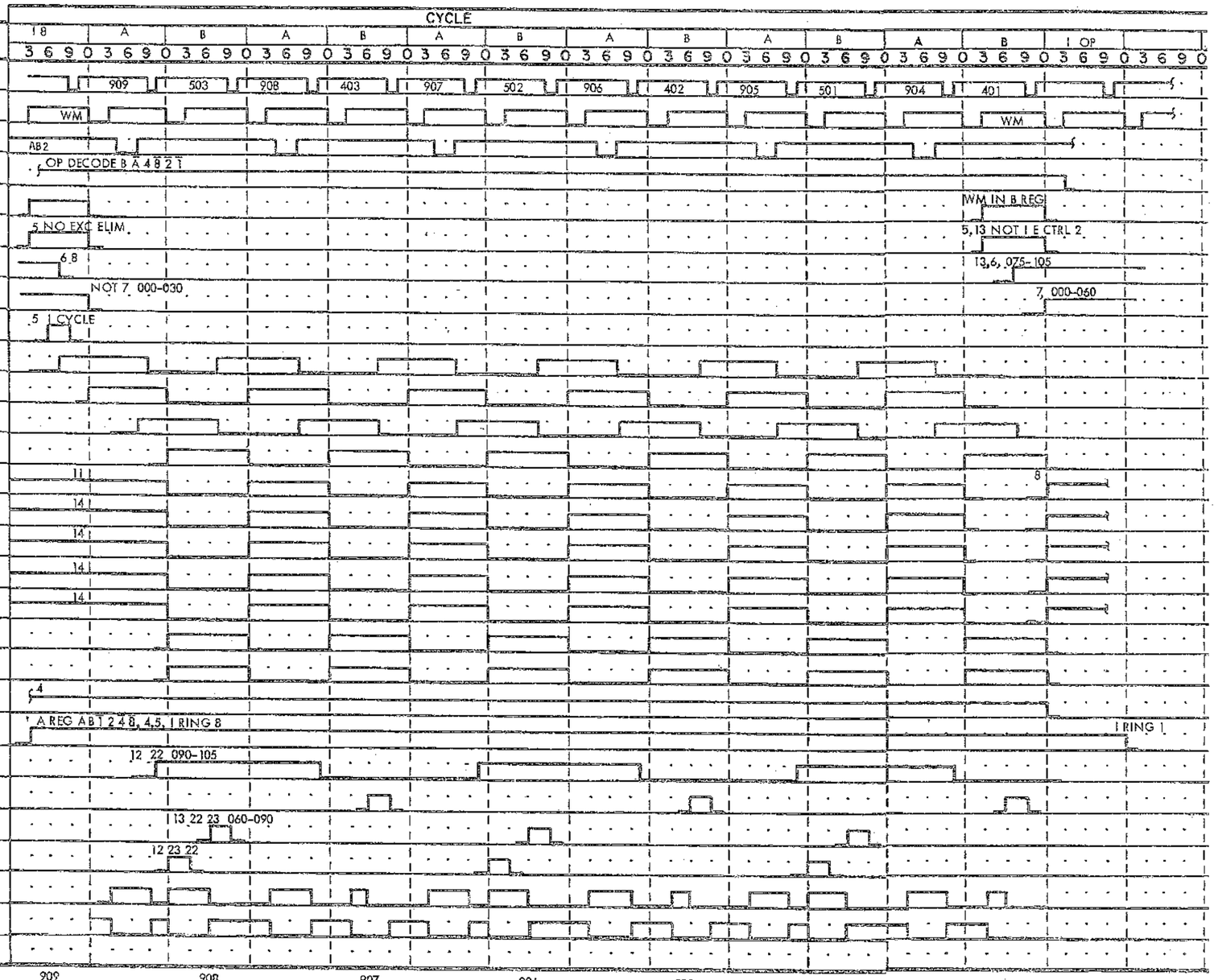


FIGURE 35. MOVE AND SCRAMBLE COLUMN BINARY SEQUENCE

		SIGNAL NAME	FRAME/GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX 32.36.XX
2		B-REGISTER	—	—	35.11.XX
3		A-REGISTER	—	—	35.16.XX
4	-T	GATED WM	01B2	C25B	31.07.11
5	-T	I/E CHANGE	01B2	B13H	31.05.31
6	+U	DELTA I CYCLE	01B2	E07N	31.21.11
7	+U	I CYCLE	01B2	E17N	31.24.11
8	+U	PUNCH OPR	01B1	LC14 F	35.27.11
9	+U	I/O OPS	01B2	B25N	31.09.21
10	+U	PFR OPR	01B7	D11G	56.15.11
11	-T	PROC PUNCH	01B4	F07N	36.24.11
12	+U	PUNCH FEED TRIGGER	01B4	E10E	36.24.11
13	+U	TRANSFER READ BRUSHES	01B7	F25H	56.15.11
14	+U	PCH SCAN CB OR AFTER 9 CAM	01B4	E09A	36.21.11
15	+U	IMP CB SET	01B4	F22A	36.10.21
16	+U	IMPULSE CB TRIGGER	01B4	C20E	36.10.21
17	-T	READ SCAN GATE	01B4	B26N	36.11.11
18	-T	R-P SCAN GATE	01B4	B10B	36.11.21
19	-T	DELTA PROCESS	01B2	B12A	31.02.11
20	-T	PROCESS LATCH	01B2	B13B	31.02.41
21	-T	LAST ADDRESS	01B4	D23H	36.16.11
22	-T	PCH SCAN CB TRIGGER	01B4	A20N	36.21.11
23	+U	PCH SCN TRIGGER	01B4	A22N	36.23.11
24	-T	AFTER 9 CB	01B4	C08G	36.21.11
25	-T	XFR SCAN	01B7	F04C	56.12.11
26	+U	ADDR SET (PFR GEN 001)	01B7	D06A	56.12.11
27	+U	(ALTERNATE CYCLE TRIGGER) ADDRESS RD AREA	01B7	D12N	56.12.11
28	-T	PFR TRANSFER STAR	01B7	D14K	56.12.11
29	+U	PFR FORCE 1	01B7	D13P	56.12.11
30	-T	PFR FORCE HUNDREDS C 82	01B7	D15H	56.12.11
31	-T	MOD CTRL TRAN	01A8	C10A	32.42.41
32	+U	MOD CTRL PLUS 1	01A8	D06N	32.42.11
33	-T	PFR CHECK PLANE REG RESET	01B7	A07G	56.10.91
34	-T	UPPER TRANS REG	01B7	D23G	56.10.91
35	+U	INHIBIT XU 11	01B7	D25N	56.17.41
36	+U	PUNCH COMPLETE TRIGGER	01B4	A12E	36.01.21
37	-T	ALL SCANS COMPLETE	01A6	F21N	36.01.11

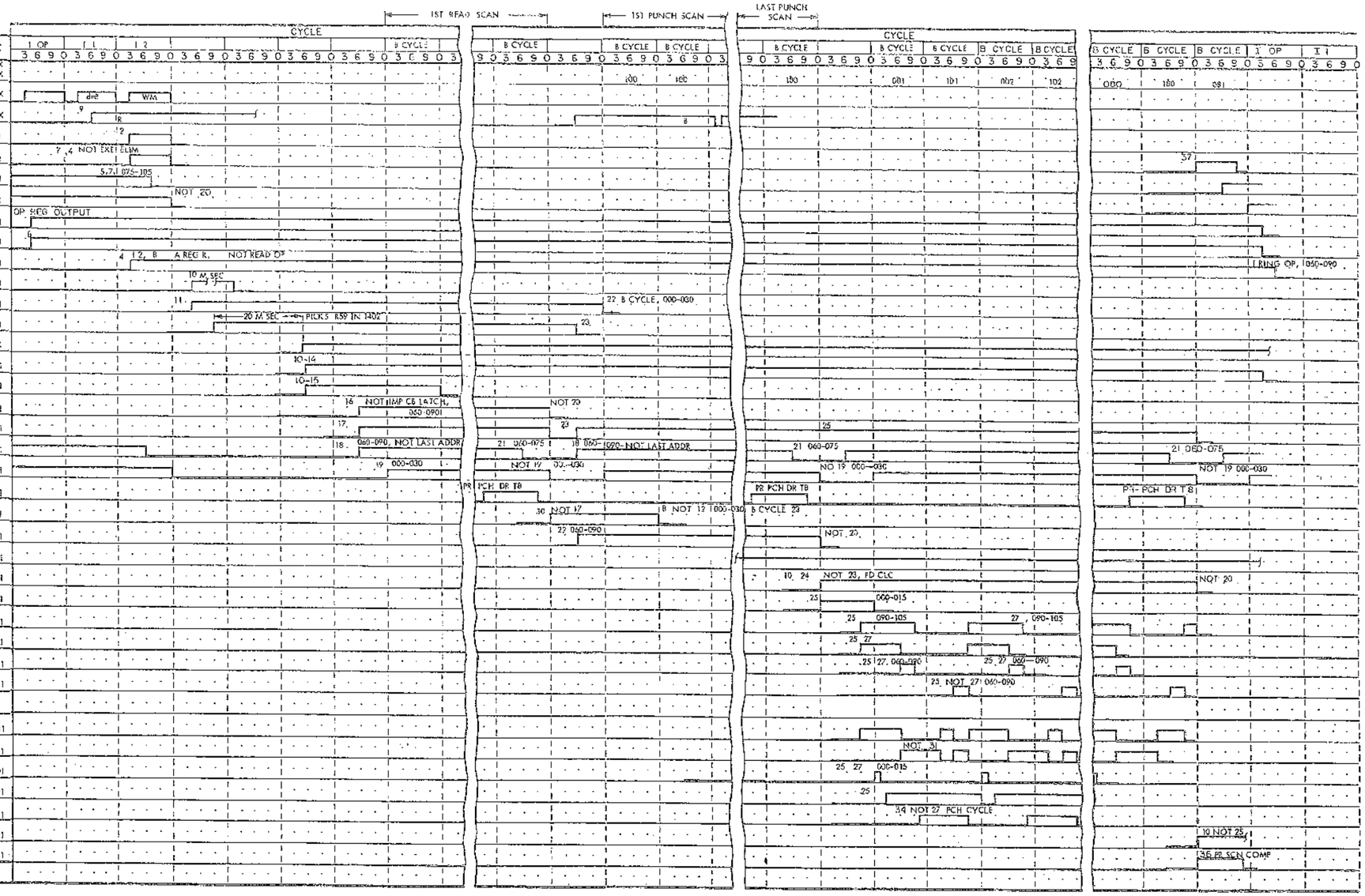


FIGURE 36. PUNCH FEED READ SEQUENCE

903 K (d)
905 S

903 K (701) d
908 S

701 M

	SIGNAL NAME		FRAME GATE	TEST POINT	LOGIC
1		STORAGE ADDRESS REGISTER	—	—	32.35.XX' 32.36.XX
2		B-REGISTER	—	—	35.11.XX
3		A-REGISTER	—	—	35.10.XX
4	+U	STACK SEL OPR	01B1	B11N	35.25.11
5	-T	GATED WM	01B2	C25B	31.07.11
6	-T	I/E CHANGE	01B2	B13H	31.05.31
7	+U	DELTA I-CYCLE	01B2	E07N	31.21.11
8	-T	I-CYCLE	01B2	E19N	31.24.11
9	+U	I-STAR RESTORE	01A7	B17H	32.39.11
10	+U	EXE ELIM	01B2	C08H	31.05.11
11	-T	PROGRAM SKIP	01B2	C23A	31.08.11
12	+U	I-A STAR GATE	01B2	D05C	31.08.11
13	+U	SET I-RING OP	01B2	F15A	31.30.11
14	-T	A-STAR GATE OUT	01A7	B16B	32.32.21
15	-T	I-RING OP	01B6	E20N	31.31.31
16	+U	STACKER SELECT d CHAR 1-	01B4	F08A	36.50.11
		2-	01B4	F08D	
		4-	01B4	F09H	
		8-	01B4	F08F	
17	+U	MODIFIER CONTROL +1	01A8	D06N	32.42.11
18	-T	MODIFIER CONTROL XFER	01A8	C10A	32.42.41
19		MODIFIER OUTPUT ON BUS LINES	—	—	32.43.XX
20		DATA ON INH DRIVE LINES	—	—	—
		I STAR AT END OF CYCLE			

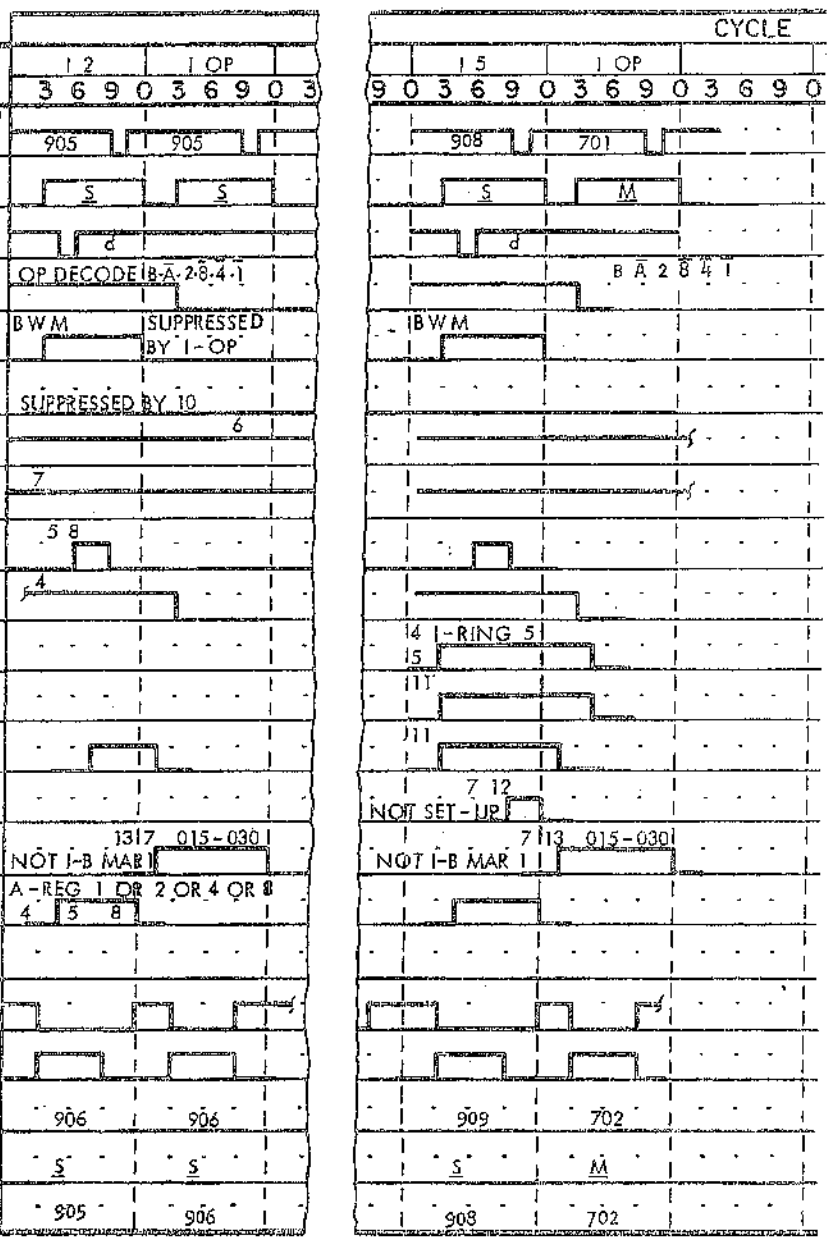
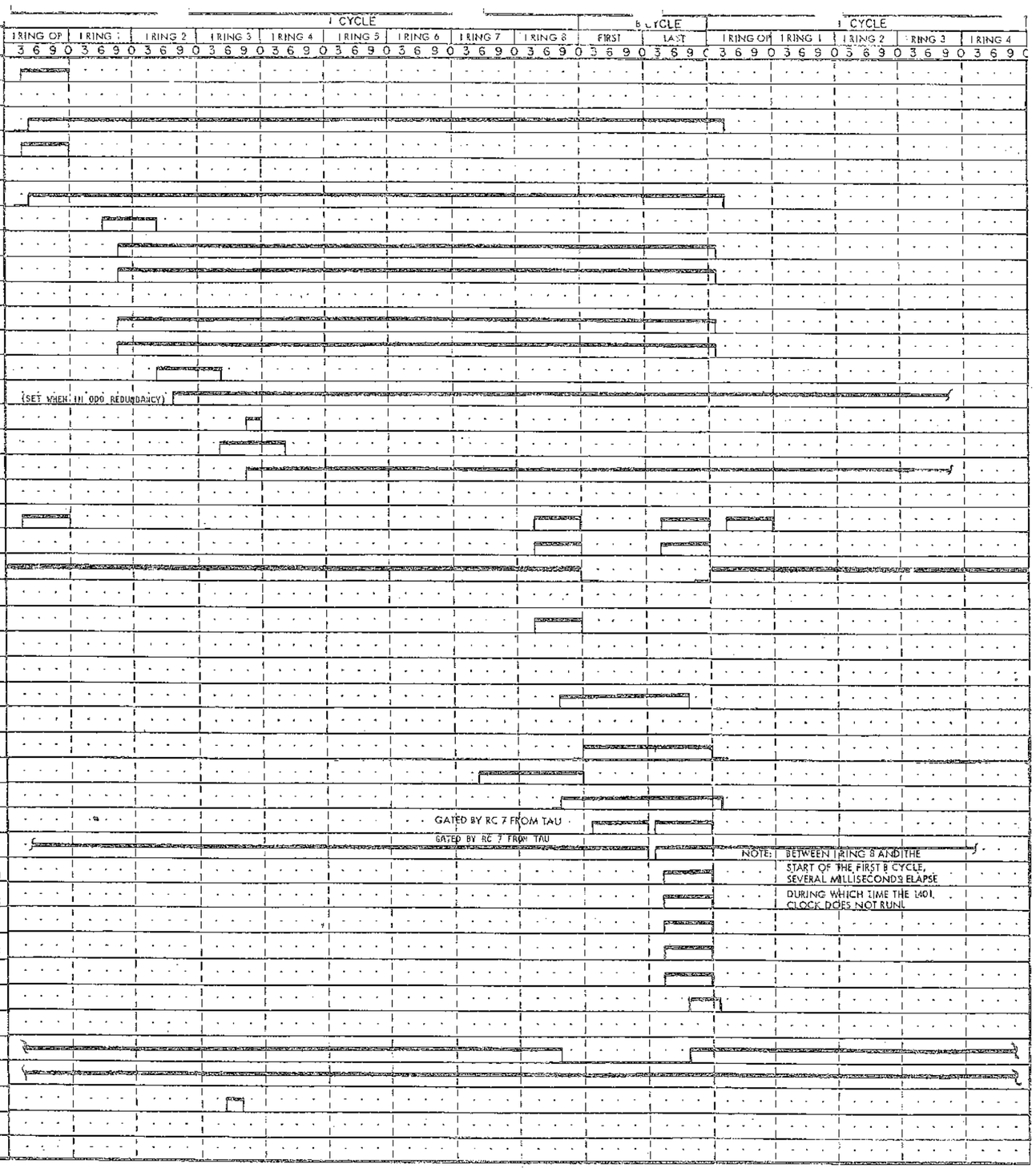


