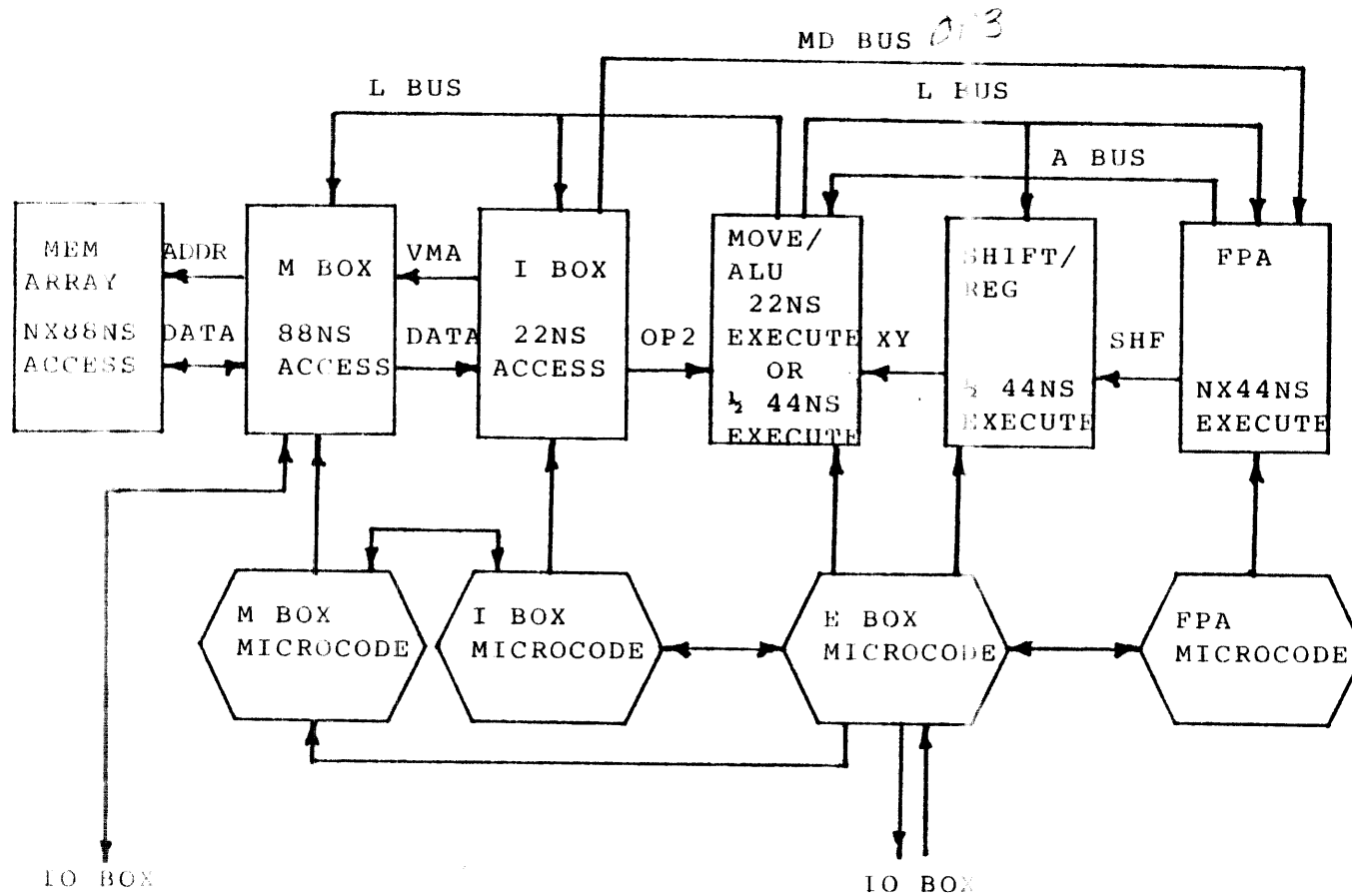


PROJECT JUPITER  
2ND LVLS  
D. HOOPER  
18 AUG 80

DEC COMPANY CONFIDENTIAL

GENERAL

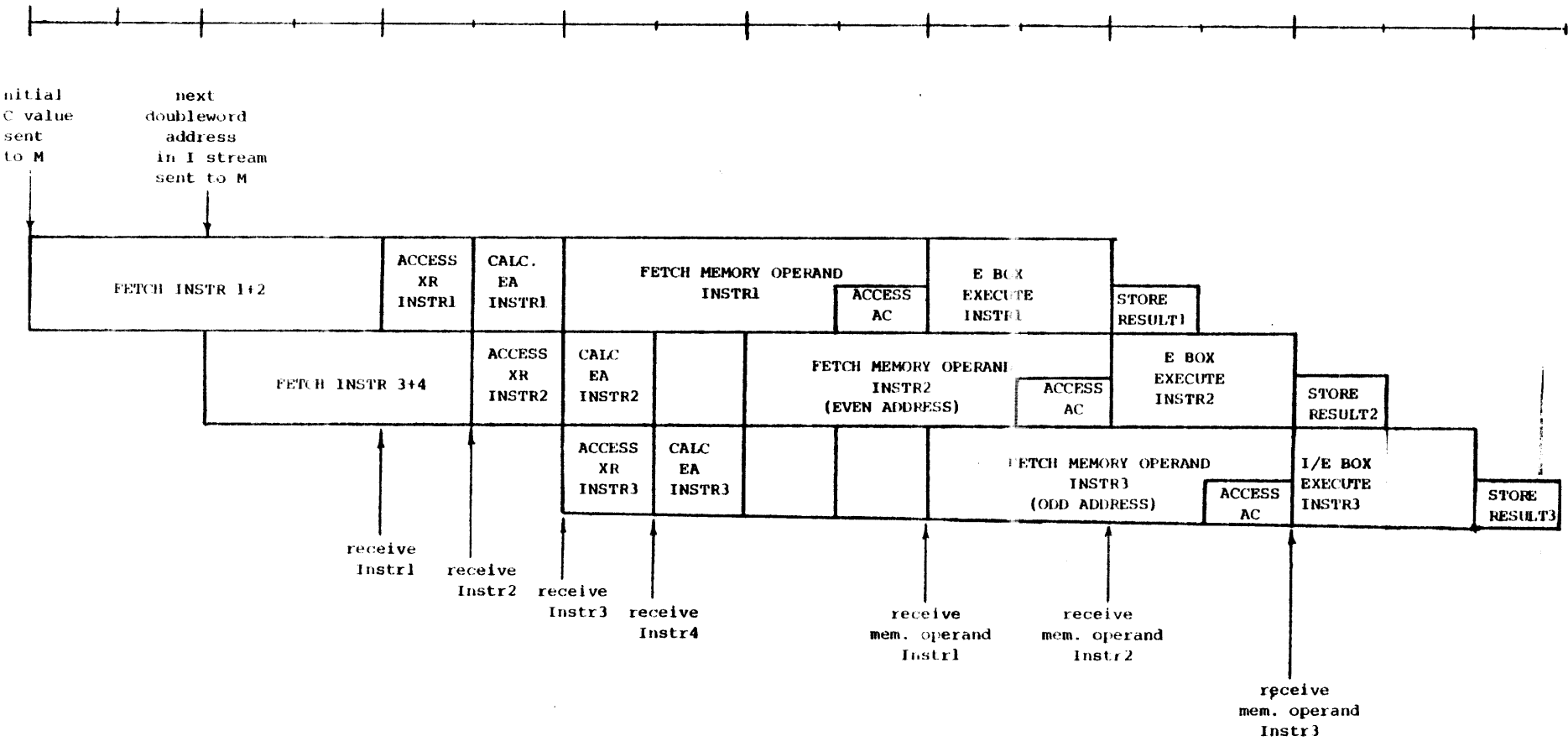


KC10/  
2080 CPU  
BLOCK FLOW

DEC COMPANY CONFIDENTIAL

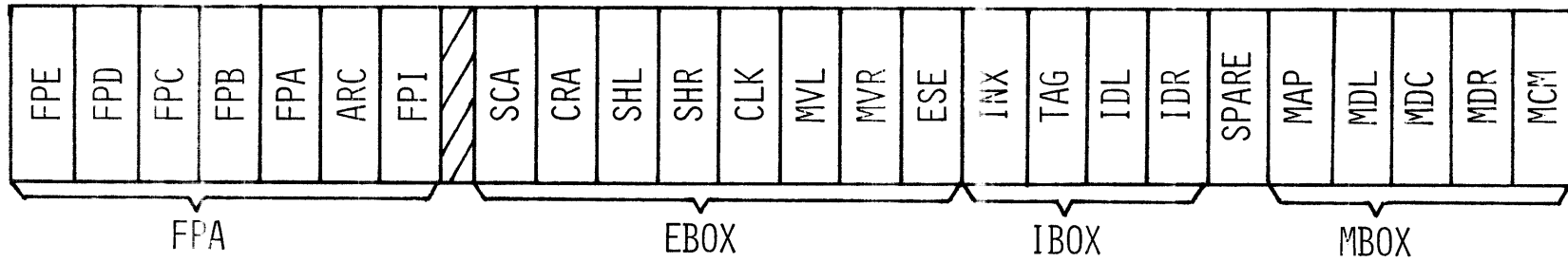
# KC10 /2080 CPU PIPELINE

22Ns



DEC COMPANY CONFIDENTIAL

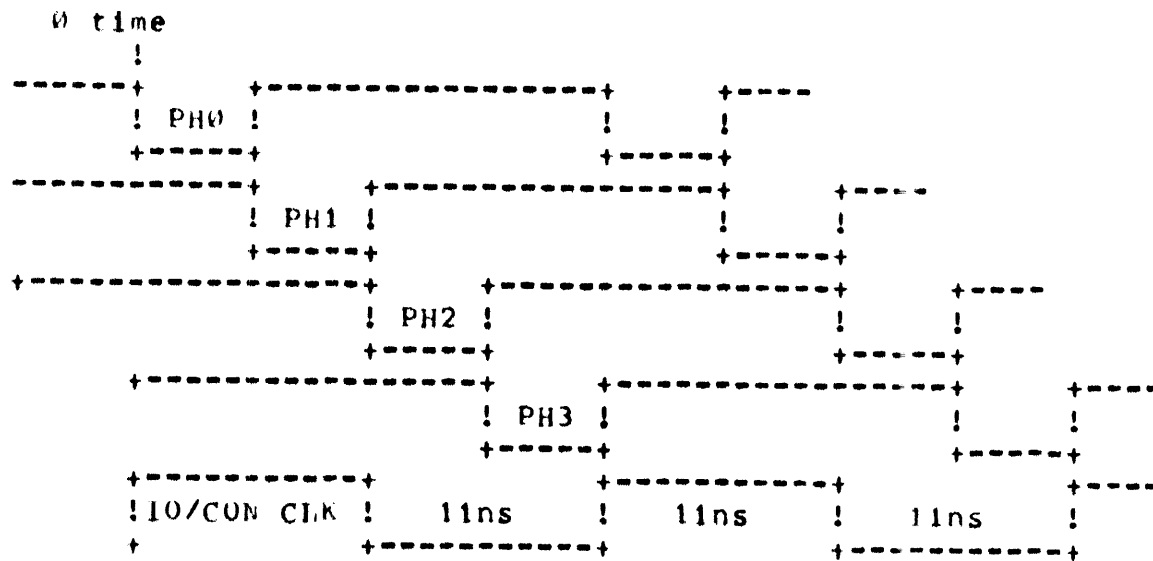
KC10/2080 CPU PARTITIONING



10 JULY 80  
D. HOOPER  
REV 18 AUG 80

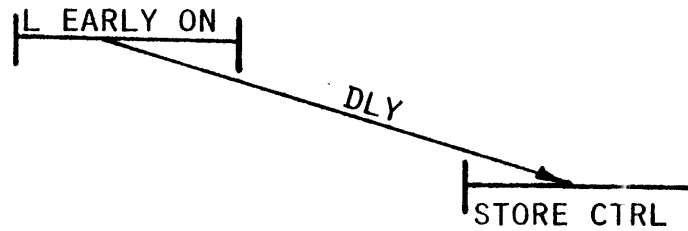
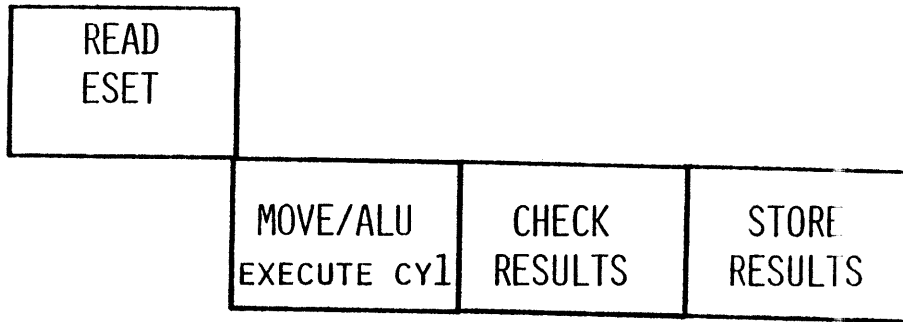
DEC COMPANY CONFIDENTIAL

# KC10/2080 CPU CLOCKS



3/6/80

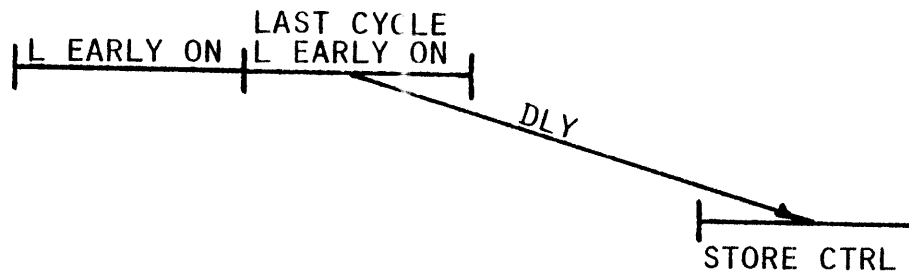
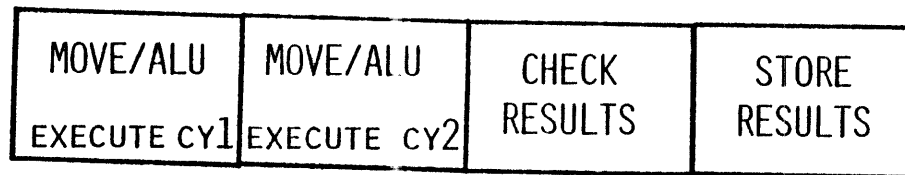
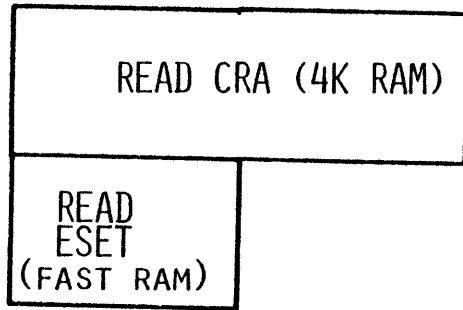
DEC COMPANY CONFIDENTIAL



22ns INSTRUCTION TIMING

3/5/80  
D.HOOPER

DEC COMPANY CONFIDENTIAL

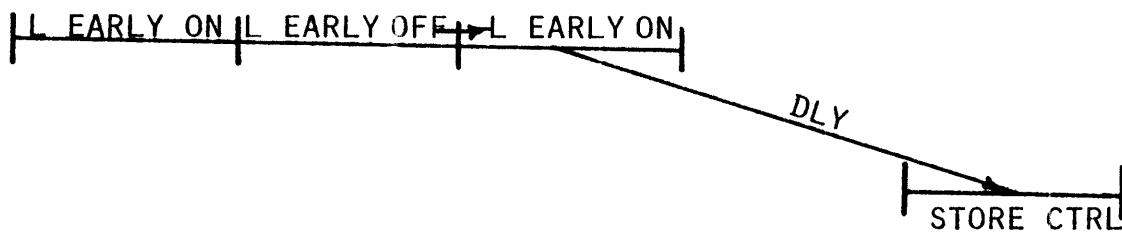
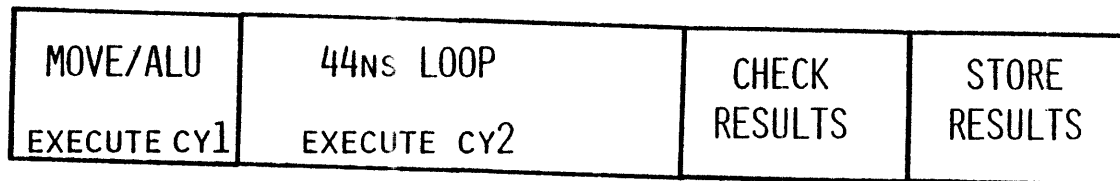
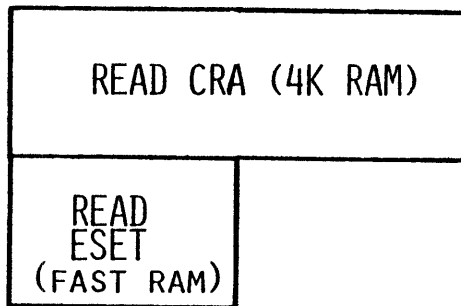


