

**IBM**

Manual of Instruction

*On sale!*

**401**

Data Processing System  
Instructional Logic Diagrams  
Volume **4**

IBM Form 55 398

Ausgabe August 1962



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723830	32	STORAGE ADDRESS VALIDITY CHECK	723888	106	PRINT BUFFER STORAGE AND DATA FLOW 1 (PF)
			723889	107	PRINT BUFFER STORAGE AND DATA FLOW 2 (PF)
723831	36	ADD SUBTRACT AND ADDER CONTROLS	723890	108	PRINT BUFFER CLOCK (PF)
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723856	71	MODIFY OP AND STORAGE CONTROL PULSES			
723857	72	STORAGE DECODE SWITCHES 4 TO 12K			
723858	73	CORE STORAGE DRIVE CIRCUIT AND SENSE CIRCUITS 4 TO 12K			

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4/10/62	11,3,8,30,31	1/31/70	TA 1370 K	NAME INDEX FOR 1401 MACHINES
				ABOVE SERIAL 25000
				DESIGN
				TYPE
				DETAIL
				SCALE
				NONE
				CHECK
				DRAW
				YE
				1-24-62
				APPRO
				CHECK
				2/27/64

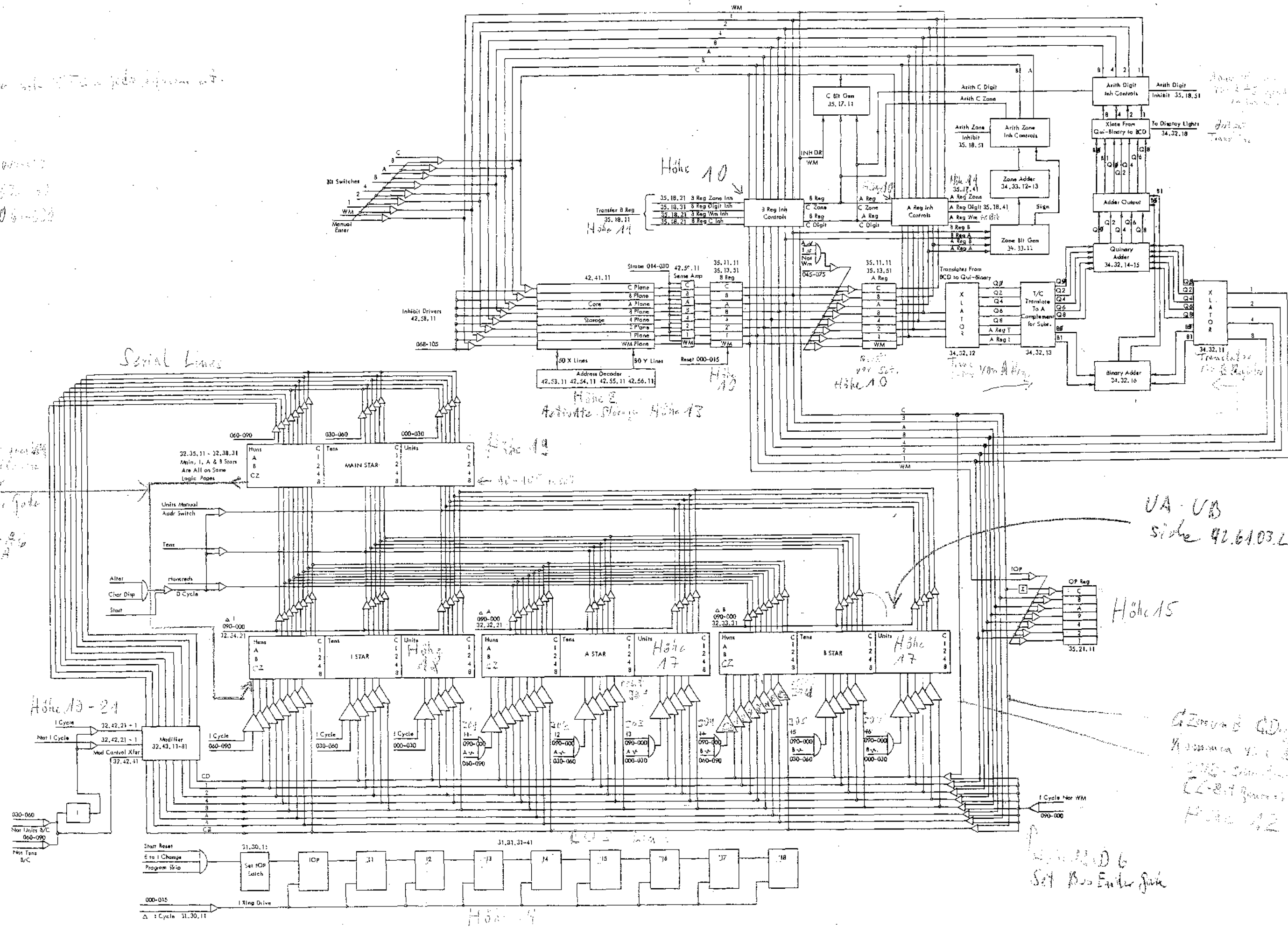
Link to see what the job requires.

Unit 10000  
Main 50-51  
Cable 06-020

Serial Lines

IC 10000  
Main 50-51  
I Star 17-86  
Höhe 17-86  
18A

IBM 1401 SYSTEM DATA FLOW



UA-UB  
Seite 92.61.03.L

Höhe 15

Gezeichnet von  
Kreuzer 10.1.58  
200-500-500  
CC-87-900-000  
Höhe 12

1401 D 6  
Set Bus Ende Seite

Höhe 19

AED goes on with -ve shift

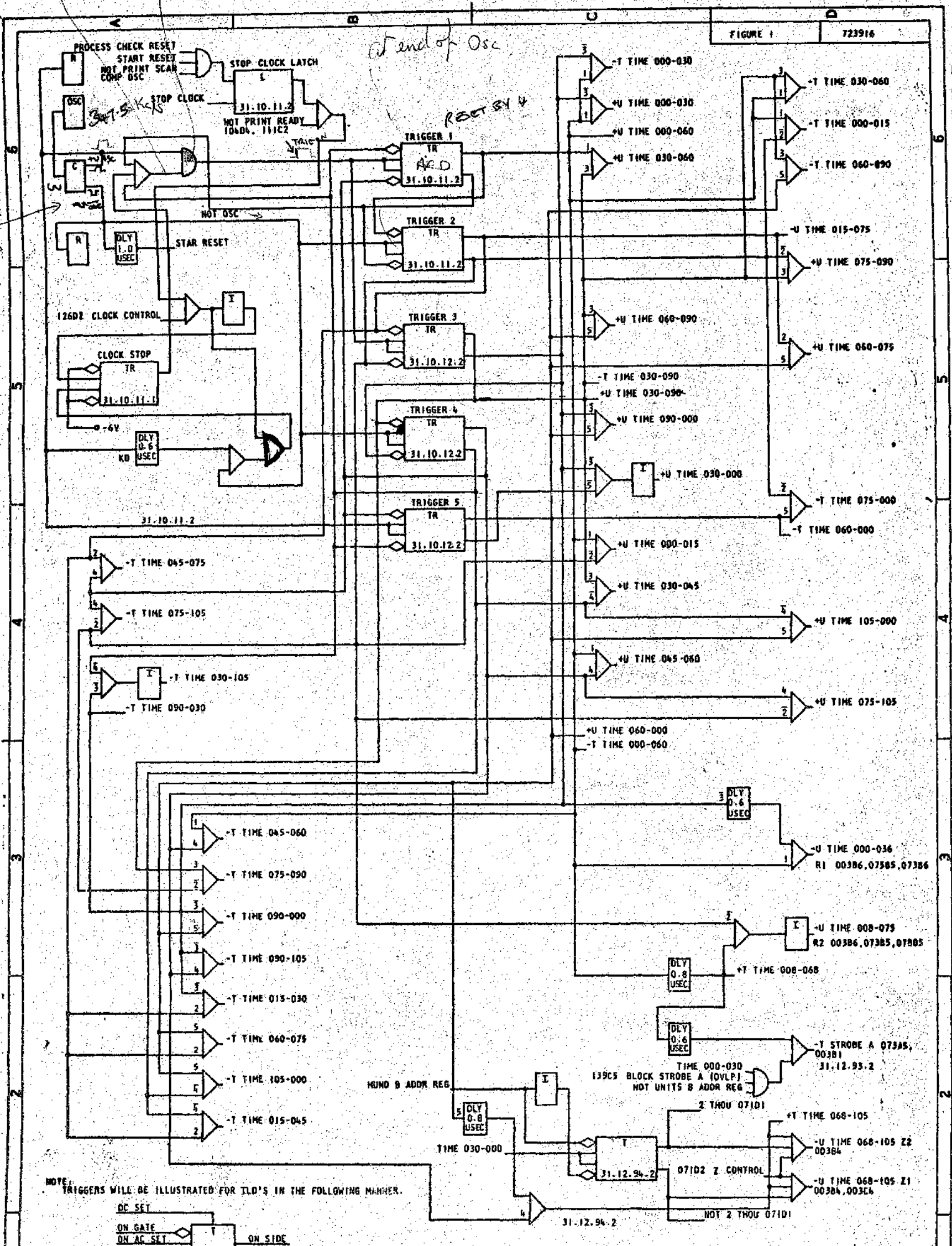
Will clamp this line on function

end of Osc

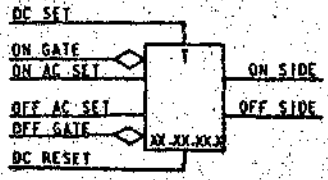
RESET BY 4

NOT OSC GOES TO RTZERO

FIGURE 1 723916

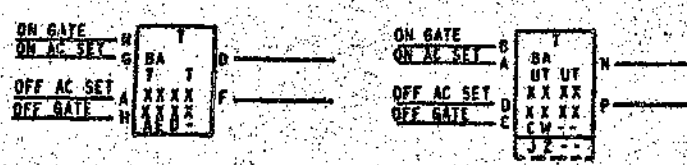


NOTE: TRIGGERS WILL BE ILLUSTRATED FOR ILO'S IN THE FOLLOWING MANNER.



THIS STANDARD WILL BE FOLLOWED REGARDLESS OF TRIGGER TYPE. IT SHOULD BE NOTED THAT TRIGGERS IN THE ALD'S DO NOT NECESSARILY CORRESPOND TO THIS STANDARD.

FOR EXAMPLE:



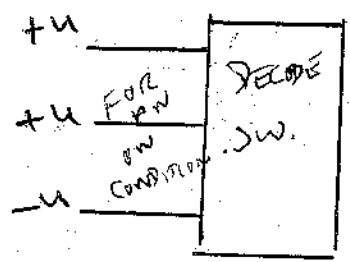
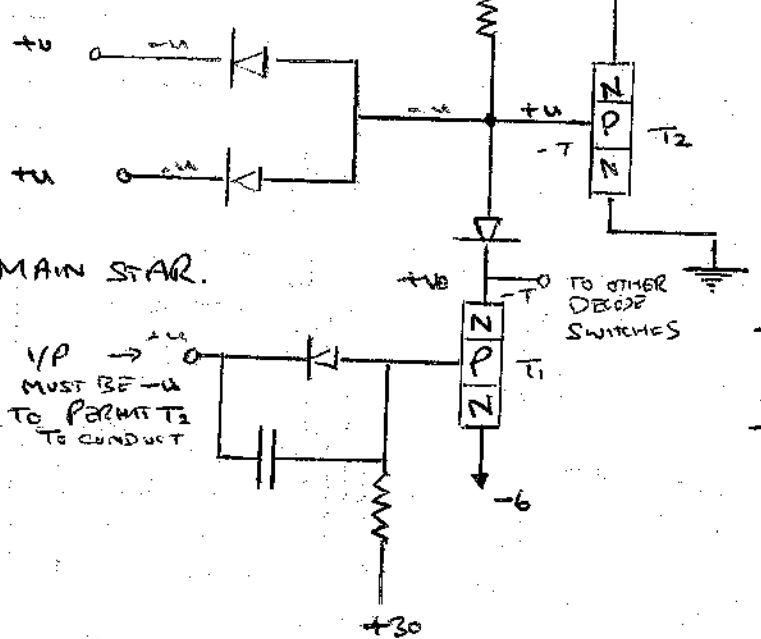
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	1-58301			NAME	CLOCK CONTROL AND		
8-21-62	114144B	31.7.62	TA 1379 K	CLOCK PULSES			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK	DRAWN	VE	11-8-61
				APPRO	CHECK		27/11-166