FIGURE 37. STACKER SELECT K AND STACKER SELECT BRANCH

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		B-REGISTER (WM) B4 (M)	—	—	35.21.11
2			—	—	
3	+U	MOVE OPERATION	01B1	B12N	35.25.11
4		B REGISTER (WM) C321 (L)	—	—	35.21.11
5			—	—	
6	+U	LOAD OPERATION	01B1	B11F	35.25.11
7		A REGISTER AB4 (%)	—	—	70.11.21
8	+U	UNIT SELECT LATCH, UNIT SELECT	02A2	A06C	70.11.21
9	-T	TAPE ±1 MODE	02A	A03D	70.11.21
10					
11	+U	I/O OPS	01B2	B25N	31.09.21
12	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
13		A REGISTER BA 2 (B) (ODD REDUNDANCY)	—	—	70.61.31
14	-T	REDUNDANCY LATCH	02A2	B10G	70.61.31
15	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
16		A REGISTER 1, 2, 3, 4, 5, OR 6	—	—	71.11.11 71.11.31
17	+U	SELECT TAPE UNIT (TAPE UNIT LAT 1, 2, 3, 4, 5, OR 6)	02A1	—	71.11.11 71.11.31
18					
19	+U	B REGISTER WORD MARK	01B2	C20E	31.07.11
20	+U	GATED WORD MARK	01B2	B25F	31.07.11
21	+U	I CYCLE	01B2	E17N	31.24.11
22					
23	-T	I/E CHANGE	01B2	B13H	31.05.31
24					
25					
26	+U	DELTA B-CYCLE	01B2	E15H	31.23.11
27					
28	-T	B CYCLE	01B2	D24N	31.26.11
29		A REGISTER B 81 (R)	—	—	70.11.21
30	+U	READ CALL	02A2	A22H	70.11.21
31	+U	CLOCK START CONTROL	02A1	B22Q	71.31.21
32	-T	TAPE CLOCK	02A1	B09N	71.31.21
33	+U	CHECK CHARACTER	02A1	A17E	71.71.21
34	-T	GROUP MARK	02A1	C07A	71.71.21
35	-T	FORCED GROUP MARK	02A2	A19C	70.61.31
36		FORCE GROUP MARK INTO A REGISTER	02A2	A10H	70.61.21
37	-T	FORCED I/E CHANGE	02A2	A13A	70.11.41
38	+U	SET TO 1 RING OP	01B2	E15A	31.30.11
39					
40	-T	DELTA I CYCLE	01B2	D13A	31.21.11
41	+U	DELTA PROCESS	01B2	A18N	31.02.11 31.31.11
42	+U	UNIT RESET	02A2	B11H	70.11.21


I CYCLE
B CYCLE
I CYCLE
3 6 9 0 3 6 9 0 3 6 9 0

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		B-REGISTER (WM) B4 (M)	—	—	35.21.11
			—	—	
3	+U	MOVE OPERATION	01B1	B12N	35.25.11
4		B REGISTER (WM) C B21 (L)	—	—	35.21.11
			—	—	
6	+U	LOAD OPERATION	01B1	B11F	35.25.11
7		A REGISTER A84 (%)	—	—	70.11.21
8	+U -T	UNIT SELECT LATCH, UNIT SELECT	02A2	A06C	70.11.21
9	-T	TAPE +1 MODE	02A2	A09P	70.11.21
11	+U	I/O OPS	01B2	B25N	31.09.21
12	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
13		A REGISTER-BA2 (B) (ODD REDUNDANCY)	—	—	70.61.31
14	-T	REDUNDANCY LATCH	02A2	B10G	70.61.31
15	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
16		A REGISTER 1, 2, 3, 4, 5, OR 6	—	—	71.11.11 71.11.31
17	+U	SELECT TAPE UNIT (TAPE UNIT LATCH 1, 2, 3, 4, 5, OR 6)	02A1	—	71.11.11 71.11.31
18	+U	GATE B REGISTER CONTENTS INTO THE B ADDRESS REGISTER	—	—	—
19	+U	B REGISTER WORD MARK	01B2	C20E	31.07.11
20	+U	GATED WORD MARK	01B2	C25B	31.07.11
21	+U	I CYCLE	01B2	E17N	31.05.31
23	-T	I/E CHANGE	01B2	B13H	31.05.31
26	+U	DELTA B CYCLE	01B2	E15H	31.23.11
28	-T	B CYCLE	01B2	024H	31.26.11
29		A REGISTER A42 (W)	—	—	70.11.21
30	+U	WRITE CALL	02A2	B20H	70.11.21
31	-T	CLOCK START CONTROL LATCH	02A1	B22Q	71.31.21
32	-T	TAPE CLOCK	02A1	B09N	71.31.21
33	+U	CHECK CHARACTER (FROM TAU)	02A1	A17E	71.71.21
35	-T	FORCED GROUP MARK	02A2	A19C	70.61.31
36	-T	UNIT WRITE GATE	02A2	B10A	70.51.31
37	-T	FORCED I/E CHANGE	02A2	A13A	70.11.41
38	+U	SET TO I RING OP	01B2	E15A	31.30.11
40	+U	DELTA I CYCLE	01B2	D13A	31.31.11
41	+U	DELTA PROCESS	01B2	A18N	31.62.11
42	+U	UNIT RESET	02A2	B11H	70.11.21
43	+U +P	DISCONNECT DISCONNECT CALL TO TAU	02A2	B17N B17P	70.51.21

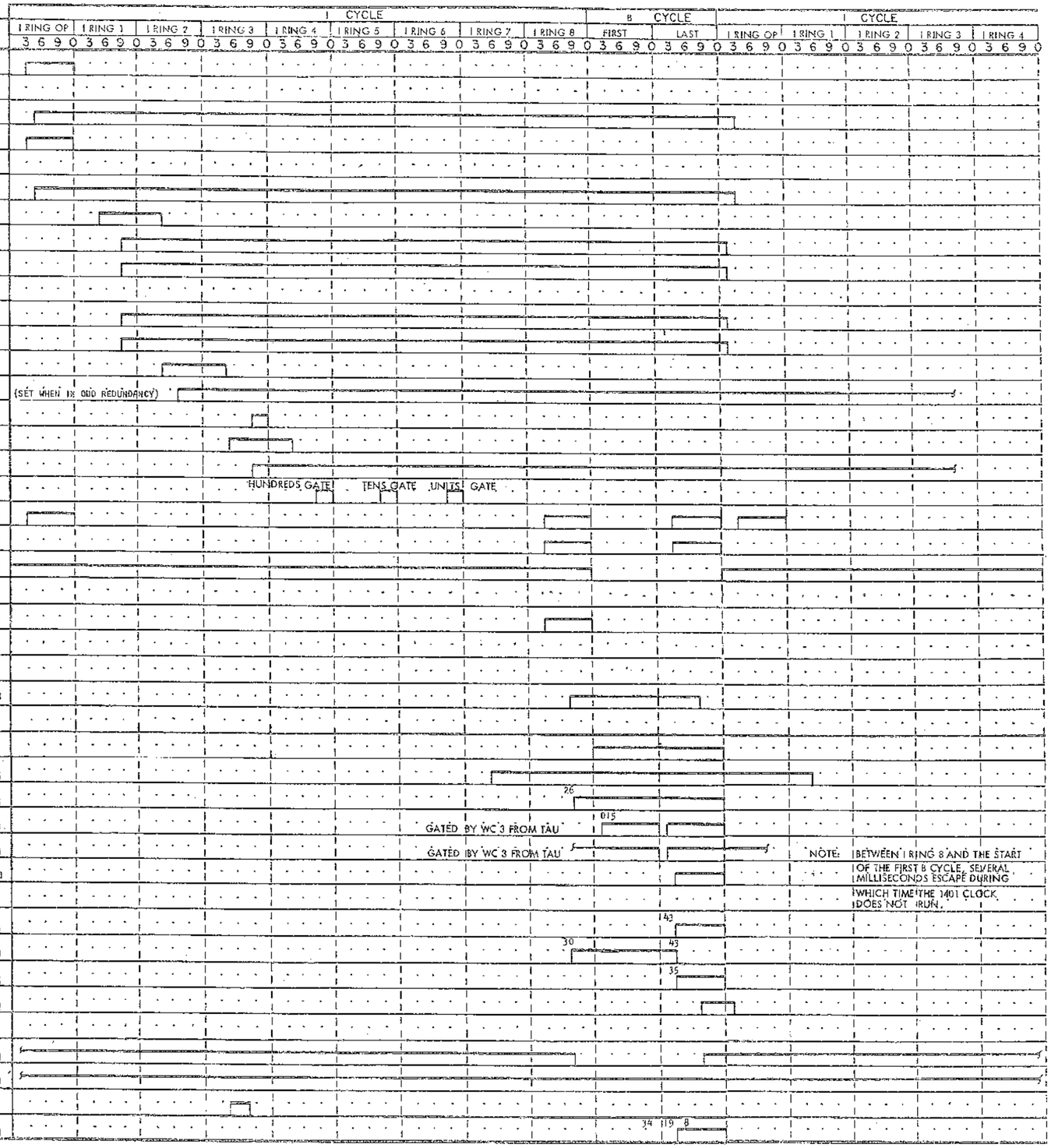


FIGURE 39. MOVE (LOAD) WRITE OPERATION

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA B CYCLE LATCH	01B2	E09E	31.23.11
2	+U	DELTA B CYCLE	01B2	E15H	31.23.11
3	-T	B CYCLE	01B2	D24H	31.26.11
4	+U	LOAD OPERATION	01B1	B11F	35.25.11
5		DATA FROM TAPE	—	—	70.61.21
6		C REGISTER A841 (WS CHAR)	—	—	70.61.21
7	-T	WS READ	02A2	A01H	70.61.31
8	+U	TAPE READDRESS	02A2	B20A	70.51.31
9	-T	READDRESS LATCH (CY CONTROL)	01B2	C09N	31.04.11
10	-T	NOT READDRESS LATCH	02A2	A17H	70.51.31
11	+U	INHIBIT WORD MARK	02A2	A10A	70.61.31
12			—	—	
13			—	—	
14		RESET B ADDRESS REGISTER	—	—	32.33.11 32.33.21
15		GATE INTO B ADDRESS REGISTER FROM MODIFIER	—	—	32.33.11 32.33.21
16		GATE OUT THE B ADDRESS REGISTER	01A7	B21G	32.33.31
17	-T	NOT ADDRESS REGISTER RESET	01B2	F08P	31.04.11
18		GATE ADDRESS REG CONTENTS INTO MOD	—	—	32.39.21

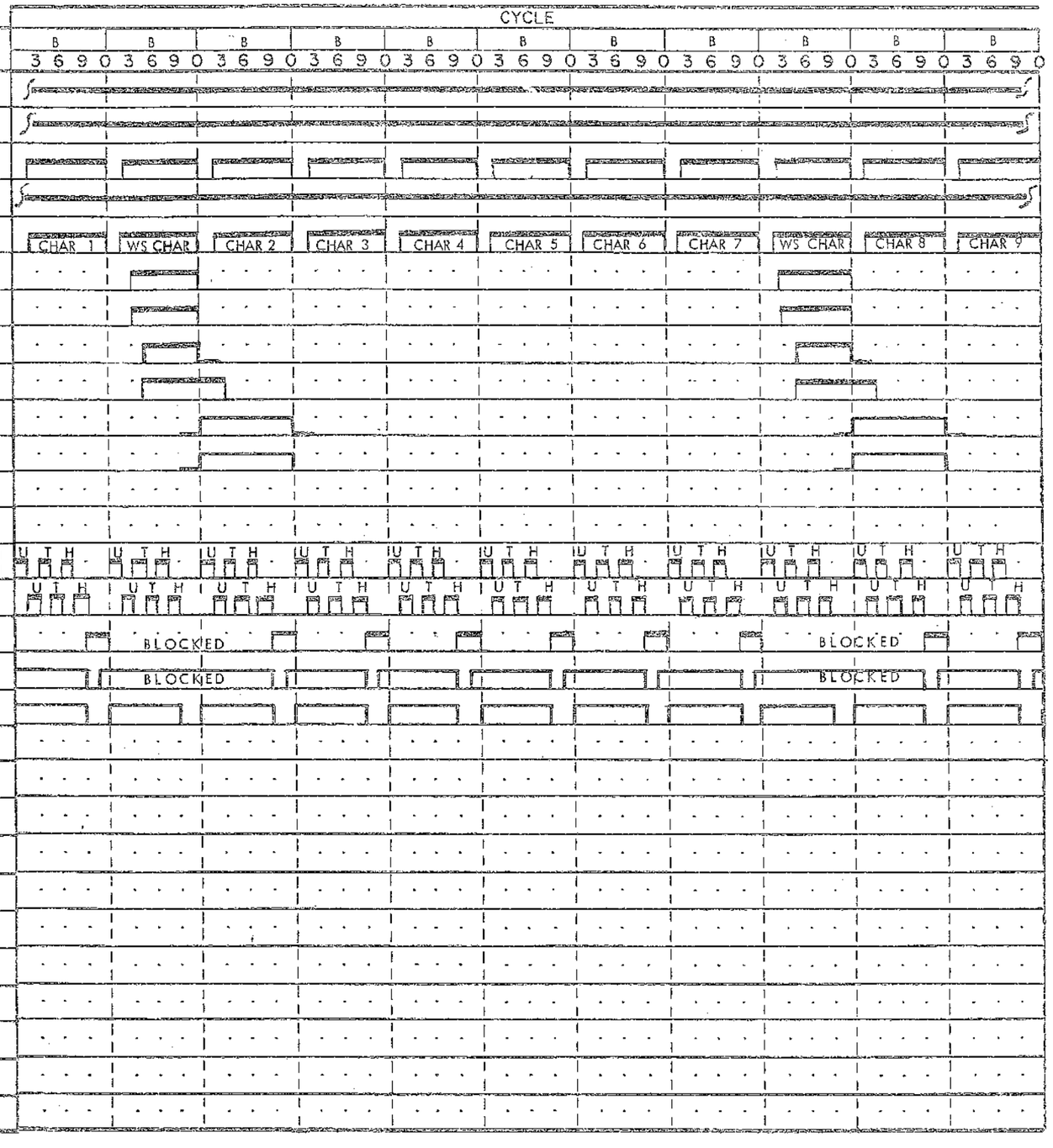


FIGURE 40. LOAD TAPE AND READ A WORD SEPARATOR CHARACTER

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA B CYCLE LATCH	01B2	F09F	31.23.11
2	+U	DELTA B CYCLE	01B2	E15H	31.23.11
3	-T	B CYCLE	01B2	D24N	31.26.11
4		DATA READ FROM STORAGE	—	—	70.51.21
5	+U	LOAD OPERATION	01B1	B11F	35.25.11
6	-T	WRITE CALL	02A2	A03B	70.11.21
7	-T	B REGISTER WORD MARK	02A2	B10B	70.51.21
8	-T	READDRESS LATCH	02A2	A17E	70.51.31
9	+T	NOT READDRESS LATCH	02A2	A17H	70.51.31
10	+U	TAPE READDRESS	02A2	B20A	70.51.31
11	-T	READDRESS LATCH (CY CONTROL)	01B2	C09N	31.04.11
12	-T	WS ON TAPE	02A2	B12B	70.51.31
13		FORCE LINES A, 8, 4, 1 TO TAU	—	—	70.51.21
14			—	—	
15		RESET B ADDRESS REGISTER	—	—	32.33.11
16		GATE INTO B ADDRESS REGISTER FROM MODIFIER	—	—	32.33.11
17	-T	GATE OUT THE B ADDRESS REGISTER	01A7	B21G	32.33.31
18	-T NOT	ADDRESS REGISTER RESET	01B2	F08P	31.04.11
19			—	—	
20		GATE ADDRESS REG CONTENTS INTO MOD AND INTO STORAGE	—	—	—