44ns INSTRUCTION TIMING

3/5/80  
D.HOOPER

DEC COMPANY CONFIDENTIAL

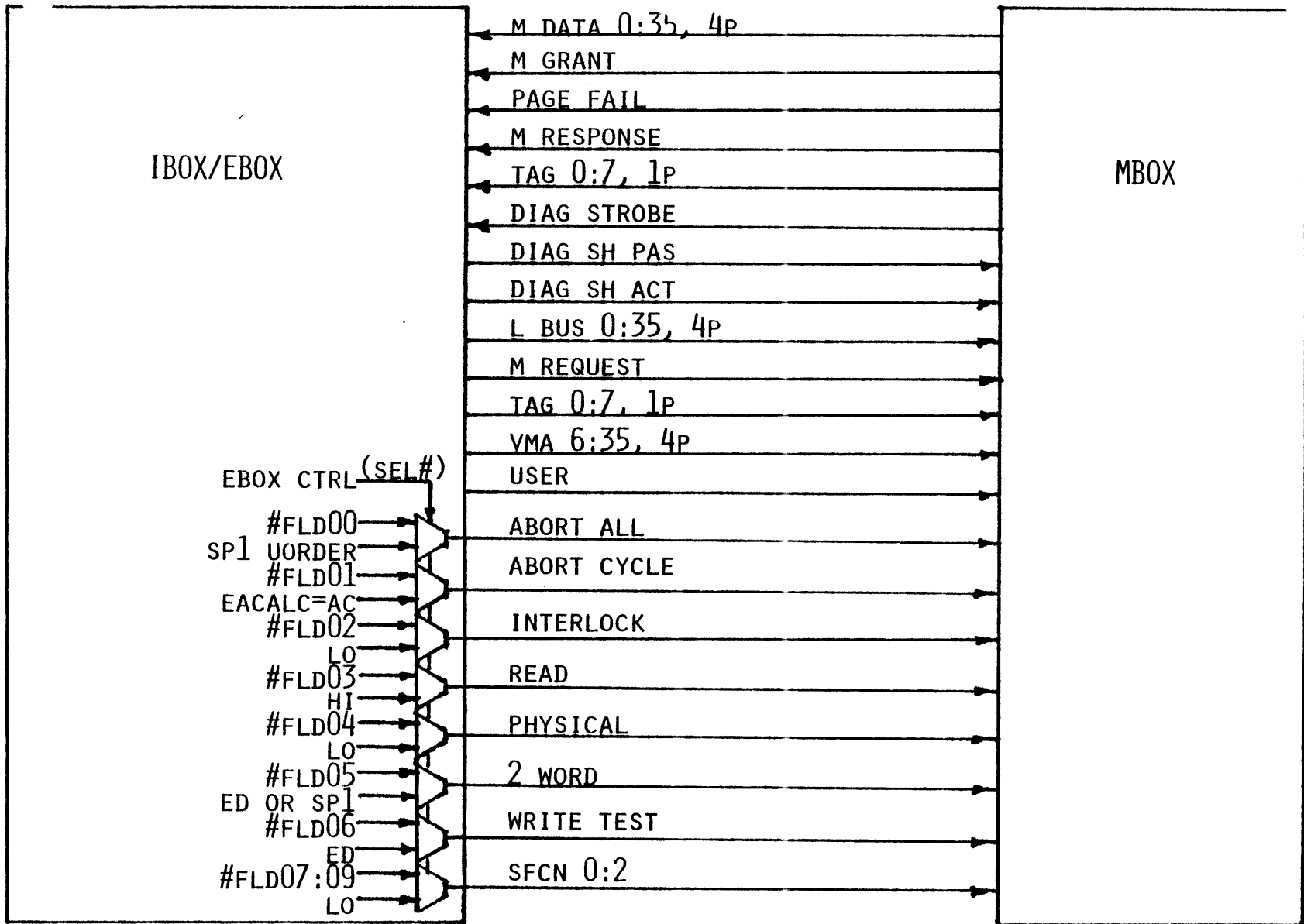




66ns INSTRUCTION TIMING

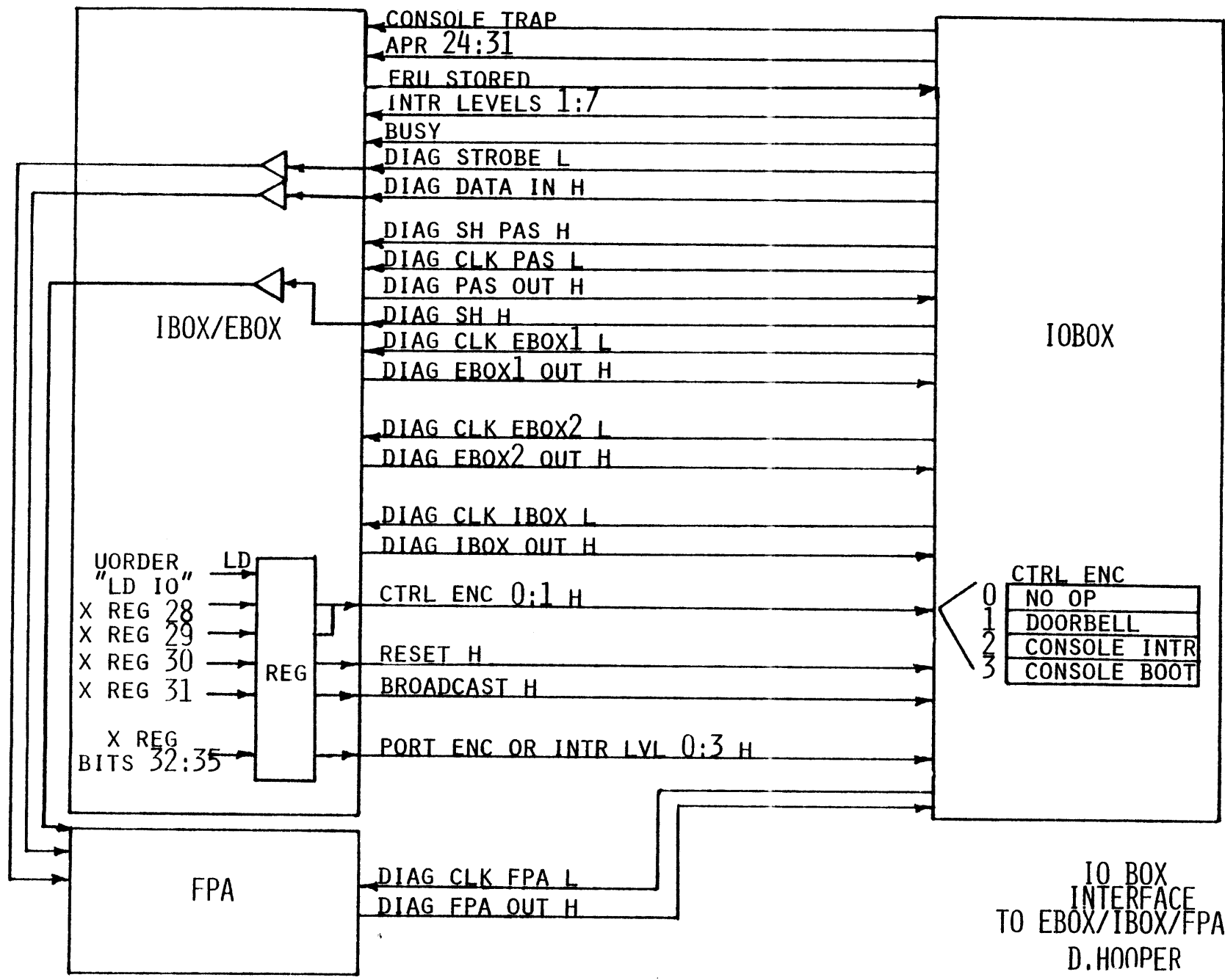
3/5/80  
D.HOOPER

DEC COMPANY CONFIDENTIAL

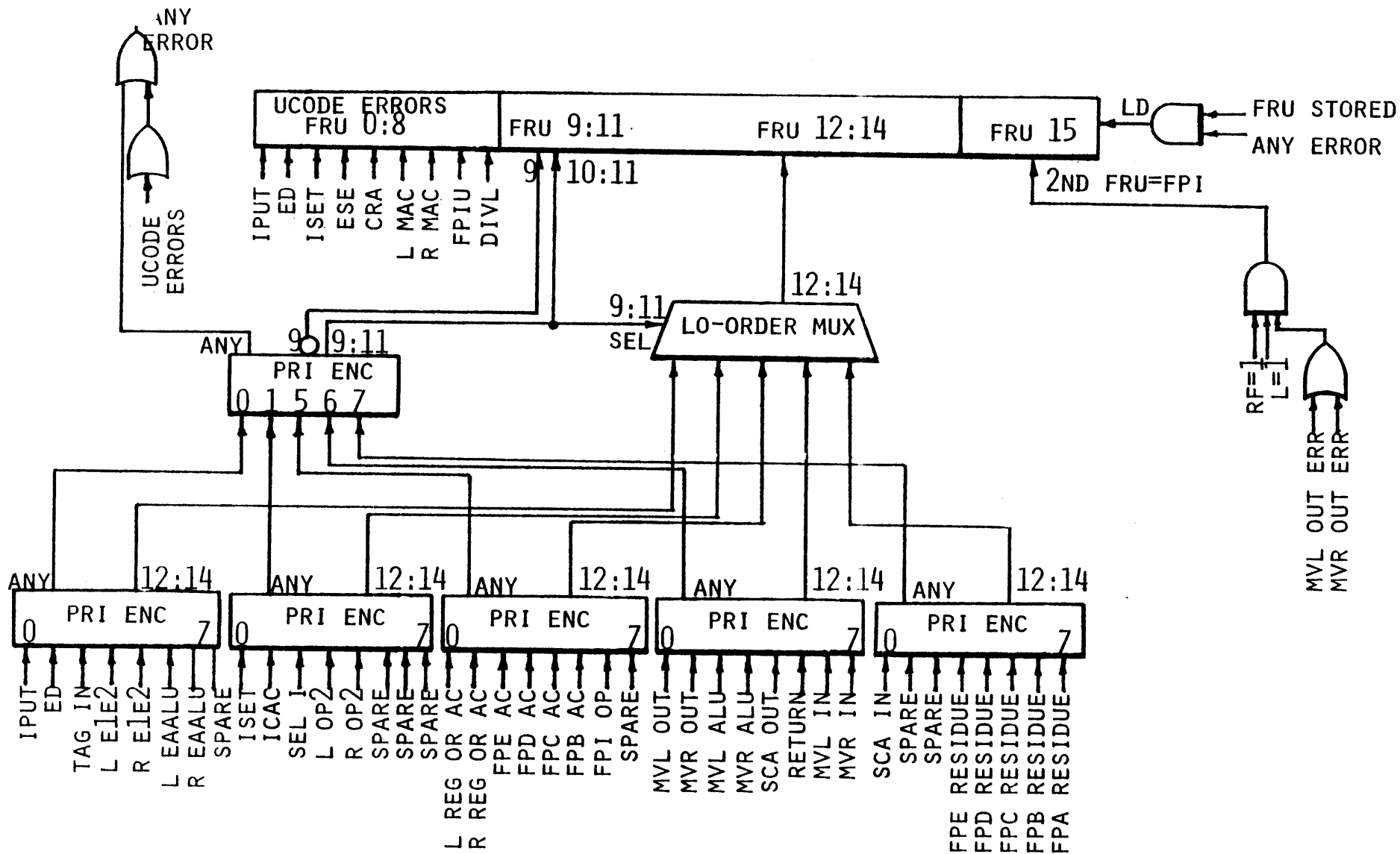


KC10/2080  
 EUNIT/MBOX INTERFACE  
 D. HOOPER  
 15AUG 80

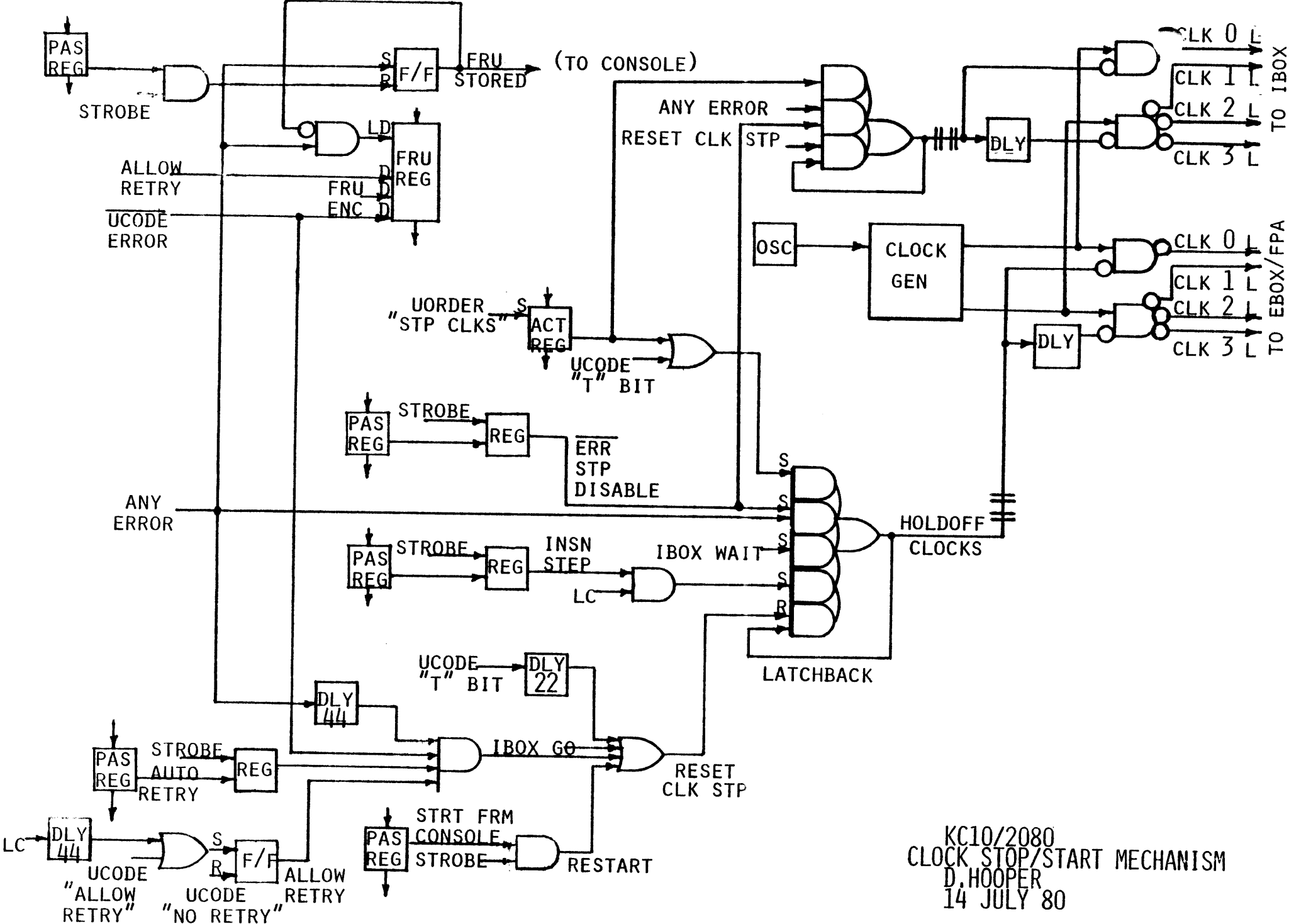
DEC COMPANY CONFIDENTIAL



IO BOX  
INTERFACE  
TO EBOX/IBOX/FPA  
D.HOOPER  
12 AUG 80

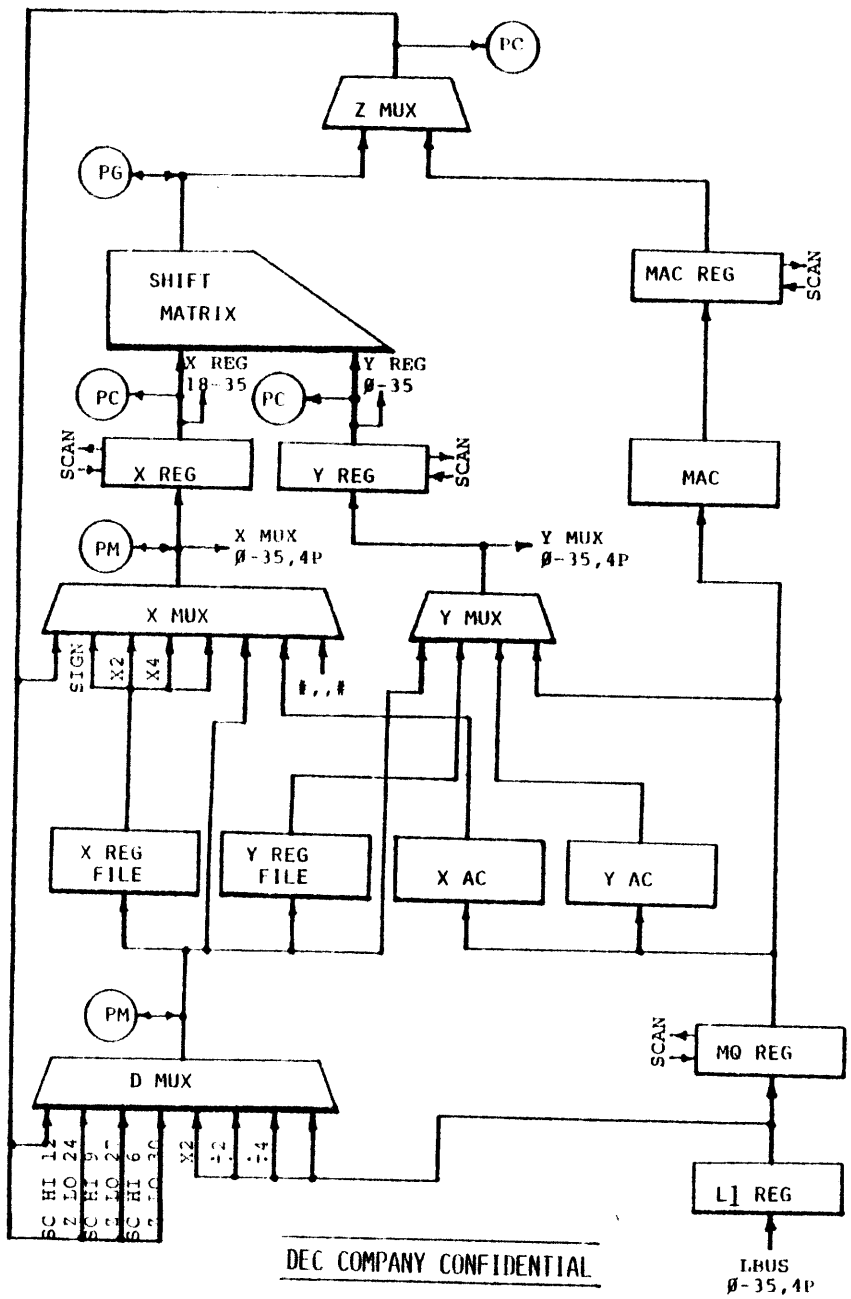


KC10/2080  
 FRU PRIORITY ENCODER  
 D. HOOPER  
 31 JULY 80

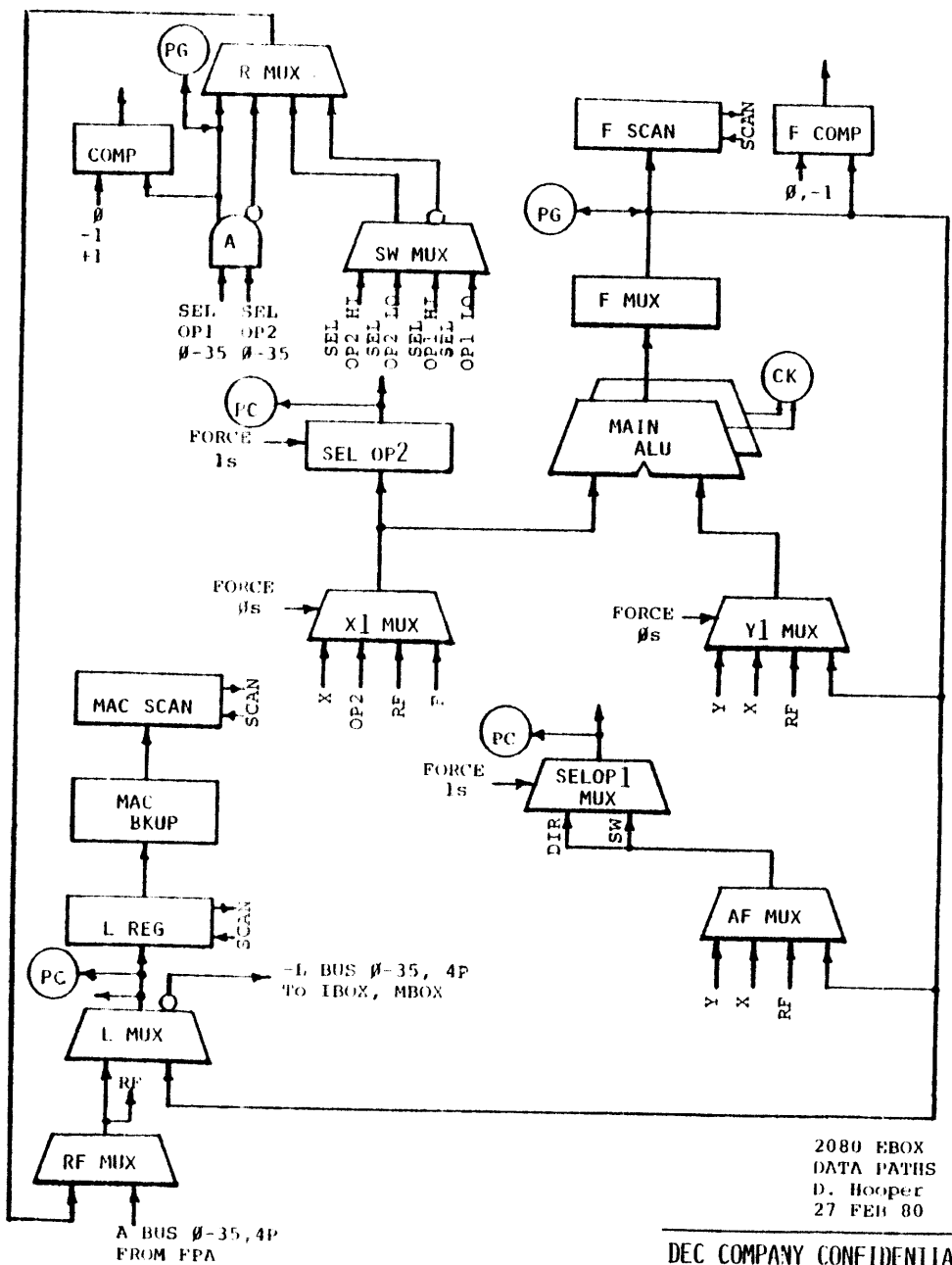


KC10/2080  
 CLOCK STOP/START MECHANISM  
 D. HOOPER  
 14 JULY 80

EBOX



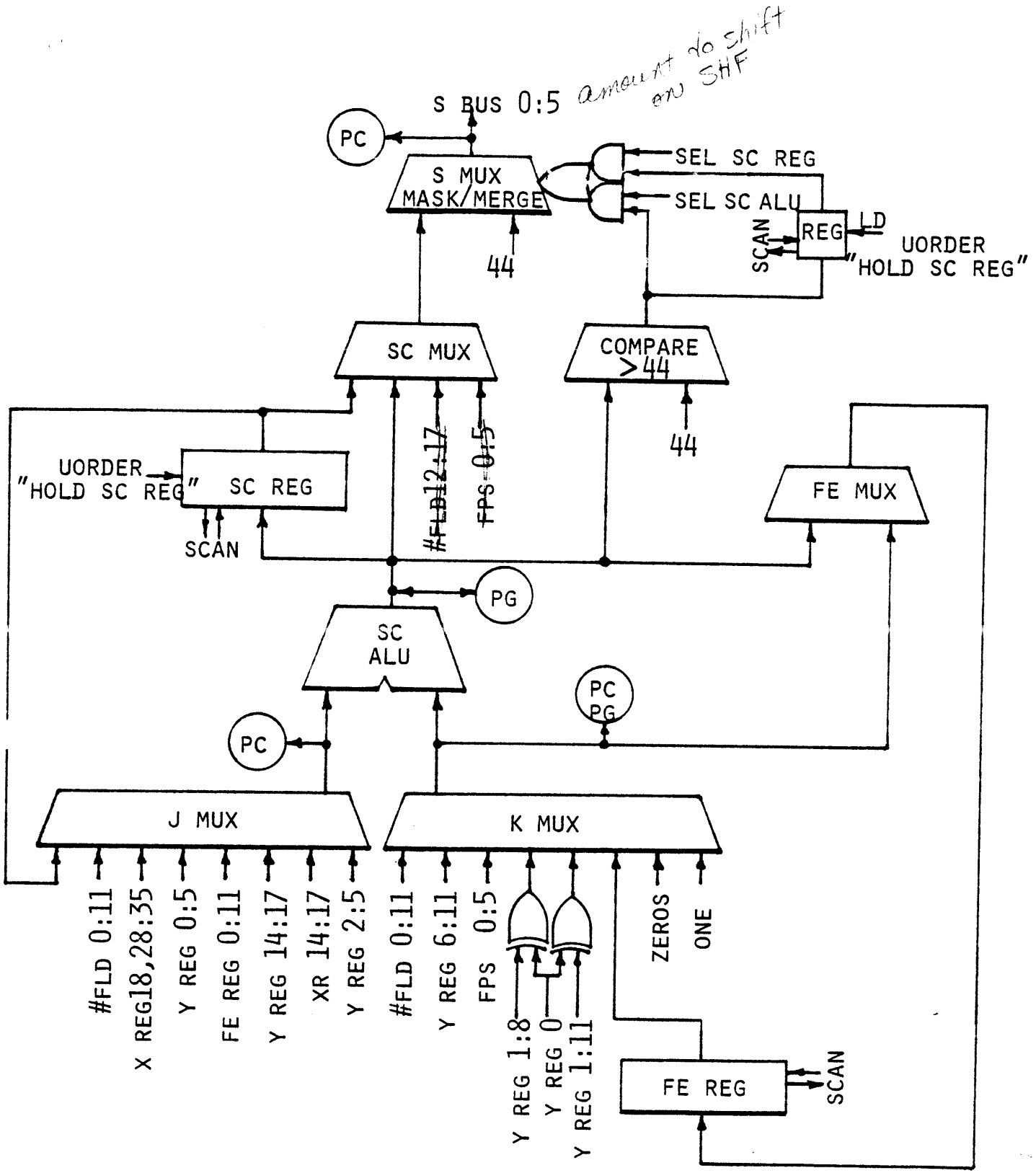