DECODE SWITCH

-u VP  
KEEPS T2 OFF

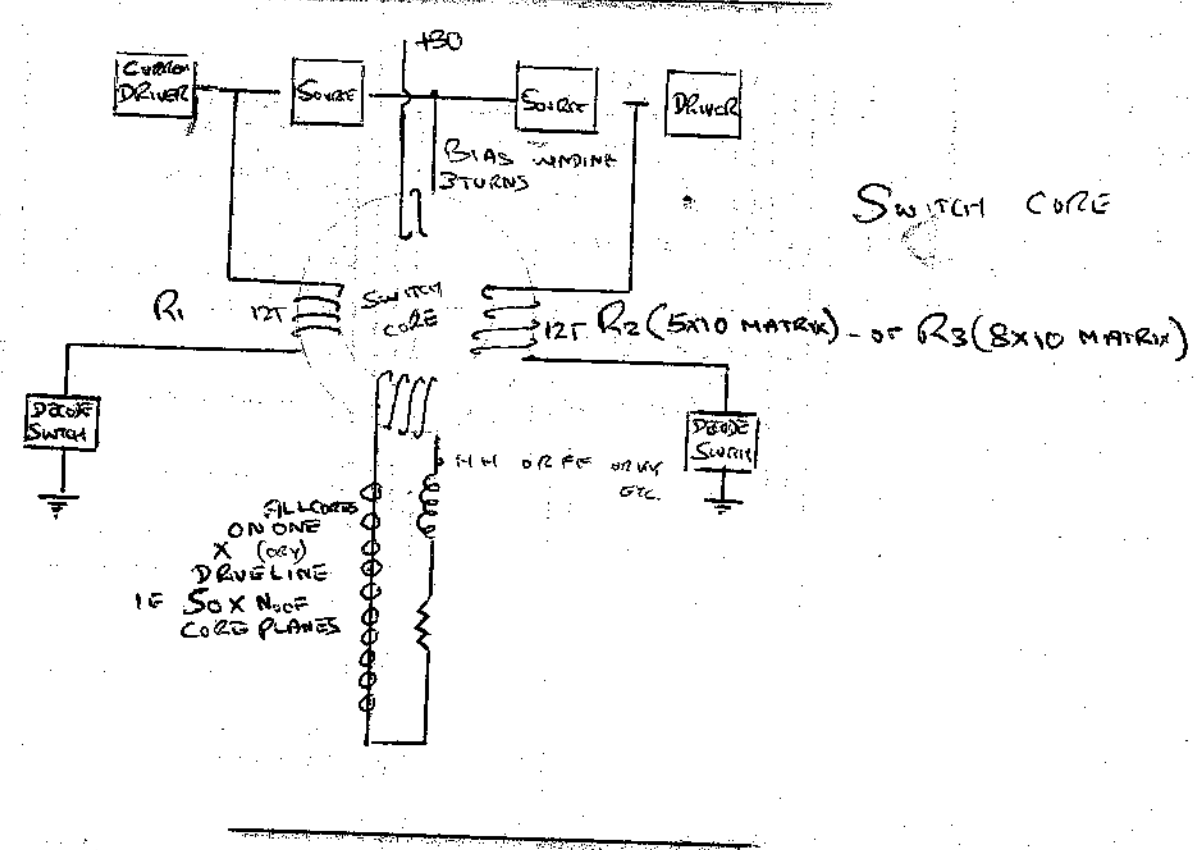
FROM MAIN STAR.



T2 MUST CONDUCT TO ACTIVATE SWITCH CORES

T1 MUST NOT.

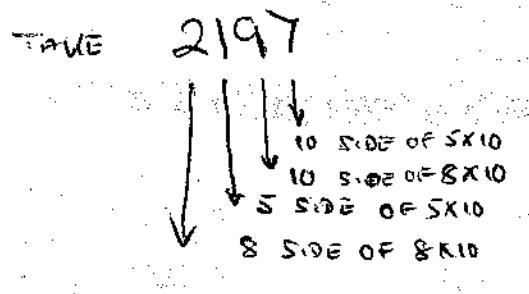
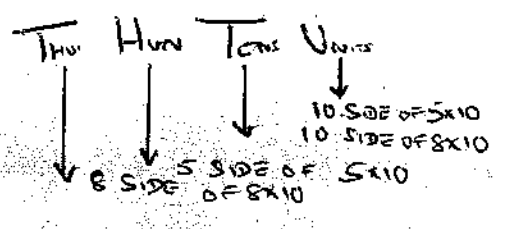
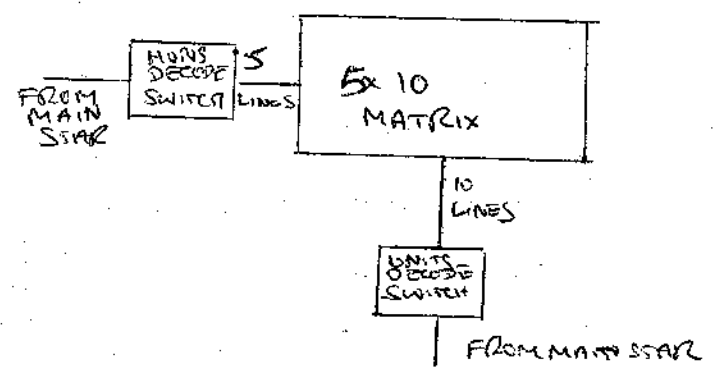
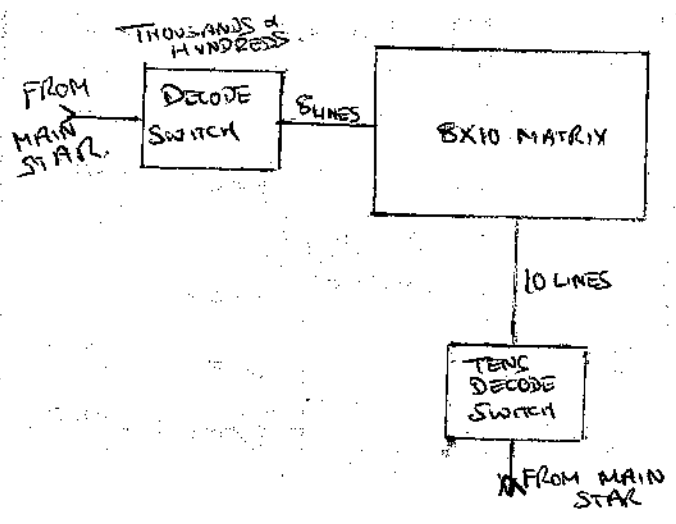
+u + u - u ACTIVATE DECODE SWITCHES



SWITCH CORE

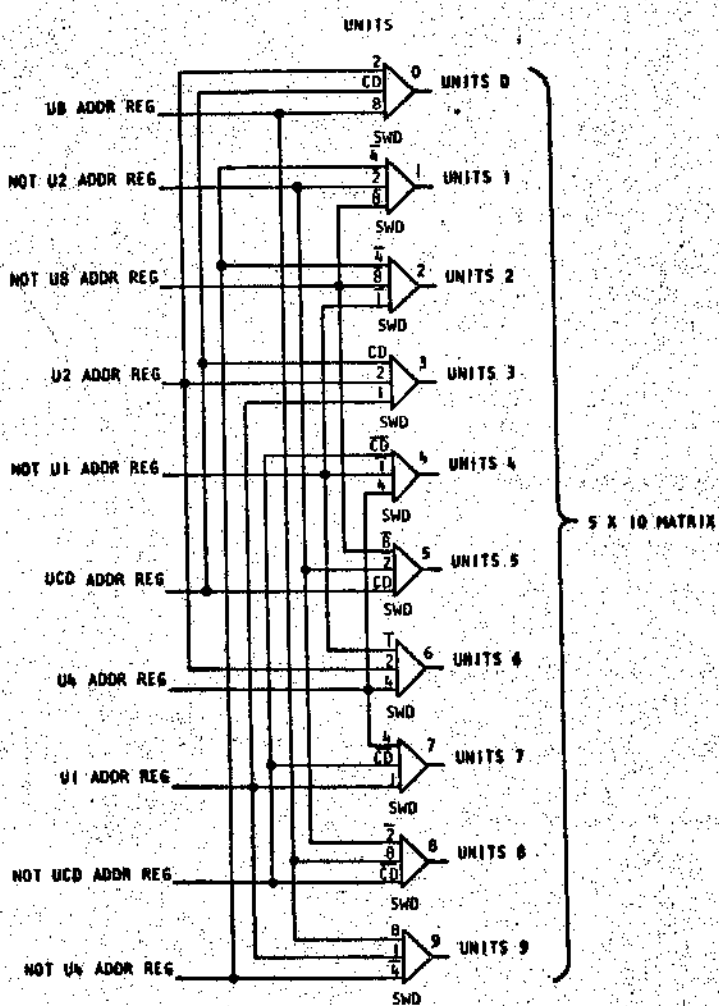
8x10 MATRIX

(2 40 2)