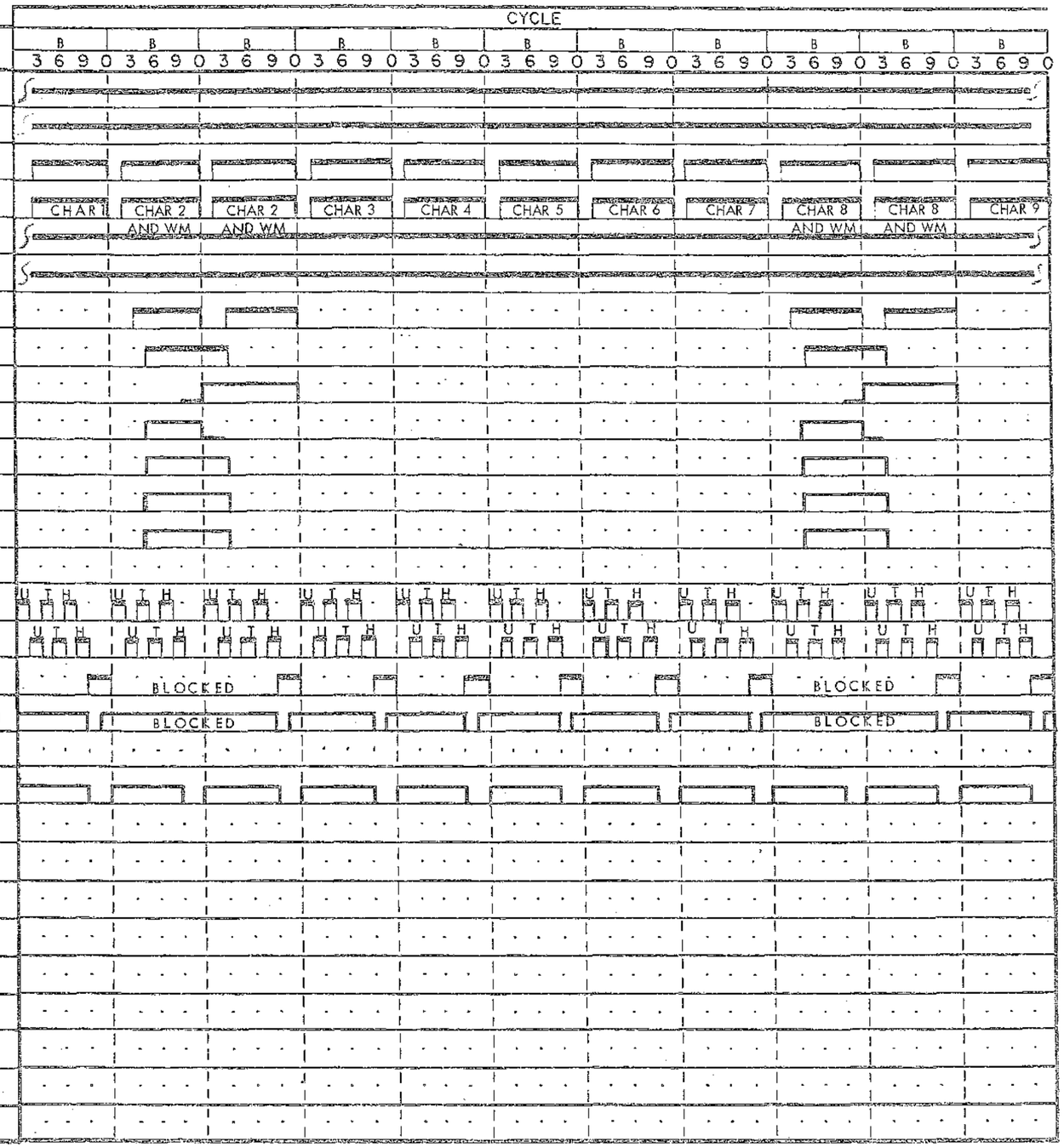


FIGURE 41. LOAD TAPE AND WRITE A WORD SEPARATOR CHARACTER

U% UI (d) B d = B

	SIGNAL NAME		FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA I CYCLE	01B2	B12H	31.21.11
2		B-REGISTER (WM) A4 (U)	—	—	35.21.11
3		OP DECODE (WM) A4 (U)	—	—	35.26.11
4	+U	U OP CODE	01B2	C12F	35.26.11
5	+U	EXECUTE ELIMINATE	01B2	C08H	31.05.11
6		A-REGISTER A 84 (%)	—	—	70.11.21
7	-T	UNIT SELECT LATCH, UNIT SELECT	02A2	B05N	70.11.21
8	-T	TAPE +1 MODE	02A2	A09D	70.11.21
9	+U	I/O OPERATE	01B2	B25N	31.09.21
10	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
11					
12					
13	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
14		A REGISTER 1	—	—	71.11.11
15	+U	SELECT TAPE UNIT (TAPE UNIT LATCH 1)	—	—	71.11.11
16	+U	B REGISTER WORD MARK	01B2	C20E	31.07.11
17	+U	U OP CODE GATE	02A1	A04N	71.11.21
18		A REGISTER BA 2 (B)	—	—	71.11.21
19	+P	BACKSPACE TAU	02A1	B23B	71.11.21
20	+U	GATED WORD MARK	01B2	B25F	31.07.11
21	+U	SET I OP LATCH	01B2	D21B	31.30.11
22	-T	TAPE CLOCK	02A1	B09N	71.31.21
23					
24	+U	UNIT RESET	02A2	B11H	70.11.21

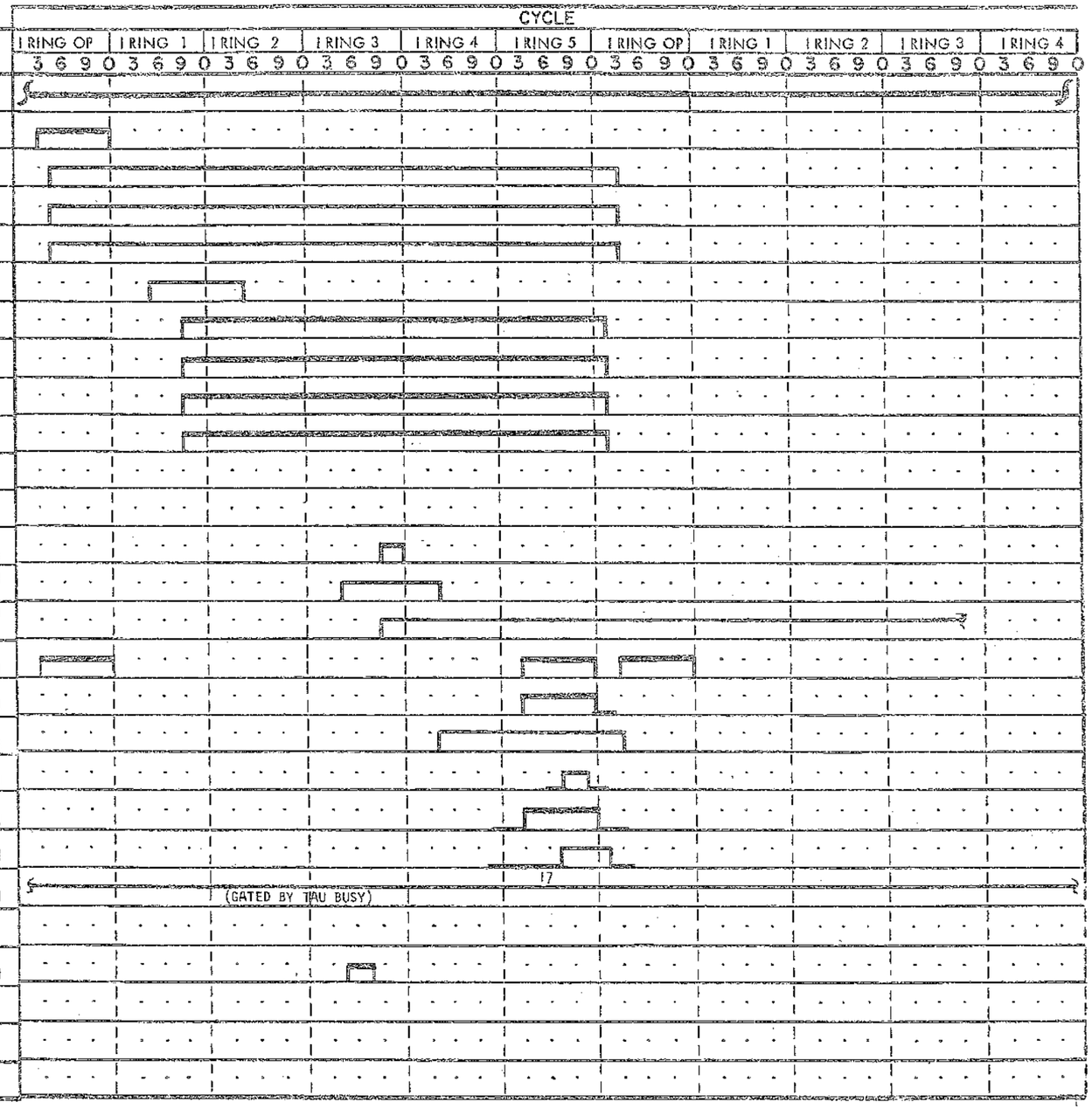


FIGURE 42. BACKSPACE TAPE OPERATION

U% UI (d) 8 d= E

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA I CYCLE	01B2	B12H	31.21.11
2		B-REGISTER (WM) A4 (U)	—	—	35.21.11
3		OP DECODE (WM) A4 (U)	—	—	35.26.11
4	+U	U OP CODE	01B2	C12F	35.26.11
5	+U	EXECUTE ELIMINATE	01B2	C08H	31.05.11
6		A-REGISTER A84 (%)	—	—	70.11.21
7	-T	UNIT SELECT LATCH, UNIT SELECT	02A2	B05N	70.11.21
8	-T	TAPE +1 MODE	02A2	A09D	70.11.21
9	+U	I/O OPS	01B2	B25N	31.09.21
10	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
11					
12					
13	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
14		A REGISTER 1	—	—	71.11.11
15	+U	SELECT TAPE UNIT (TAPE UNIT LATCH 1)	—	—	71.11.11
16	+U	B-REGISTER WORD MARK	01B2	C20E	31.07.11
17	+U	U OP CODE GATE	02A2	A05B	70.11.21
18		A-REGISTER CBA41 (E)	—	—	71.11.21
19	-T	ERASE CALL TO TAU	02A1	B18H	71.11.21
20	+U	GATED WORD MARK	01B2	B25F	31.07.11
21	+U	SET I OP LATCH	01B2	D21B	31.30.11
22	-T	TAPE CLOCK	02A1	C10P	71.31.21
23					
24	+U	UNIT RESET	02A2	B11H	70.11.21

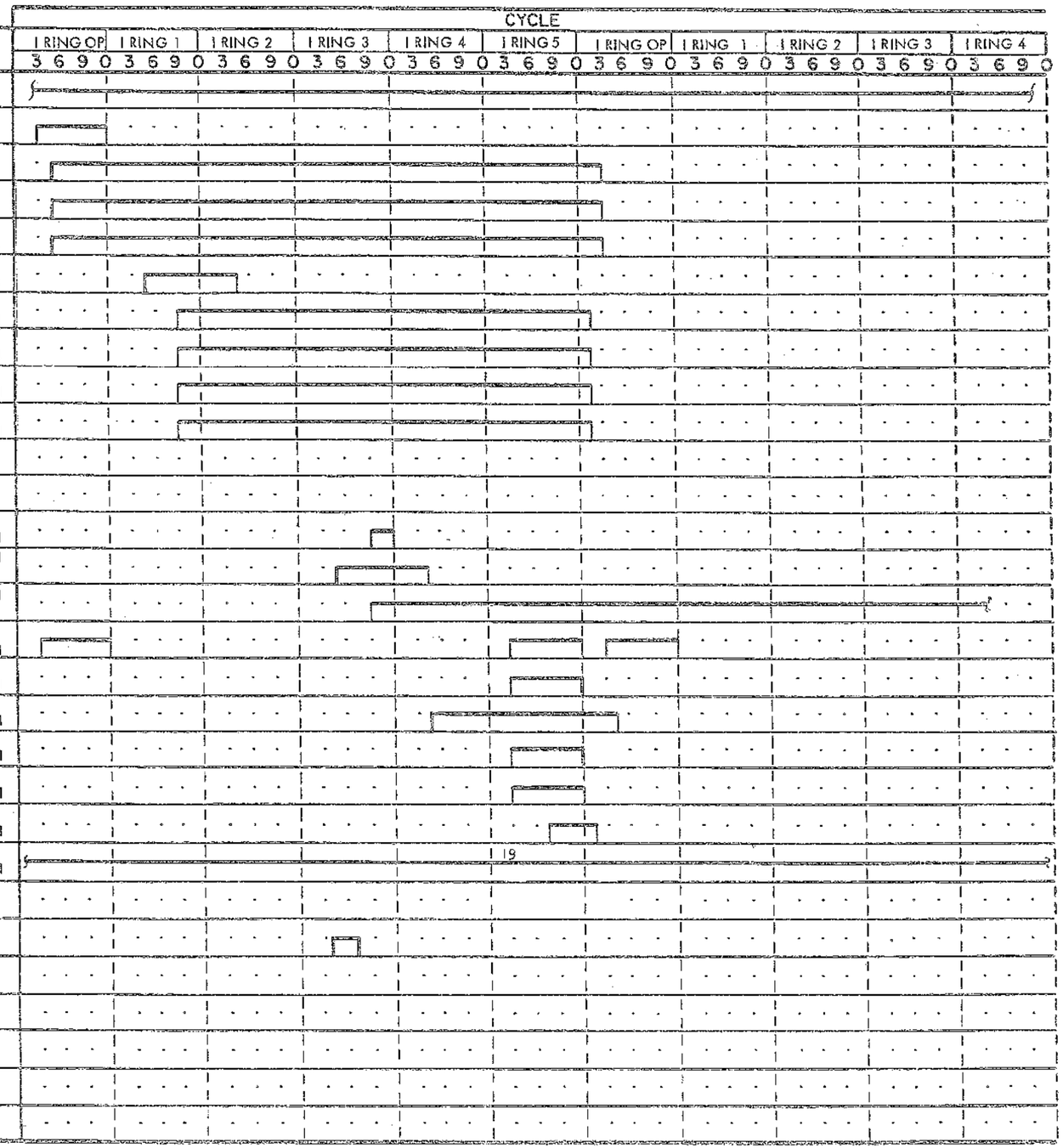


FIGURE 43. ERASE TAPE OPERATION

U%U I M B

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA I-CYCLE	01B2	B12H	31.21.11
2		B-REGISTER (WM) A4 (U)	—	—	35.21.11
3		OP DECODE (WM) A4 (U)	—	—	35.26.11
4	+U	U OP CODE	01B2	C12F	35.26.11
5	+U	EXECUTE ELIMINATE	01B2	C08H	31.05.11
6		A REGISTER A84 (%)	—	—	70.11.21
7	-T	UNIT SELECT LATCH, UNIT SELECT	02A2	B05N	70.11.21
8	-T	TAPE ÷1 MODE	02A2	A09D	70.11.21
9	+U	I/O OPS	01B2	B25N	31.09.21
10	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
11			—	—	
12					
13	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
14		A REGISTER 1	—	—	71.11.11
15	-T	SELECT TAPE UNIT (TAPE UNIT LATCH 1)	02A1	B01E	71.11.11
16	+U	B-REGISTER WORD MARK	01B2	C20E	31.07.11
17	+U	U OP CODE GATE	02A2	A05B	70.11.21
18		A-REGISTER CA4 (M)	—	—	71.11.21
19	-T	WRITE TAPE MARK CALL	02A2	C05N	70.11.41
20	+U	GATED WORD MARK	01B2	B25F	31.07.11
21	+U	SET I OP LATCH	01B2	D21B	31.30.11
22	-T	TAPE CLOCK	02A1	B09N	71.31.21
23					
24	+U	UNIT RESET	02A2	B11H	70.11.21

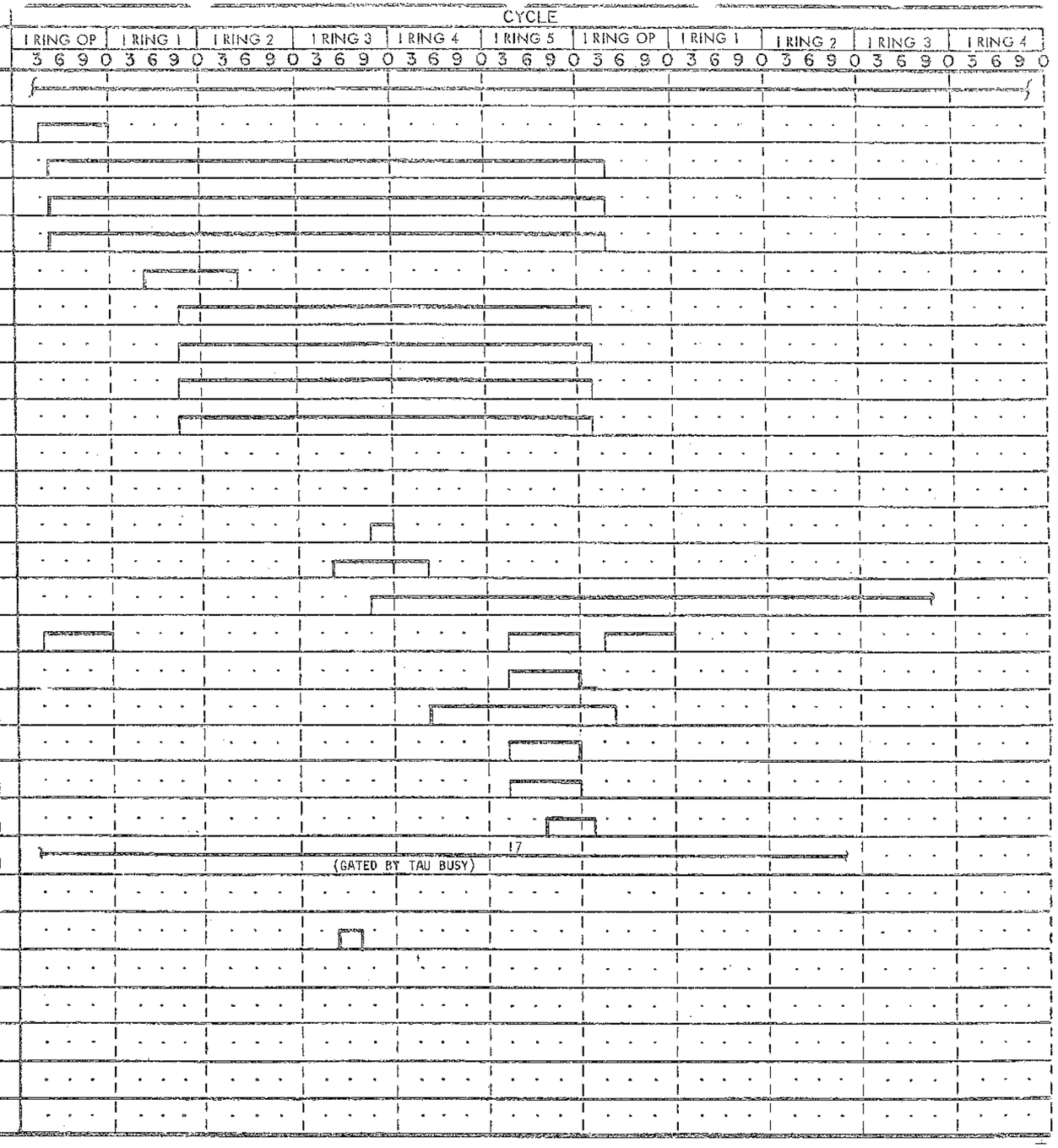


FIGURE 44. WRITE TAPE MARK

U % U I R E

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA I CYCLE	01B2	B12H	31.21.11
2		B-REGISTER (WM) A4 (U)	—	—	35.21.11
3		OP DECODE (WM) A4 (U)	—	—	35.26.11
4	+U	U OP CODE	01B2	C12F	35.26.11
5	+U	EXECUTE ELIMINATE	01B2	C08H	31.05.11
6		A-REGISTER A84 (%)	—	—	70.11.21
7	-T	UNIT SELECT LATCH, UNIT SELECT	02A^	B05N	70.11.21
8	-T	TAPE +1 MODE	02A2	A09D	70.11.21
9	+U	I/O OPS	01B2	B25N	31.09.21
10	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
11			—	—	
12					
13	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
14		A-REGISTER 1	—	—	71.11.11
15	-T	SELECT TAPE UNIT (TAPE UNIT SELECT 1)	02A1	B01E	71.11.11
16	+U	B REGISTER WORD MARK	01B2	C20E	70.11.21 31.07.11
17	+U	U OP CODE GATE	02A2	A05N	70.11.21
18		A REGISTER B81 (R)	—	—	71.11.21
19	-T	REWIND	02A1	B18N	71.11.21
20	+U	GATED WORD MARK	01B2	B25B	31.07.11
21	+U	SET I OP LATCH	01B2	E14A E20H	31.30.11
22	-T	TAPE CLOCK	02A1	B09N	71.31.21
23					
24	+U	UNIT RESET	02A2	B11H	70.11.21