DEC COMPANY CONFIDENTIAL



2080 EBOX  
DATA PATHS  
D. Hooper  
27 FEB 80

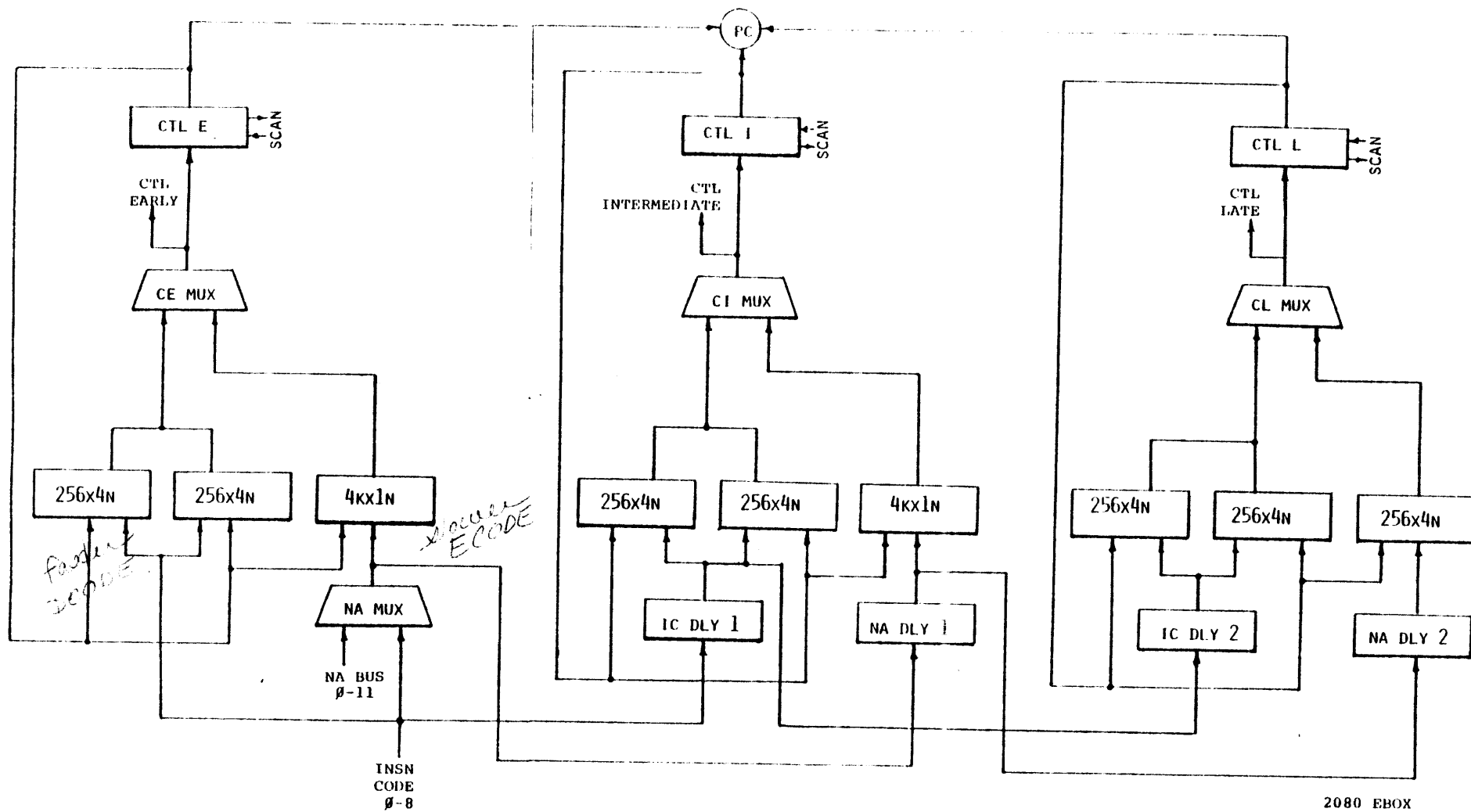
DEC COMPANY CONFIDENTIAL

*amount to shift on SHF*



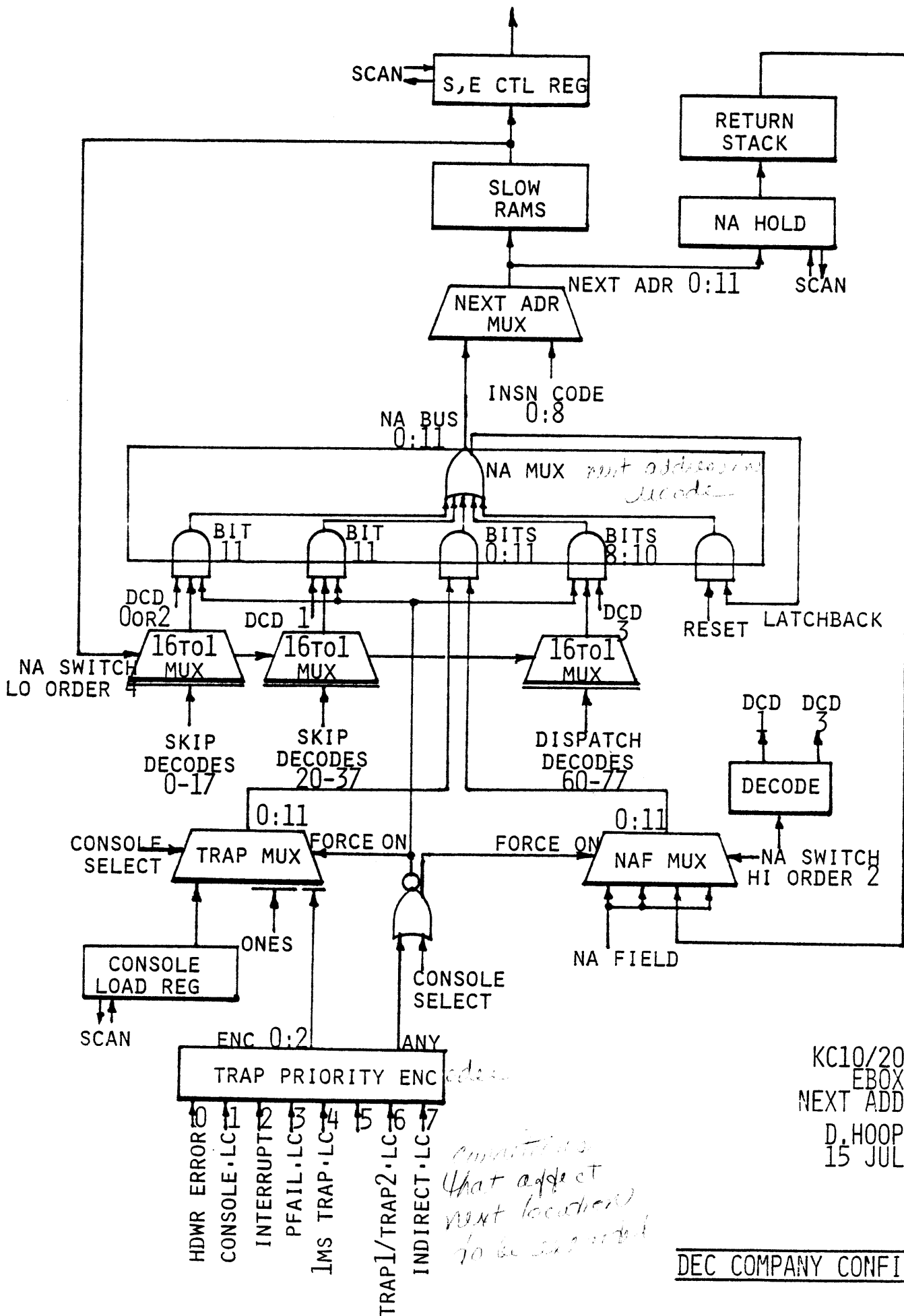
KC10/2080  
SCA  
D. HOOPER  
15 JULY 80





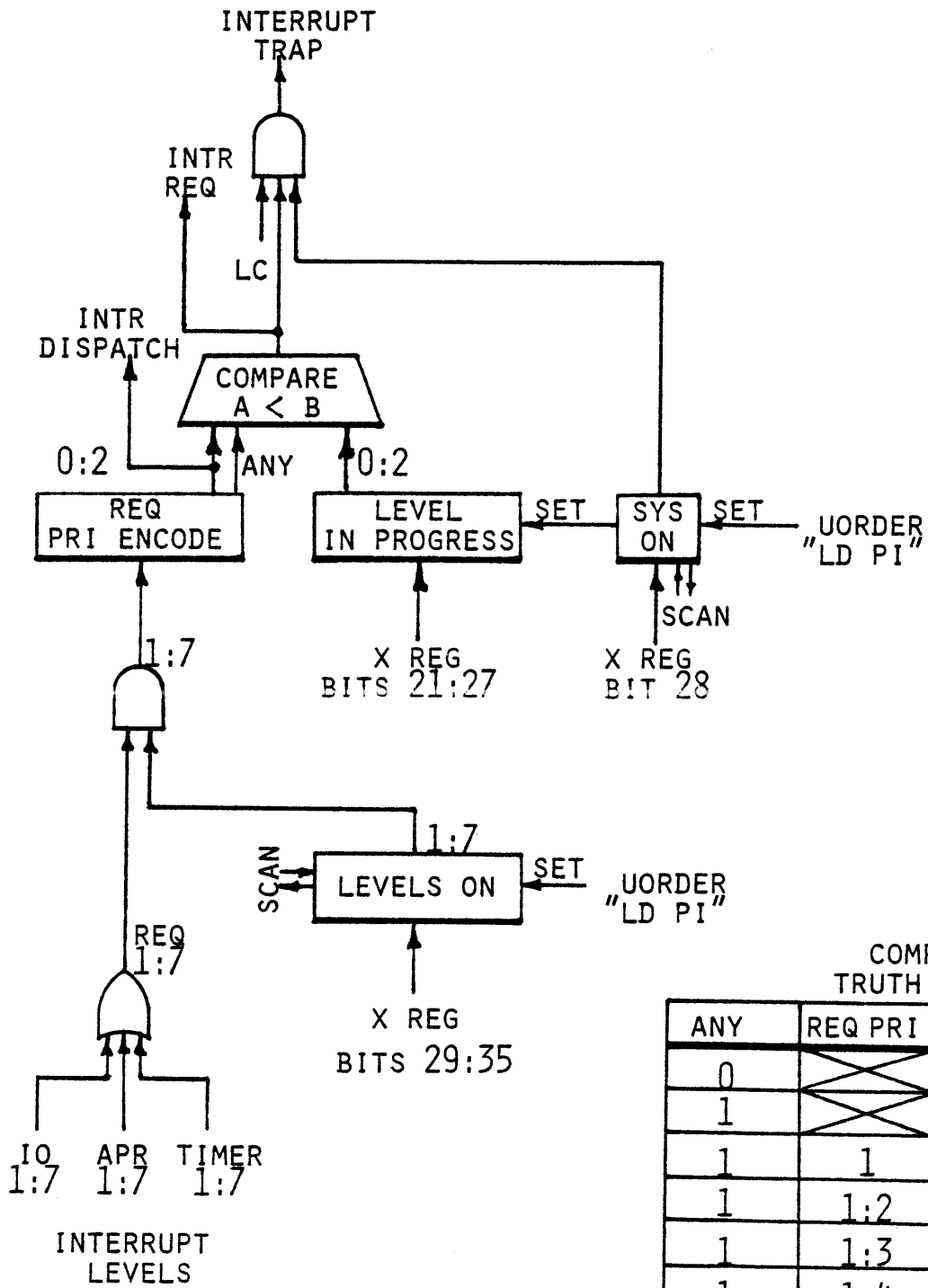
2080 EBOX  
 CTRL STORAGE  
 DON HOOPER  
 27 FEB 80

DEC COMPANY CONFIDENTIAL



*conditions that affect next location to be selected*

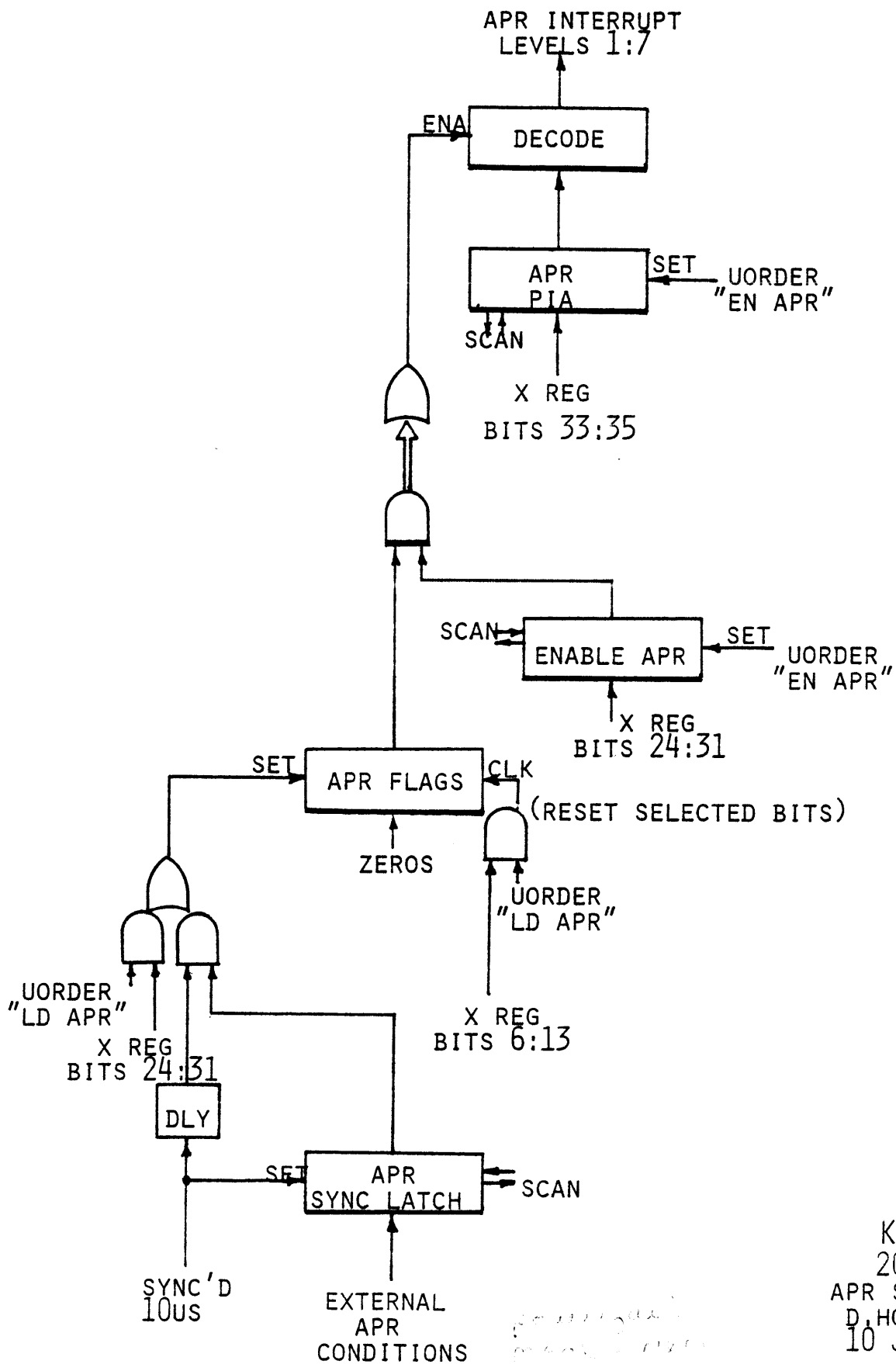
KC10/2080  
 EBOX  
 NEXT ADDRESS  
 D. HOOPER  
 15 JULY 80



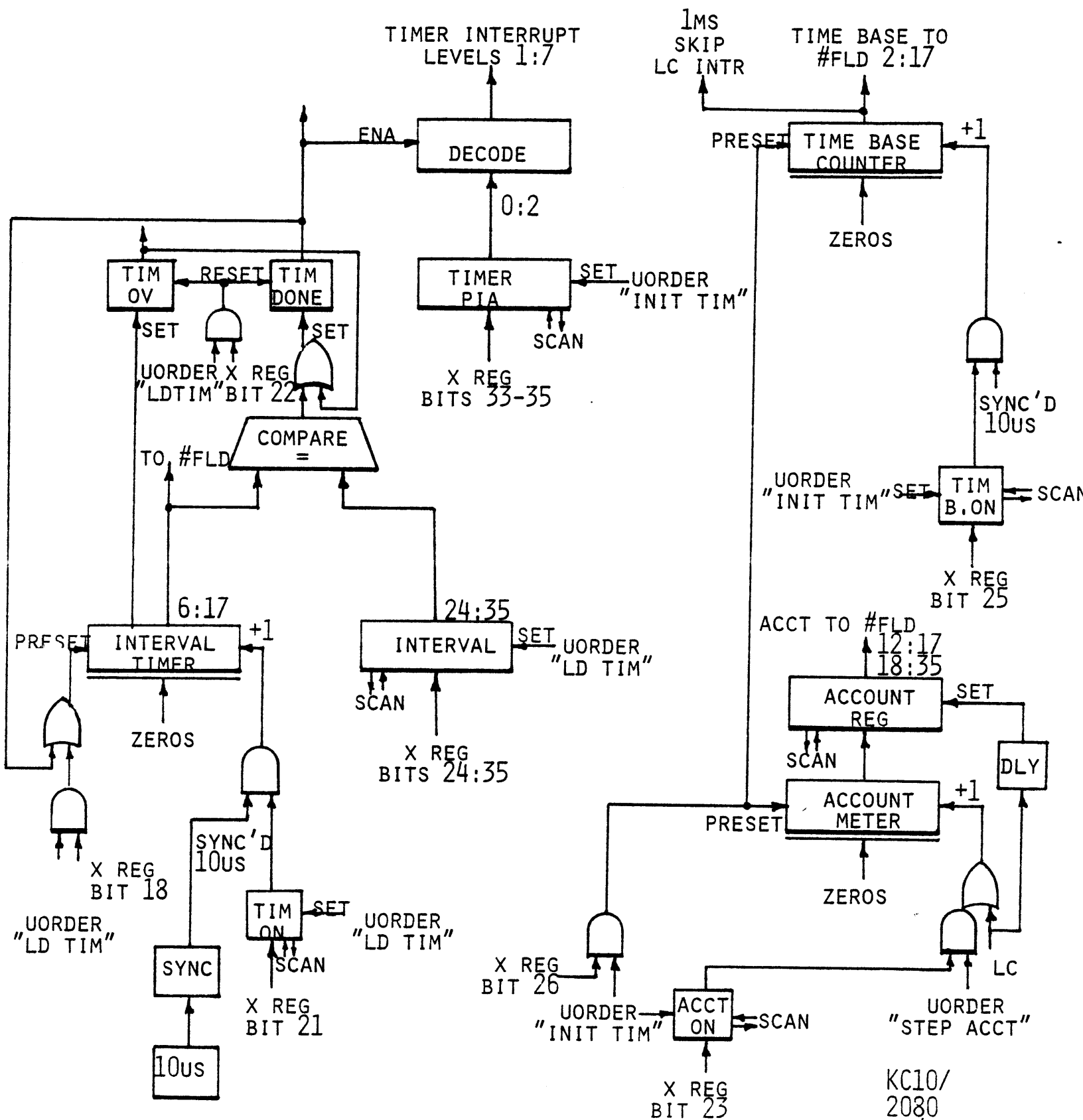
COMPARE TRUTH TABLE

ANY	REQ PRI	IN PROG	A<B
0	<del>1</del>	<del>0</del>	0
1	<del>1</del>	1	0
1	1	2	1
1	1:2	3	1
1	1:3	4	1
1	1:4	5	1
1	1:5	6	1
1	1:6	7	1
1	1:7	0	1