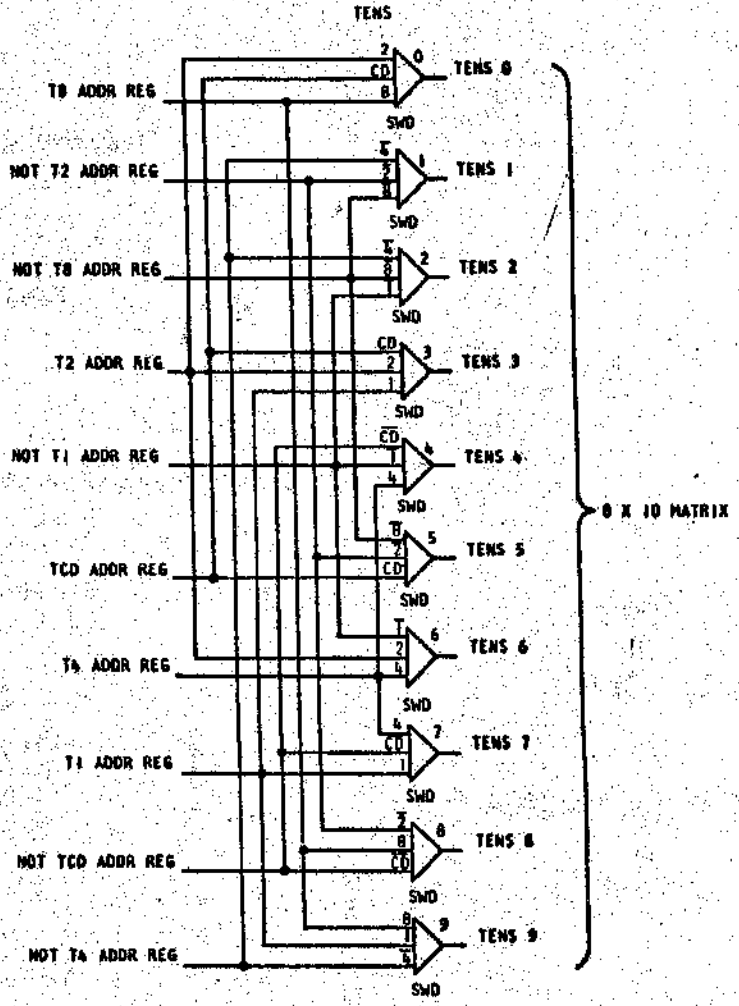


CODE

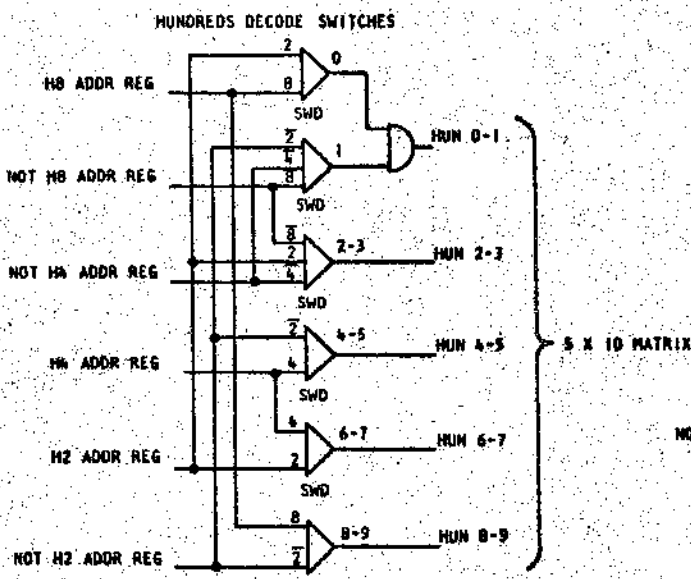
FIGURE 2 723917



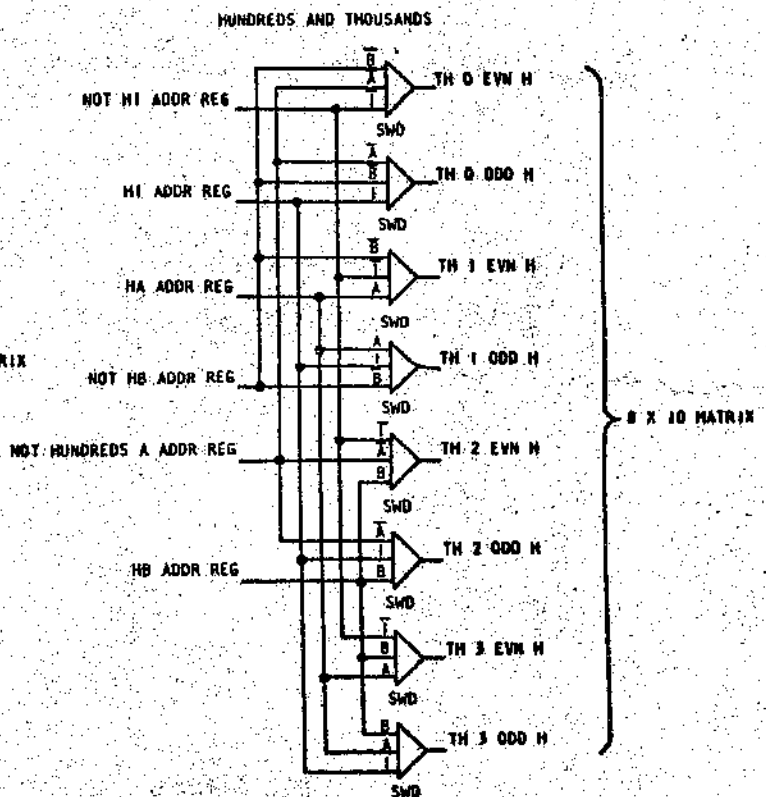
42.53.11.2



42.34.11.2



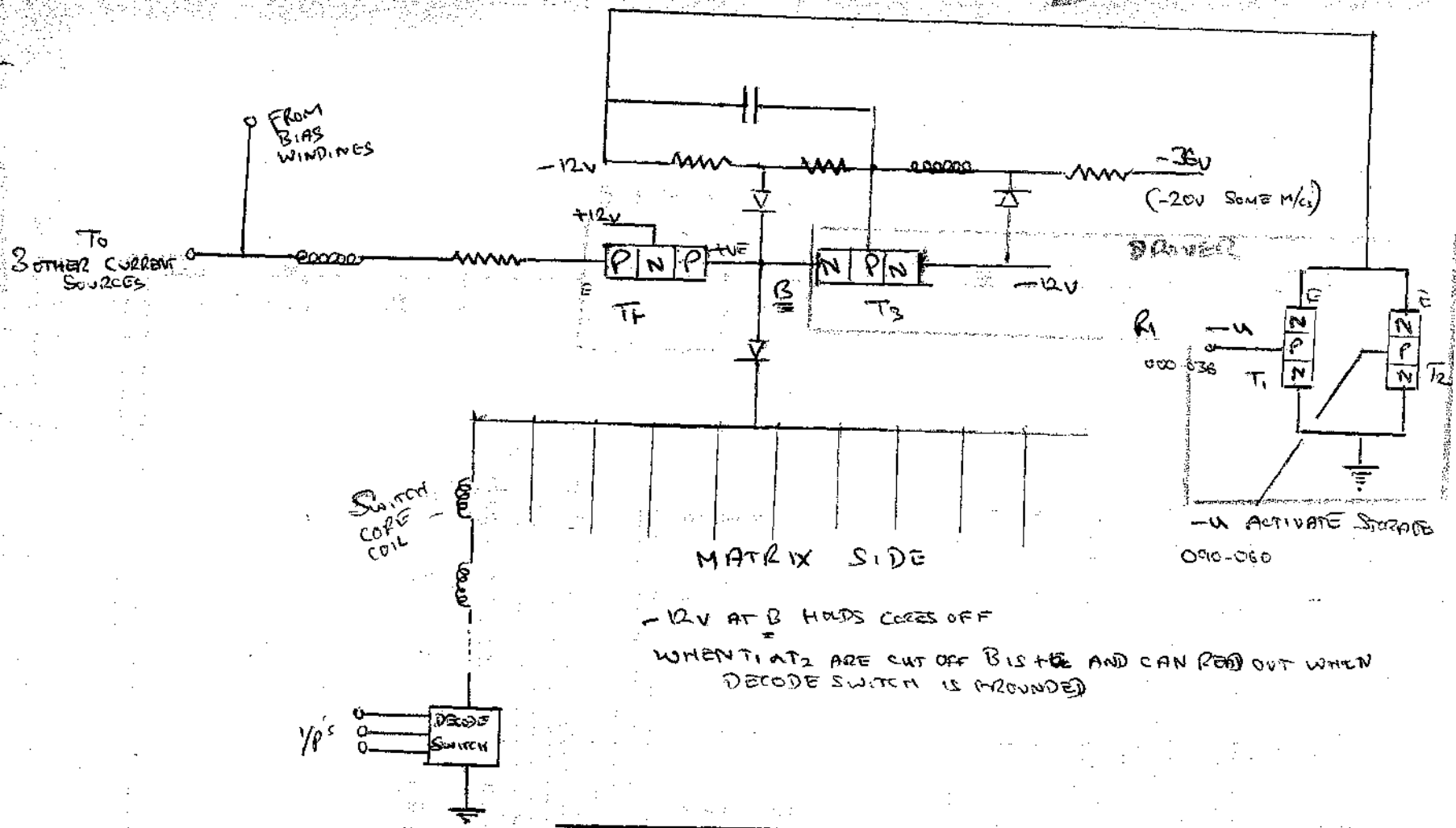
42.55.11.2



42.56.11.2

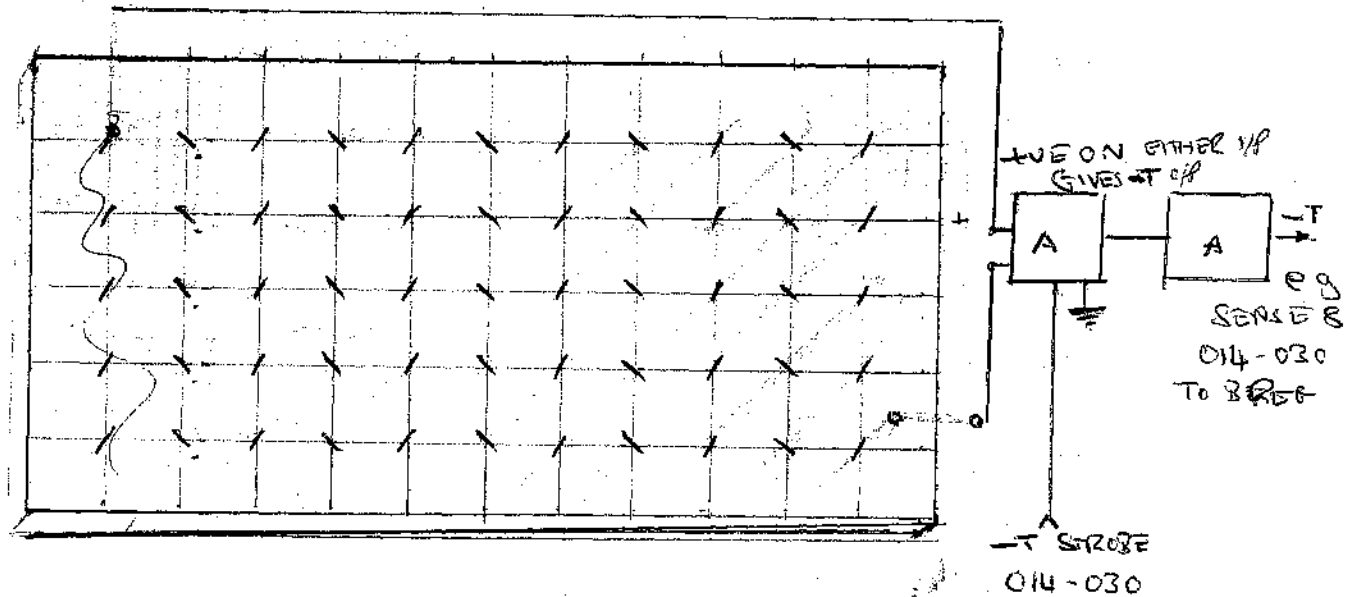
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113830 D	31.7.62	TA 1370 K	STORAGE DECODE			
SWITCHES							
				DESN		TYPE	
				RETR		SCALE	NONE
				CHEK		DRAW	VE 12-12-61
				APPR		CHEK	98 12-12-61





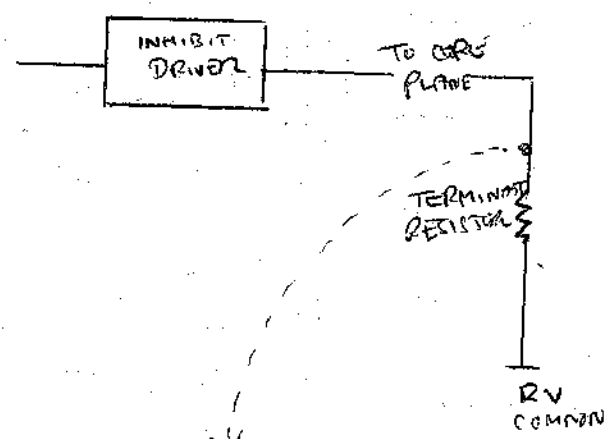
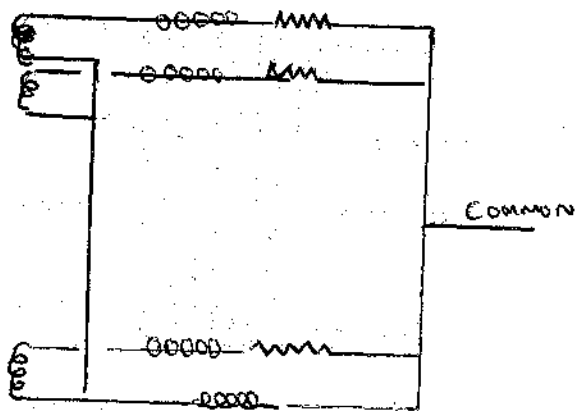
CORE PLANE  
READ OUT AND  
SENSE AMP

5X10 MATRIX  
(X DRIVE)