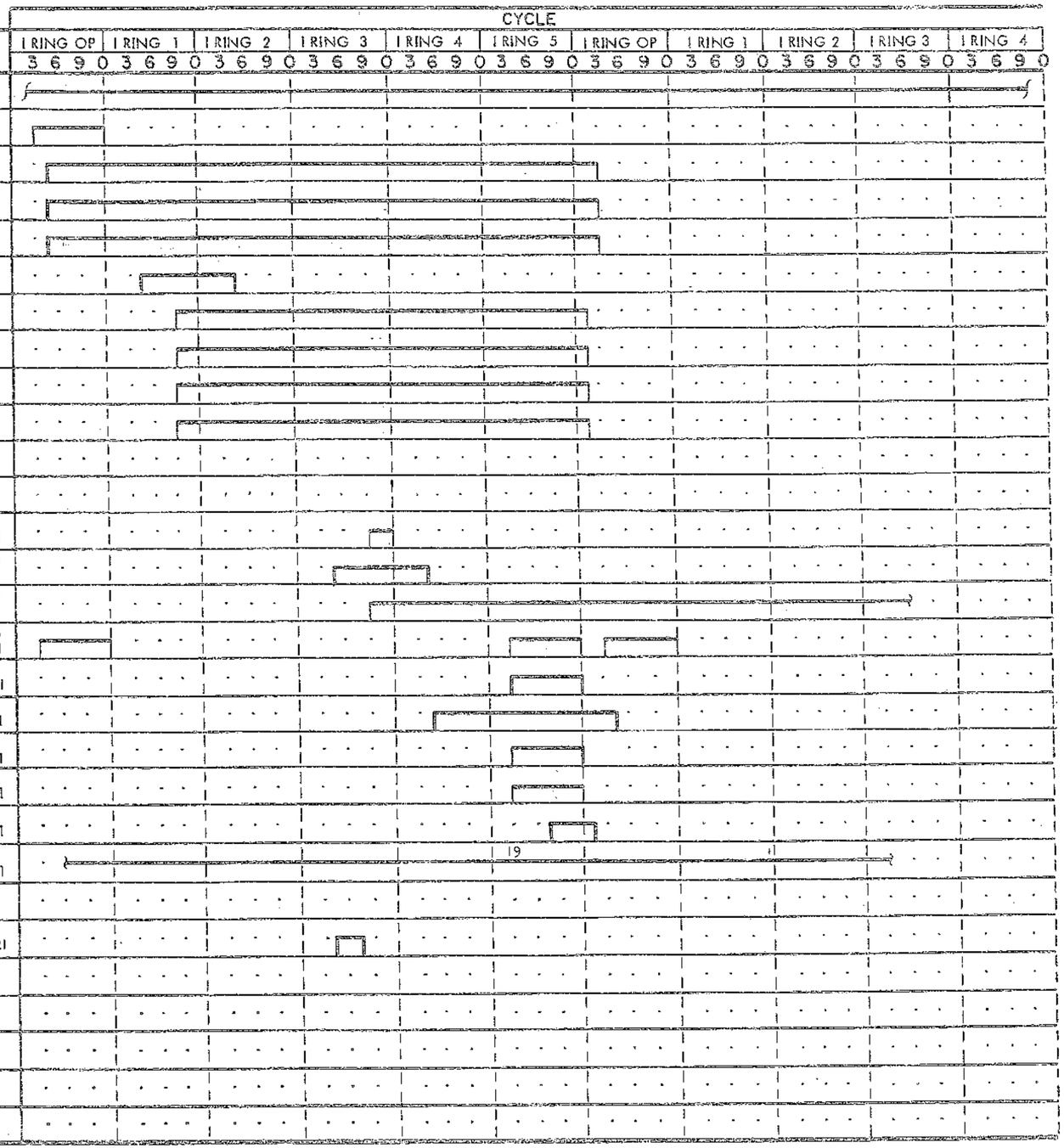


FIGURE 45. REWIND TAPE OPERATION

U % U ! (d) B d = U

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA I CYCLE	01B2	B12H	31.21.11
2		B-REGISTER (WM) A4 (U)	—	—	35.21.11
3		OP DECODE (WM) A4 (U)	—	—	35.26.11
4	+U	U OP CODE	01B2	C12F	35.26.11
5	+U	EXECUTE ELIMINATE	01B2	C08H	31.05.11
6		A REGISTER A84 (%)	—	—	70.11.21
7	+U -T	UNIT SELECT LATCH, UNIT SELECT	02A2	B05N	70.11.21
8	-T	TAPE +1 MODE	02A2	A09D	70.11.21
9	+U	I/O OPS	01B2	B25N	31.09.21
10	+U	A CYCLE ELIMINATION	01B2	C16N	31.06.11
11					
12					
13	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
14		A REGISTER 1	—	—	71.11.11
15	+U	SELECT TAPE UNIT (TAPE UNIT LATCH 1)	—	—	71.11.11
16	-T	B REGISTER WORD MARK	01B2	C20E	70.11.21 31.07.11
17	+U	U OP CODE GATE	02A2	A05B	70.11.21
18		A REGISTER CA4 (U)	—	—	71.11.21
19	+N	REWIND UNLOAD TO TAU	02A1	B17P	71.11.21
20	+U	GATED WORD MARK	01B2	B25F	31.07.11
21	+U	SET I OP LATCH	01B2	D21B	31.30.11
22	-T	TAPE CLOCK	02A1	B09N	71.31.21
23					
24	+U	UNIT RESET	02A2	B11H	70.11.21

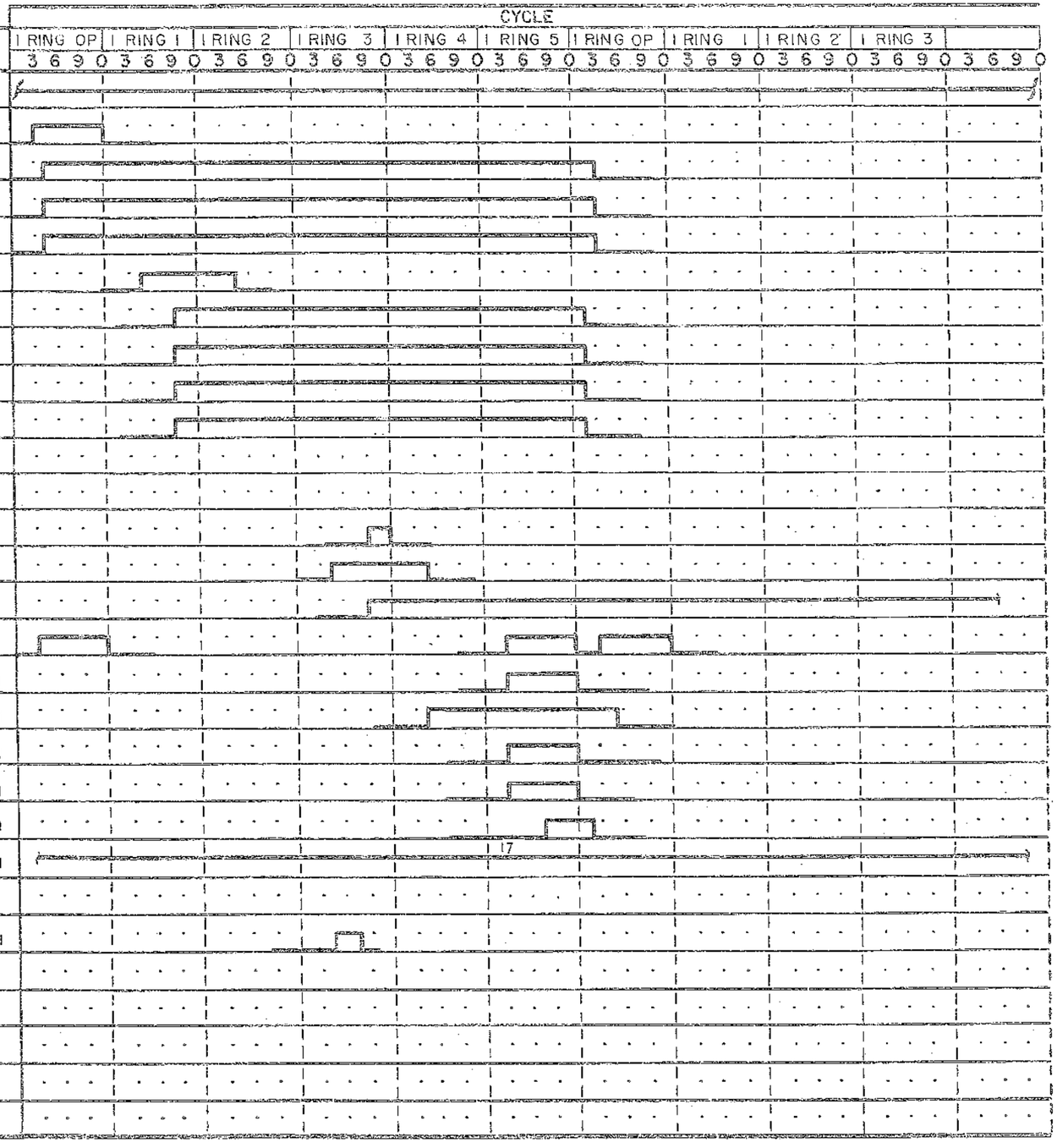


FIGURE 46. REWIND AND UNLOAD TAPE

B (AAA) (d) B

d = K (END OF FILE) OR L (TAPE ERROR)
AAA - S

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1	-T	DELTA I CYCLE	01B2	B12H	31.21.11
2		B REGISTER	—	—	35.21.11
3		OP DECODE (WM) CBA 2 (B)	—	—	35.26.11
4	-T	BRANCH OPERATION	02A1	A05G	70.11.41
5		GATE B REGISTER CONTENTS INTO A ADDRESS REG (DIGIT BY DIGIT)	—	—	32.42.11
6	+U	EXECUTE ELIMINATE	01B2	C08H	31.05.11
7		A REGISTER CB2 (K) OR A REGISTER B21 (L)	—	—	70.11.41 OR 71.11.11
9	-T	B REGISTER WORD MARK	02A2	A15E	70.51.31
10	+U	GATED WORD MARK	01B2	B25F	31.07.11
11	+U	TAU ERROR OR	02A2	A25K	70.11.41
12	+U	SEL +TI ON	02A2	A25N	70.11.41
13					
14	+U	TAPE PROGRAM SKIP	02A2	C04C	70.11.41
15	-T	PROGRAM SKIP LATCH	01B2	C23A	31.08.11
16	+U	SET TO I RING OP LATCH	01B2	E14A	31.30.11
17	-T	A ADDRESS REGISTER GATE OUT	01A7	B16B	32.32.21

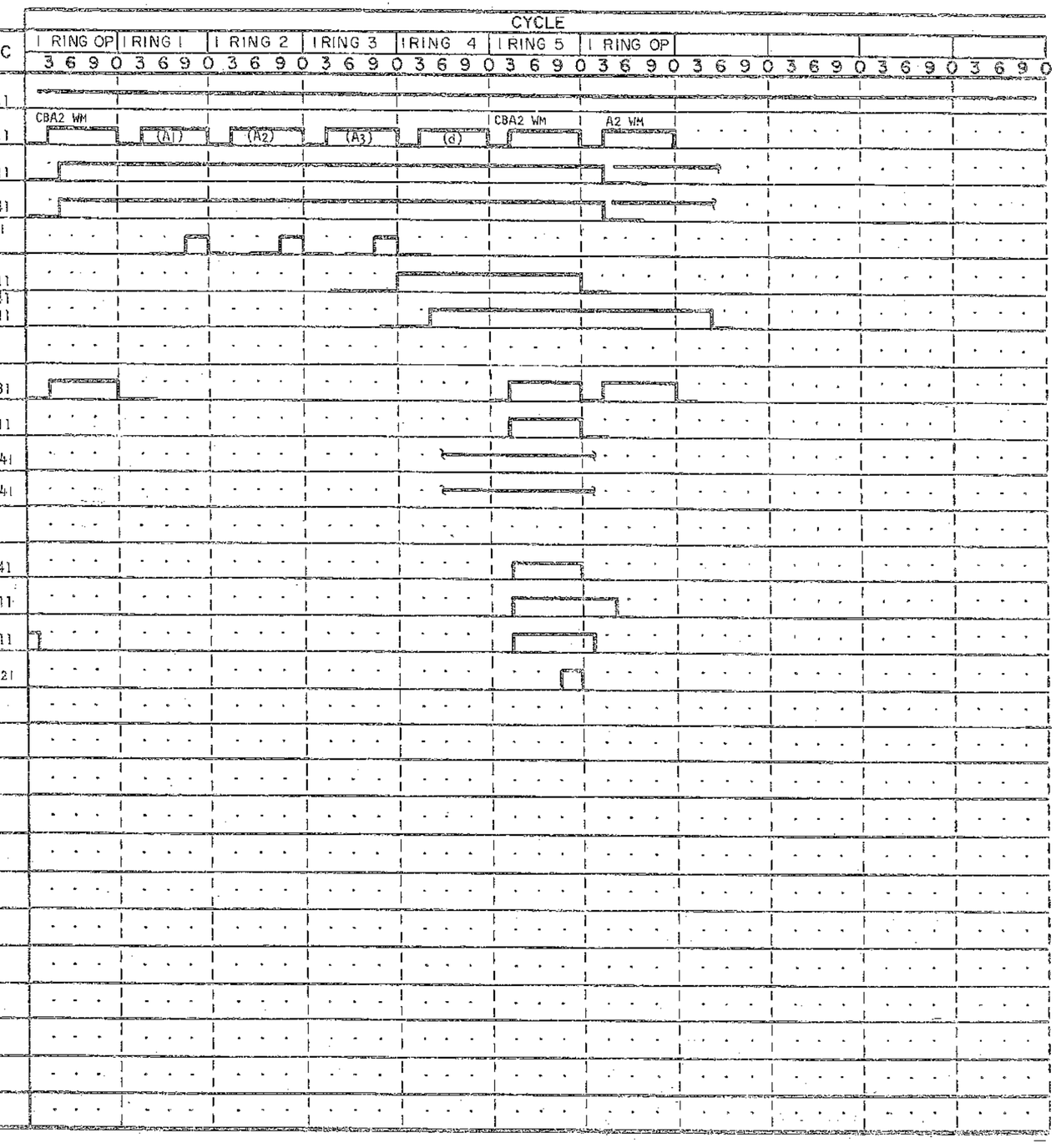


FIGURE 47. TAPE END OF FILE INDICATOR TEST AND TAPE TRANSMISSION ERROR TEST

		SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
1		B REG (WM) B 4 (M)	—	—	35.21.11
2			—	—	
3	+U	MOVE OPERATION	01B1	B12N	35.25.11
4		A REG A 84 (%)	—	—	70.11.21
5	+U	UNIT SEL UNIT SEL LATCH	02A2	A04N A06C	70.11.21
6	-T	TAPE +1 MODE	02A2	A09D	70.11.21
7					
8	+U	I/O OPS	01B2	B25N	31.09.21
9	+U	A CYCLE ELIMINATE	01B2	C16N	31.06.11
10		A REG BA 3 (C)	—	—	44.70.21
11	-T	COMPRESSED WORD LATCH	02A6	F10N	44.70.21
12	-T	REDUNDANCY LATCH (EVEN)	02A2	B04E	70.61.31
13	+U	UNIT SELECT GATE	02A2	A04N	70.11.21
14		A REG 1, 2, 3, 4, 5, OR 6	—	—	71.11.31
15	+U	SELECT TAPE UNIT (TAPE UNIT LATCH) 1, 2, 3, 4, 5 OR 6	02A1		71.11.11 71.11.31
16					
17	+U	B REG WORD MARK	01B2	C20C	31.07.11
18	+U	GATED WORD MARK	01B2	B25F	31.07.11
19	+U	I CYCLE	01B2	E17H	31.24.11
20					
21	-T	I/E CHANGE	01B2	B13H	31.05.31
22					
23					
24	+U	DELTA B CYCLE	01B2 01B2	E15H	31.23.11
25					
26	-T	B CYCLE	01B2	D24H	31.26.11
27	+U	READ WRITE GATE	02A2	B03C	70.11.21
28		A REG B 81 (R) -			70.11.21
29	+U	READ CALL	02A2	A22H	70.11.21
30	+U	CLOCK START CONTROL LATCH	02A1	B22Q	71.31.21
31	-T	TAPE CLOCK	02A1	B09N	71.31.21
32	+U	TAPE MODE CHANGE (INHIBIT B 1248)	02B6	F15G	44.70.31
33	-T	NUMERIC MODE TRIGGER	02B6	F13N	44.70.31
34	+U	CHECK CHARACTER	02A1	A17E	71.71.21
35	-T	GROUP MARK	02A1	C07A	71.71.21
36	-T	FORCED GROUP MARK	02A2	A19C	70.61.31
37		FORCE GROUP MARK INTO A REG	02A2	A10H	70.61.21
38	-T	TRANSFER STAR TO B STAR	02B6	F05R	44.70.21
39	-T	FORCED I/E CHANGE	02A2	A13A	70.11.41
40	+U	SET TO I RING OP	01B2	E15A	31.30.11
41					
42					
43					
44	-U	UNIT RESET	02A2	B11A	70.11.21
45					