KC10/  
2080  
INTERRUPT SYSTEM  
D. HOOPER  
9 JULY 80

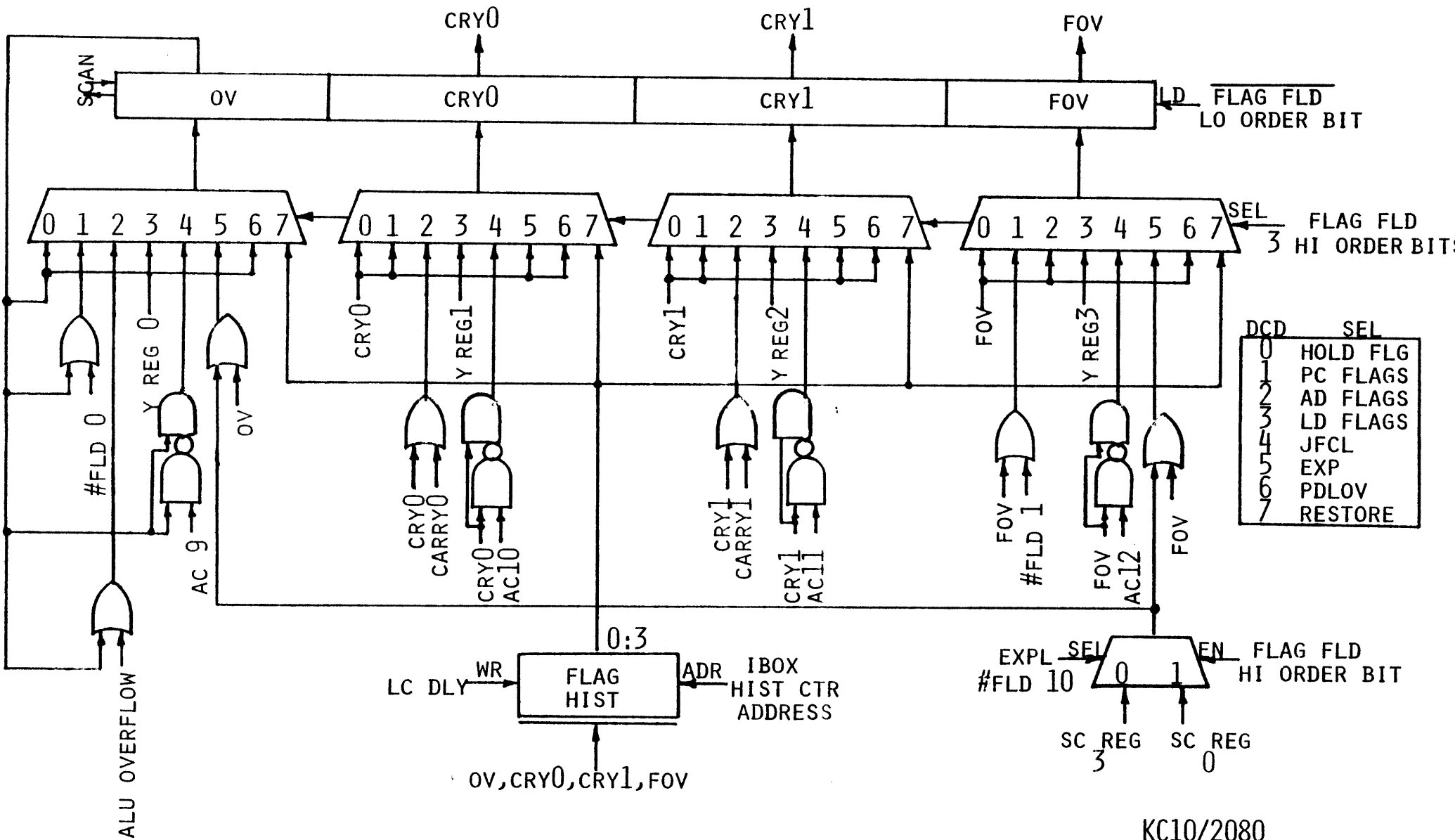


KC10/  
2080  
APR SYSTEM  
D. HOOPER  
10 JULY 80



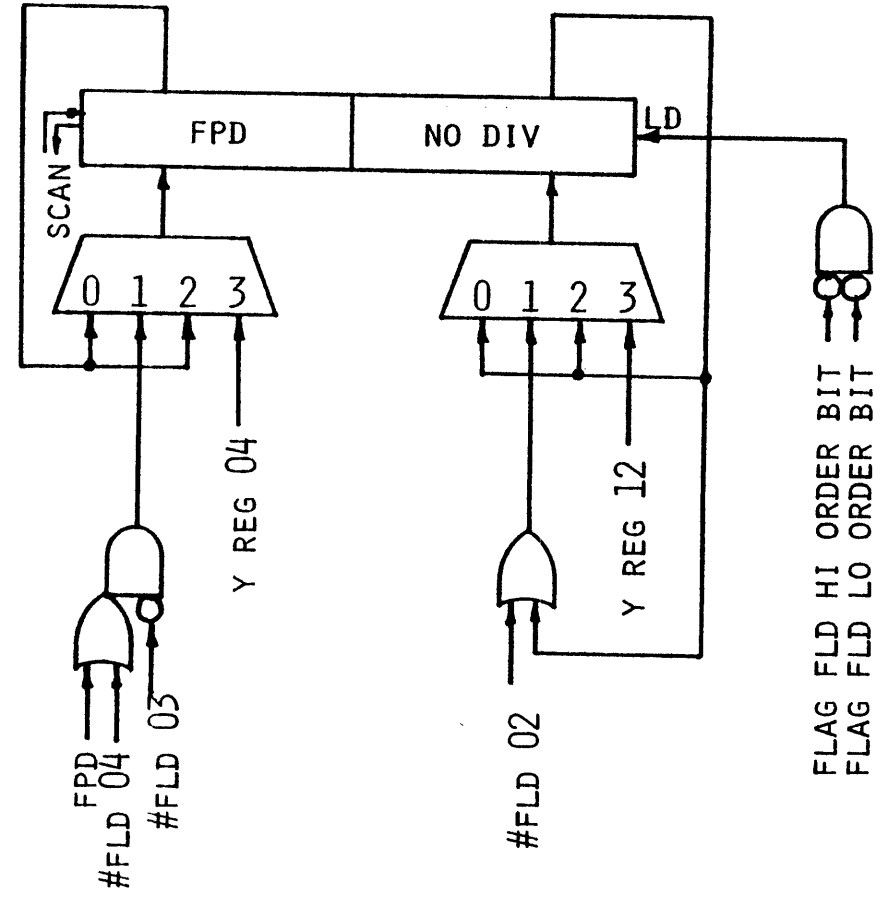
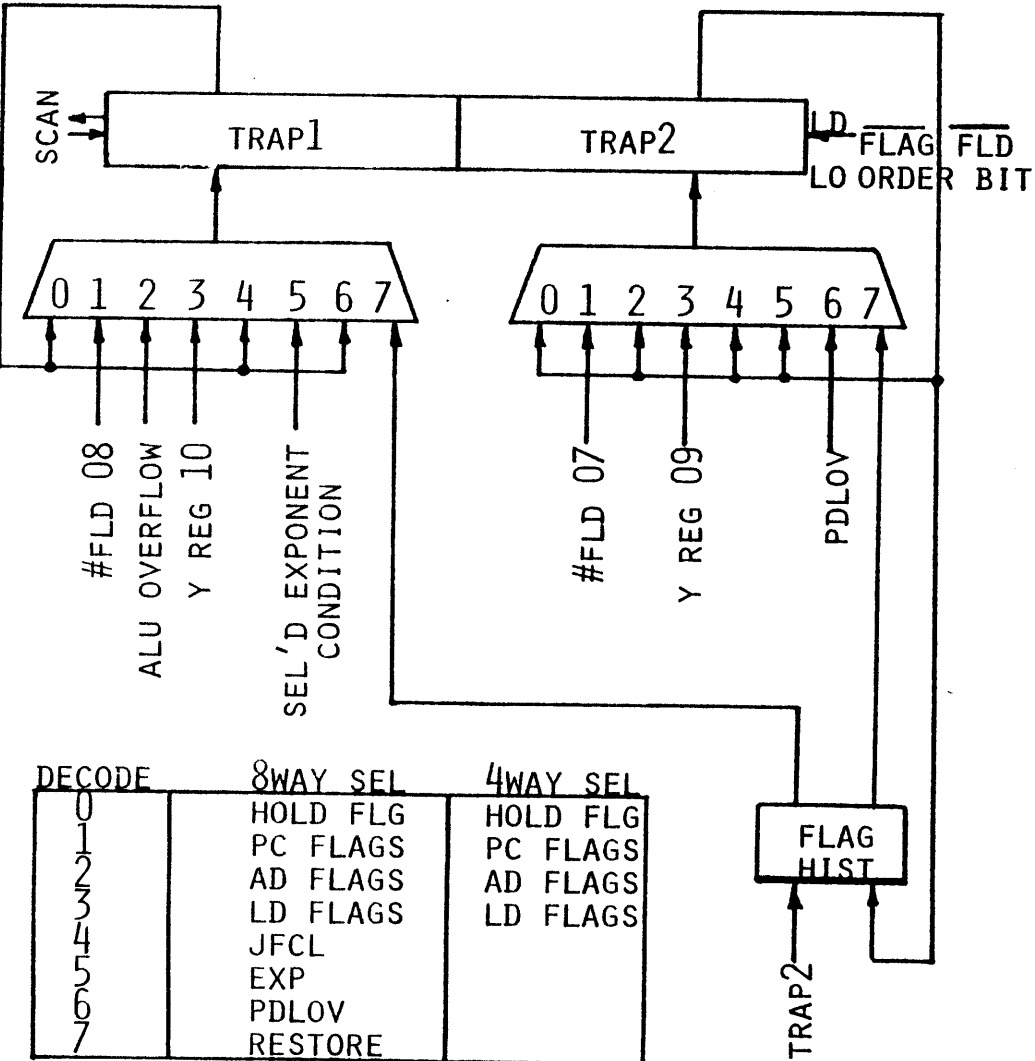
KC10/  
2080  
TIMERS/METERS  
D. HOOPER  
10 JULY 80