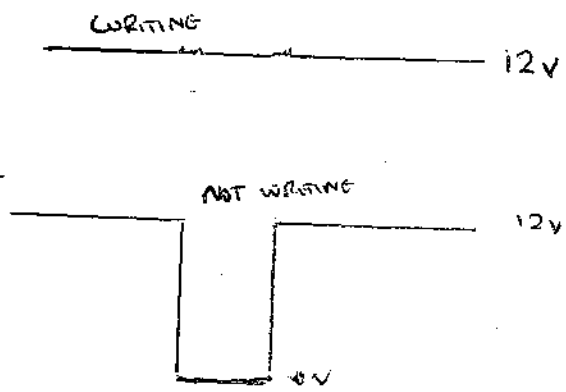


SCOTCH DRIVE TERMINATING RESISTORS

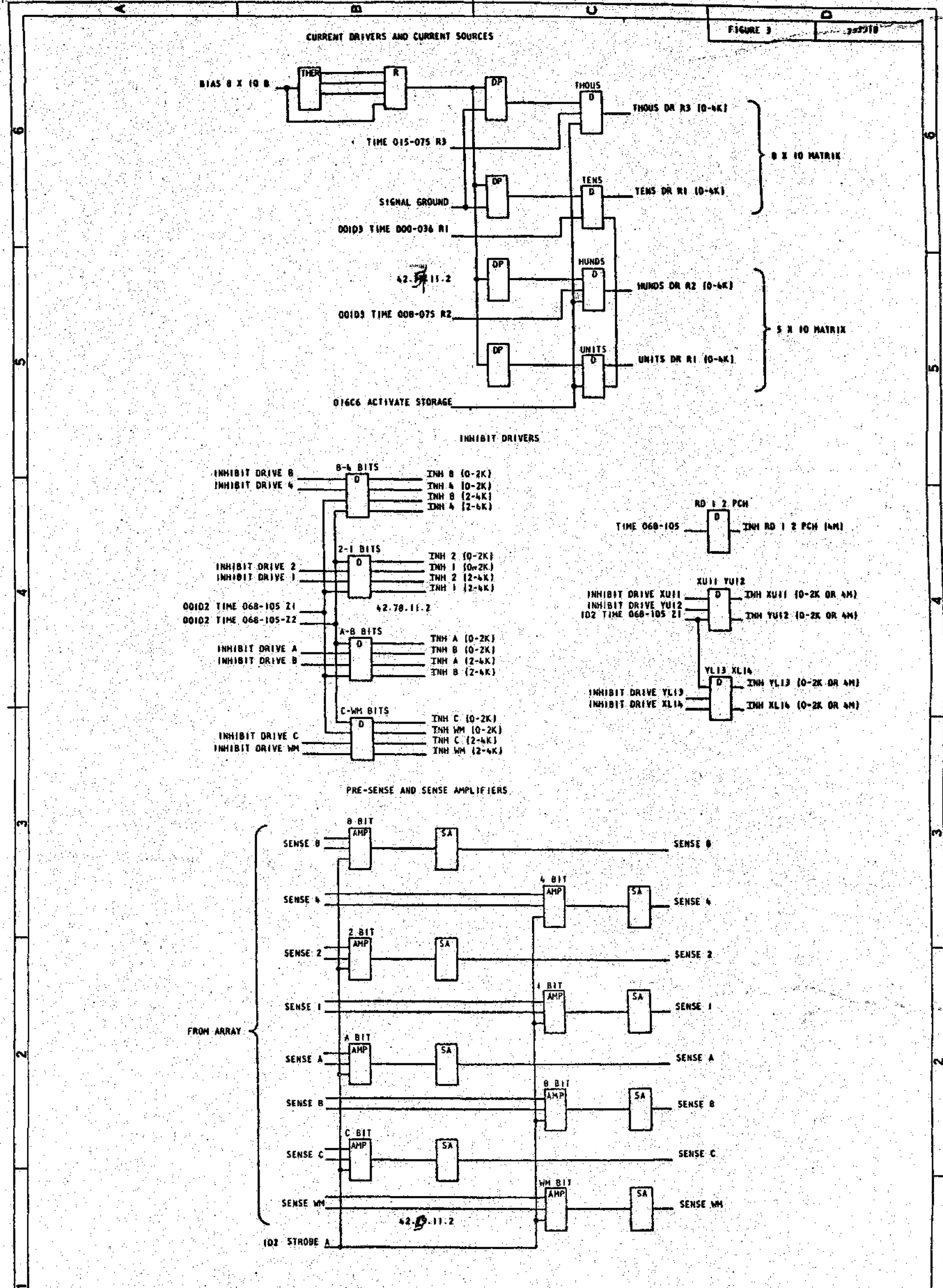
42 40 21



USE WORST PATTERN DFT  $\begin{pmatrix} B & A \\ 1 & 2 \end{pmatrix}$   
FOR SETTING UP IS V DIFFERENTIAL.



Copy

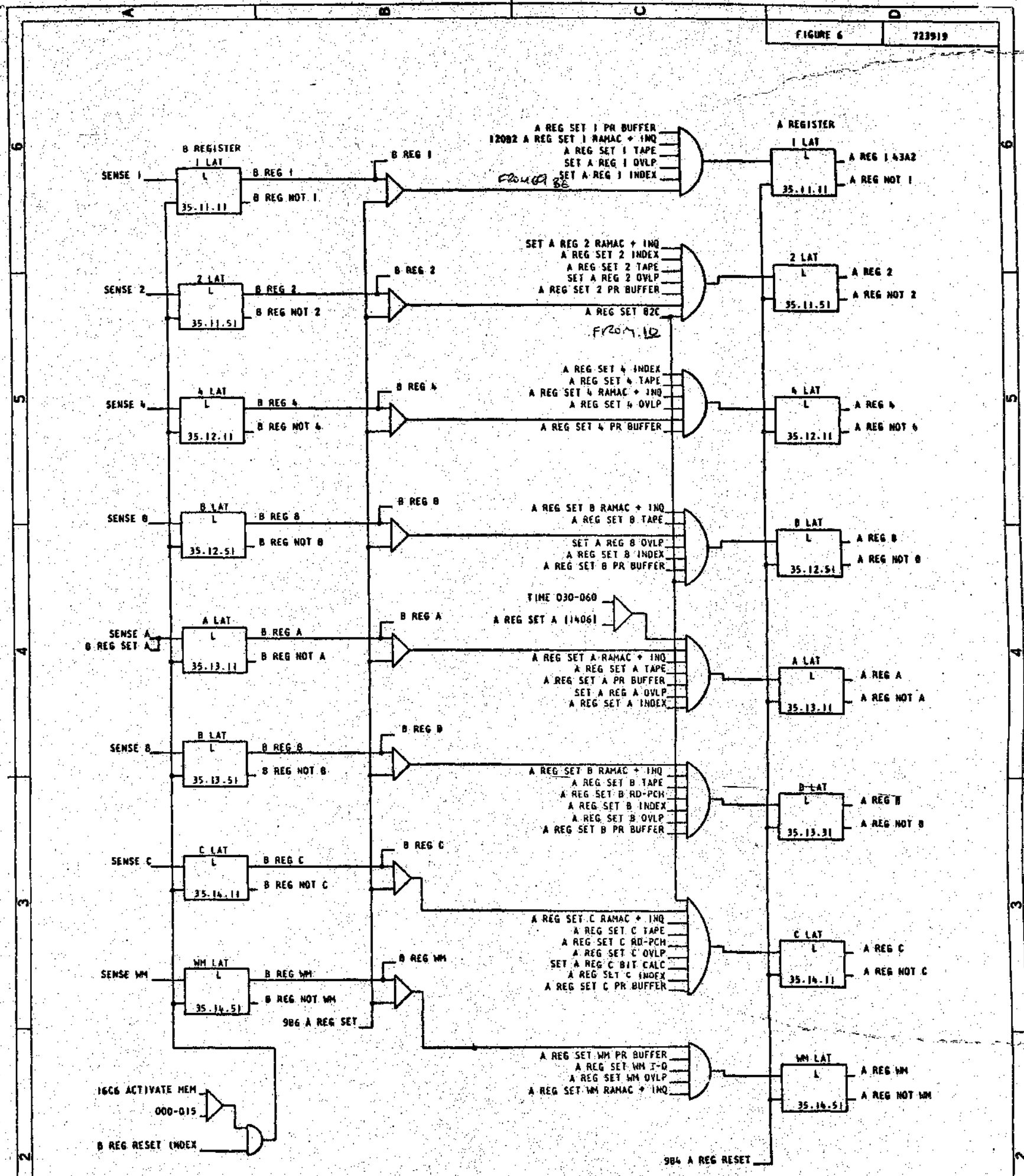


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4.10.62	113830 D	31.7.62	TA 1370 K	NAME CURRENT SWITCHES, INHIBIT
				DRIVERS PRESENSE AND SENSE AMPS
				DESIGN
				TYPE
				DETAIL
				SCALE NONE
				CHECK
				DRAW VE 12-12-64
				APPRO
				CHECK 2/2 12-13-64

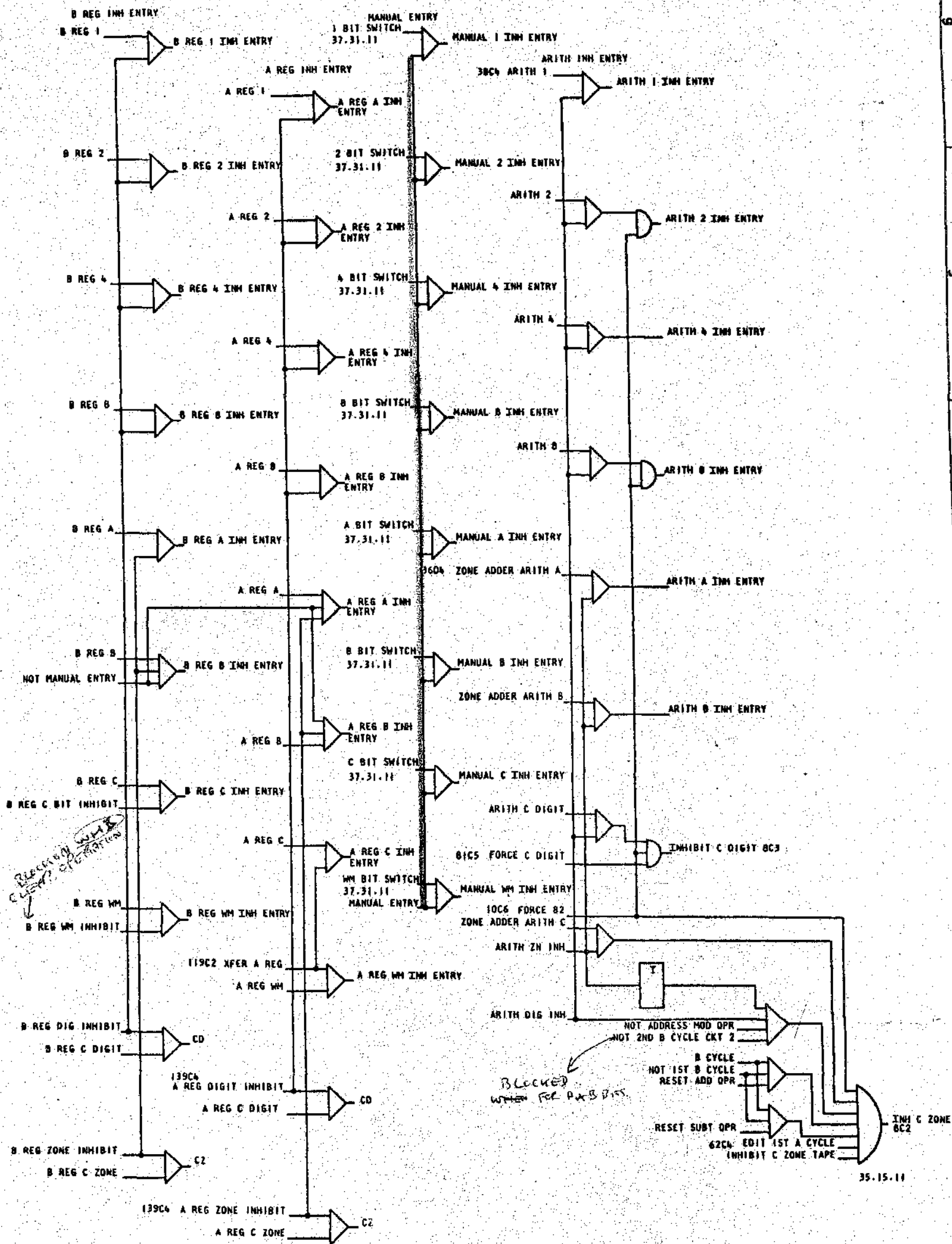


A REG B REG

FIGURE 6 723919



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.		
4-10-62	113850 D	31 7 62	TA 1370 K	NAME	DATA FLOW I	
				DESIGN		TYPE
				DETAIL		SCALE
				CHECK		DRAW
				APPRO		CHECK
						DATE



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	112830 D	31-7-62	TA 1370 K	NAME	DATA FLOW - 2		
				DESR		TYPE	
				DETA		SCALE	NONE
				CHEK		DRAW	VE 1-5-62
				APPR		CHEK	MW 1-10-62