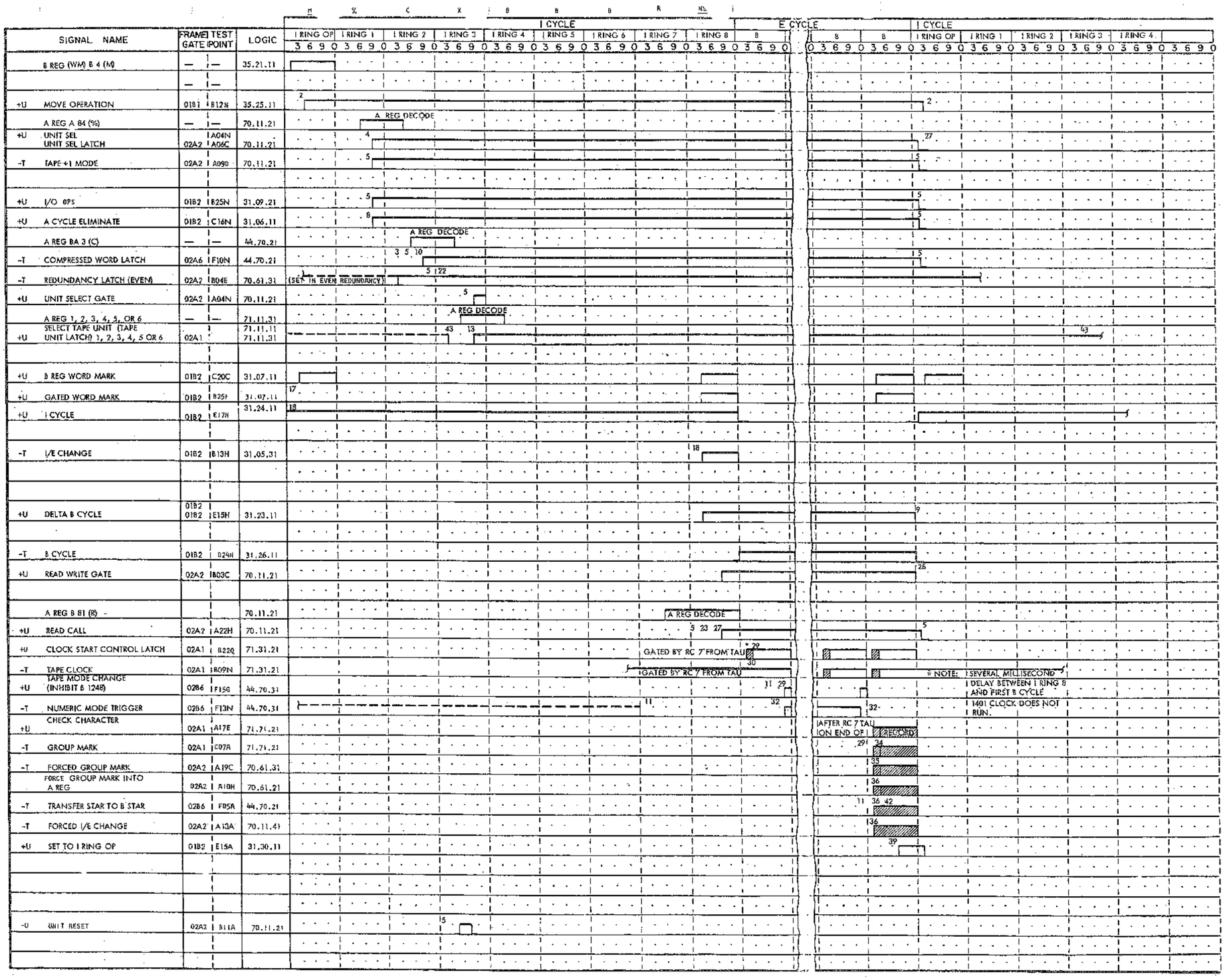


FIGURE 48. MOVE COMPRESSED TAPE READ OPERATION

399 G M
040 X 412 714
047 M

A-FIELD DATA G MΔ20985±ΔDRAKE GM
B-FIELD DATA b bbbbbbbbbbbbb

RESULTANT A-FIELD (AFTER MOVE ZERO INSERT) Δ20985±ΔDRAKE GM
RESULTANT B-FIELD (AFTER MOVE ZERO INSERT) GH Δ0020985±Δ DRAKE GM

	SIGNAL NAME	FRAME GATE	TEST POINT	LOGIC
				32.35.XX
1	STORAGE ADDRESS REGISTER	—	—	32.36.XX
2	B-REGISTER	—	—	35.11.XX
3	A-REGISTER	—	—	35.16.XX
4	-T INDEX PREVENT GATED WM	02B6	F05N	44.70.21
5	EXPAND OP X (A 124)	01B1	A21H	44.70.11
6	-T GATED WM	01B2	C25B	31.07.11
7	-T I/E CHANGE	01B2	B13H	31.05.31
8	+U DELTA I-CYCLE	01B2	E07N	31.21.11
9	-T I-CYCLE	01B2	A23F	31.24.11
23	+U FIRST B BIT	02B6	F25E	44.70.41
10	+U DELTA A-CYCLE	01B2	E09N	31.22.11
11	-T A-CYCLE	01B2	B12G	31.25.11
12	-T DELTA B-CYCLE	01B2	E09E	31.23.11
13	+U B-CYCLE	01B2	D23N	31.26.11
14	-T B-REG ZONE INHIBIT	01A3	D18P	35.18.21
15	-T B-REG DIGIT INHIBIT	01A3	D16A	35.18.31
16	-T B-REG C-BIT INHIBIT	01A3	C11H	35.18.21
17	+U INHIBIT WM	01A3	E15D	35.14.51
18	+U XFER A REG DIGIT ZONE	02B6	F26G	44.70.21
19	-T A-REG ZONE INHIBIT	01A3	F20H	35.18.41
20	-T A-REG DIGIT INHIBIT	01A3	B13H	35.18.41
21	+U DELTA CHARACTER	02B6	F19N	44.70.31
22	-T NUMERIC MODE	02B6	F13N	44.70.31
24	2ND A-REG B BIT	02B6	F23H	44.70.41
25	+U 2ND B-BIT TRIGGER	02B6	F24N	44.70.41
26	+U A-CYCLE ELIMINATE	02B6	F06D	44.70.21
27	-T INHIBIT 82 CD CZ	02B6	F07H	44.70.21
28	-T STORE I-E CHANGE	02B6	F12N	44.70.31
29	WRITE PULSE AND DATA ON INHIBIT DRIVE LINES	01A1		42.58.11

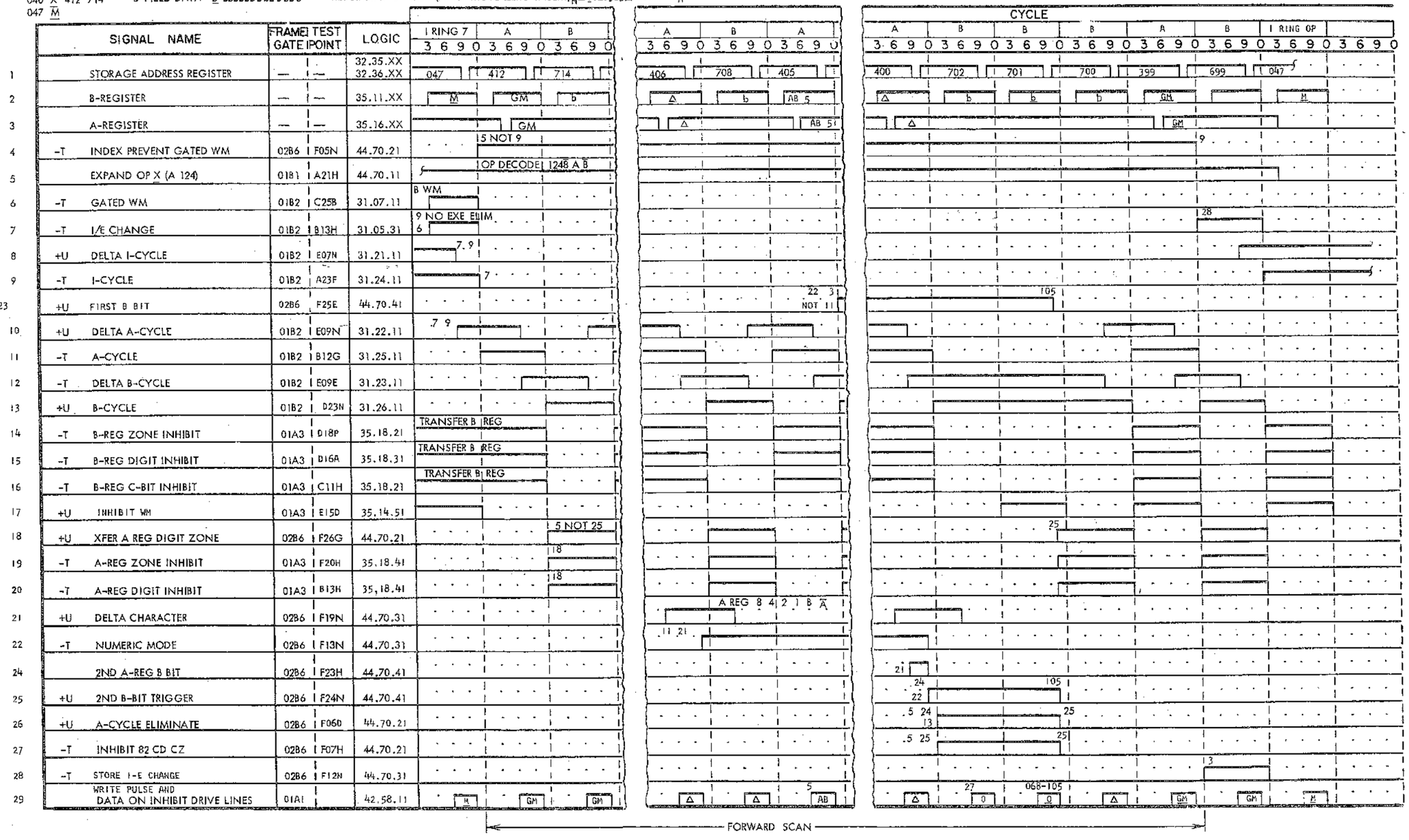


FIGURE 49. MOVE WITH ZERO INSERTION X (AAA) (BBB)

(807) # (898) (257)
(814) X

ORIG A-FIELD
ORIG B-FIELD

NZX = (6527)
H'T W = (7836 + A-TAG)

RESULTANT B-FIELD LWC = (14363 + A-TAG)

	SIGNAL NAME	FRAME	TEST POINT	LOGIC
1	STORAGE ADDRESS REGISTER	—	—	32.3X.XX.2
2	B-REGISTER	—	—	35.1X.XX.2
3	A-REGISTER	—	—	35.1X.XX.2
4	+U MODIFY (#) OP	01B1	B26H	44.62.02.2
5	-T DELTA I CYCLE LATCH	01B2	C11N	31.21.11.2
6	-T I CYCLE LATCH	01B2	E19N	31.24.11.2
7	-T DELTA A CYCLE LATCH	01B2	E09N	31.22.11.2
8	-T A CYCLE LATCH	06B4	F02P	42.65.01.2
9	-T DELTA B CYCLE LATCH	06B4	F02N	42.65.01.2
10	-T B CYCLE LATCH	01B2	E23H	31.26.11.2
11	+U CYCLE TR 1	06B4	F05E	42.65.01.2
12	+U CYCLE TR 2	06B4	F06E	42.65.01.2
13	+U CYCLE TR 3	06B4	F07E	42.65.01.2
14	+U A CYCLE ELIMINATE	06B4	F22P	42.65.01.2
15	+U TRANSFER B-REGISTER	06B4	F22A	42.65.02.2
16	-T ARITH ZONE	06B4	F09H	42.65.02.2
17	-T ARITH DIGIT	06B4	E07P	42.65.02.2
18	-T MOD OP BLOCK NU CARRY	06B4	F09N	42.65.02.2
19	-T B-REG ZONE INHIBIT	06B4	F10H	42.65.02.2
20	+U RESET A-REGISTER	06B4	F15A	42.65.02.2
21	+U A-REG SET A (FOR CARRY)	06B4	F15H	42.65.02.2
22	-T ADDER CARRY	06B4	E01E	42.65.03.2
23	-T ZONE ADDER CARRY	06B4	F14A	42.65.03.2
24	+U ADDRESS MOD I-E CHANGE	06B4	F18N	42.65.02.2
25	+U MODIFIER CONTROL -1	01A8	B04H	32.42.11.2
26	-T MODIFIER CONTROL +3	06B4	F13H	42.65.02.2
27	-T MODIFIER CONTROL XFER	01A8	C10A	32.42.41.2
28	MODIFIER OUTPUT ON BUS	—	—	32.43.XX.2
29	DATA ON INHIBIT DRIVE	—	—	35.1X.XX.2

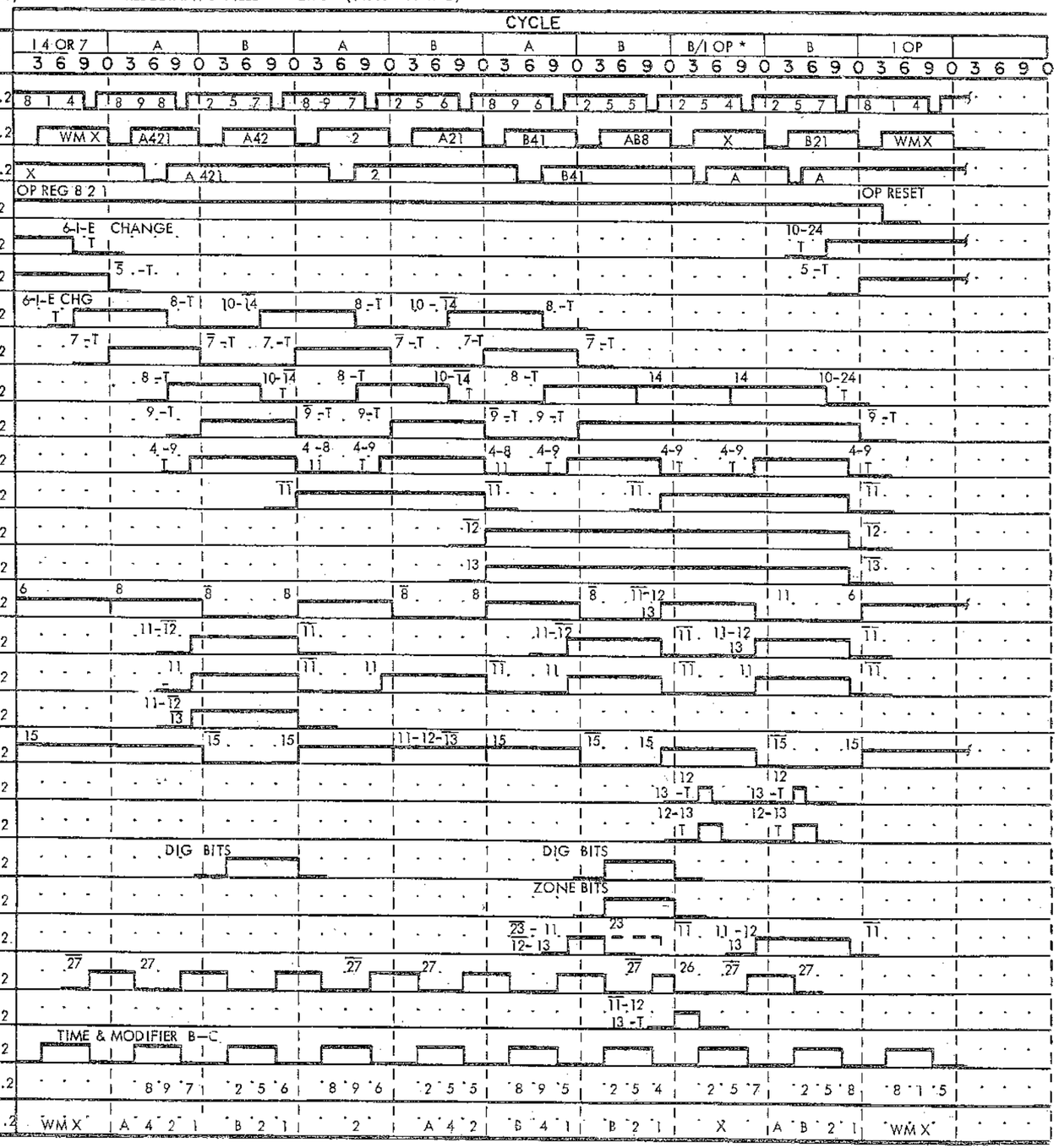


FIGURE 50. ADDRESS MODIFY TIMING # (AAA) (BBB)

MULTIPLY OPERATION

A – FIELD ADDRESS			457	458
A – FIELD BEFORE OPERATION			3	B_6
A – FIELD AFTER OPERATION			3	B_6

INSTRUKTIONS: (900) L 783 678
(907) @ 458 678
(914) B 900

B – FIELD ADDRESS			673	674	676	676	677	678
B – FIELD BEFORE OPERATION			2	0	3	3	2	1
B – FIELD AFTER CLEAR OPER.					1	0	0	0
B – FIELD AFTER ADD 2A OPER.					0	0	7	B_2
B – FIELD AFTER ADD A OPER.			0	0	0	1	0	B_8
B – FIELD AFTER ADD 2A OPER.			0	0	7	3	0	B_8

	SCOPE POINT	LEVEL	I	A	B	A	B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	B	AUX B	B	AUX A	AUX B	A	B	B	B	I
M-STAR			914	458	678	458	678	457	677	676	675	458	678	457	677	676	675	458	678	457	677	676	675	678	674	677	673	458	676	457	675	674	673	914
A-STAR			458	458		457		456				457		456				457		456								457		456				
B-STAR			678		678		677		676	675	674		677		676	675	674		677		676	675	674		673		672		675		674	673	672	
A-AUX-STAR				458								458						458																
B-AUX-STAR					678							458	678					458	676					677		676			676					
B-REGISTER			2	B_6	1	B_6	0	3	2	3	3	B_6	0	3	0	0	1	B_8	B_2	3	7	0	0	B_8	0	0	1	B_6	1	3	0	0	0	B
A-REGISTER			8	B_6		B_6		3		C	C	B_6		3		C	C	B_6		3		C	C	C	C	C	C	B_6		3		C	C	0
TB INHIBIT			2	B_6	0	B_6	0	3	0	0	1	B_6	B_2	3	7	0	0	B_6	B_8	3	0	1	0	B_8	0	0	0	B_6	3	3	7	0	0	B
B-CYCLE	44.14.01 02B 7B16 C	7																																
B-AUX STAR RI UNITS	44.16.11 02A 7C09 K	5																																
AUX STAR SET LATCH	44.11.01 02B 7B17 N	7																																
B-AUX STAR GATE OUT	44.16.01 02A 7C10 B	5																																
TRANSFER B-REG.	38.40.11 01A 3B01 H	5																																
CLEAR B-FIELD LATCH	44.11.41 02B 7D21 G	7																																
FORCE 02C	44.11.41 02B 7A16 N	7																																
SIGN TRIGGER	44.11.31 02B 7A05 P	7																																
SET PROD. SIGN LATCH	44.11.41 02B 7B11 H	7																																
X-POSITION LATCH	44.11.21 02B 7C17 B	7																																
MULTIPLIER LATCH	44.11.21 02B 7C17 H	7																																
A-CYCLE ELEMINATE LATCH	44.11.11 02B 7C17 A	7																																
2A LATCH	44.12.11 02B 7A20 H	7																																
A LATCH	44.12.11 02B 7A20 N	7																																
A-AUX LATCH	44.14.11 02B 7B07 H	7																																
B-AUX LATCH	44.14.31 02B 7B06 H	7																																
ARITH. DIGIT GATE	44.13.21 02B 7C09 A	7																																
COMPLEMENT FROM CALC	44.13.11 02B 7C07 A	7																																
DOUBLER CARRY TRIG.	44.18.41 01A 7L22 A	5																																
ADDER CARRY	34.33.11 01B 3C24 C	7																																
CARRY TRIGGER	34.26.11 01B 3E16 N	7																																
A REG NOT 1 FROM CALC																																		
A REG 02 CALC		5																																
A REG 02' CALC		5																																
I/E CHANGE	44.13.01 02B 7A24 N	5																																
			I	A	B	A	B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	B	AUX B	B	AUX A	AUX B	A	B	B	B	I