DEC COMPANY CONFIDENTIAL

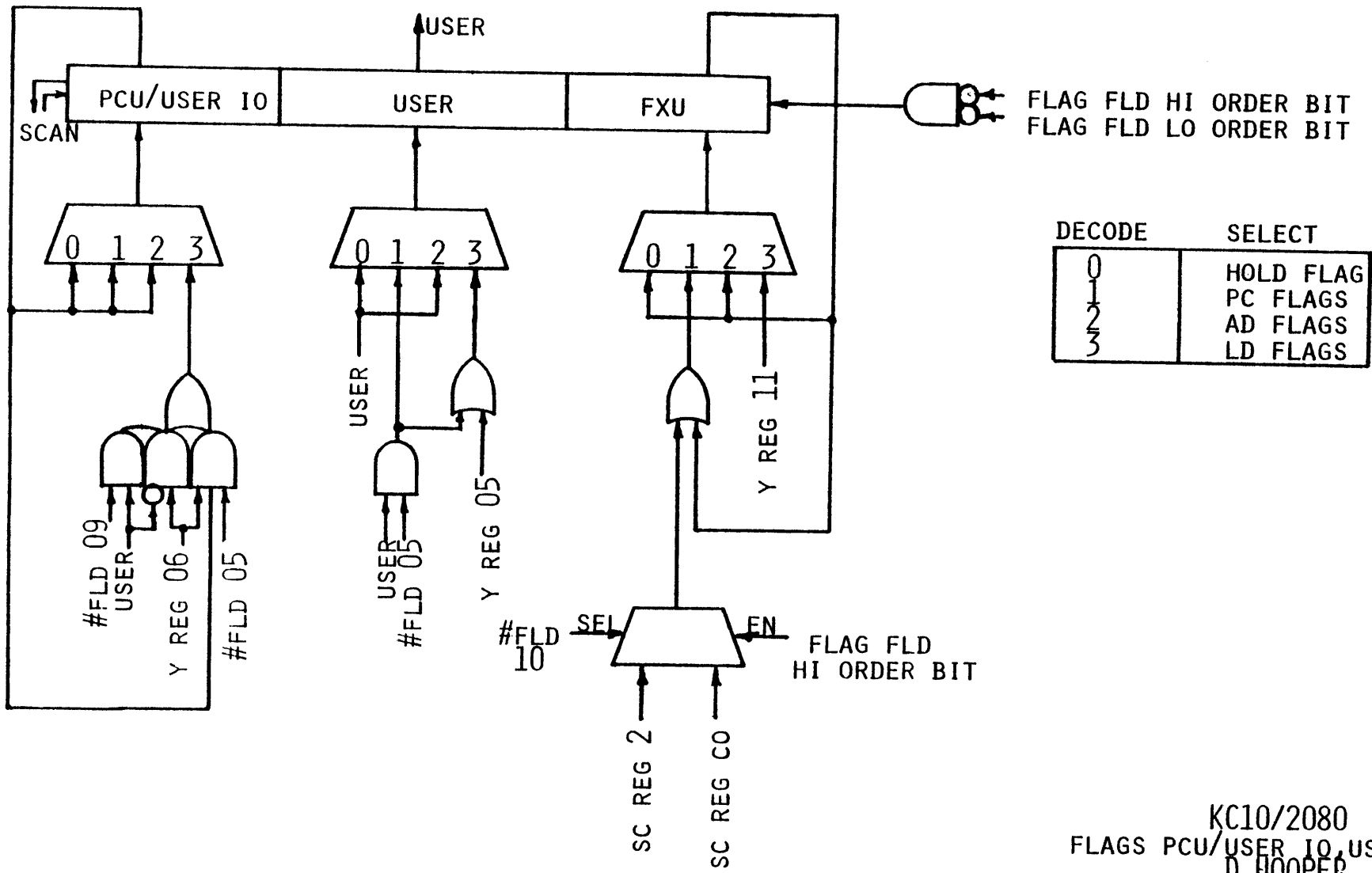


DEC COMPANY CONFIDENTIAL

KC10/2080  
 FLAGS OV, CRY0, CRY1, FOV  
 D. HOOPER  
 16 JULY 80



KC10/2080  
 FLAGS TRAP1, TRAP2, FPD, NO DIV  
 D. HOOPER  
 22 JULY 80

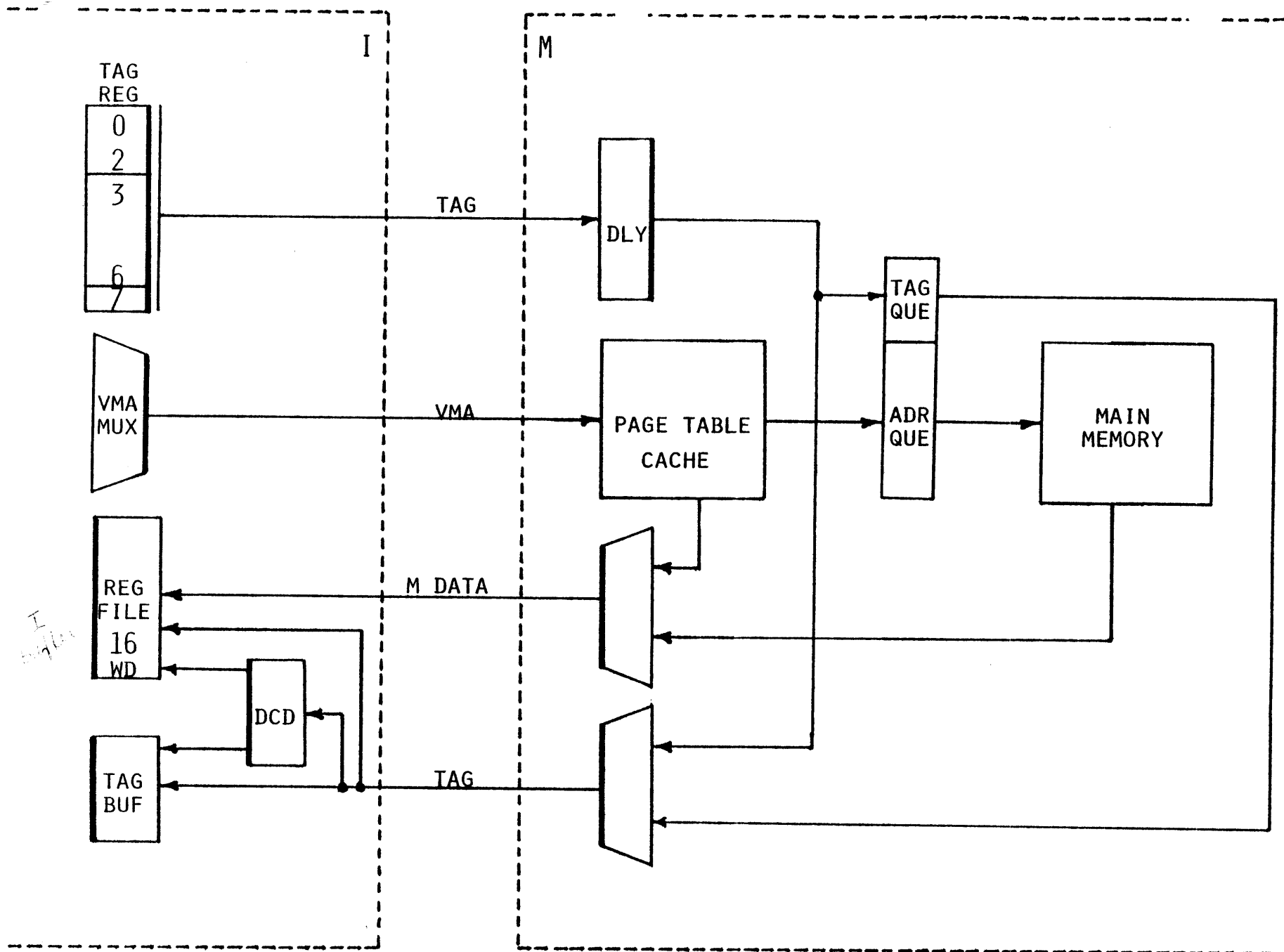


KC10/2080  
 FLAGS PCU/USER IO, USER, FXU  
 D. HOOPER  
 22 JULY 80

DEC COMPANY CONFIDENTIAL

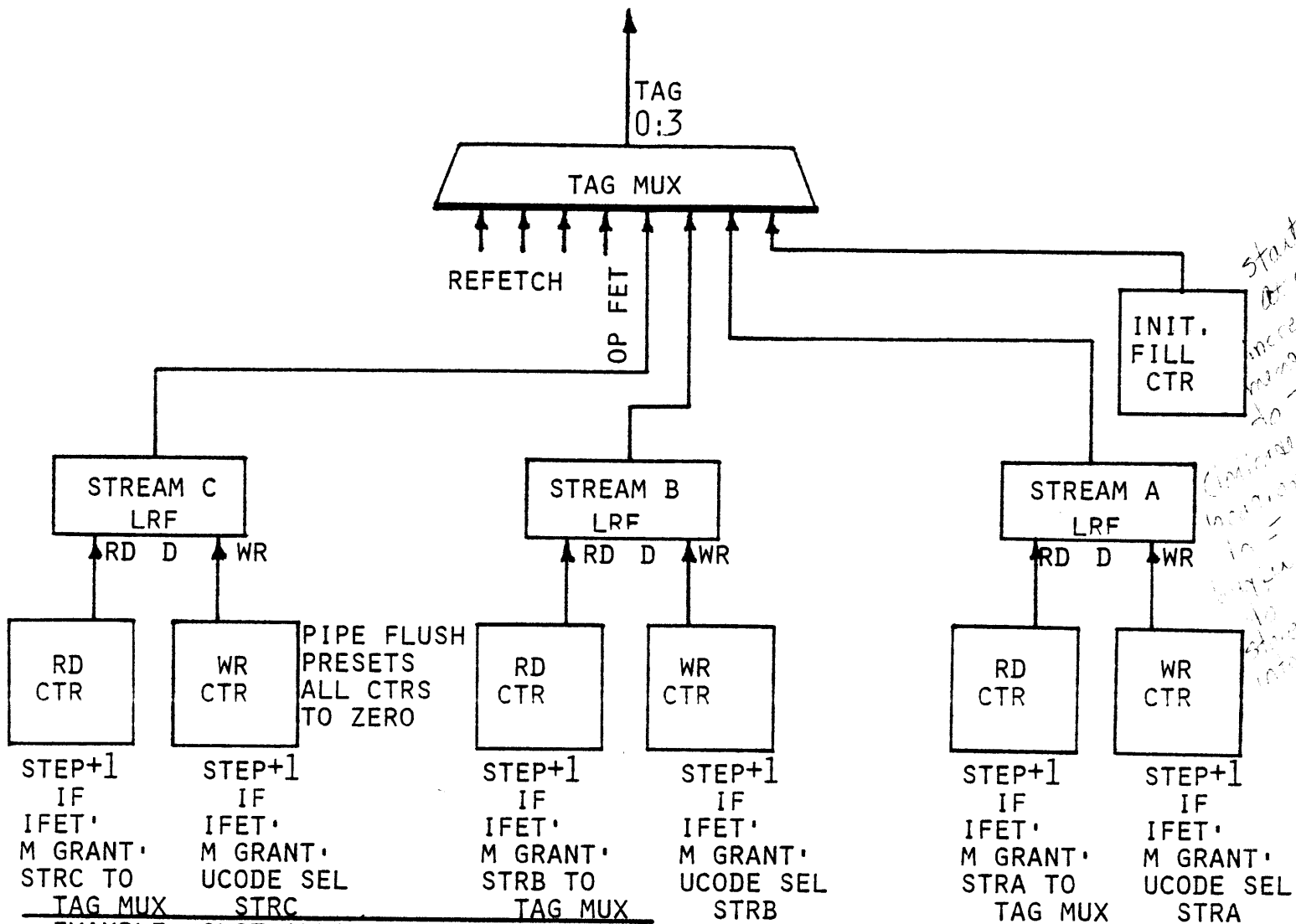


IBOX

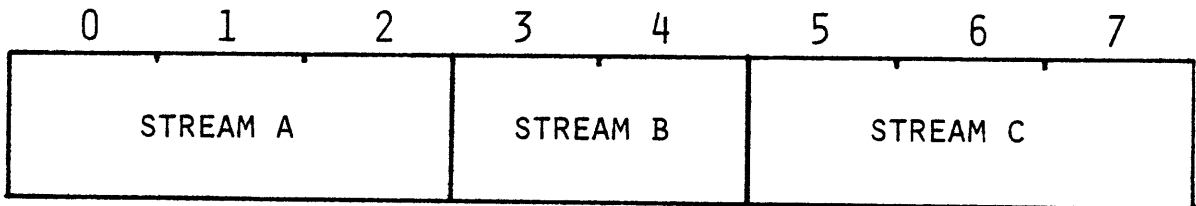


2080 TAG SYSTEM

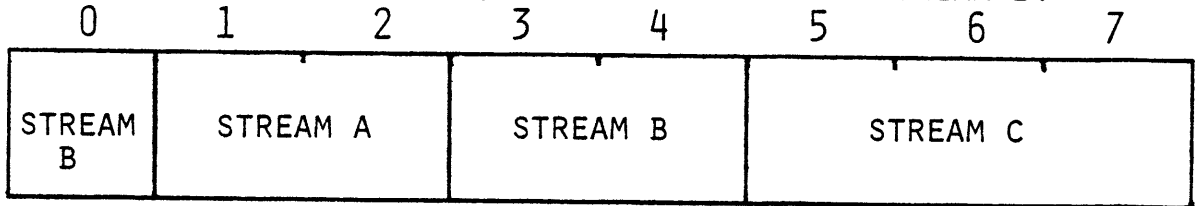
D.HOOPER 3/5/80



EXAMPLE: SLOT ALLOCATION BY STREAM



STREAM A IS CANCELLED BY EBOX, IBOX FETCHES INTO STREAM B:



KC10/2080 LRF SYSTEM

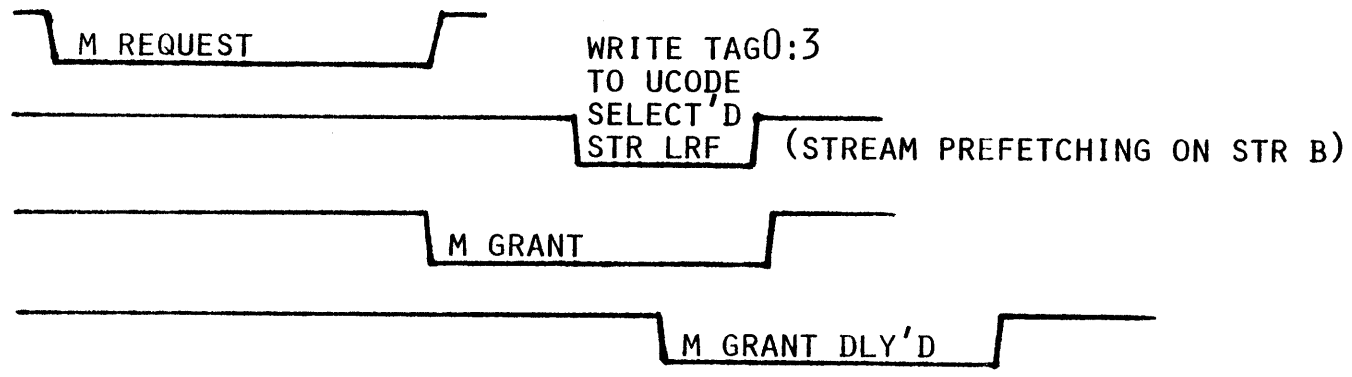
D. HOOPER  
3/5/80 REV15AUG80

DEC COMPANY CONFIDENTIAL



INPUT EARLY CTRL

VMA+TAG+CTRL TO M



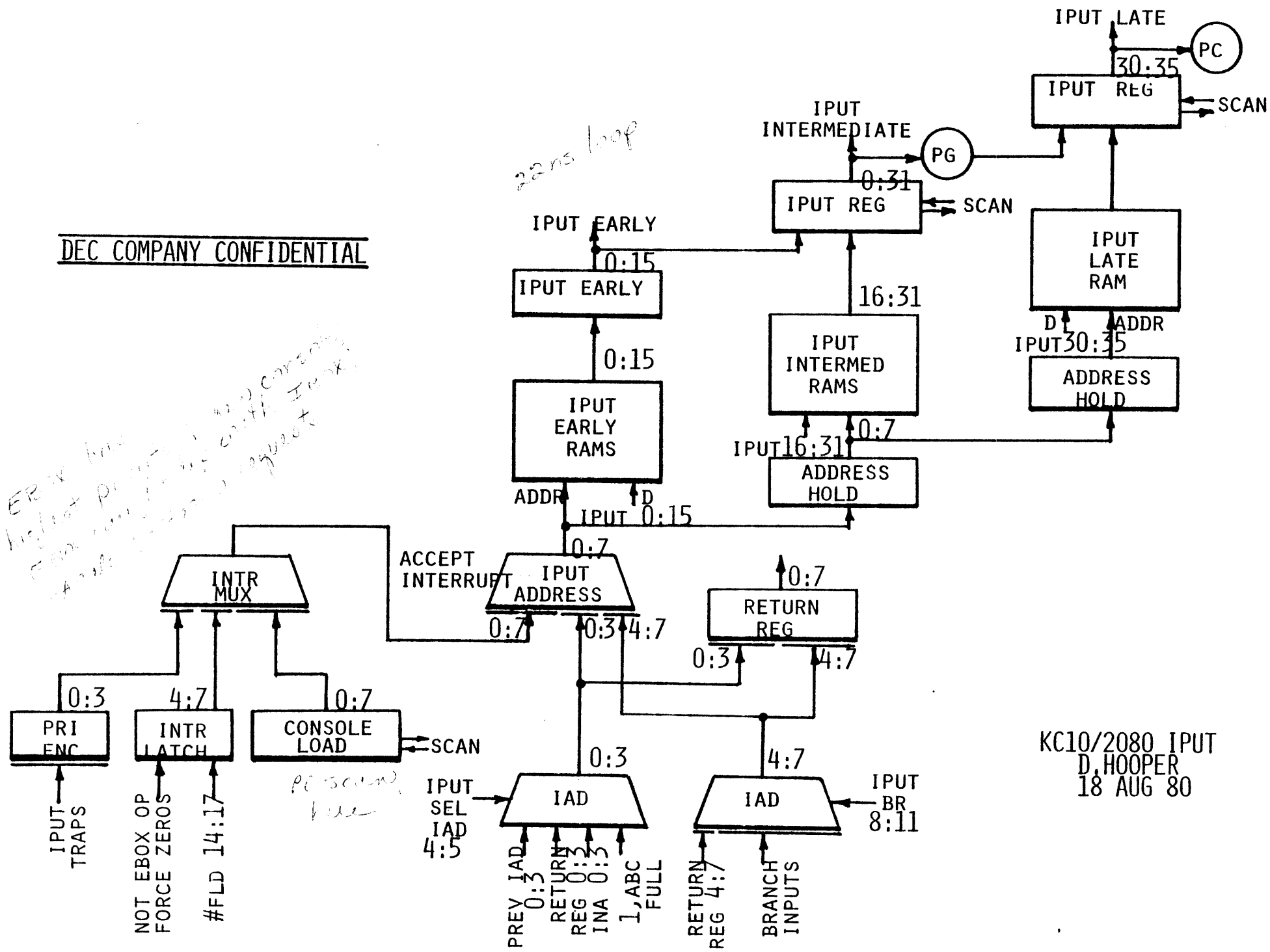
WR CTR +1 STR B

RD CTR +1 STR A (PRIOR TO THIS, EBOX HAS CANCELLED STR A, CAUSING SELECTION OF STR A TO NEXT ITAG)

DEC COMPANY CONFIDENTIAL

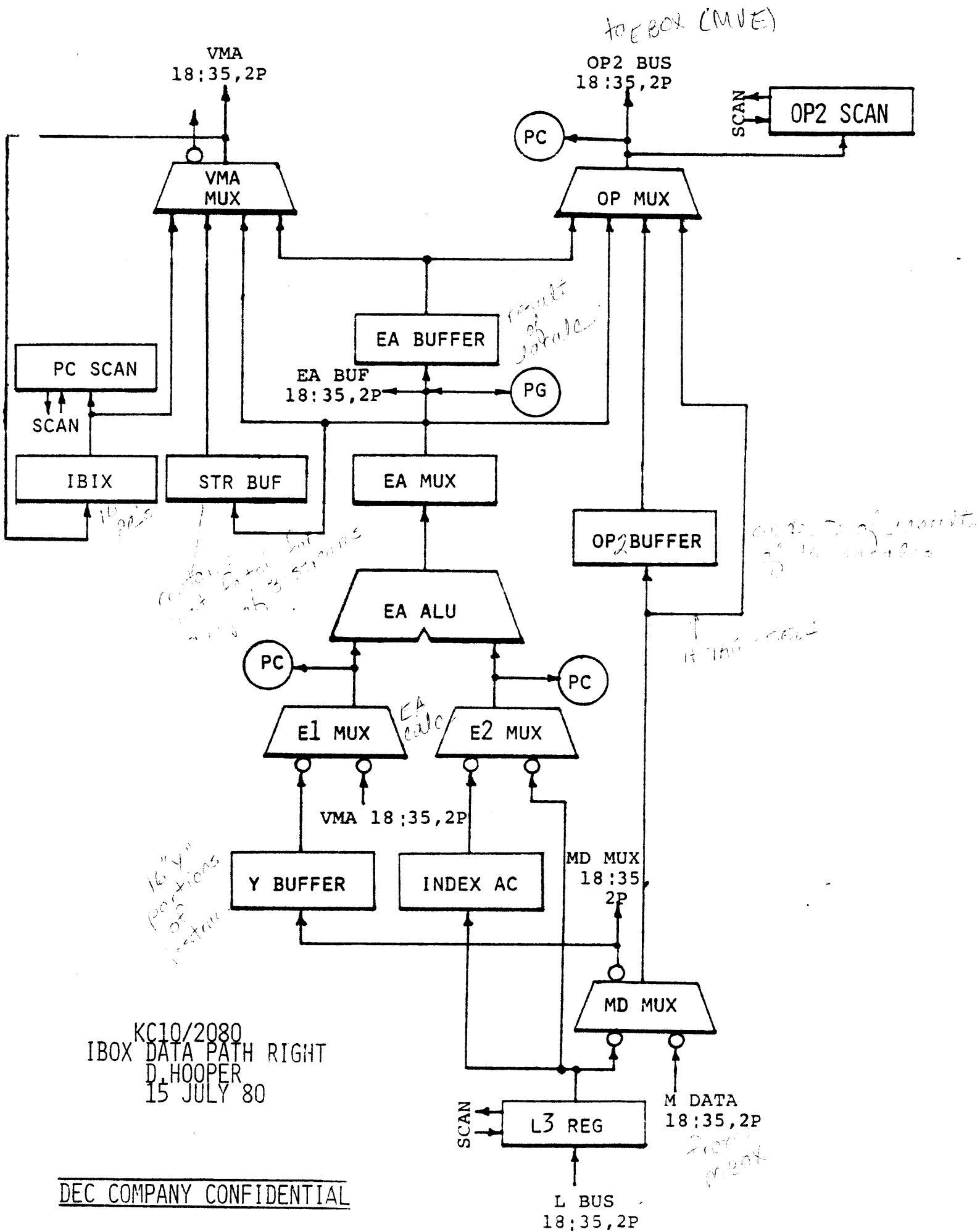
KC10/2080  
 LRF READ-WRITE TIMING  
 D. HOOPER  
 15 AUG 80