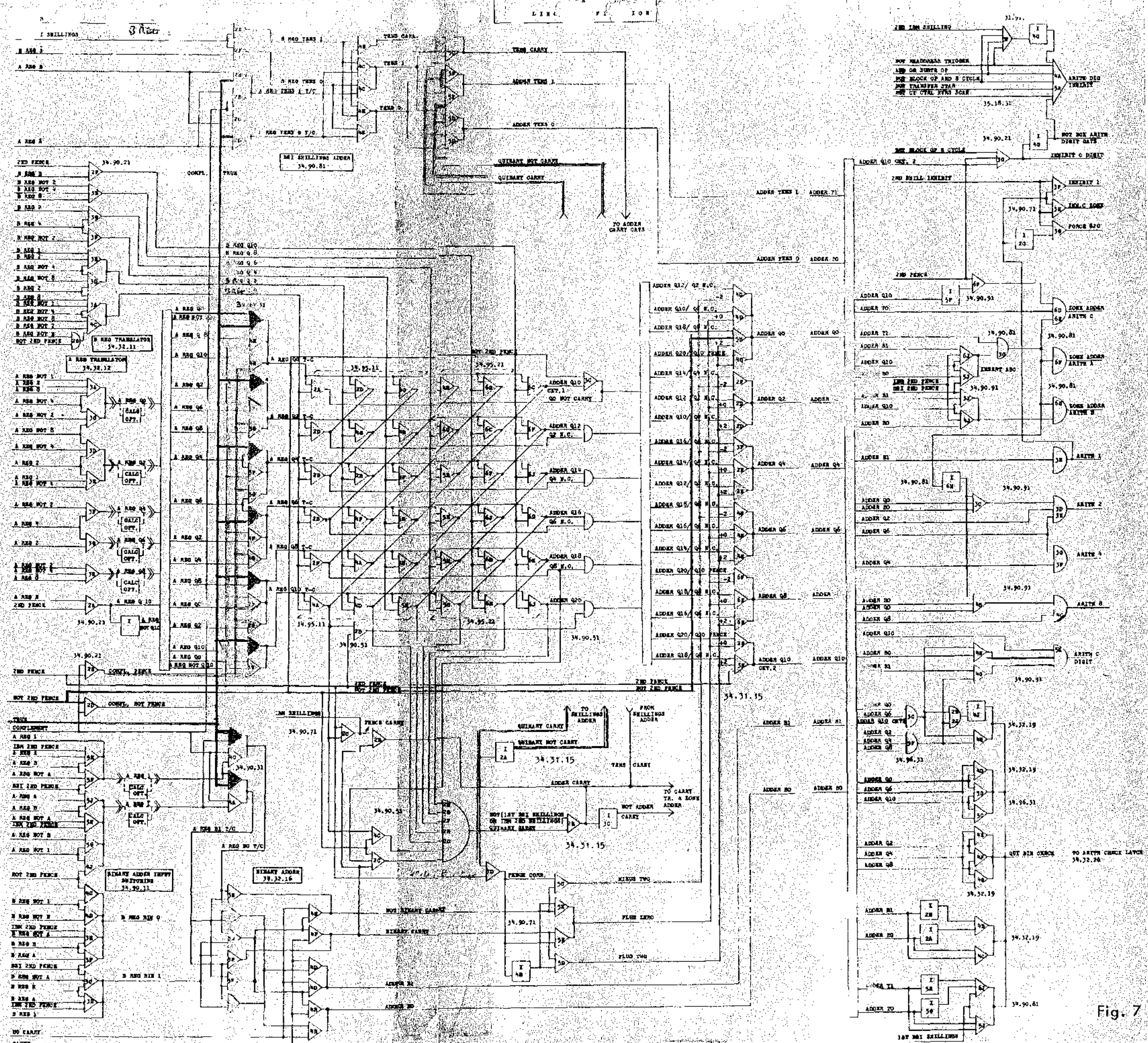
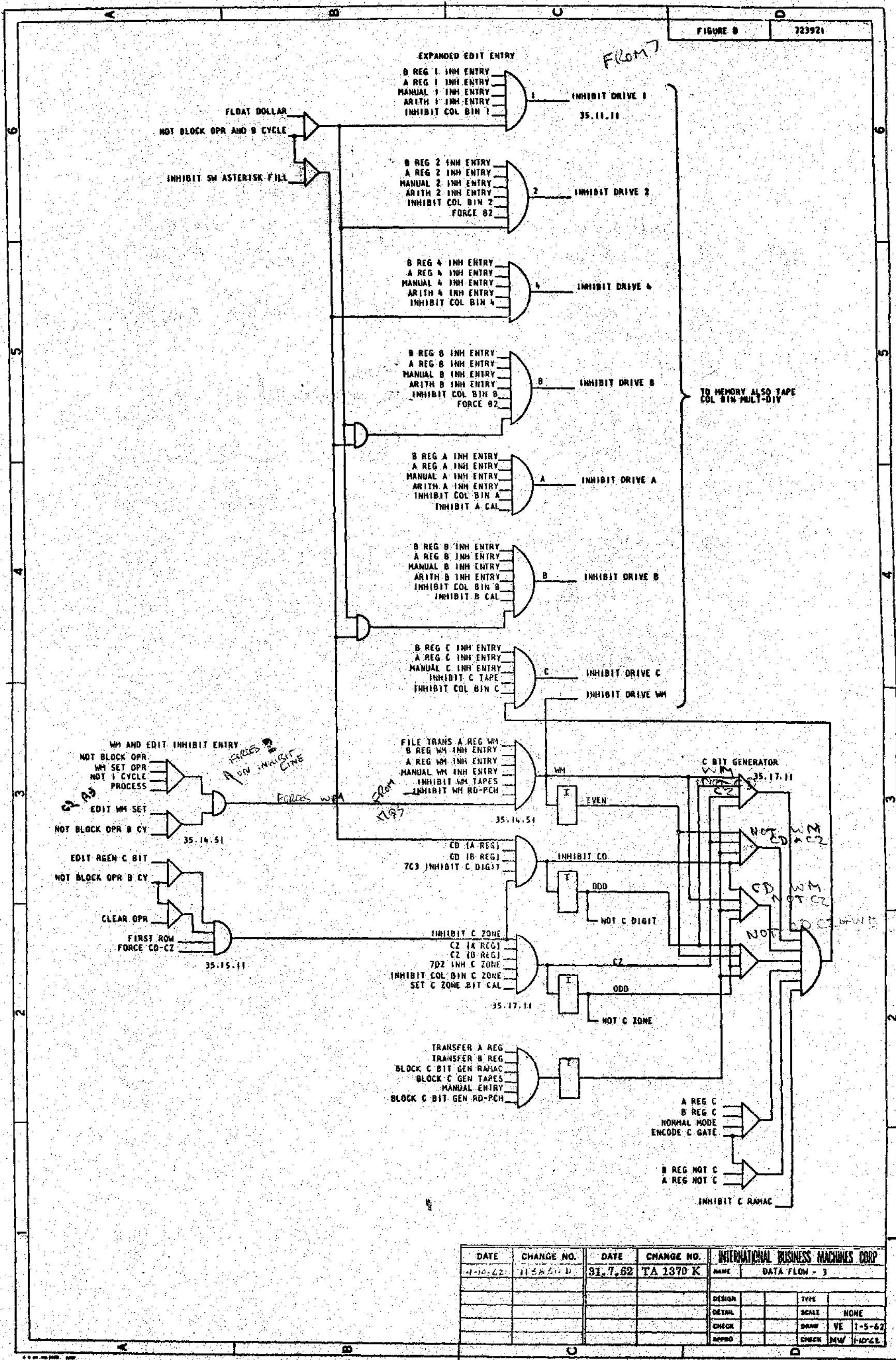


Fig. 7

3 BIT GEN

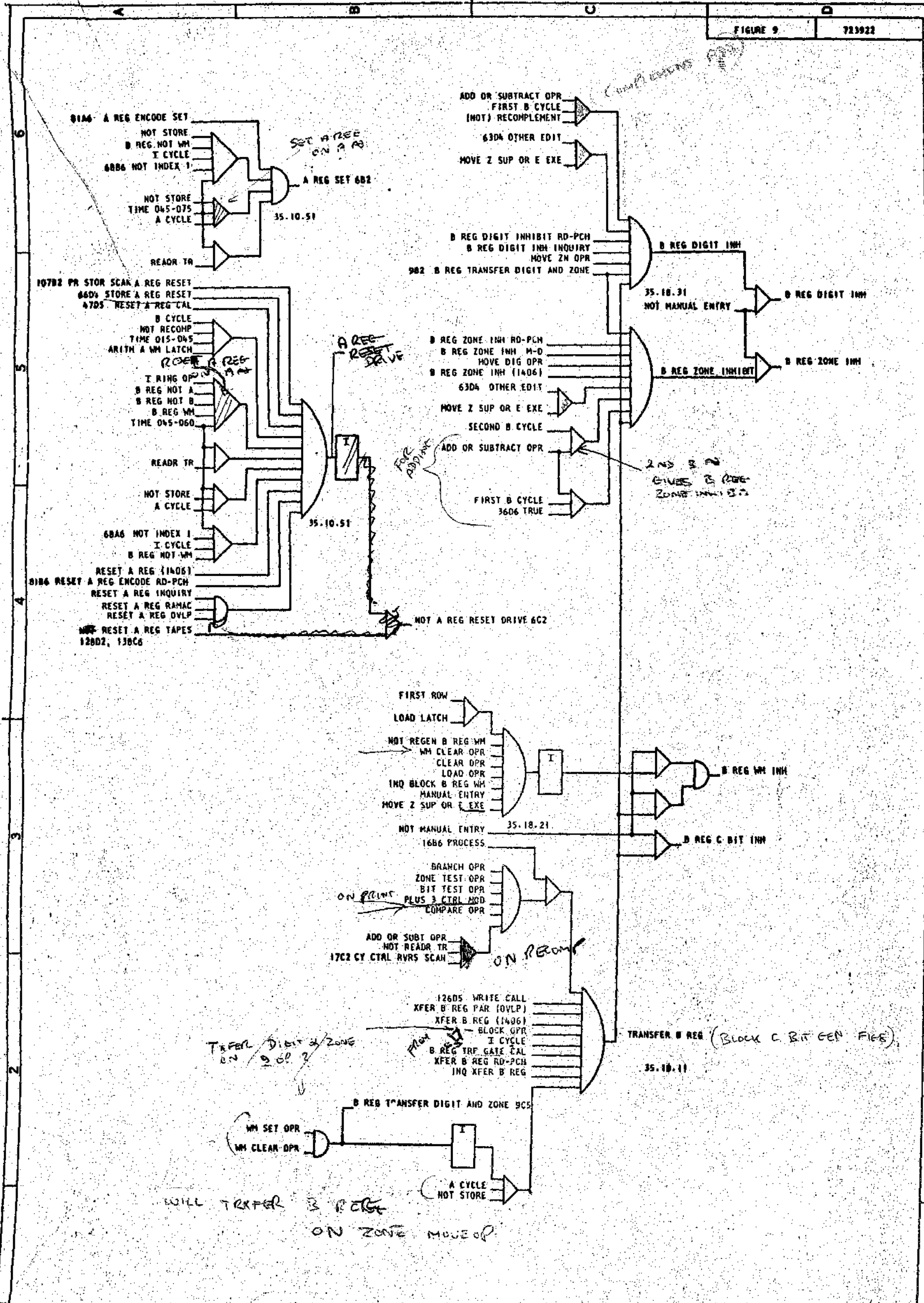
FIGURE 8 723921



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP		
1-10-62	1158 G1 D	31-7-62	TA 1370 K	NAME	DATA FLOW - 3	
				DESIGN		TYPE
				DETAIL		SCALE NONE
				CHECK	DRAW VE	1-5-62
				APPRO	CHECK MW	1-10-62



OP	INHIBIT		LBIT GEN	I/E	WM INHIBIT.	
	A	B			A	B
L	xfer	xfer A	-	AWLT.	Breg xfer	Areg xfer
M	xfer B	ADig AZN	✓	GT.D.WM.BA	Bxfer	BReg WM A
9	Breg D Breg Z	Breg D Breg Z	✓	1 char BA	Forced	Forced.
*	---	---	✓	---	Blocked	Blocked.
Y	xfer Breg	Areg Z Breg D	✓	---	X Breg	Breg WM inh.
D	---	Areg B Breg Z	✓	---	---	---
C	---	xfer Breg.	---	Same as Move Op.	---	---