SET | SHIFT | SHIFT

A-FIELD BEFORE OPERATION		2	7^B
A-FIELD AFTER OPERATION		2	7^B

INSTRUCTIONS: (900) $\frac{A}{B}$ 783 678
(907) $\frac{A}{B}$ 458 676
(914) $\frac{B}{B}$ 900

A-FIELD BEFORE OPERATION			0	0	3	4	0^B
B-F. AFTER DIVIDE - COMPARE			0	1	0	3	4	0^B
B-F. AFTER DIVIDE - COMPARE			0	1	0	3	4	0^B
B-F. AFTER SUBT. A & DIV. COMP.			0	1	0	0	7	0^B
B-F. AFTER DIVIDE - COMPARE			0	1	2^{AB}	0	7	0^B
B-F. AFTER SUBT. 2A & DIV. COMP.			0	1	2^{AB}	0	1	6^B

SCOPE TRIGGER POINT	02 B7 B17 N AUX STAR SET LATCH	T	I_T	A	B	A	B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	I_{op}
M - STAR			914	458	676	458	676	457	675	674	673	676	458	677	457	676	675	674	458	677	457	676	675	674	678	458	678	457	677	676	675	458	678	457	677	676	675	914
A - STAR			458	458		457		456					457		456				457		456					457		456					457		456				
B - STAR			676		676		675		674	673	672	677		676		675	674	673		676		675	674	673	678		677		676	675	674		677		676	675	674	
A - AUX - STAR				458																																		
B - AUX - STAR					676							677													678														
B - REGISTER			2	7^B	3	7^B	3	2	0	0	0	3	7^B	4	2	3	0	0	7^B	4	2	3	0	1	7	7^B	0^B	2	7	0	0	7^B	6^B	2	7	0	2^{AB}	B
A - REGISTER			8	7^B	7	7^B	7	2	2	C	C	C	7^B		2		C	C	7^B		2		C	C	C	7^B		2		C	C	7^B		2		C	C	0
TO INHIBIT			2	7^B	3	7^B	3	2	0	0	0	3	7^B	4	2	3	0	1	7^B	7	2	0	0	1	7	7^B	0^B	2	7	0	2^{AB}	7^B	4^B	2	1	0	2^{AB}	B
B - CYCLE	44. 11. 01 03 B 7 B16 C	T																																			
B-AUX STAR RI. UNITS	44. 16. 01 02 A 7 C09 H	U																																			
AUX STAR SET LATCH	44. 11. 01. 02 B7 B17 N	T																																			
B-AUX-STAR GATE OUT	44. 16. 01 02 A 7 C10 B	T																																			
TRANSFER B-REG	35. 40. 11 01 A 3 B 01 H	U																																			
SET A-REG C-BIT	44. 11. 11. 02 B7 D03 A	T																																			
X POS. LATCH	44. 11. 21. 02 B 7 C17 B	T																																			
A ∧ ELIM. LATCH	44. 11. 11. 02 B 7 C17 A	T																																			
SIGN TRIGGER	44. 11. 31. 02 B 7 A05 P	T																																			
SET SIGN GATE	44. 13. 01 02 B 7 D08 D	T																																			
QUOT. TRIGGER	44. 12. 01 02 B 7 A 13 N	T																																			
COMPARE GATE	44. 13. 01 02 B 7 A 22 N	U																																			
A LATCH	44. 12. 11 02 B 7 C08 P	U																																			
2A LATCH	44. 12. 11. 02 B 7 C08 A	U																																			
B<A LATCH	44. 19. 21. 02 A 7 E12 N	T																																			
B< 2A. LATCH	44. 19. 31. 02 A 7 E15 N	T																																			
COMPLEMENT GATE	44. 18. 11. 02 B 7 B03 N	T																																			
SUBT. A LATCH	44. 19. 21. 02 A 7 E12 H	T																																			
SUBT. 2 A LATCH	44. 18. 31. 02 A 7 E15 H	T																																			
END DIVIDE LATCH	44. 12. 01. 02 B 7 B14 F	U																																			
FORCE B 0	44. 18. 31 02 A 7 D03 H	U																																			
FORCE B 1	44. 18. 31 02 A 7 C24 D	T																																			
FORCE Q 0	44. 18. 31 02 A 7 D09 N	U																																			
FORCE Q 2	44. 18. 31. 02 A 7 D10 P	T																																			
MOD. CONTR. +1	32. 44. 11. 01 A E F 20 N	U																																			
CARRY	34. 38. 11. 01 E 3 E 16 N	T																																			

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	I_T	A	B	A	B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	I_{op}
	SET AUX-STARS	COMP. OPERATION						SET QUOT. DIGIT	SHIFT D'END FIELD	COMP. OPERATION						SET QUOT. DIGIT	SUBT. + COMP. OPER.			SET QUOT. DIGIT	SHIFT D'END FIELD	COMP. OPERATION				SET QUOT. DIGIT	SUBT. + COMP. OPER.			SET QUOT. DIGIT						

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Console Indicators
31, 20, 11

1401 INTERMEDIATE LEVEL DIAGRAMS

1-4	CLOCKING AND STORAGE
10-22	DATA FLOW AND CONTROLS
25-34	ARITHMETIC OPERATIONS (ADD, SUBT, MULT, DIV)
35-40	MOVE AND LOAD (MOVE, LOAD, CLEAR, EDIT, COMPARE)
41-44	ADVANCE PROGRAMMING (Q OPR, STORE)
45-52	LOGIC OPERATIONS (BRANCH, NO OP, STOP)
53-58	1406 EXPANDED STORAGE
60-79	INPUT/OUTPUT (READ, PRINT, PUNCH AND OPTIONS)
80-89	MAGNETIC TAPE

CLOCKING AND STORAGE

1 CLOCK CONTROL AND CLOCK PULSES
2 STORAGE DECODE SWITCHES
3 CURRENT SWITCHES, INHIBIT DRIVERS
4 PRESENSE AND SENSE AMPLIFIERS

DATA FLOW AND CONTROLS

10 DATA FLOW A, B Reg
11 DATA FLOW CONTROLS
12 INHIBIT CHECK AND A AND B CHECK
13 CYCLE CONTROL
14 ADDRESS STOP, I RING, PROG SKIP
15 OP REGISTER, OP CODE DEVELOPMENT
16 OP CODE AND OP CHECK
17 A STAR AND B STAR
18 I STAR, AUTO SCAN, STAR MANUAL SET
19 STAR MODIFIER AND CONTROLS
20 MODIFIER
21 MODIFIER AND ADDRESS VALIDITY CHECK

ARITHMETIC OPERATIONS

25 ADD SUBT AND ADDER CONTROL
26 ADD SUBT AND ADDER CONTROLS
27 A AUX STAR AND GATE CONTROLS
28 B AUX STAR AND GATE CONTROLS
29 MULTIPLY AND DIVIDE CONTROLS
30 MULTIPLY AND DIVIDE CONTROLS
31 MULTIPLY AND DIVIDE CONTROLS
32 MULTIPLY AND DIVIDE CONTROLS

MOVE AND LOAD

35 MOVE, LOAD, CLEAR, AND COMPARE
36 COMPARE
37 HI LO EQUAL COMPARE
38 ZONE TEST AND WORD MARK SET
39 EDIT AND EXPANDED EDIT
40 EXPANDED EDIT ASTERISK AND DECIMAL OPTION

ADVANCE PROGRAMMING

41 ADVANCE PROGRAMMING Q OPR, STORE LOGIC OPERATIONS
42 ADVANCE PROGRAMMING CONTROLS

LOGIC OPERATIONS

45 BRANCH, NO OP AND STOP OPR
50 RAMAC AND INQUIRY
51 RAMAC AND INQUIRY
52 51 COLUMN FEED

1406 EXPANDED STORAGE

53 MODIFY OP AND STORAGE CONTROL PULSES
54 STORAGE DECODE SWITCHES 4 TO 12K
55 CORE STORAGE DRIVE CKTS AND SENSE CKTS 4 TO 12K
56 STORAGE DECODE SWITCHES 12 TO 16K
57 CORE STORAGE DRIVE CKTS AND SENSE CKTS 12 TO 16K
58 FULL STORAGE PRINT OUT

INPUT/OUTPUT

60 DATA FLOW AND READ CONTROLS
61 PUNCH DATA FLOW
62 PUNCH CONTROLS AND PFR OPTION
63 READER AND PUNCH CHECK CIRCUITS
64 PFR DATA FLOW, CHECKING AND CONTROLS
65 PFR PUNCH CONTROLS
66 PFR READ PUNCH CONTROLS
67 COLUMN BINARY READ CONTROLS AND DATA FLOW
68 MOVE COLUMN BINARY CONTROLS
69 PRINT DATA FLOW
70 PRINT COUNTERS
71 PRINT RINGS
72 PRINT CONTROLS
73 PRINT BUFFER STORAGE AND DATA FLOW
74 PRINT BUFFER RINGS AND CONTROLS
75 PRINT BUFFER COUNTER
76 PRINT BUFFER CONTROLS
77 PRINT BUFFER CONTROLS
78 CARRIAGE CONTROLS
79 DUAL SPEED CARRIAGE CONTROLS

MAGNETIC TAPE

80 READ AND WRITE TAPE
81 READ AND WRITE TAPE WITH WORD MARKS
82 TAPE CONTROL CODES
83 TAPE BRANCH CODES
84 READ COMPRESSED TAPE
85 MANUAL TAPE OPERATION, RESET AND LOAD
86 EXPANDED TAPE
87 I/O BRANCH
88 I/O SELECT

Controls for Alterations
37.20.11

1401 INTERMEDIATE LEVEL DIAGRAMS

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16 OP CODE AND OP CHECK
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19 STAR MODIFIER AND CONTROLS
20 MODIFIER
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28 B AUX STAR AND GATE CONTROLS
29 MULTIPLY AND DIVIDE CONTROLS
30 MULTIPLY AND DIVIDE CONTROLS
31 MULTIPLY AND DIVIDE CONTROLS
32 MULTIPLY AND DIVIDE CONTROLS

MOVE AND LOAD

35 MOVE, LOAD, CLEAR, AND COMPARE
36 COMPARE
37 HI LO EQUAL COMPARE
38 ZONE TEST AND WORD MARK SET
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57 CORE STORAGE DRIVE CKTS AND SENSE CKTS 12 TO 16K
58 FULL STORAGE PRINT OUT

INPUT/OUTPUT

60 DATA FLOW AND READ CONTROLS
61 PUNCH DATA FLOW
62 PUNCH CONTROLS AND PFR OPTION
63 READER AND PUNCH CHECK CIRCUITS
64 PFR DATA FLOW, CHECKING AND CONTROLS
65 PFR PUNCH CONTROLS
66 PFR READ PUNCH CONTROLS
67 COLUMN BINARY READ CONTROLS AND DATA FLOW
68 MOVE COLUMN BINARY CONTROLS
69 PRINT DATA FLOW
70 PRINT COUNTERS
71 PRINT RINGS
72 PRINT CONTROLS
73 PRINT BUFFER STORAGE AND DATA FLOW
74 PRINT BUFFER RINGS AND CONTROLS
75 PRINT BUFFER COUNTER
76 PRINT BUFFER CONTROLS
77 PRINT BUFFER CONTROLS
78 CARRIAGE CONTROLS
79 DUAL SPEED CARRIAGE CONTROLS

MAGNETIC TAPE

80 READ AND WRITE TAPE
81 READ AND WRITE TAPE WITH WORD MARKS
82 TAPE CONTROL CODES
83 TAPE BRANCH CODES
84 READ COMPRESSED TAPE
85 MANUAL TAPE OPERATION, RESET AND LOAD
86 EXPANDED TAPE
87 I/O BRANCH
88 I/O SELECT

1401 - SYSTEM
INSTALLATION PROCEDURE

1. CHECK ALL MATERIAL RECEIVED AGAINST SHIPPING CHECK OFF LIST CONTAINED IN SYSTEM INSTALLATION PARTS PACKAGE (THIS PACKAGE CONTAINS ALL DETACHABLE CABLES ETC.)

2. REMOVE ALL SHIPPING TAPE, BRACES AND OTHER MATERIAL AS PER PACKING AND UNPACKING INSTRUCTIONS INCLUDED WITH EACH UNIT.

   AT THIS TIME MAKE A THOROUGH PHYSICAL CHECK FOR DAMAGED, BROKEN OR LOOSE PARTS RESULTING FROM SHIPMENT (INCLUDING EDGE CONNECTORS). CAUTION: TURN FEED OVER MANUALLY WHEN REINSERTING BRUSH ASSEMELY TO PREVENT BRUSH DAMAGE.

3. INSTALL THE FILE FEED MAGAZINE ON THE 1402. (REFER TO 1402 CE REFERENCE MANUAL FOR INSTRUCTIONS.)

4. CHECK THE 1402 RELAY GATE FOR LOOSE RELAYS AND DISPLACED ARMATURES.

5. MANUALLY TRIP CLUTCHES AND FEED CARDS THROUGH THE READ AND PUNCH FEEDS, CHECK FOR BINDS.

6. CHECK ALL MANUAL KNOBS, LEVERS, AND COVERS ON THE 1403 FOR PROPER OPERATION.

7. INSTALL (2) ANTI-WALK FOOT COMPONENT PARTS (2SETS) TO THE 1403 FRAME NEAR THE CASTERS BY THE FOLLOWING PROCEDURE:

   INSERT THE MOUNTING STUD IN THE MACHINE FRAME FOR ITS FULL THREADED LENGTH, ASSEMBLE THE FOOT COVER AND MOUNTING FOOT TO THE STUD. BACK THE MOUNTING STUD OFF FOR THE REQUIRED DISTANCE TO STABILIZE THE MACHINE.

8. 1403-CHECK FOR OIL IN THE HYDRAULIC RESERVOIR. APPROX LEVEL TO BOTTOM OF MAGNETS.

9. 1403-CHECK FOR OIL IN THE RESERVOIR AT THE RIGHT END OF THE "T" CASTING (IBM NO.6) - 1403.

10. ALL 1401 MACHINES FROM DECEMBER 1961 (USA NO.20890) AND UP WILL BE DESIGNED FOR CABLES TO EXIT UNDERNEATH THE MACHINE. THE MACHINE WILL BE SHIPPED WITH CABLES ABOVE FRAME AND SHOULD BE INSTALLED AS DESCRIBED BELOW:

   A) AT 01B1-01E8 - REMOVE THROW AWAY COVER AND DISCARD.

   B) AT 01B1- REMOVE COVER SUPPORT BRACKET (194370) AND RETAIN. OPEN GATE 01B1.

   C) AT 01E8 - RUN ALL CABLES DOWN THROUGH THE OPENING AT 01B1-01E8. STARTING WITH CABLE NEAREST REAR OF MACHINE, PLACE A LOOP THROUGH THE OPENING SUCH THAT THE CABLE CONNECTOR GOES THROUGH LAST.

   D) AT 01B1-01E8
   INSTALL HOUSING (723351).
   INSTALL FIRE BARRIER THEN INSTALL FILTER.
   INSTALL COVER SUPPORT BRACKET, (194370) REMOVED IN STEP B, AT THE CENTER OF THE FRAME.
   INSTALL COVER (194372).
   FOR RAISED FLOOR INSTALLATION INSTALL KICK PLATE (597329).
   FOR ABOVE FLOOR INSTALLATION INSTALL KICK PLATE (723359).
   CLOSE GATE 01B1.

   E) AT 02B4-02B5 -
   REMOVE COVER (194372).
   OPEN GATE 02B4.
   CONNECT CABLES - FIRST PASSING THEM UP FROM UNDERNEATH FRAME.
   INSTALL HOUSING (723352).
   FOR ABOVE FLOOR INSTALLATIONS INSTALL CLAMP (723353) TO HOLD CABLES AT 02B5 SIDE OF MACHINE. THIS INCLUDES THE THREE 1403 CABLES IF THEY PASS UNDERNEATH THE LENGTH OF THE 1401.
   INSTALL FIRE BARRIER THEN INSTALL FILTER.
   FOR ABOVE - FLOOR INSTALLATIONS INSTALL KICK PLATE (723360).
   FOR RAISED FLOOR INSTALLATIONS INSTALL KICK PLATE (597329).
   INSTALL COVER (194372).
   CLOSE GATE 02B4.

11. CONNECT CABLES FROM THE 1401 TO THE 1402. - (SEE NOTE I).

12. CONNECT CABLES FROM THE 1401 TO THE 1403. (SHOE WITH GOLD PLATED PINS CONNECTS TO FRONT RECEPTACLE. ON CURRENT MACHINES THESE WILL ONLY FIT ONE WAY).

   A) IF SYSTEM HAS EXPANDED MEMORY, CONNECT POWER AND SIGNAL CABLES FROM 1401 TO THE 1406 (06B7) (WILL ONLY FIT ONE WAY AFTER 1401-20010 -SEE NOTE I).