DEC COMPANY CONFIDENTIAL

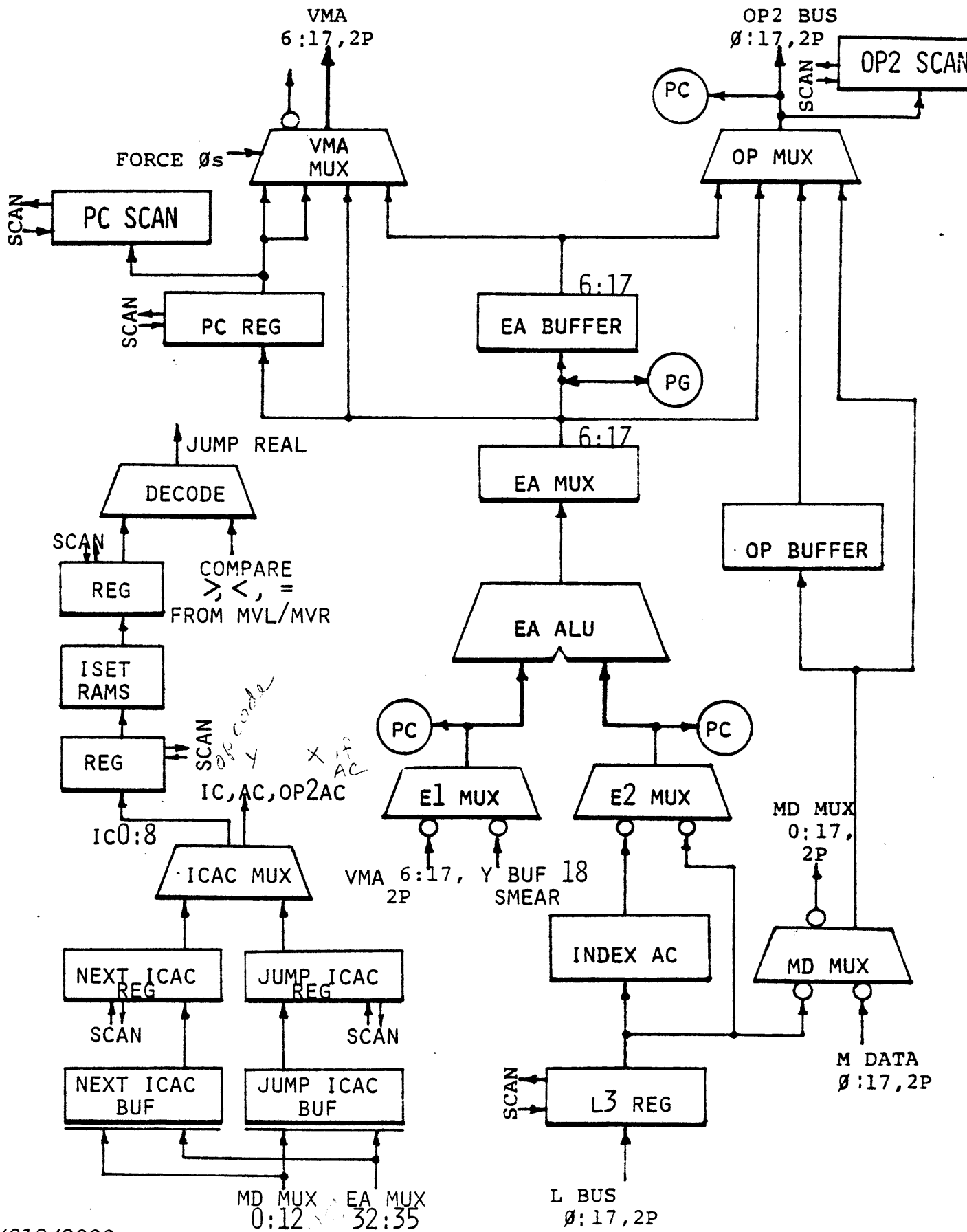


*ERx line  
highest priority with IENK  
from console request*

KC10/2080 IPUT  
D. HOOPER  
18 AUG 80

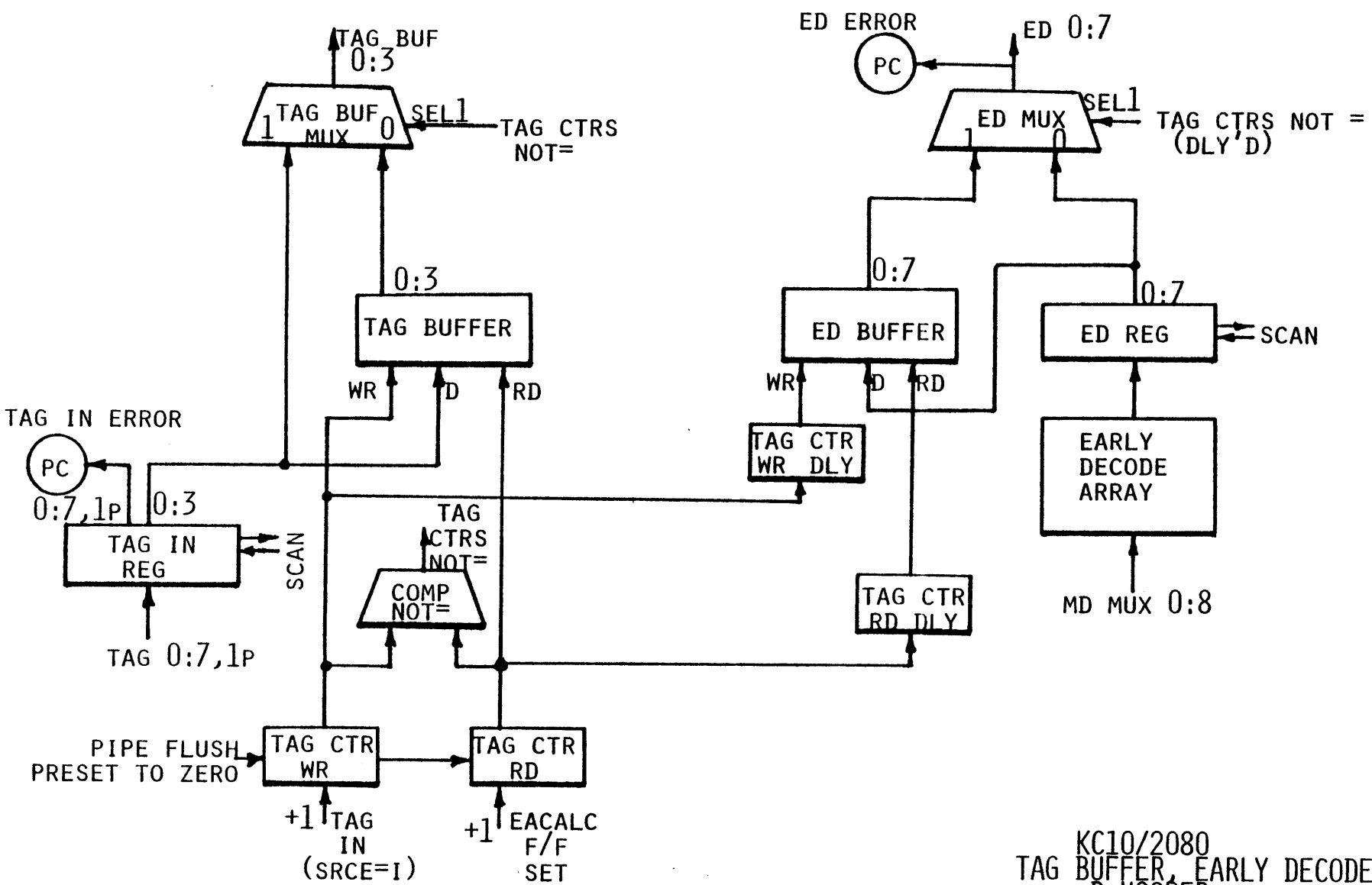


KC10/2080  
 IBOX DATA PATH RIGHT  
 D. HOOPER  
 15 JULY 80



IBOX KC10/2080  
 DATA PATH LEFT  
 D. HOOPER  
 15 JULY 80

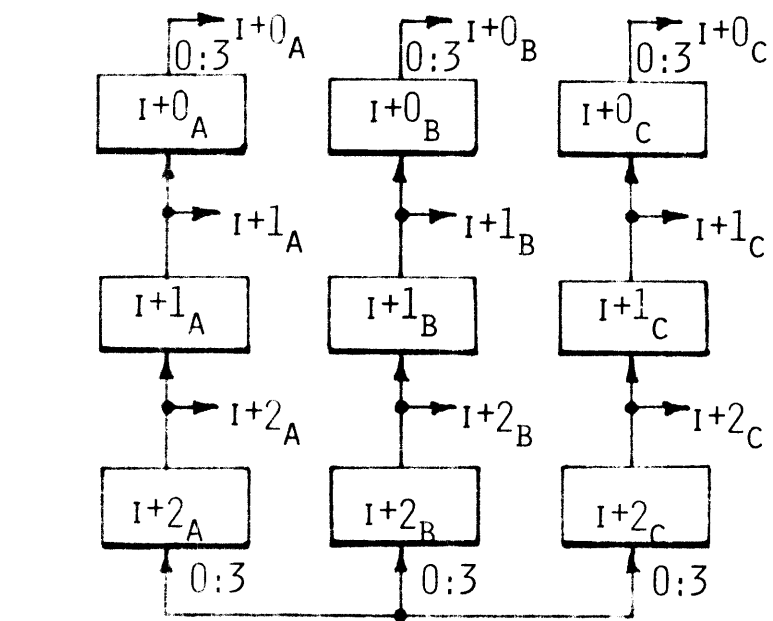
DEC COMPANY CONFIDENTIAL



KC10/2080  
TAG BUFFER, EARLY DECODE  
D. HOOPER  
18 AUG 80



next instruction on  
same box

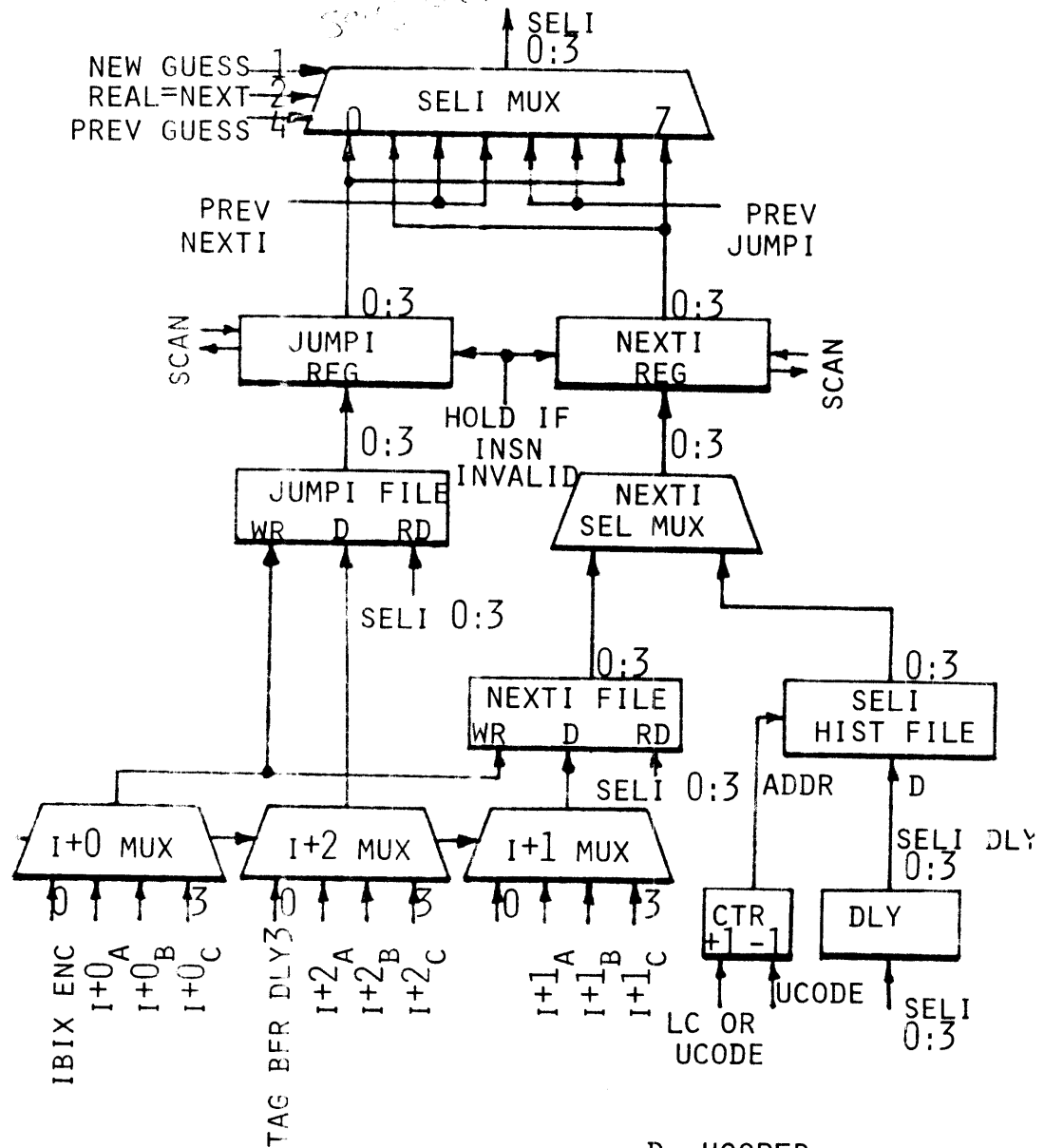


PREV GUESS NXT  
REAL NEXT  
NEW GUESS NXT

000	SEL JMP
001	SEL NXT
010	SEL PREV NXT
011	SEL PREV NXT
100	SEL PREV JMP
101	SEL PREV JMP
110	SEL JMP
111	SEL NXT

TAG OUT 0:3

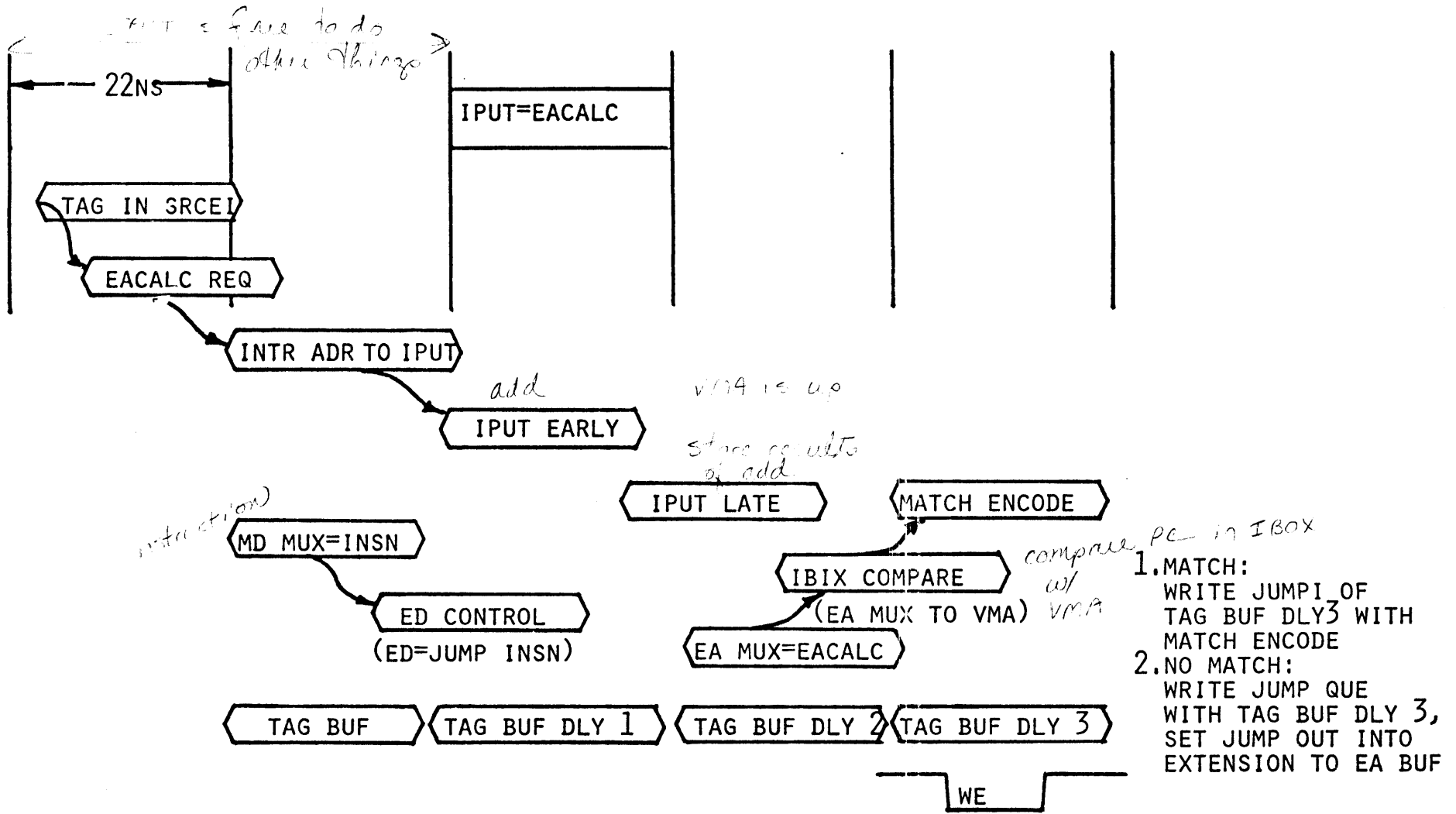
STR SEL



*Shows how it fixes bad guesses - keeps history of previous guesses*

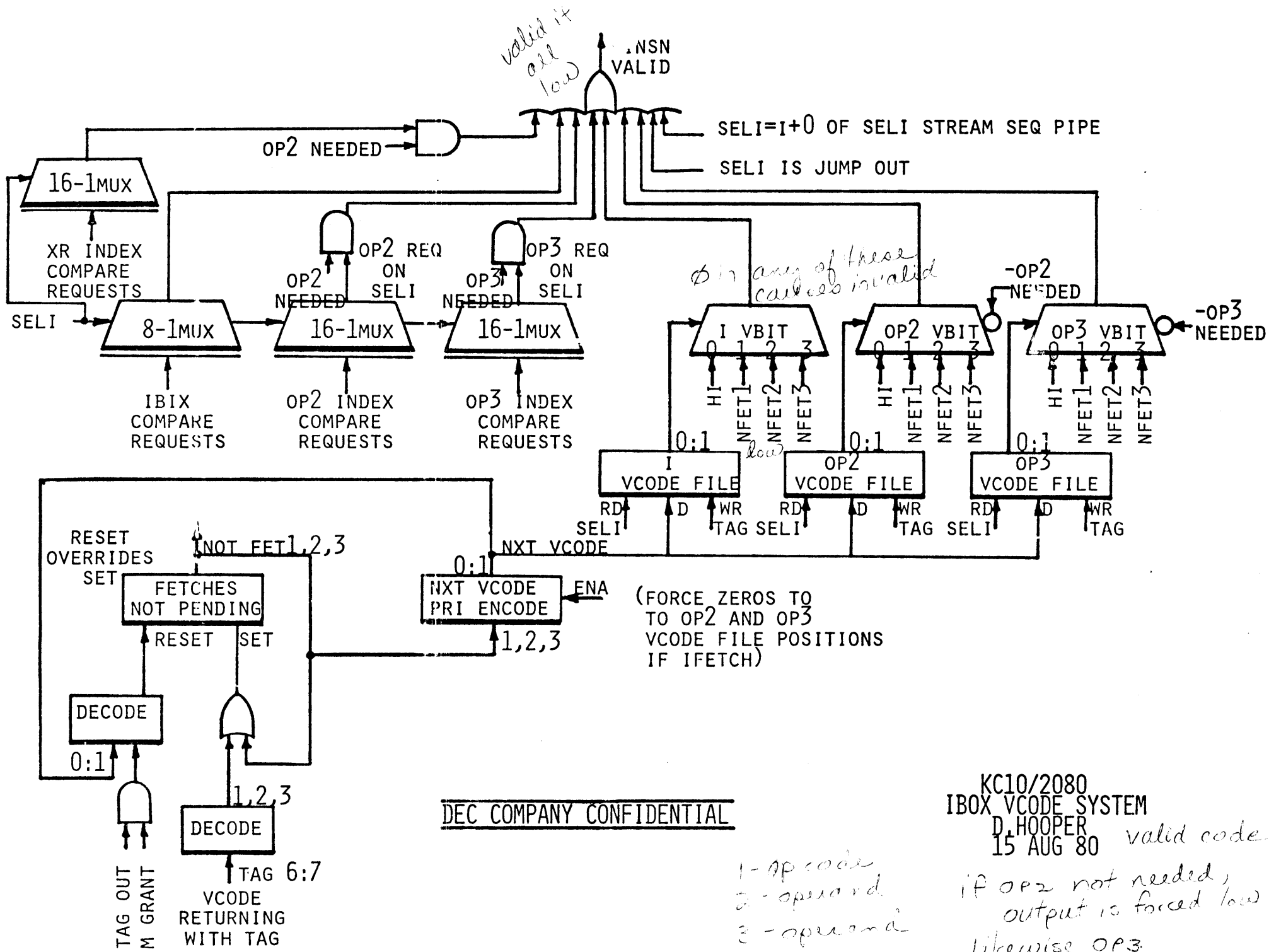
KC10/2080 SETUP OF NEXT OR SKIP/JUMP INSTRUCTION

D. HOOPER  
15 AUG 80



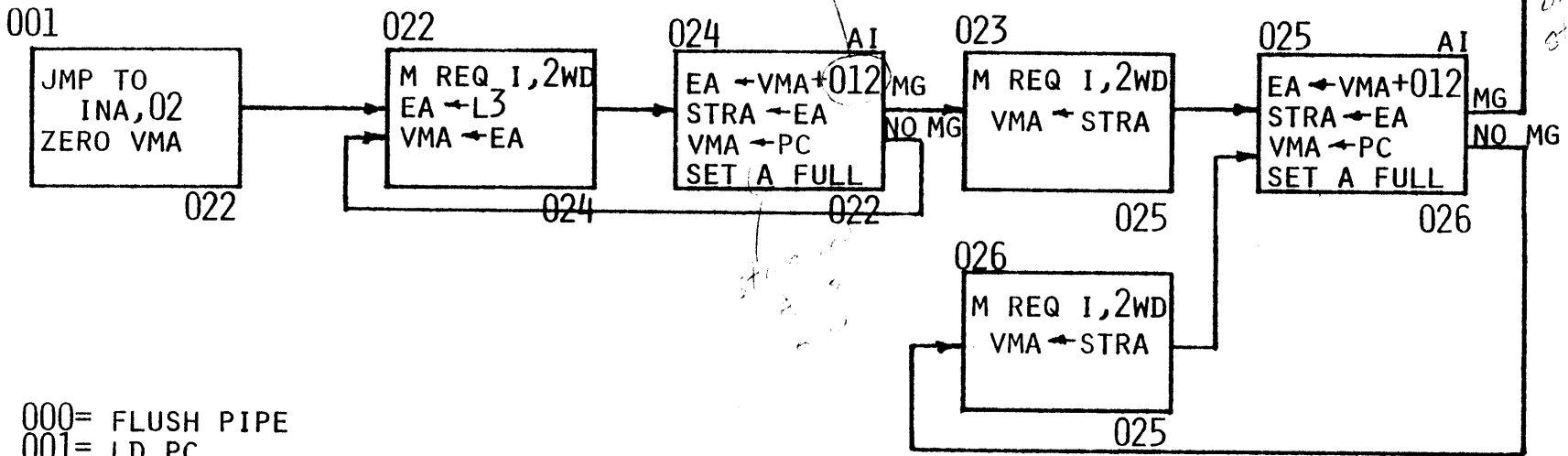
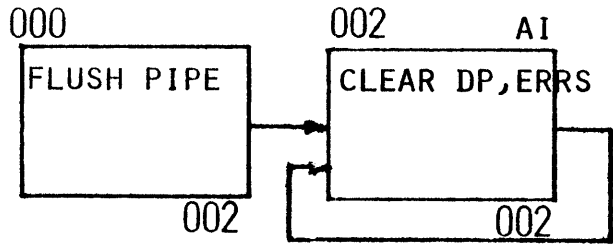
DEC COMPANY CONFIDENTIAL

KC10/2080  
 EACALC OF JUMP  
 D. HOOPER  
 19 AUG 80



**DEC COMPANY CONFIDENTIAL**

KC10/2080  
IBOX VCODE SYSTEM  
D. HOOPER  
15 AUG 80 *valid code*



ABC	IAD
000	200
001	220
010	240
011	260
100	300
101	320
110	340
111	360

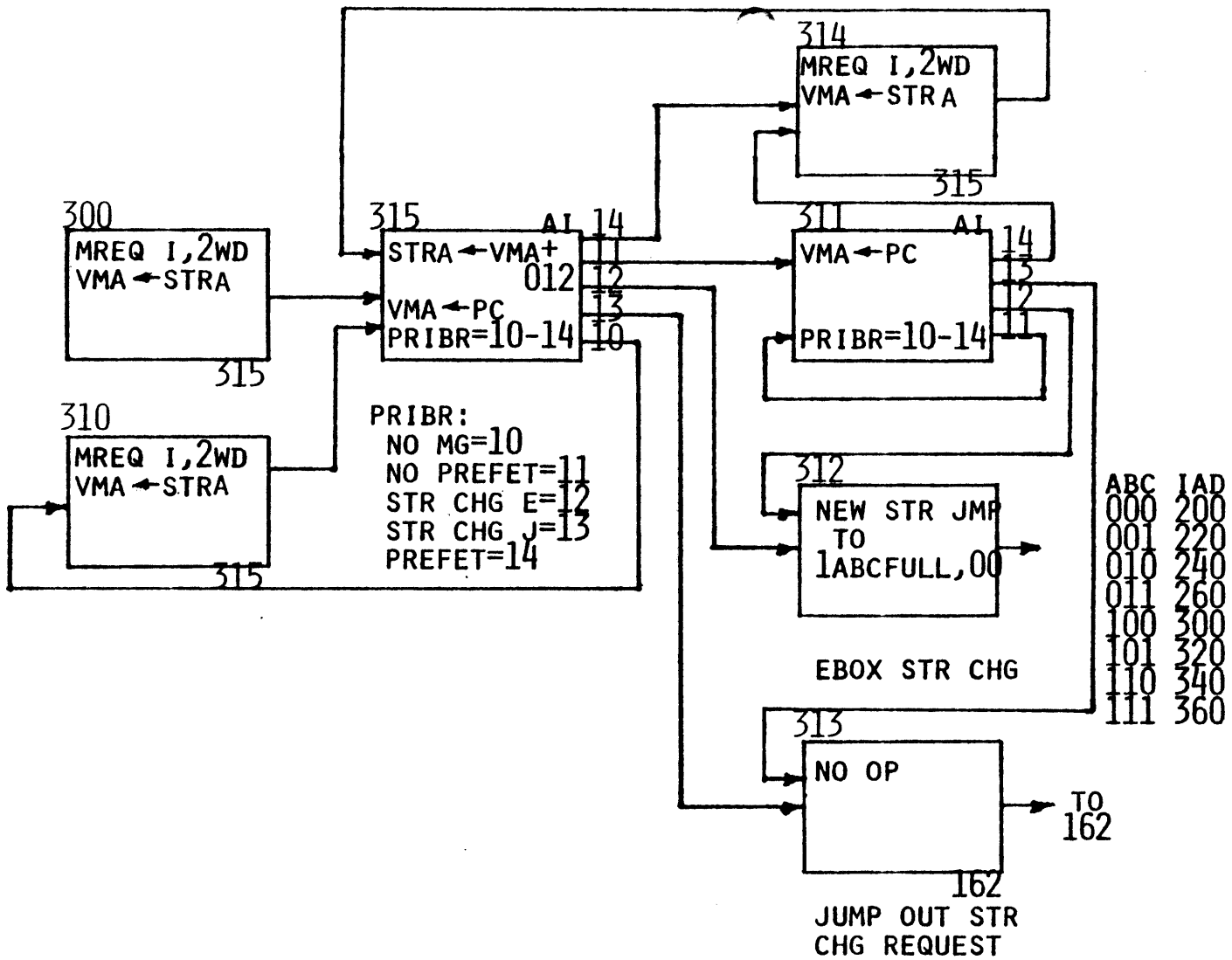
*difficult to read (in program)  
 IBCFULL, 00  
 address*