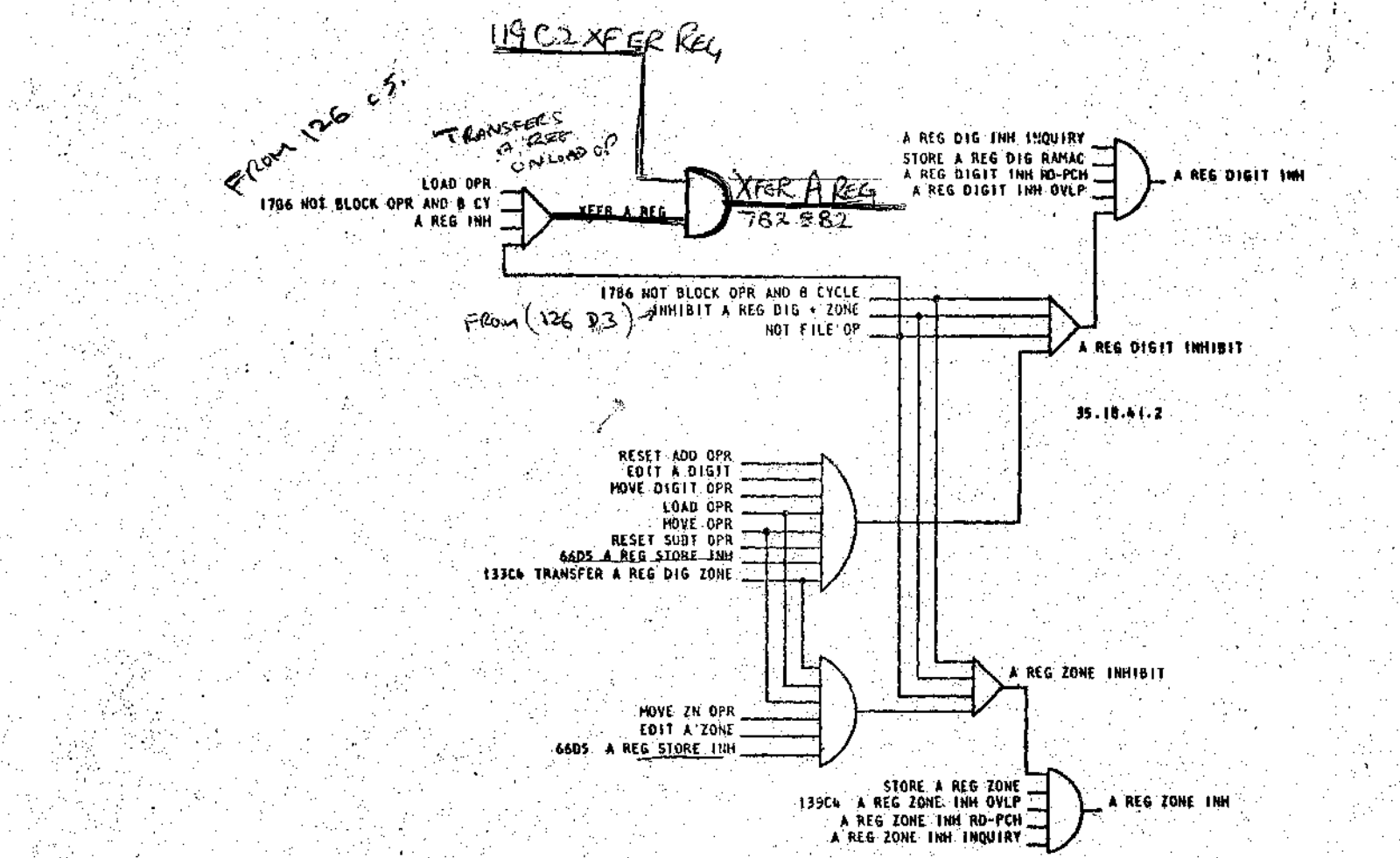
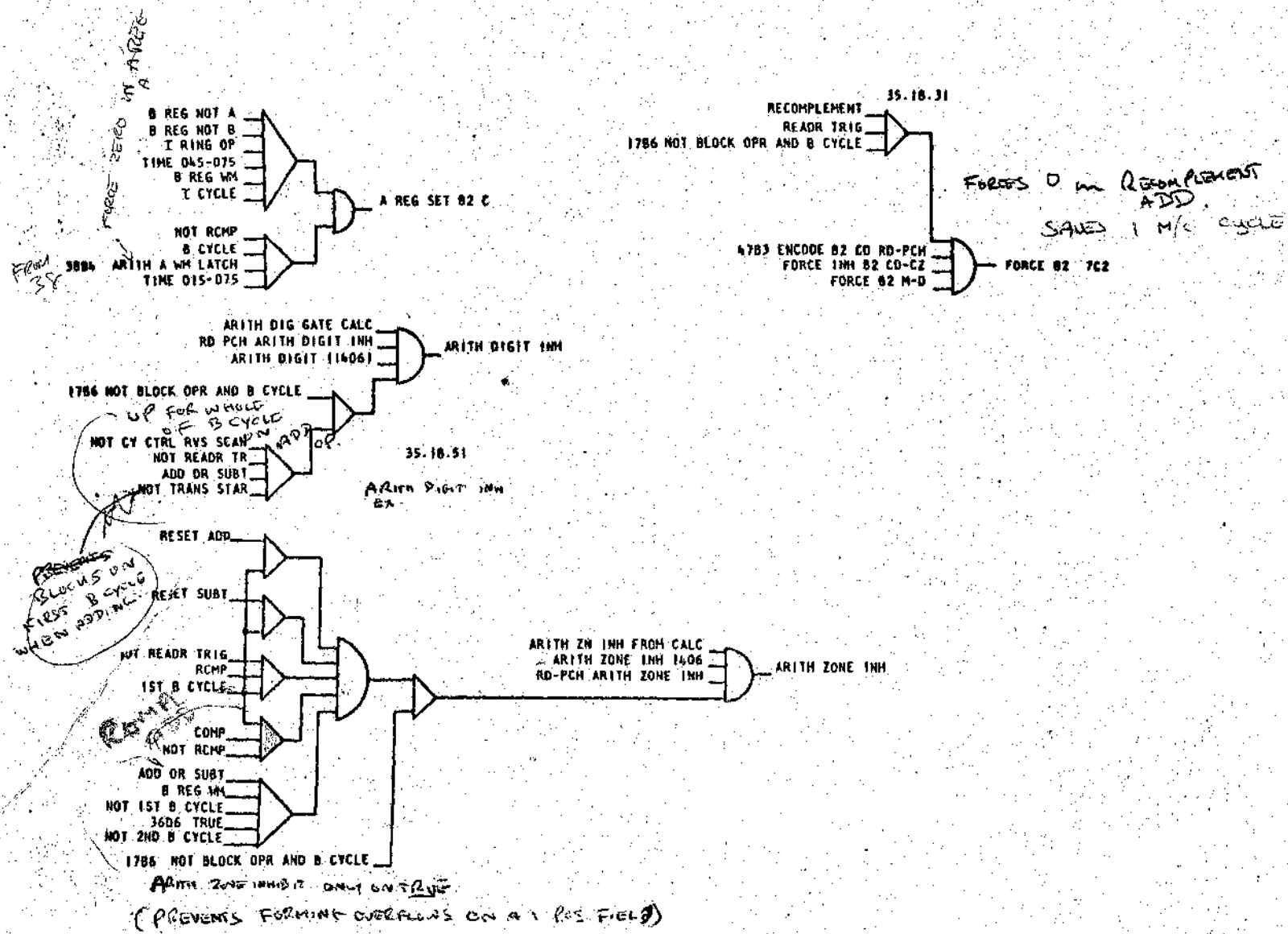


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113330D			NAME	DATA FLOW CONTROLS I		
6-21-62	114448	31.7.62	TA 1370 K	DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 1-5-62
				APPRO		CHECK	MW 1-10-62

# A REG STA INHIBIT

FIGURE 10

723923



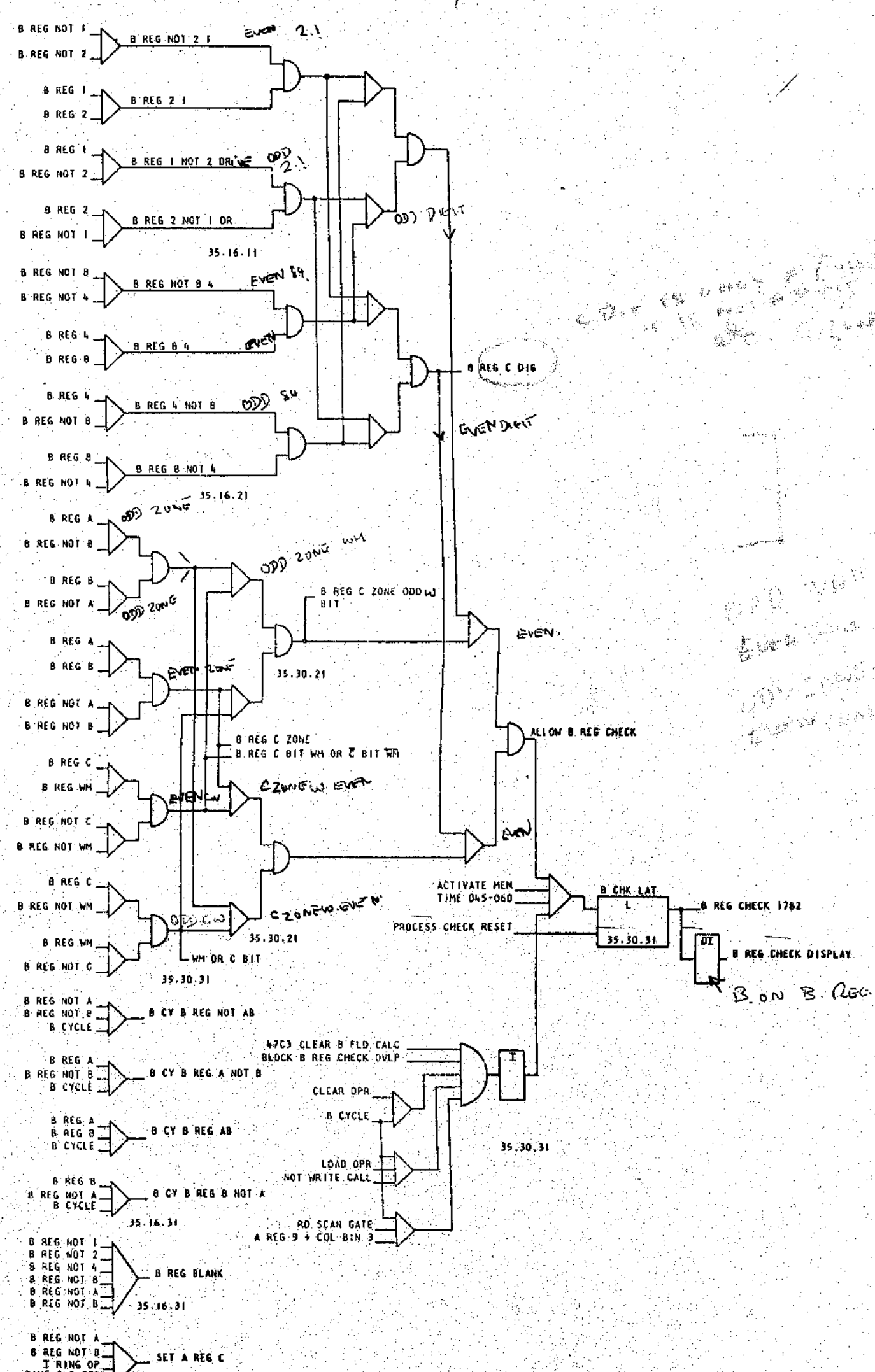
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	115850 D			NAME	DATA FLOW CONTROLS 2		
6-21-62	114144 B	01 7 62	TA 1370 K	DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 1-5-62
				APPRO		CHECK	MW 1-10-62



# B REG. PARITY.

WHEN LOOKING FOR  
PARITY FAULTS LOOK FOR  
THINGS ARE RIGHT BECAUSE THEY  
USUALLY CAUSE THE ERRORS.