		KEY LOCATION
NOTE I - 1402 CANNON CONNECTORS-THREAD ON OUTSIDE OF RING	-SMALL-NEAR PIN	3
	-LARGE-NEAR PIN	3
1406 CANNON CONNECTORS-THREAD ON OUTSIDE OF RING	-SMALL-NEAR PIN	6
	-LARGE-NEAR PIN	15

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13. POWER CABLE CONNECTION:

A) 60 CYCLE MACHINES:
CONNECT THE MAIN POWER CABLE TO THE UPPER TERMINALS ON THE INNER CIRCUIT BREAKER OF THE 1402 UNIT. THE GREEN-YELLOW (GROUND) WIRE SHOULD BE CONNECTED TO THE FRAME OF THE 1402. REFER TO 1402 WIRING DIAGRAM NO.609400 PAGE 11.01.11.1.

B) 50 CYCLE MACHINES:
CONNECT THE MAIN POWER CABLE TO THE UPPER TERMINALS ON THE CIRCUIT BREAKER OF THE 1402 UNIT. THE GREEN-YELLOW (GROUND) WIRE SHOULD BE CONNECTED WITH THE FRAME. THE NEUTRAL LINE SHOULD BE CONNECTED WITH THE NEUTRAL (0) POINT OF THE VOLTAGE MODE TERMINAL IN THE 1402.

ON MODEL D (WITHOUT 1402) THE MAIN POWER CABLE SHOULD BE CONNECTED TO THE UPPER TERMINALS OF THE CIRCUIT BREAKER (FOR 1401) IN 1401 (GATE 02B7, 02B8). THE NEUTRAL LINE SHOULD BE CONNECTED TO THE NEUTRAL POINT Y. THE GREEN-YELLOW LINE (GROUND) SHOULD BE CONNECTED WITH FRAME.

C) CONNECT THE ADDITIONAL YELLOW-GREEN GROUND WIRES AS SHOWN ON THE REFERENCE DRAWINGS, 4062985A-4062988A (OR LATER SUFFIXES) ON SECT. 5/6 A TO PROVIDE CORRECT GROUND CONNECTIONS. CHECK THE GROUND WIRE CONNECTION OF THE 1402 MAIN POWER CABLE OR, IF THE MACHINE IS A MODEL D, CHECK THE SAME OF THE 1401 CONNECTION MAIN POWER CABLE AND MAKE CERTAIN, THAT THIS CONNECTION IS PARTICULAR UNOBJECTIONABLE. FOR SYSTEM WITH 1405 ATTACHMENT SEE NOTE II

14. DO NOT CONNECT TAPE UNIT CABLES AT THIS TIME.

15. CHECK CUSTOMERS POWER RECEPTACLE FOR THE PROPER TYPE OF VOLTAGE SUPPLY AND GROUND. GROUND CONNECTION SHOULD BE GREEN/YELLOW WIRE NON-CURRENT CARRYING EARTH GROUND. IF IT IS NECESSARY TO CHANGE THE SYSTEM VOLTAGE SEE STEP 1.0 OF REFERENCE MATERIAL.

16. LIFT CARRIAGE BRUSHES AND OPEN "T" CASTING ON THE 1403 BEFORE APPLYING POWER.

17. APPLY POWER, CHECK ALL BLOWERS FOR OPERATION ON THE 1401 (AND 1406) ESPECIALLY THE ONE OVER THE CORE STORAGE UNITS. ALSO CHECK THE CARRIAGE BLOWER ON THE RIGHT SIDE OF THE 1403. PLACE A CARD OVER THE LOUVERS IN THIS COVER. IF THE CARD IS DRAWN AGAINST THE COVER, THE BLOWER IS OPERATING.

18. CHECK FOR PROPER PHASE ROTATION ON THE 1403. SLIP A PIECE OF PAPER OR TAB CARD THROUGH THE PAPER FEED ROLLERS ON THE BACK OF THE MACHINE. THE PAPER OR CARD SHOULD BE FED DOWN. IF THIS IS CORRECT CLOSE THE "T" CASTING AND CHECK TO SEE THAT THE CHAIN IS TURNING COUNTER CLOCKWISE, LOOKING DOWN AT IT. FINALLY CHECK TO SEE THAT AIR IS BLOWING INTO THE HAMMER UNIT. THIS CHECK CAN BE MADE BY PLACING A CARD OVER THE LOUVERS IN THE COVER ON THE LEFT SIDE OF THE 1403. IF THE CARD IS DRAWN AGAINST THE COVER, AIR IS BEING BLOWN INTO THE MACHINE. COMPLETE THE CHECK BY FEELING THAT AIR IS BEING BLOWN OUT OF THE HAMMER UNIT AT THE SIDES OF THE UNIT. IF ALL THREE OF THE ABOVE ARE INCORRECT REVERSE ANY TWO LEADS ON THE MAIN POWER CABLE. IF ONE OR TWO ARE INCORRECT FOLLOW PROCEDURE OUTLINED IN THE 1403 REFERENCE MANUAL PAGE 6, FORM NO.225-6493. (IF THE SYSTEM DOES NOT HAVE A PRINTER BUT HAS 729 TAPE DRIVES USE STEP 27A FOR CHECKING PHASE RELATIONSHIP).

19. IF ALL PHASING IS CORRECT IT IS NOW SAFE TO LOWER CARRIAGE BRUSHES. A CARRIAGE TAPE SHOULD BE INSTALLED.

20. CHECK 1401, 1402 (AND 1406) POWER SUPPLY VOLTAGES. THEY SHOULD BE ± 2% WHEN MEASURED AS DESCRIBED BELOW.

A) MEASURE -6V, +6V, -12 VOLT OUTPUT AT GATE LOCATION 01B3. ADJUST FOR PROPER OUTPUT. ALWAYS ADJUST -6V BEFORE ADJUSTING -12V SEE 1401 WIRING DIAGRAM FOR LOCATION OF SUPPLIES LOCATED ON 02A4, AND 02A5 (1401 ONLY).

B) MEASURE -6V, +6V, AND -12V AT GATE LOCATION 02A1 ON MACHINES WITH TAPES. IF THIS FEATURE IS NOT PRESENT, MEASURE AT GATE LOCATION 02A7, 02A8 OR 02B6 DEPENDING ON WHICH MAY BE PRESENT. ADJUST FOR PROPER OUTPUT FROM THE SUPPLIES WHICH ARE LOCATED ON 02A3 AND 02A6. ALWAYS ADJUST -6V BEFORE ADJUSTING -12V. REFER TO 1401 WIRING DIAGRAM, (1401 ONLY).

C) MEASURE -36 VOLTS ON 02B2 ON MAGNETIC TAPE SYSTEMS WITH TAU 2.

NOTE II CONVERTER 50/60 CPS TO BE GROUNDED TO CENTRAL GROUNDING TERMINAL IF LOCATED IN THE SAME ROOM. MAKE SURE, THAT THERE IS NO GROUND CONNECTION BETWEEN CONVERTER AND 1405.

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D) MEASURE -60 VOLTS ON 01B6 AT THE -60 VOLT BUS BAR. ADJUST FOR THE PROPER OUTPUT FROM THE SUPPLY LOCATED IN THE 1402. IN MODEL D THIS SUPPLY IS LOCATED ON 01B4 (1401 ONLY).

E) MEASURE -20 VOLTS ON 01A1 AT F25R AND ADJUST FOR PROPER OUTPUT FROM THE SUPPLY LOCATED IN THE 1402. IN MODEL D, SUPPLY IS LOCATED ON GATE 02A8. (TURN OFF ALL POWER-INCLUDING LINE POWER INPUT TO 1402- AND MOVE TAPS ON SUPPLY IF ADJUSTMENT IS NECESSARY).

NOTE - -20 VOLT POWER SUPPLIES (PART NUMBER 473 430) ON 1402 "M" SUFFIX AND LATER, ARE NOT ADJUSTABLE. (PN 4118226 - 50 CYCLE)

F) MEASURE +30 VOLTS ON 01A1 (AND 1406 CORE ARRAY GATES) AT F26N.
MEASURE +12V FIXED ON 01A1 (AND 1406 CORE ARRAY GATES) AT F26Q.
MEASURE +12V VARIABLE (18V DIFF) ON 01A1 (AND 1406 CORE ARRAY GATES) AT F13Q. ALWAYS ADJUST +30V BEFORE ADJUSTING +12V. IF VOLTAGE VARIATION OF THE MEMORY IS DESIRED REFER TO SERVICE AID CEM 107.

G) THE MARGINAL VOLTAGES ARE NOT MEASURED. (IF THE ABOVE STEPS ARE FOLLOWED, THESE VOLTAGES SHOULD BE WITHIN TOLERANCES).

H) ON LATER MACHINES THE MARGINAL VOLTAGE SUPPLY WILL NOT BE PERMANENTLY INSTALLED IN THE SYSTEM. A PORTABLE SUPPLY CAN BE ORDERED BY THE BRANCH OFFICE. THIS WILL PROVIDE GREATER FLEXIBILITY FOR CHECKING THE SYSTEM INCLUDING ANY PERIPHERAL EQUIPMENT. A SPACE FOR STORAGE OF THE PORTABLE SUPPLY IS AVAILABLE IN THE LEFT END OF THE 1402 DIRECTLY UNDER THE PUNCH DRIVE MOTOR. THE PORTABLE SUPPLY CAN BE PLUGGED INTO ANY 220V RECEPTACLE AND IS USED THE SAME AS THE FIXED MARGINAL SUPPLY. CAUTION: PORTABLE SUPPLIES OF US ORIGIN ARE TO BE PLUGGED INTO 115V RECEPTACLE.

21. RUN READER AND PUNCH WITH NON-PROCESS RUNOUT KEY.

22. RUN READ WITH PROCESS UNIT. (PUT IN READ OP MANUALLY).

23. RUN PUNCH WITH PROCESS UNIT.

24. RUN PRINTER WITH PROCESS UNIT WITH NO INFORMATION IN THE PRINT AREA.

24A. CARRIAGE CONTROL SINGLE SHOT ADJUSTMENTS.

MAKE THESE ADJUSTMENTS ONLY IF THE 1403 IS BEING FIELD MERGED. OTHERWISE, PROCEED TO THE NEXT STEP.

A) 4.5 MILLISECOND SINGLE SHOT ADJUSTMENT. (LOGIC 36.43.21.2).

A TAG LOCATED ON THE 1403 TRANSLATOR HANDLE SHOWS THE TIMING FOR THE 4.5 MS SINGLE SHOT. ADJUST THE 4.5 MS SINGLE SHOT FOR THIS TIMING.

B) 16 MILLISECOND SINGLE SHOT ADJUSTMENT. (LOGIC 36.31.31.2).

SUBTRACT THE ACTUAL TIMING OF THE 4.5 MS SINGLE SHOT FROM 21.4. ADJUST THE 16 MS SINGLE SHOT FOR THIS TIMING.

C) 10 MS "CARRIAGE INTERLOCK" SINGLE SHOT ADJUSTMENT. (LOGIC 36.46.21.2).

SUBTRACT 1.7 MS FROM THE FINAL ADJUSTMENT OF THE 16 MS SINGLE SHOT. ADJUST THE 10 MS SINGLE SHOT FOR THIS TIMING.

24B. IF IT IS DESIRED TO TEST THE RESET CHECK CIRCUITS PROCEED TO THE REFERENCE MATERIAL STEP 2.0.

25. RUN COMBINATION OP CODES 3, 5, 6 AND 7.

26. REMOVE POWER AND INSTALL TAPE UNIT CABLES.

A) FOR C, D AND F SYSTEMS - WHEN 729 AND 7330 TAPE UNITS ARE INTERMIXED, CABLES CANNOT BE CROSS CONNECTED. I.E. EACH END OF ANY TAPE CABLE MUST CONNECT TO THE SAME TYPE TAPE UNIT ON EITHER END. THE FIRST TAPE UNIT IN THE SYSTEM MUST ALSO BE CONNECTED TO THE PROPER CONNECTOR IN THE PROCESSING UNIT. AFTER THE INITIAL CABLE HOOKUP HAS BEEN MADE AND CHECKED OUT, THE CONNECTORS ON EACH END OF THE CABLES MUST BE IDENTIFIED WITH "729" OR "7330" LABELS PROVIDED IN THE SYSTEM MAINTENANCE PACKAGE FOR THIS PURPOSE. (NOTE - 729 AND 7330 CABLES HAVE IDENTICAL CONSTRUCT.)

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27A. IF SYSTEM HAS TYPE 729 TAPE DRIVES APPLY POWER AND CHECK ROTATION OF MOTORS BY HITTING LOAD REWIND. IF THE HEAD DOES NOT COME DOWN, CHECK FOR VACUUM IN COLUMNS. IF AIR IS BLOWING OUT, THE PHASING IS REVERSED. IF AIR IS BEING SUCKED IN, PHASING IS CORRECT AND SOMETHING ELSE IS PREVENTING THE HEAD FROM COMING DOWN. IF ROTATION IS INCORRECT, TURN OFF ALL POWER TO SYSTEM (LINE POWER INCLUDED) AND REVERSE ANY TWO PHASES AT CIRCUIT BREAKER NO. 2 IN THE 1402. (REFER TO 1402 LOGICS FOR DIAGRAM-SEC 1A).
NOTE: ON MOD D SYSTEMS, CIRCUIT BREAKER IS LOCATED 02B8.
TURN POWER ON AND RECHECK ROTATION.

27B. IF SYSTEM HAS TYPE 7330 TAPE DRIVES;

A) CLEAN TRANSPORT AND CHAMBER.

B) CHECK 7330 POWER CONTROL SWITCHES OFF.

C) INSTALL TERMINATOR SHOE.
CAUTION: DO NOT, AT ANY TIME, TURN POWER ON WITHOUT A TERMINATOR SHOE INSTALLED ON THE 7330. DO NOT PLACE THE TERMINATOR SHOE ON THE 1401.

D) TURN ON 1401 MAIN LINE POWER.

E) TURN ON 7330 POWER CONTROL SWITCHES.

F) CHECK; READ BUS SIGNAL LEVEL, WRITE CIRCUIT FEED THROUGH, SKEW AND TRACKING AS PER 7330 C.E. REFERENCE MANUAL.

28. CHECK TAPE OPERATION FROM THE C.E. CONSOLE (02A1)

A) WRITE TAPE WITH TERMINAL AT A26 ON PIN A FOR CONTINUOUS WRITING, ON PINS B, C, AND D FOR WRITING WITH GAPS AND ON PIN J FOR 1 CHARACTER RECORDS.

B) WRITE TAPE MARK.

C) BACK SPACE AND READ 1 RECORD TO CHECK TAPE INDICATE.

D) REWIND AND READ.

29. CHECK TAPES WITH PROCESS UNIT.

A) MANUAL TAPE OP WRITE.

B) MANUAL TAPE OP READ.

30. IF SYSTEM HAS EXPANDED MEMORY, RUN THE PROGRAMS SHOWN BELOW TO INSURE THAT THE 1406 SIGNAL CABLES CONTACTS ARE MAKING;

A) FOR 8K SYSTEM, MANUALLY ENTER A "C" BIT IN LOCATION 7999 AND THEN ENTER L, 7999 7998_, IN ANY MEMORY LOCATIONS. BY STARTING THE LOAD OP, THE ENTIRE MEMORY SHOULD BE LOADED WITH "C" BITS. STORAGE SCAN. MANUALLY ENTER C, A, B, 8, 4, 2, 1 INTO 7999. THEN PROCEED AS ABOVE BY LOADING C, A, B, 8, 4, 2, 1 INTO THE ENTIRE MEMORY. STORAGE SCAN.

B) FOR 12K SYSTEM, MANUALLY ENTER IN LOCATION 11,999 AND USING PROGRAM L 11,999 11,999_, PROCEED AS IN STEP (A).

C) FOR 16K SYSTEM, MANUALLY ENTER IN LOCATION 15,999 AND USING PROGRAM L 15,999 15,998_, PROCEED AS IN STEP (A).

31. RUN CE DIAGNOSTIC TEST AS OUTLINED IN THE DIAGNOSTIC TEST PROCEDURE BOOK.

32. IF SYSTEM HAS EXPANDED MEMORY, PERFORM A FULL STORAGE PRINT OUT.

33. IF SYSTEM HAS 1311 DISK STORAGE DRIVES - REFER TO 1311 CUSTOMER ENGINEERING REFERENCE MANUAL (NUMBER 227-5649-X) AND ITS SUPPLEMENT (NUMBER 227-5758-X) SECTION 1.2.X FOR COMPLETE INSTALLATION INSTRUCTIONS AND CHECKOUT PROCEDURES.

34. 1401 METER CHECKOUT PROCEDURE

IMPORTANT NOTE:

NOT MORE THAN 50 HOURS ALLOWED TEST TIME ON ANY OF THE METERS.

A) MANUALLY ENTER THE FOLLOWING PROGRAM, STARTING IN LOCATION 444, 444-1, B445

B) 1402 CHECKOUT:

RUN CARDS OUT OF READER AND PUNCH. DEPRESS CHECK RESET ON 1402. START PROGRAM AT LOCATION 444. CPU METER SHOULD RUN FOR 400 MILLISECONDS. PLACE BLANK CARDS IN THE READER. DEPRESS START KEY. BOTH METERS SHOULD RUN. DEPRESS STOP KEY. BOTH METERS SHOULD STOP. SWITCH TO C.E. MODE ON 1401 METER PANEL. DEPRESS START KEY. ONLY C.E. METER SHOULD RUN. DEPRESS STOP KEY. SWITCH BACK TO CUSTOMER MODE. DEPRESS START KEY. BOTH METERS SHOULD RUN. DEPRESS STOP KEY. OPEN FRONT AND SIDE COVERS ON 1402. TURN ON OVERRIDE INTERLOCK SWITCH AND TURN THE "ON LINE-OFF LINE" SWITCH TO "OFF LINE". DEPRESS START KEY. ONLY CPU METER SHOULD RUN. DEPRESS STOP KEY. TURN "ON LINE-OFF LINE" BACK TO "ON LINE". TURN OVERRIDE INTERLOCK SWITCH OFF. CLOSE COVERS. REMOVE CARDS FROM READ HOPPER AND PERFORM A NON-PROCESS RUN-OUT. DEPRESS CHECK RESET ON 1402, THEN PRESS START KEY. ONLY THE CPU METER SHOULD RUN. DEPRESS STOP KEY.

C) MANUALLY INSERT A PUNCH OP. (4) INTO LOCATION 444. REFER TO SECTION IB AND PERFORM THESE STEPS FOR THE PUNCH SIDE.

D) 1403 CHECK-OUT:

MANUALLY ENTER A PRINT OP (2) IN ADDRESS 444.