*if stream is full*

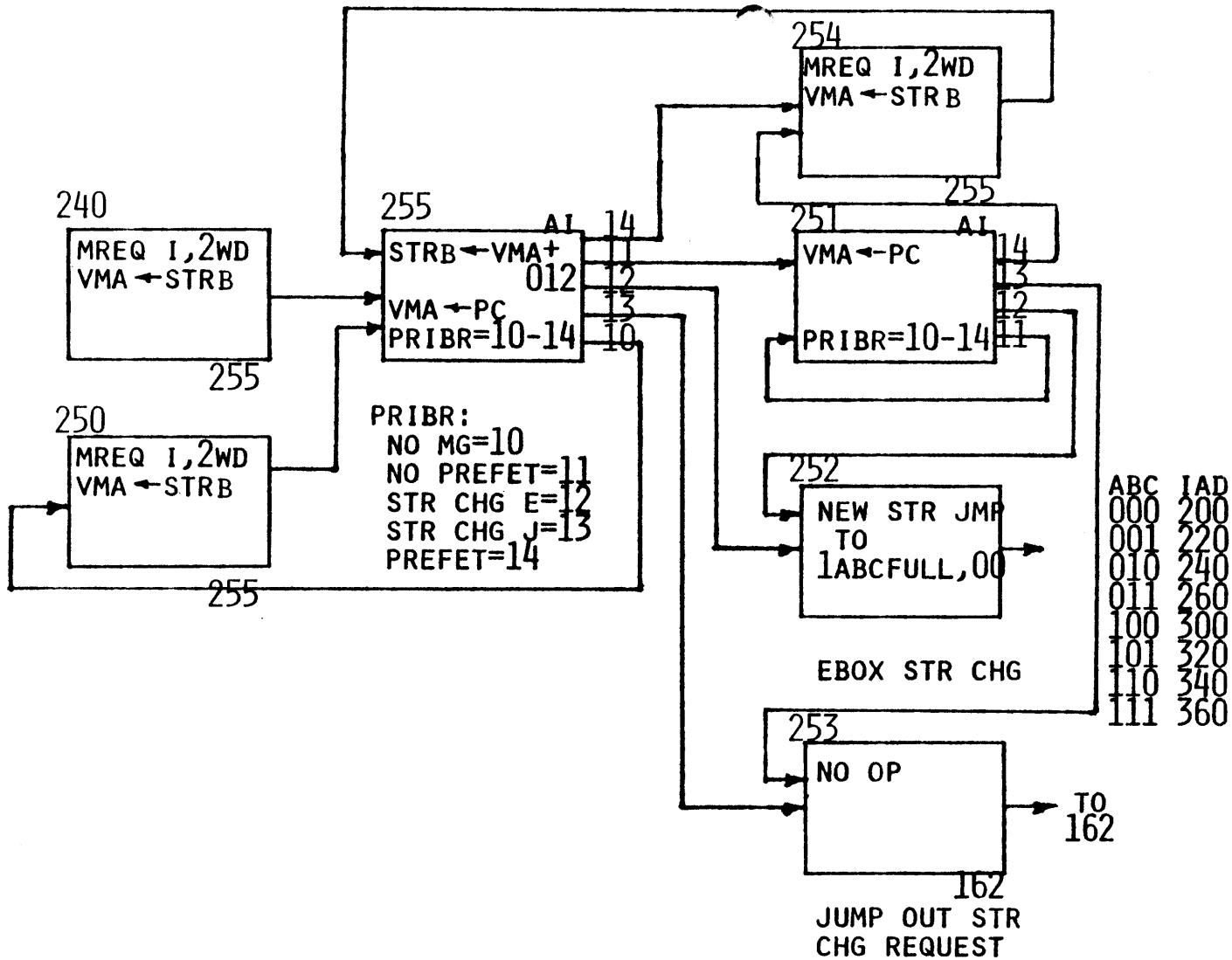
000= FLUSH PIPE  
 001= LD PC  
 002= CLEAR ERRS

DEC COMPANY CONFIDENTIAL

2080/KC10  
 IBOX PRESET, LOAD PC  
 D. HOOPER  
 13 AUG 80

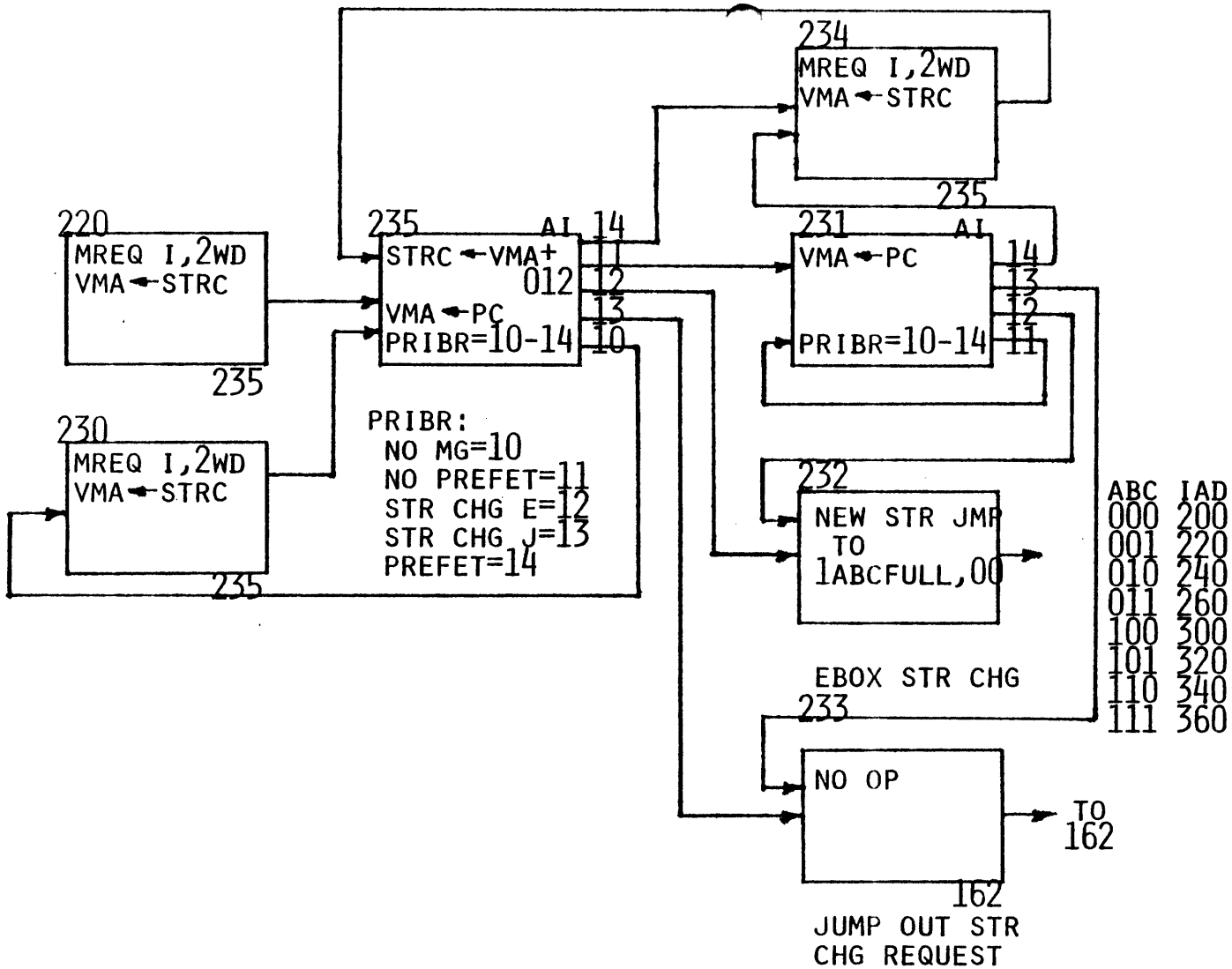


2080/KC10 IBOX  
STREAM A PREFETCH  
D. HOOPER  
14 AUG 80



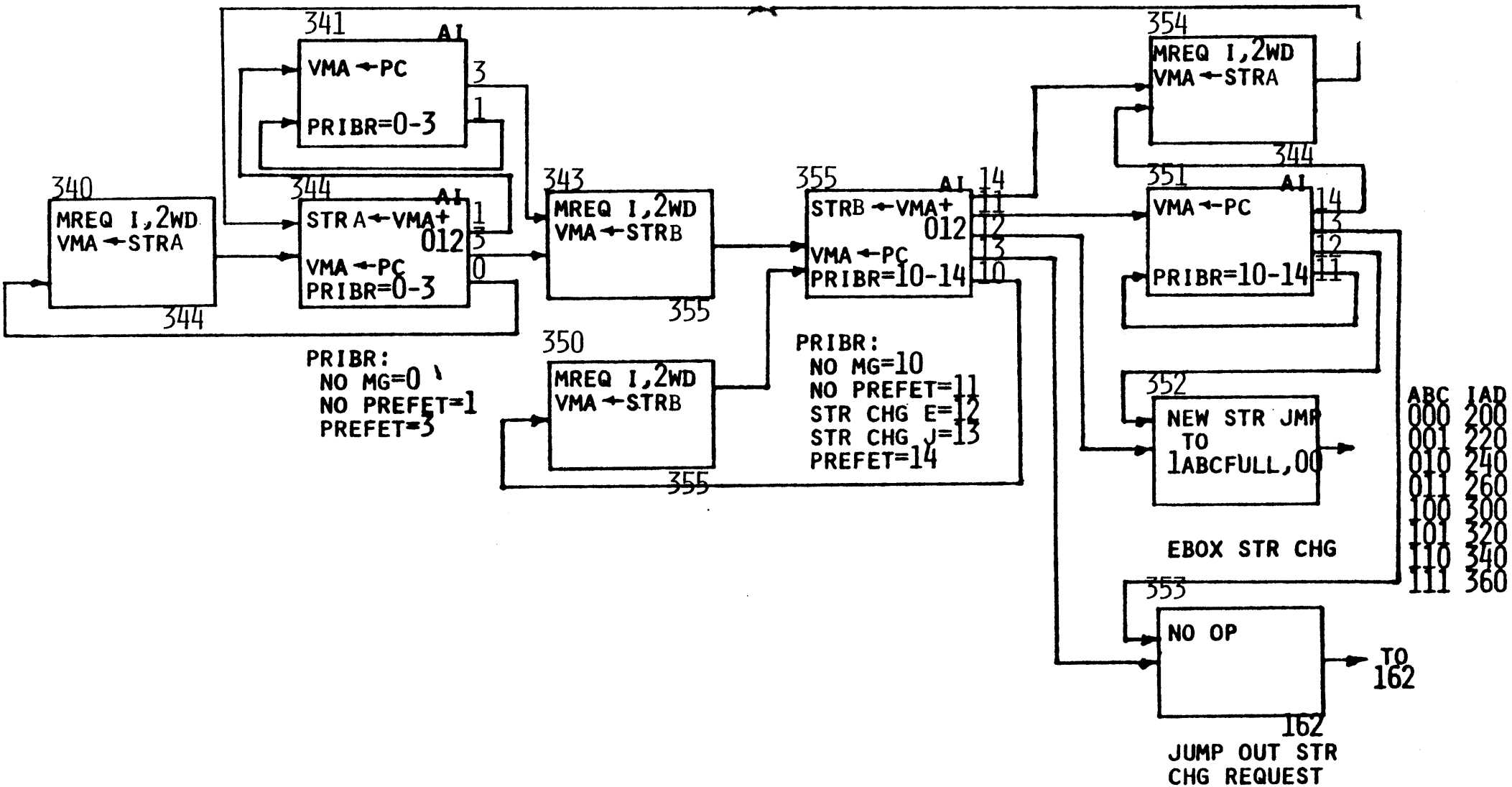
DEC COMPANY CONFIDENTIAL

2080/KC10 IBOX  
 STREAM B PREFETCH  
 D. HOOPER  
 14 AUG 80



DEC COMPANY CONFIDENTIAL

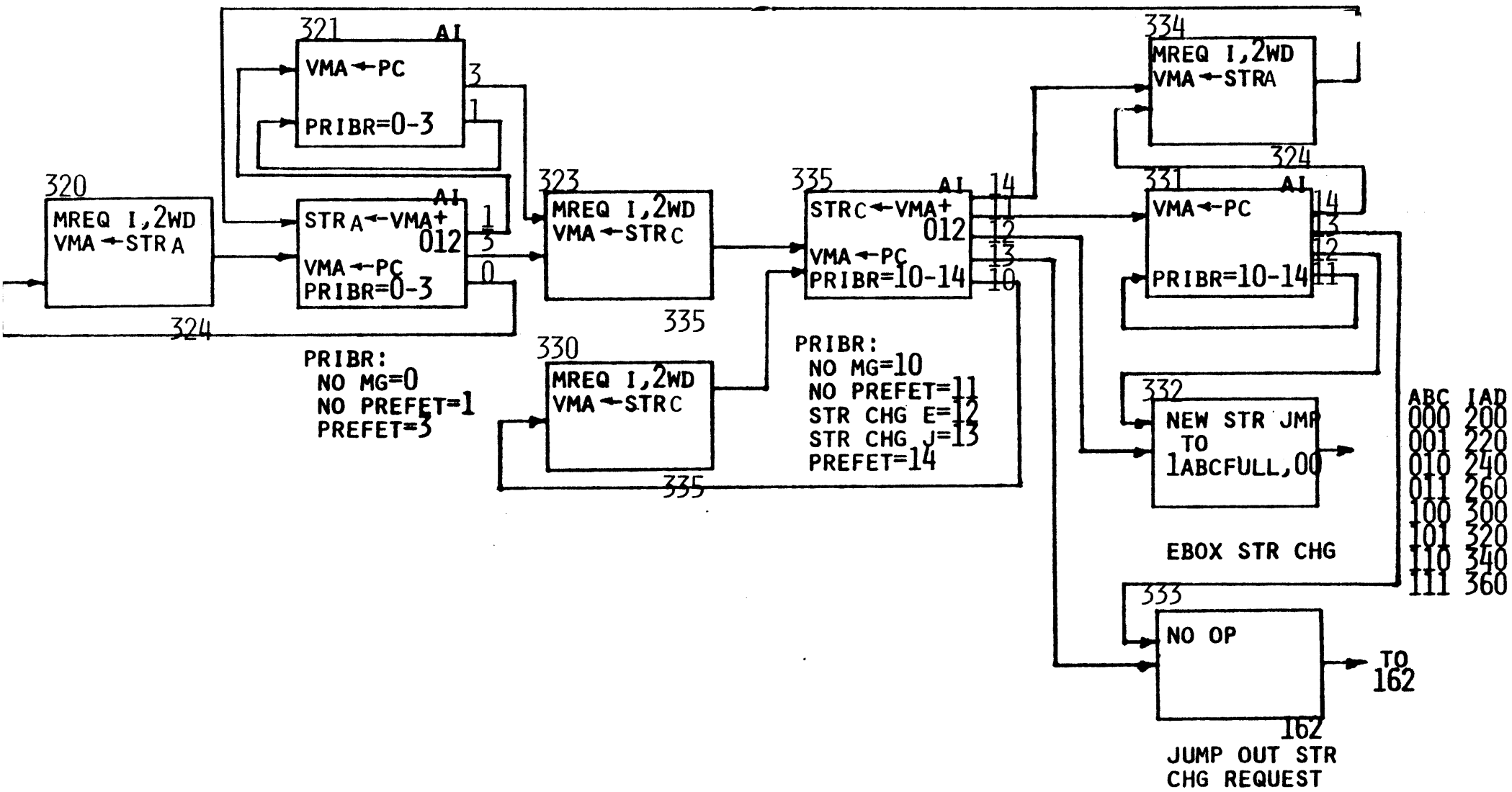
2080/KC10 IBOX  
STREAM C PREFETCH  
D. HOOPER  
14AUG 80