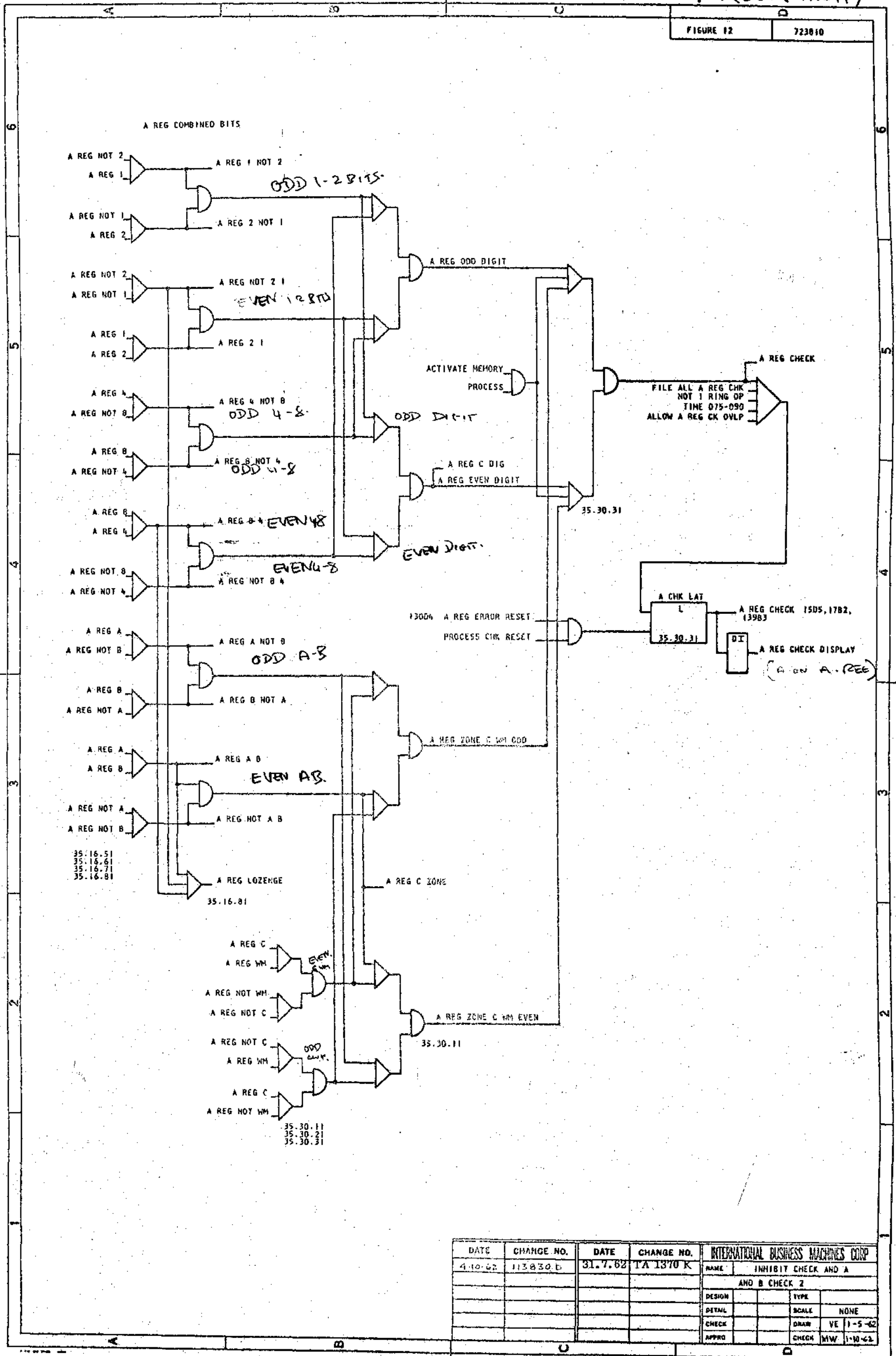
FIGURE 11 723809



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113230 D	31.7.62	TA 1370K	NAME:	INHIBIT CHECK AND A AND B CHECK I		
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 4-5-62
				APPRO		CHECK	MW 1-10-62

# A. REG. PARITY

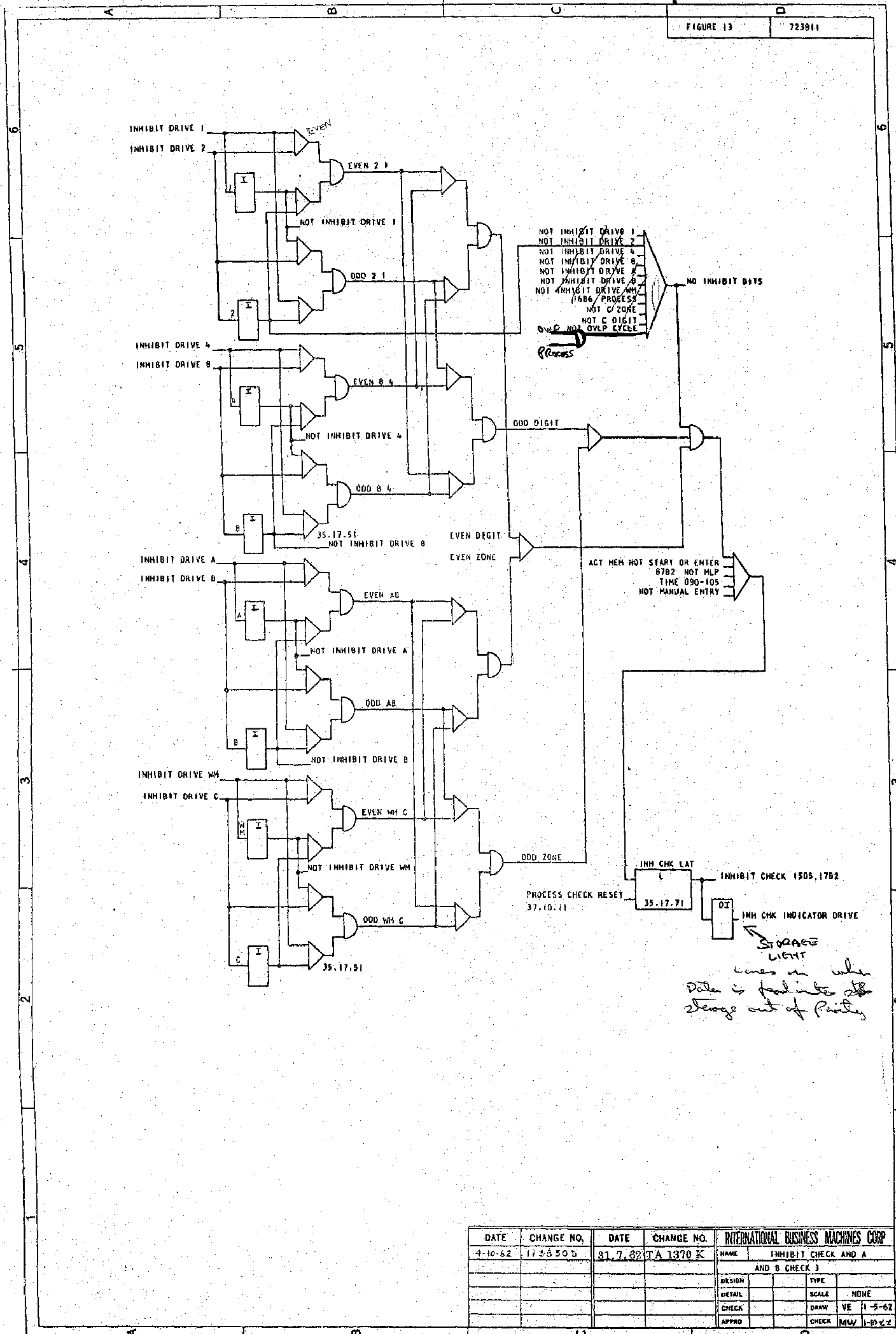
FIGURE 12 723010



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4.10.62	113830 B	31.7.82	TA 1370 K	NAME	INHIBIT CHECK AND A		
					AND B CHECK Z		
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	VE 1-5-62
				APPRO		CHECK	MW 1-10-62

# INHIBIT PARITY

FIGURE 13      723911



*comes on when data is fed into the storage out of Parity*

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113350b	81.7.62	TA 1370 K	NAME	INHIBIT CHECK AND A AND B CHECK 3		
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 1-5-62
				APPRO		CHECK	MW 1-10-62



AVOID CHANGE ON EXECUTE PHASE OF COMPARE & BRANCH

BLOCKS I-E CHANGE ON ADDRESS

FOR CLEAR (BAV ONLY)

FORCES 0 ON LAST

AVOID CHANGE WHEN ADDRESS (AFTER A BAV)

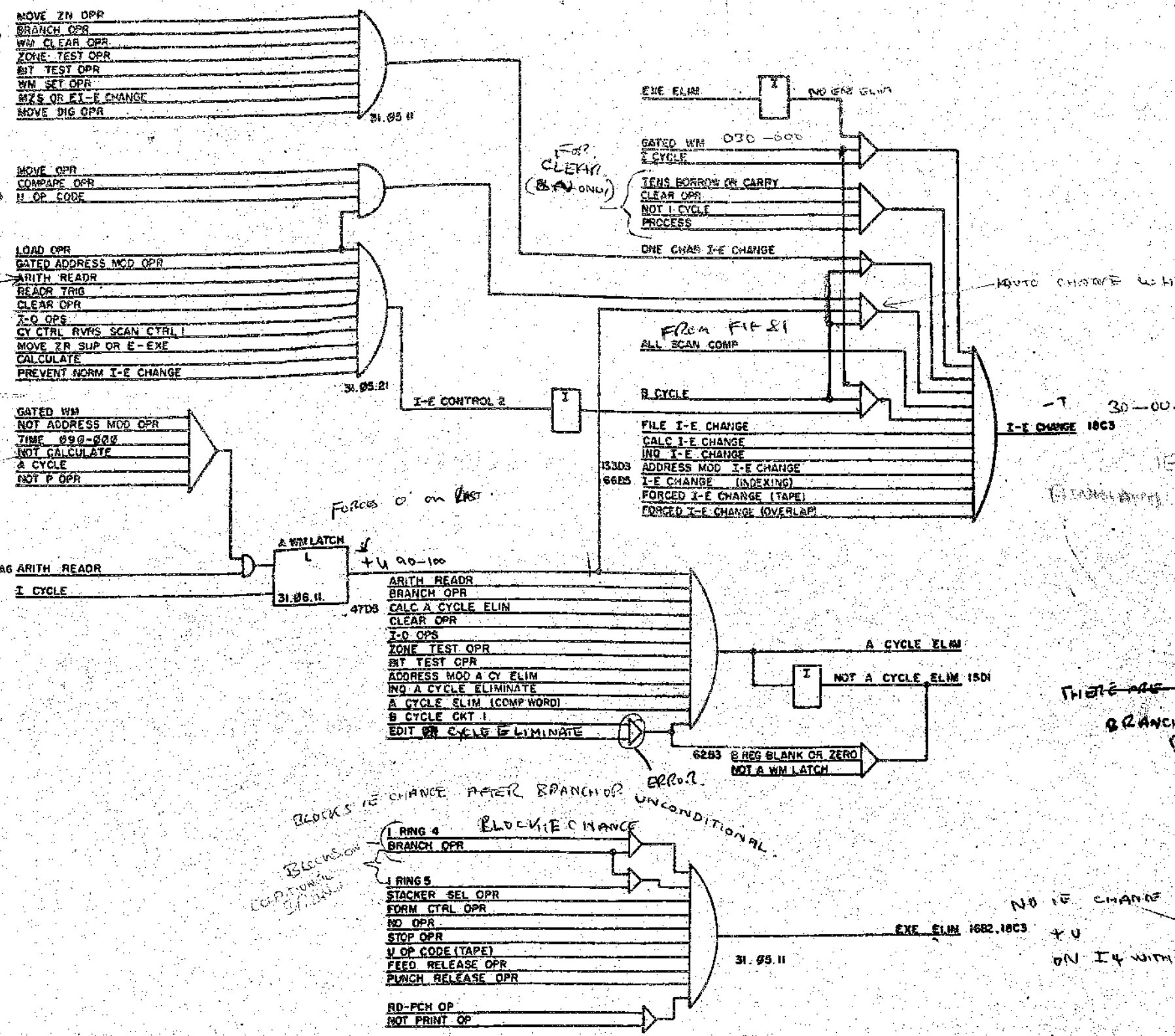
IF CHANGE FOR WORD IS  
 BRANCHING 00-00  
 B  
 MING UP  
 DATA  
 NOTE CHANGE  
 BAV  
 GATED WM  
 THERE ARE NO  
 BRANCH OF  
 BAV