WITH NO FORMS IN THE 1403, START THE PROGRAM AT 444. DEPRESS START KEY. CPU METER SHOULD RUN FOR 400 MILLISECONDS. INSERT FORMS IN 1403 AND DEPRESS START. BOTH THE CPU METER AND THE 1403 METER SHOULD RUN. DEPRESS STOP KEY. BOTH METERS SHOULD STOP. DEPRESS START KEY. BOTH METERS SHOULD RUN. DEPRESS SPACE KEY ON 1403. 1403 METER SHOULD STOP WHILE CPU METER SHOULD CONTINUE TO RUN. RESTART PROGRAM AT 444 AND BOTH METERS SHOULD RUN. DEPRESS CARRIAGE RESTORE KEY ON 1403. 1403 METER SHOULD STOP WHILE CPU METER SHOULD CONTINUE TO RUN. DEPRESS STOP KEY. SWITCH TO C.E. MODE ON THE 1401 METER. DEPRESS START KEY. ONLY THE C.E. METER ON THE 1401 SHOULD RUN. DEPRESS STOP KEY. C.E. METER SHOULD STOP. SWITCH BACK TO CUSTOMER MODE. DEPRESS START KEY ONLY. CPU METER SHOULD RUN.

THIS PROCEDURE CHECKS TO SEE THAT THE METER RUN LINE WILL NOT DROP OUT ON OPERATIONS THAT INVOLVE LONG PROCESS TIME BEFORE AN I/O OPERATION. MANUALLY ENTER THE FOLLOWING PROGRAM STARTING IN LOCATIONS 444, 774 AND 885.

```
444  NN1A  777888          B 4668852
     B 447L 777888B 444
774  0001
885  0001
```

START PROGRAM AT ADDRESS 444 AND SCOPE THE OUTPUT OF THE 400 MILLISECONDS SINGLE SHOT. THE SINGLE SHOT SHOULD REMAIN ON.

ALTER THE TWO NUMBERS OP. AND READ OP. INST. AT LOCATION 444-446 TO F 1 2 AND REPEAT THE PROCEDURE. THE SAME RESULTS SHOULD OCCUR.

E) 1404 CHECK-OUT:

WITH T-CASTING IN PLACE ON THE FORMS SIDE, PERFORM THE STEPS LISTED IN SECTION 1D. WHEN THESE CHECKS HAVE BEEN COMPLETED, SHIFT T-CASTING TO CARD FEED SIDE. MANUALLY ENTER THE FOLLOWING PROGRAM STARTING AT LOCATION 444.

```
F 1 B 444   B 450
```

PLACE BLANK CARDS IN THE HOPPER. START THE PROGRAM AT LOCATION 444. WHEN CARDS BEGIN ARRIVING IN THE STACKER DEPRESS STOP KEY RESTART THE PROGRAM AT LOCATION 450. BOTH THE CPU METER AND THE 1404 METER SHOULD RUN.

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34. (CONTINUED)

DEPRESS STOP KEY. BOTH METERS SHOULD STOP. SWITCH TO CE MODE ON THE CPU METER PANEL. DEPRESS START KEY. ONLY THE CE METER SHOULD RUN. DEPRESS STOP KEY. SWITCH BACK TO CUSTOMER MODE. REMOVE CARDS FROM HOPPER AND PERFORM A NON-PROCESS RUN-OUT. DEPRESS CHECK RESET ON THE 1404. DEPRESS START KEY. ONLY THE CPU METER SHOULD RUN. DEPRESS STOP KEY. CPU METER SHOULD STOP.

F) TAPE DRIVE CHECK-OUT:

ENTER THE FOLLOWING PROGRAM STARTING IN LOCATION 444.

444

M % U 1 453 W B 452 _ (USE CE TAPE).

LOAD TAPE ON TAPE DRIVE 1 AND LEAVE DRIVE IN AN "NOT READY STATUS". START PROGRAM AT 444. ONLY CPU METER SHOULD RUN.

MAKE DRIVE 1 READY. BOTH METERS SHOULD RUN. DEPRESS RESET KEY ON TAPE DRIVE. BOTH METERS SHOULD CONTINUE TO RUN.

DEPRESS STOP KEY. BOTH METERS SHOULD STOP. SWITCH TO CE MODE ON 1401 METER. DEPRESS START KEY. ONLY CE METER SHOULD RUN. DEPRESS STOP KEY. CE METER SHOULD STOP. SWITCH BACK TO CUSTOMER MODE. REWIND TAPE DRIVE AND MAKE READY. DEPRESS START KEY. ONLY CPU METER SHOULD RUN. DEPRESS STOP KEY. RESTART PROGRAM AT 444. DEPRESS STOP KEY. UNLOAD TAPE DRIVE. DEPRESS START KEY. ONLY CPU METER SHOULD RUN.

REPEAT THIS PROCEDURE FOR EACH DRIVE ON THE SYSTEM.

G) 1311 CHECK-OUT:

WITH ALL 1311 DRIVES ON THE SYSTEM UNLOADED AND ALL METER SWITCHES ON THE DRIVES OFF, START THE PROGRAM AT LOCATION 450 (450=B 450). ONLY THE CPU METER SHOULD RUN. DEPRESS STOP KEY. TURN ON METER SWITCH ON ALL FILES ON THE SYSTEM. LOAD A DISK PACK ON A DRIVE AND MAKE THE DRIVE READY. DEPRESS SYSTEM START KEY. BOTH CPU METER AND 1311 METERS SHOULD RUN. (MASTER AND SAT WITH PACK ON ONLY). WITH CPU STILL RUNNING, TURN ALL METER SWITCHES OFF. METERS SHOULD CONTINUE TO RUN UNTIL STOP KEY IS DEPRESSED. WITH ALL METER SWITCHES OFF, DEPRESS START KEY. ONLY CPU METER SHOULD RUN. DEPRESS STOP KEY. TURN ALL METER SWITCHES ON. SWITCH TO CE MODE ON CPU METER PANEL. DEPRESS START KEY. ONLY CE METER SHOULD RUN. DEPRESS STOP KEY. SWITCH BACK TO CUSTOMER MODE. UNLOAD DRIVE THAT HAS PACK ON IT. DEPRESS START KEY. ONLY CPU METER SHOULD RUN. DEPRESS STOP KEY.

H) 1405 CHECK-OUT:

TURN METER SWITCH ON THE 1405 TO THE OFF POSITION. START PROGRAM AT LOCATION 450 (B 450). ONLY CPU METER SHOULD RUN. DEPRESS STOP KEY. TURN METER SWITCH ON 1405 TO THE ON POSITION. DEPRESS START KEY. BOTH METERS SHOULD RUN. DEPRESS STOP KEY. BOTH METERS SHOULD STOP. SWITCH TO CE MODE ON CPU METER PANEL. DEPRESS START KEY. ONLY CE METER SHOULD RUN. DEPRESS STOP KEY. SWITCH BACK TO CUSTOMER MODE.

I) 1407 CHECK-OUT:

TURN THE METER ON-OFF SWITCH ON THE 1407 TO THE OFF POSITION. START THE BRANCH LOOP PROGRAM AT LOCATION 450. ONLY THE CPU METER SHOULD RUN. DEPRESS STOP KEY. TURN METER ON-OFF SWITCH TO THE ON POSITION. DEPRESS START KEY. BOTH METERS SHOULD RUN. DEPRESS STOP KEY. SWITCH TO CE MODE ON THE CPU METER PANEL. DEPRESS START KEY. ONLY THE CE METER SHOULD RUN. DEPRESS TOP KEY. SWITCH BACK TO CUSTOMER MODE. DEPRESS START KEY. BOTH METERS SHOULD RUN. TURN THE METER ON-OFF SWITCH TO THE OFF POSITION. BOTH METERS SHOULD CONTINUE RUNNING. DEPRESS STOP KEY, THEN START KEY. ONLY THE CPU METER SHOULD RUN. DEPRESS STOP KEY. TURN METER ON-OFF SWITCH TO OFF POSITION. PLACE MODE SWITCH IN ALTER POSITION. TRY TO ENTER INFORMATION IN STORAGE USING TYPEWRITER KEYBOARD. SHOULD BE LOCKED UP.

J) ALL SERIAL I/O DEVICES:

MAKE I/O DEVICE READY. ENTER A PROGRAM TO CALL FOR THE I/O DEVICE FOLLOWED BY A BRANCH LOOP. EXAMPLE:

```
      444
M % XXXXXWB452
```

START THE PROGRAM RUNNING. BOTH CPU METER AND THE I/O METER SHOULD RUN. DEPRESS STOP KEY. BOTH METERS SHOULD STOP. SWITCH TO CE MODE ON THE CPU METER PANEL. DEPRESS START KEY ONLY. THE CE METER SHOULD RUN. DEPRESS STOP KEY. SWITCH BACK TO CUSTOMER MODE. CLEAR THE I/O DEVICE. (EXAMPLE; 1012--DEPRESS TAPE FEED KEY). DEPRESS START KEY. ONLY CPU METER SHOULD RUN. DEPRESS STOP KEY.

REFERENCE MATERIAL
FOR 60 CYCLE SYSTEMS ONLY

1.0 TO CHANGE THE SYSTEM FROM 208V TO 230V COMPLETE THE FOLLOWING:

1401

A) EXPANDED BULK REGULATOR (ALL MODELS EXCEPT A)
GATE 02A3 - MOVE WIRE OR WIRES ON BULK REGULATOR TB-4 TO TB-5.

B) 1250 WATT REGULATOR. LOCATED IN THE LEFT SIDE OF THE 1402. ON MODEL D SYSTEMS LOCATED ON GATE 02A7. MOVE THE WIRE ON THE 1250 WATT REGULATOR TB-4 TO TB-5.

C) 115V AC ISOLATION TRANSFORMER. LOCATED BEHIND THE RELAY PANEL ASSEMBLY IN THE 1402. ON MODEL D SYSTEMS LOCATED IN 02B7-8 GATE AREA. REMOVE THE WIRE ON THE TRANSFORMER SOLDER TERMINAL 6 AND SOLDER TO TERMINAL 7. ON LATER MODEL D MACHINES TERMINAL 7 IS WIRED TO TERMINAL POSITION 7 OF THE 8 POSITION BLOCK NEAR THIS TRANSFORMER. ON THESE MACHINES REMOVE THE WIRE ON TERMINAL POSITION 6 OF THIS BLOCK AND INSTALL ON TERMINAL 7.

D) 24V AC STEP DOWN TRANSFORMER. LOCATED IN THE 1402 BEHIND THE FUSE PANEL. (DOES NOT EXIST ON SYSTEMS BELOW 20.000) ON MODEL D SYSTEMS LOCATED IN 02B7 GATE AREA. REMOVE THE WIRE ON STEP DOWN TRANSFORMER TB POSITION 2 AND INSTALL ON TB POSITION 3.

E) -60V AT 10 AMP OR -60V AT 20 AMP SUPPLY. LOCATED IN THE BACK OF THE 1402. ON MODEL D MACHINES LOCATED IN GATE AREA 01B4. REMOVE WIRE FROM VR1-4 AND INSTALL ON VR1-5. (VR1 IS THE 12 POSITION TERMINAL BLOCK LOCATED TO THE BOTTOM OF THIS UNIT.)

F) 3V MARGINAL CHECK SUPPLY. (EXCEPT PORTABLE SUPPLIES) LOCATED IN THE LEFT END OF THE 1402. LOCATED IN GATE 02A8 ON MODEL D. REMOVE WIRE ON MC POWER SUPPLY POSITION VR1-4 AND INSTALL ON POSITION VR1-5. (THIS WIRING CHANGE IS MADE INTERNALLY OF THE SUPPLY ASSEMBLY DIRECTLY ON THE TRANSFORMER.)

1406

A) 415 WATT REGULATOR IN 1406 GATE 06B8. (NOT ON EARLIER SYSTEMS) REMOVE WIRE FROM TB POSITION 4 AND INSTALL ON TB POSITION 5.

1403

A) ONLY THE CHAIN MOTOR IS AFFECTED. WIRE TB7 AS PER WIRING DIAGRAM PAGE 01.09.1.

1405

A) CHANGE TRANSFORMER TAPS FOR 3 TRANSFORMERS AS SHOWN ON LOGIC PAGES 75.58.11 AND 75.58.21.

1407

A) NO CHANGE REQUIRED.

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7330

A) REFER TO 729 SERVICE AID CEM - NUMBER 246.

729

A) ADD F/E 352075. THIS BILL INCLUDES A 230V TO 208V STEPDOWN TRANSFORMER.

1311

MOD IV AND MOD II

REFER TO CUSTOMER ENGINEERING REFERENCE MANUAL SUPPLEMENT (NUMBER 227-5758-X) FIGURE 1-3.

METER DEVICES

A) METER POWER SUPPLY (ALL CONFIGURATIONS ONLY THE INPUT AC POWER TO THE TRANSFORMER IS CHANGED. MOVE WIRE FROM TB-AC-4 TO TB-AC-5.

1.01 FOR 50 CYCLE SYSTEMS ONLY

1401

A) IF IT IS NECESSARY TO CHANGE THE 1402 OR ON MODEL D THE 1401 FROM 220V TO 380 V AND VICE VERSA REFER TO FBM 4064750.

1406

A) NO CHANGE REQUIRED.

1403

A) LOOK FOR FBM 4121780

1405

A) LOOK FOR DESCRIPTION NO. 4064211 EN AND FO R WIRING DIAGRAM NO. 4064220.

1407

A) NO CHANGE REQUIRED.

7330

A) LOOK FOR WIRING DIAGRAM 73.50.20.2 PART NO. 2092503.

729

A) IF IT IS NECESSARY TO CHANGE TO 220V LOOK FOR 8013923.
IF IT IS NECESSARY TO CHANGE TO 380V LOOK FOR 8013924.

1311

A) MACHINE HAS A SEPERATE POWER CORD AND 220V SINGLE PHASE INPUT.

METER DEVICES

A) METER POWER SUPPLY ALL CONFIGURATIONS ONLY THE INPUT AC POWER TO THE TRANSFORMER IS CHANGED. MOVE WIRE FROM TB -AC-4 TO TB-AC-5. (ALWAYS 220V, NO CHANGE REQUIRED.)

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1.1 IF IT IS NECESSARY TO CHANGE THE SYSTEM FROM 230V TO 208V REVERSE THE INSTRUCTIONS IN STEP 1.0 ABOVE.

1.2 IF A VOLTAGE CHANGE IS MADE ON THE SYSTEM ENTER AN MES ORDER SO THAT RECORDS WILL BE PROPERLY UPDATED.

1.3 PROCEED NEXT TO STEP 16.

2.0 RUN PRINTER WITH PROCESS UNIT WITH NO INFORMATION IN THE PRINT AREA.

2.1 IF THE 1401 MACHINE NO. IS 10000-20000, PROCEED NEXT TO STEP 2.3.

2.2 IF THE 1401 MACHINE NO. IS 20000-AND ABOVE, SKIP STEP 2.3 AND PROCEED NEXT TO STEP 2.4.

2.3 TEST RESET CHECK CIRCUIT AS FOLLOWS:

A) CLEAR THE ENTIRE PRINT AREA AND EXECUTE A PRINT OPERATION WITH THE SCOPE SYNC ON C17N +U NOT FIRST SCAN GOING PLUS ON 36.35.11.1 (01A6).

B) SCOPE BO3N AND BO4N ON GATE 01B5, LOGIC 36.37.51.1 SHOULD GO TO +T WHEN NOT PRINTING AND -T WHEN PRINTING. SCOPE DO3H, G AND DO4G LOGIC 36.37.41.1 AND CO4H, G AND DO4H LOGIC 36.39.91.1 THEY SHOULD BE AT +T WHEN NOT PRINTING. WHEN PRINTING, THEY WILL GO +T IN THE HALF OF A SUBSCAN JUST PRIOR TO THE TIME 1/6 OF THE HAMMERS MAY BE OPTIONED TO PRINT (SIX RESETS PER PRINT SCAN).

C) SCOPE PIN E OF TRIGGER IN E21 ON 01B5, LOGIC 36.37.51.1 SHOULD TURN ON (GO TO +U) 110 USEC AFTER SYNC GOES POSITIVE. SHOULD TURN OFF 220 USEC AFTER IT TURNS ON. PATTERN SHOULD REPEAT ITSELF EVERY 555 USEC WHILE PRINTING.

D) SCOPE PIN E OF TRIGGER IN F20 ON 01B5, LOGIC 36.37.51.1 SHOULD TURN ON (GO TO +U) 190 USEC AFTER SYNC GOES POSITIVE. SHOULD TURN OFF 220 USEC AFTER IT TURNS ON. PATTERN SHOULD REPEAT ITSELF EVERY 555 USEC WHILE PRINTING.

E) IF ABOVE TRIGGERS ARE OPERATING PROPERLY, PROCEED TO STEP F. IF NOT, THE HAMMER DRIVER RESETS ARE NOT WORKING PROPERLY. CHECK LOGIC ON 36.37.41.1 TO GET RESETS WORKING PROPERLY, THEN REPEAT STEPS C AND D THEN PROCEED TO F IF C AND D ARE O.K.

F) SCOPE PIN G OF F02 ON 01B5 (LOGIC 36.37.51.1) FOR THE FOLLOWING STEPS.

G) BEING VERY CAREFUL, TIE PIN E OF TRIGGER IN E21 TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4B ON 36.37.51.1, AND PIN G OF F02 ON 01B5 SHOULD GO TO +U AND STAY THERE BECAUSE THE RESET CHECK LATCH HAS BEEN "SET" WHICH WILL HOLD ALL THE HAMMER DRIVERS RESET. AFTER REMOVING CLIP LEAD, RESET THE LATCH WITH THE I-O CHECK RESET SWITCH.

H) TIE E21H TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4C AND RESULT SHOULD BE AS FOR STEP G, RESET LATCH AS FOR STEP G.

I) TIE F20E TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4D AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

J) TIE F20H TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 4E AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

K) A WITH PRINT STORAGE - TIE E20B TO "GROUND" WITH CLIP LEAD. THIS CHECKS LOGIC BLOCK 3F AND 4F AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

B WITHOUT PRINT STORAGE - TIE F15B TO "GROUND" WITH CLIP LEAD WHILE EXECUTING A PRINT OPERATION. THIS CHECKS LOGIC BLOCK 2G AND RESULT SHOULD BE THE SAME AS FOR STEP G. RESET LATCH AS FOR STEP G.

L) A WITH PRINT STORAGE - OPEN T-FRAME ON 1403 WHILE EXECUTING THE ABOVE PRINT OPERATION WITH THE PRINT AREA CLEAR. THIS CHECKS LOGIC BLOCKS 5J AND 6J ON LOGIC 36.31.01.1 (GATE 01A6). RESULT SHOULD BE THE SAME AS FOR STEP G. RESET THE LATCH WITH THE I-O CHECK RESET SWITCH.

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