DEC COMPANY CONFIDENTIAL

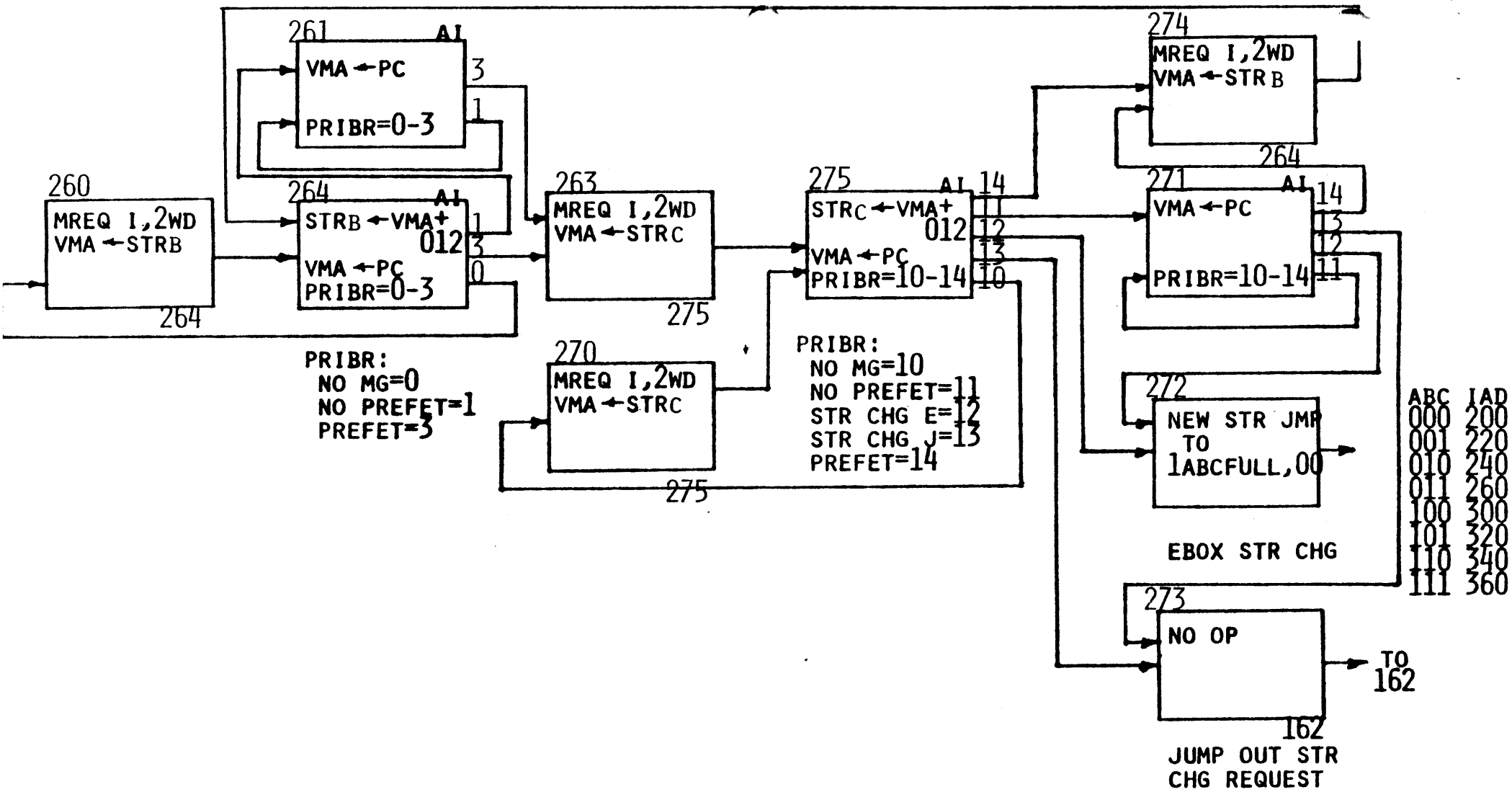
2080/KC10 IBOX  
STREAM AB PREFETCH  
D. HOOPER  
14 AUG 80





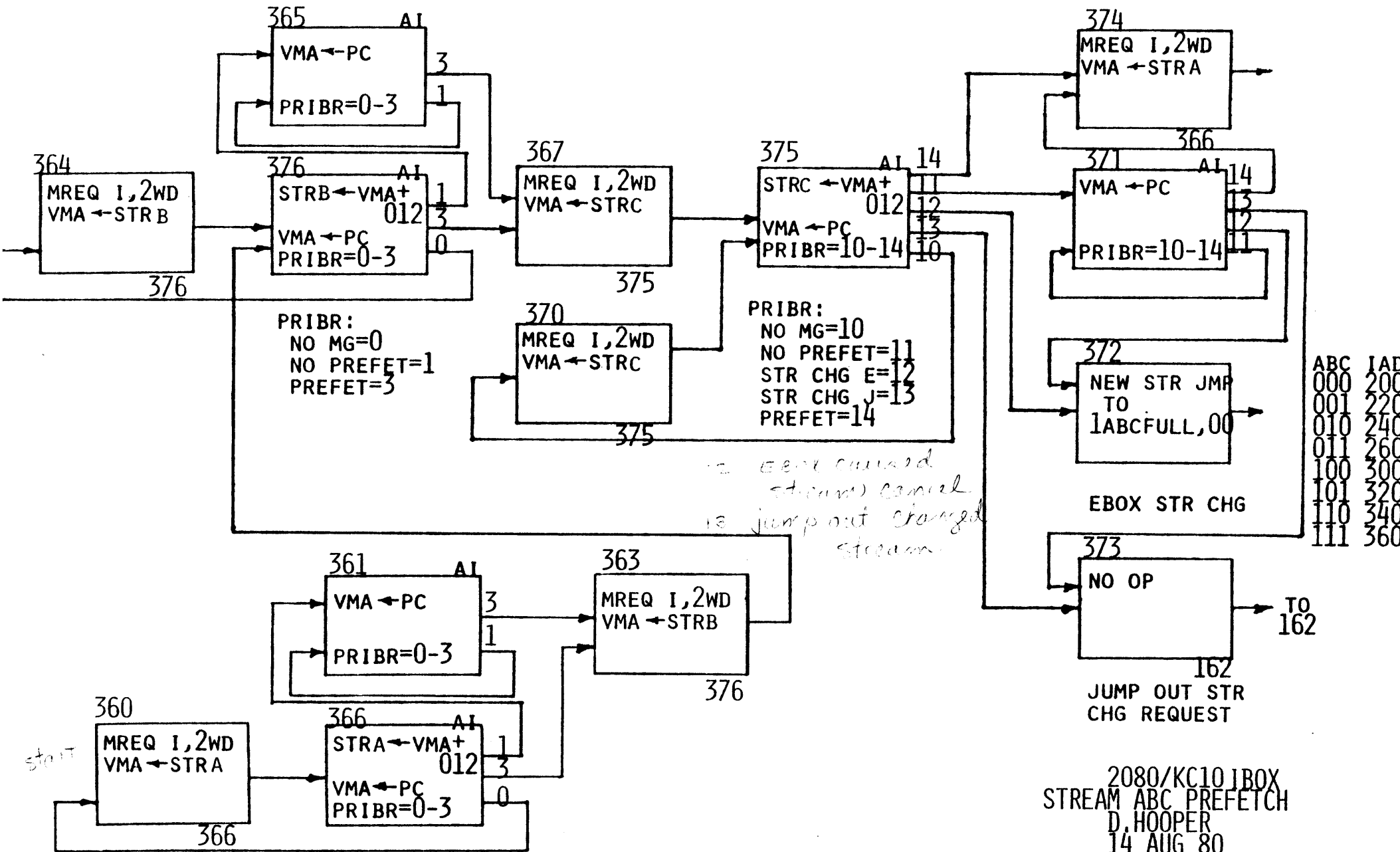
DEC COMPANY CONFIDENTIAL

2080/KC10 IBOX  
STREAM AC PREFETCH  
D. HOOPER  
14 AUG 80



DEC COMPANY CONFIDENTIAL

2080/KC10 IBOX  
STREAM BC PREFETCH  
D. HOOPER  
14AUG 80



*every time  
stream changed  
is jump out changed  
stream*

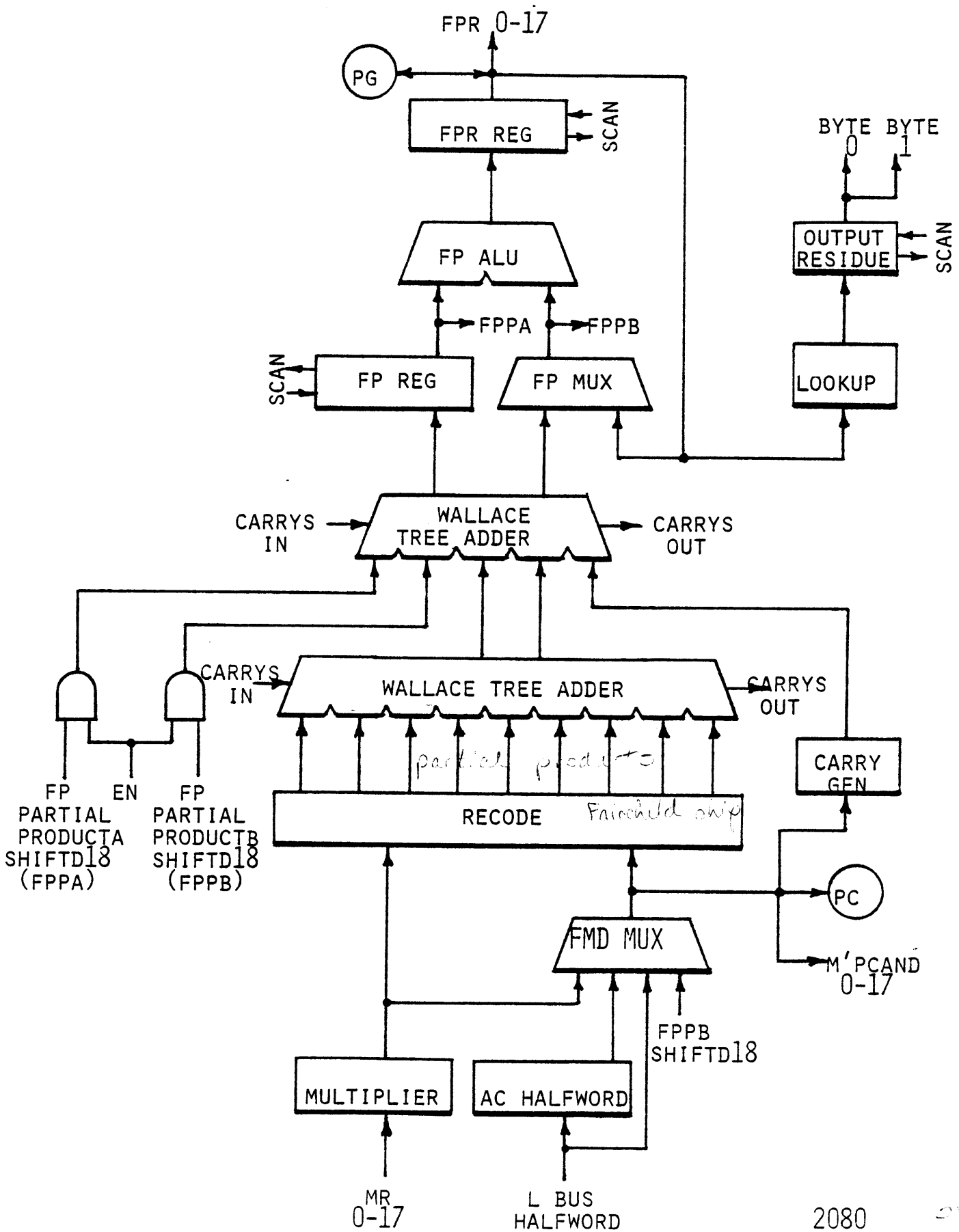
PRIBR:  
NO MG=0 no MGRANT → loop & wait for it  
NO PREFET=1 no prefetch → loop & wait (every caught up w/ IBOX)  
PREFET=3

DEC COMPANY CONFIDENTIAL

*start*

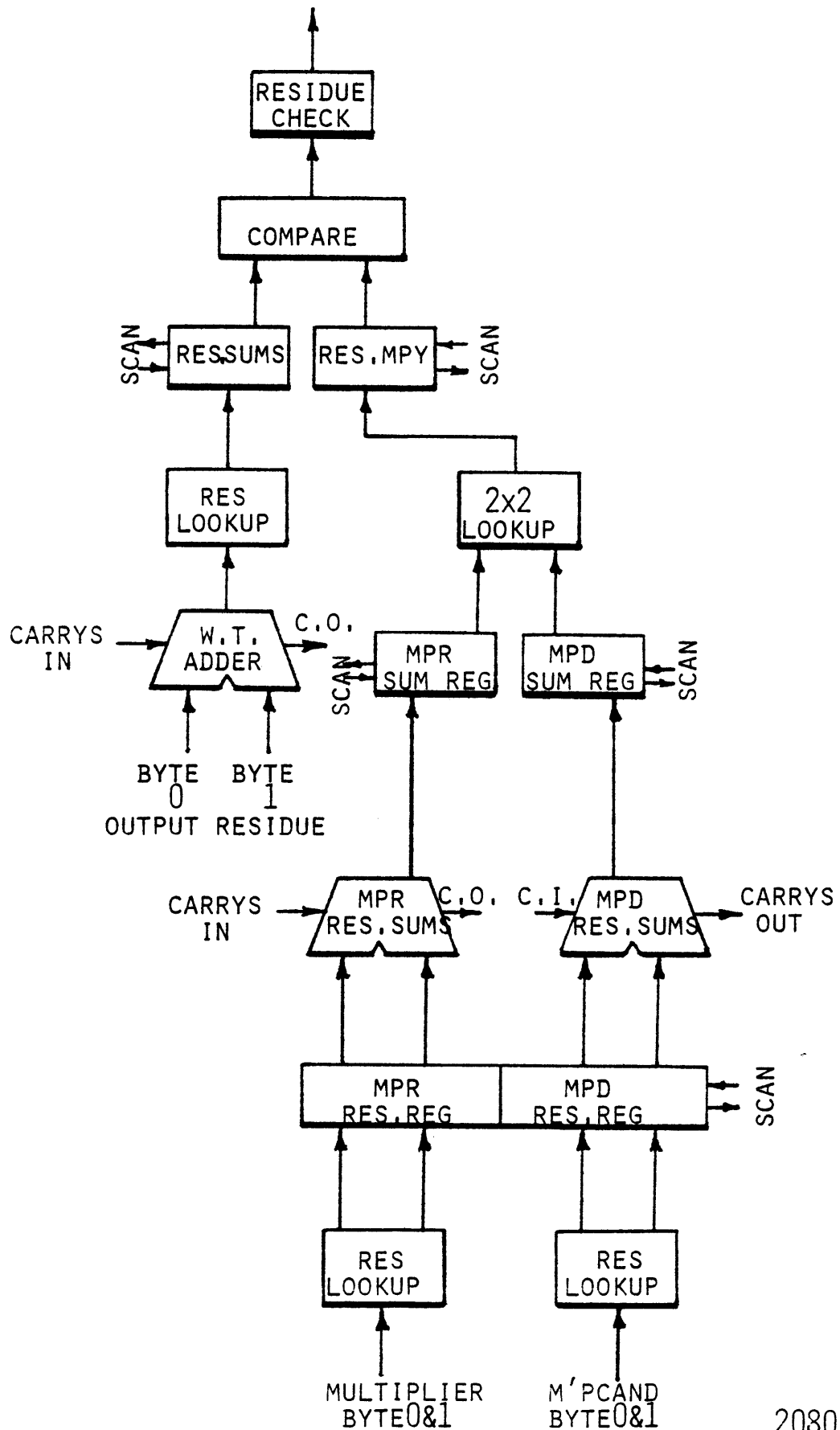
*STRB ← stream A  
PRIBR ← 0-3*

FPA



DEC COMPANY CONFIDENTIAL

2080  
MULTIPLY  
ARRAY  
D.HOOPER 3/5/80

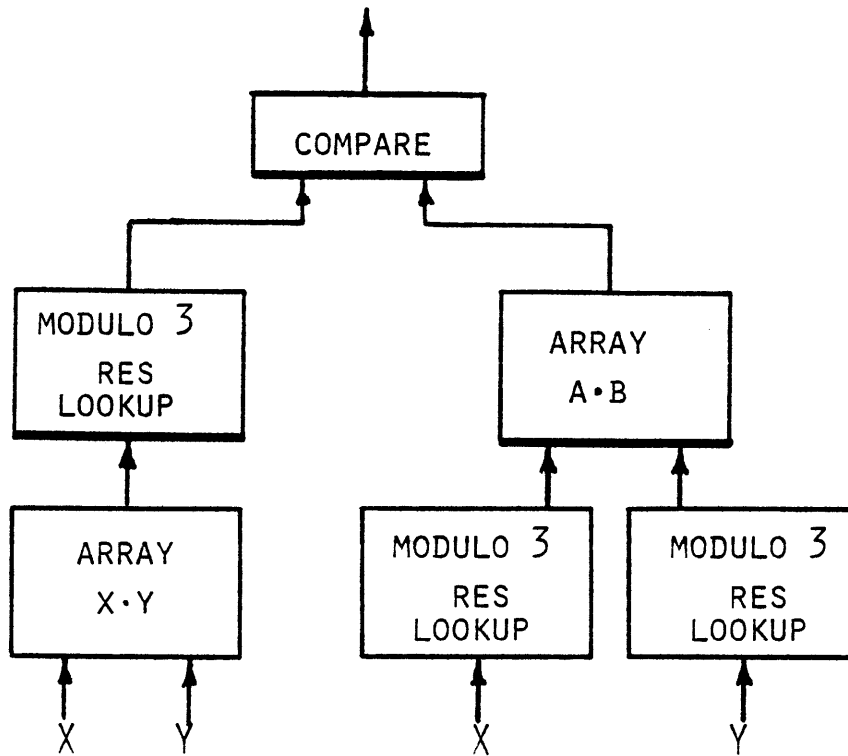


D. HOOPER  
3/5/80

DEC COMPANY CONFIDENTIAL

2080  
MODULO 3  
MULTIPLY  
ARRAY  
CHECKER

## 2080 MODULO 3 CHECKING ALGORITHM



EXAMPLE: X Y

$$X = (X-A) + A \quad \text{WHERE } A = \text{REMAINDER AFTER } \frac{X}{3}$$

$$Y = (Y-B) + B \quad \text{WHERE } B = \text{REMAINDER AFTER } \frac{Y}{3}$$

$$X \cdot Y = [(X-A) \cdot (Y-B)] + [A \cdot (Y-B)] + [B \cdot (X-A)] + [A \cdot B]$$

SINCE: RESIDUE  $(X-A) \equiv 0$

AND RESIDUE  $(Y-B) \equiv 0$ ,

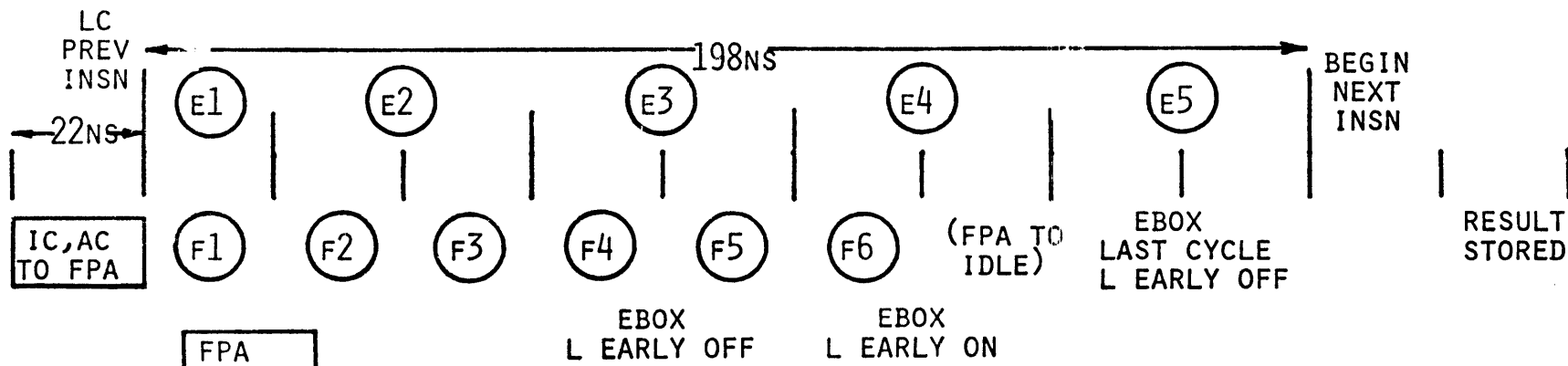
THEN: RESIDUE  $(X-A) \cdot (Y-B) \equiv 0$

RESIDUE  $A \cdot (Y-B) \equiv 0$

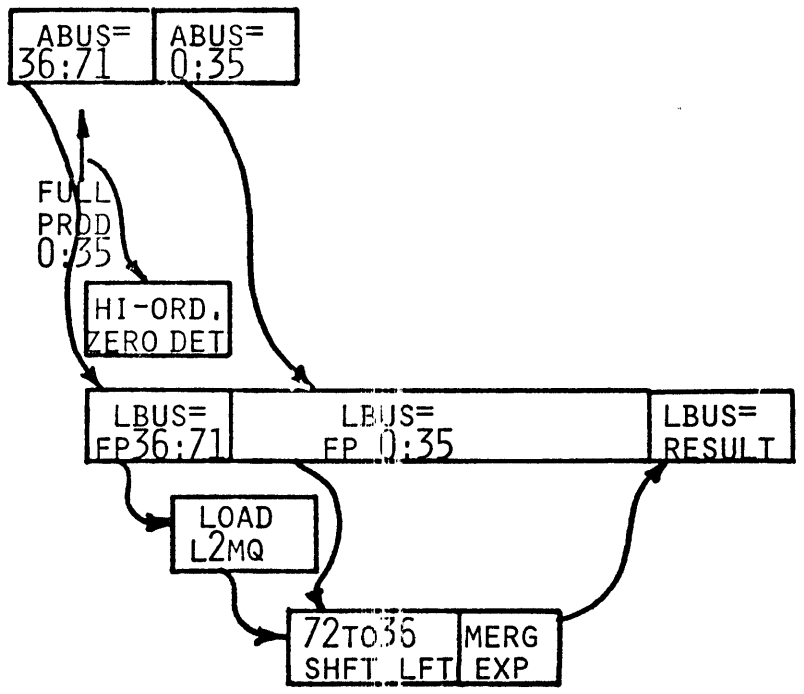
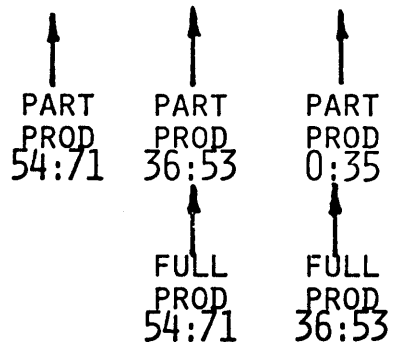
RESIDUE  $B \cdot (X-A) \equiv 0$

RESIDUE  $X \cdot Y \equiv A \cdot B$

DEC COMPANY CONFIDENTIAL



FPA UCODE  
(CTRL TO SETUP MPLR, MPCAND)



DEC COMPANY CONFIDENTIAL

*single precision  
Floating point copy  
in FPA*

KC10/2080  
FMP  
D. HOOPER  
19 AUG 80