BLOCKS I-E CHANGE AFTER BRANCH OR UNCONDITIONAL

BLOCKS ON  
 UNCONDITIONAL

NO I-E CHANGE  
 ON I4 WITH B

I-E CHANGE



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	11830D	31.7.62	1A 1370 K

DESIGN	TYPE	DATE
DESIGN		
CHECK		
APPROV		

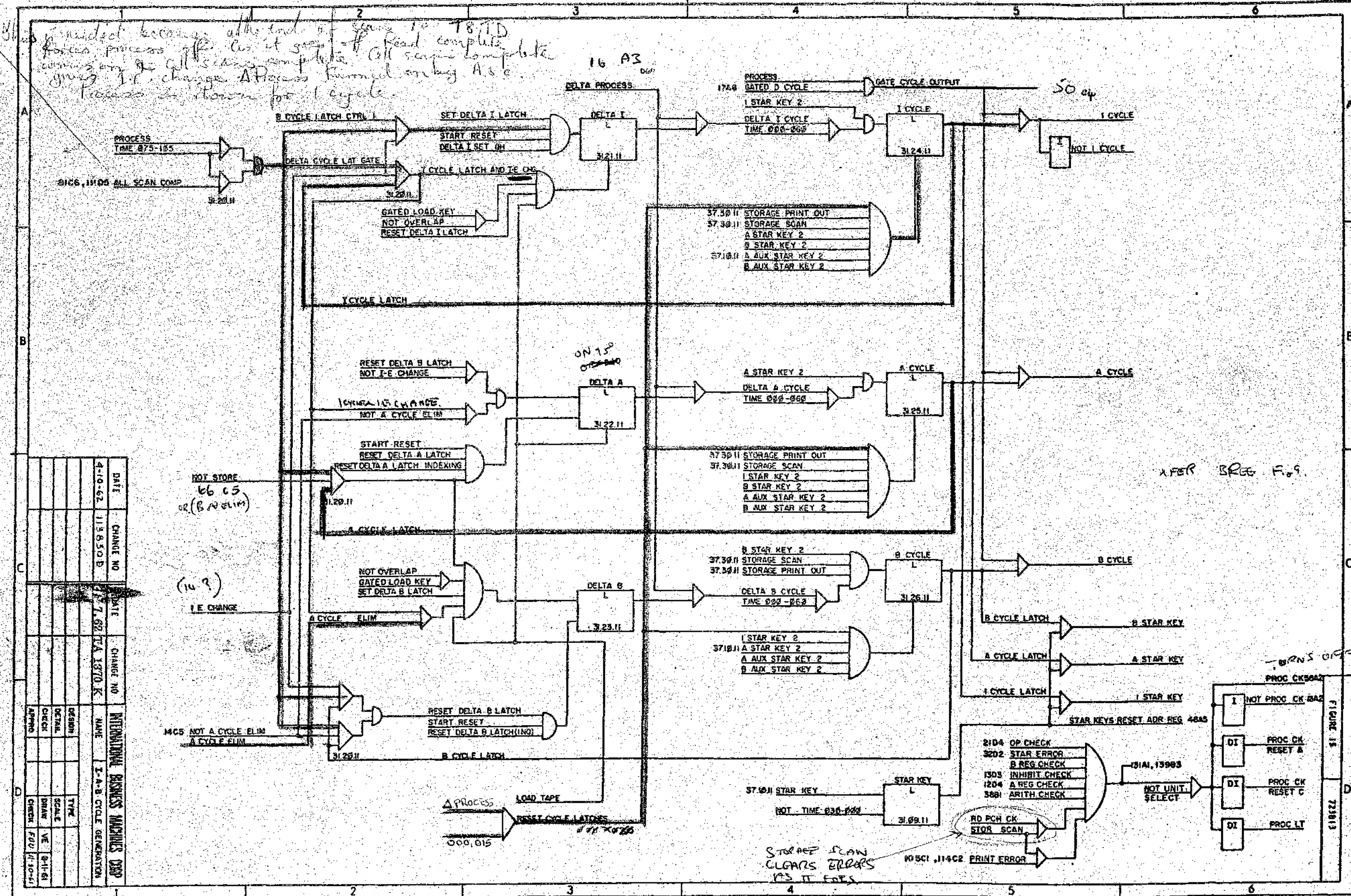
  

NAME	I-E CHANGE #	A CYCLE ELIM EXEC ELIM

CHGR	FOU	DATE

FIGURE 14 722812



provided because at the end of scans 10, 18, 19  
 process occurs after it goes off read complete  
 commission of all scans complete all scans complete  
 group 10 change A process triggered on by A & C  
 process is stored for 1 cycle

DATE	CHANGE NO	DATE	CHANGE NO
4-10-62	11850 B	7-1-62	TA 1870 K

DESIGN	TIME	SCALE	DATE
DETAILED			5-11-61
CHECK			
APPROV			

NAME	TYPE
INTERNATIONAL BUSINESS MACHINES CORP	
I-A-B CYCLE GENERATOR	

NOT STORE  
 66 65  
 or (B A ELIM)

(10 9)  
 I E CHANGE

MCS NOT A CYCLE ELIM  
 A CYCLE ELIM

LOAD TAPE  
 RESET CYCLE LATCHES  
 000,015

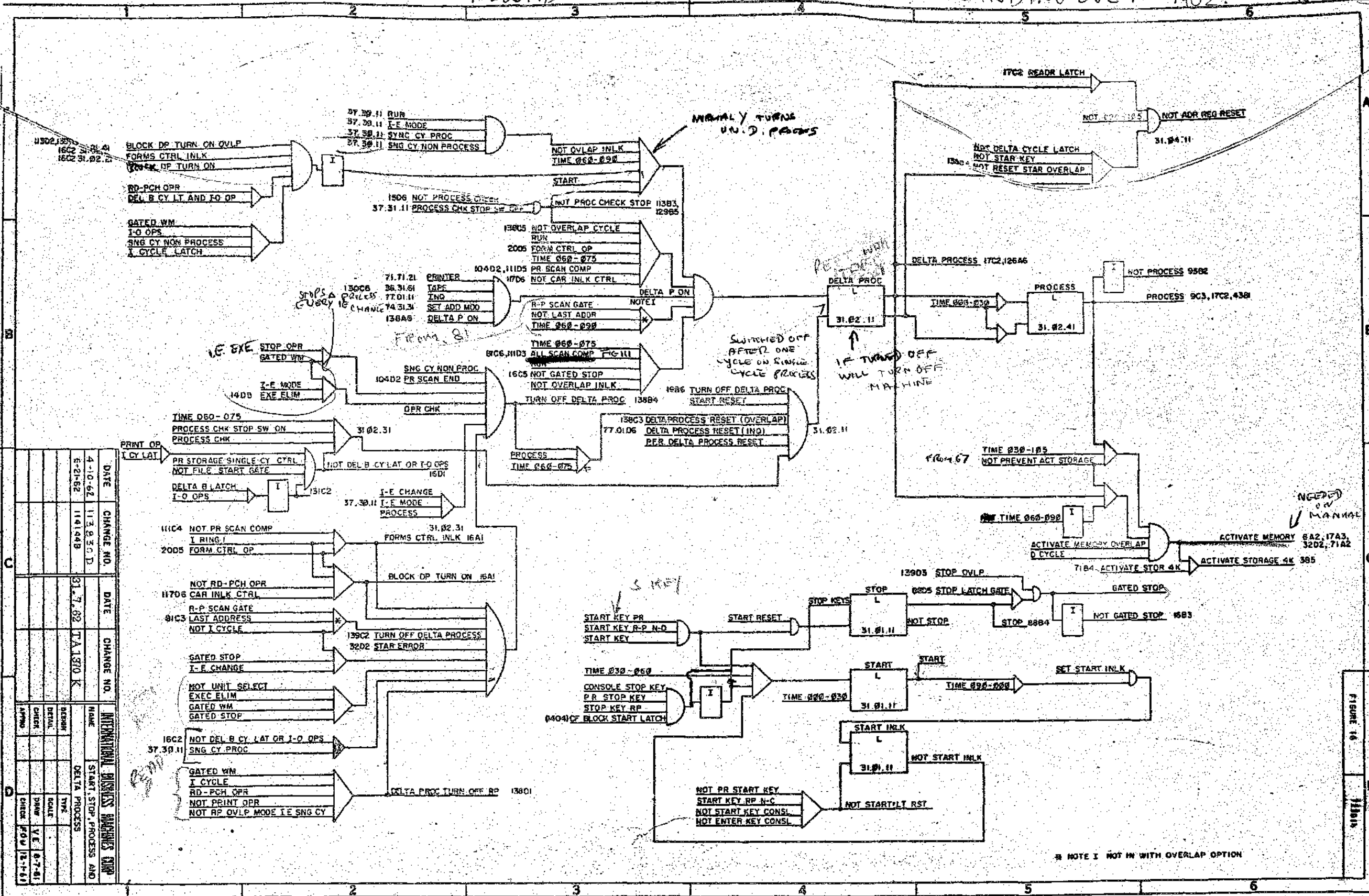
STORAGE SCAN  
 CLEARS ERRORS  
 AS IT GOES  
 BECAUSE NO  
 RECEV X 0 10  
 ETC.

X FER BREG Fig 9

PROCESS LIGHT

FIGURE 15  
721813

ALWAYS LIFT BRUSHES WHEN WINDING OVER 1402. SINGLE CYCLING



DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113230 D		
5-2-62	114148 B		
		31-7-62	1A1310 K

NAME	START, STOP, PROCESS AND DELTA PROCESS
INTERNATIONAL BUSINESS MACHINES CORP.	
TYPE	
MODEL	
CHAS.	
DATE	
BY	
CHKD	
APP'D	

NOTE 1 NOT IN WITH OVERLAP OPTION

FIGURE 16

NEEDED ON MANUAL ENTRY

MANUALLY TURNS U.N.D. PAGES

RESET WITH DELTA PROC

SWITCHED OFF AFTER ONE CYCLE ON SINGLE CYCLE PROCESS

IF TURNED OFF WILL TURN OFF MACHINE

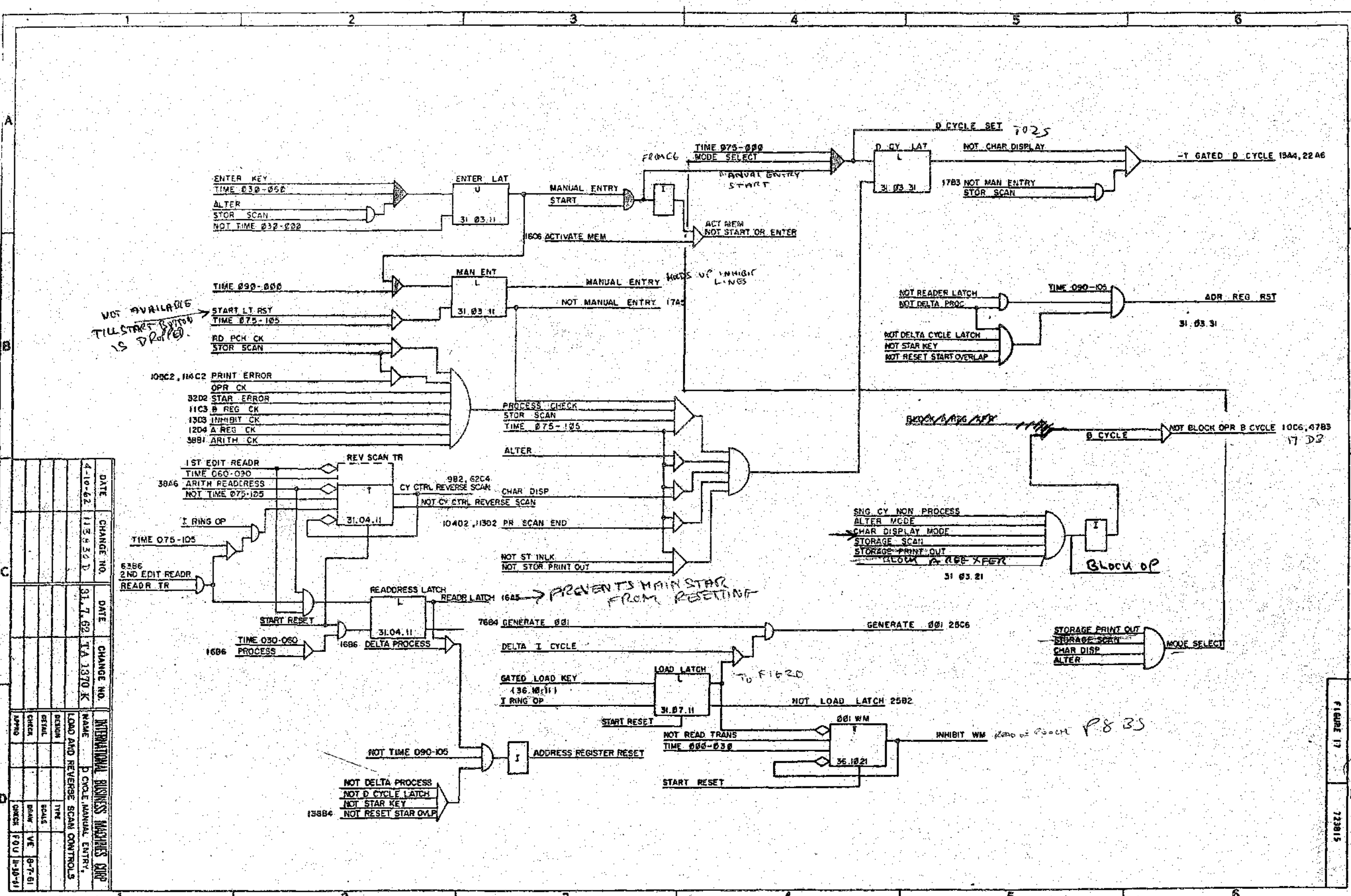
STOPS A CARRY IS CHANGE

FROM 81

FROM 67

S KEY



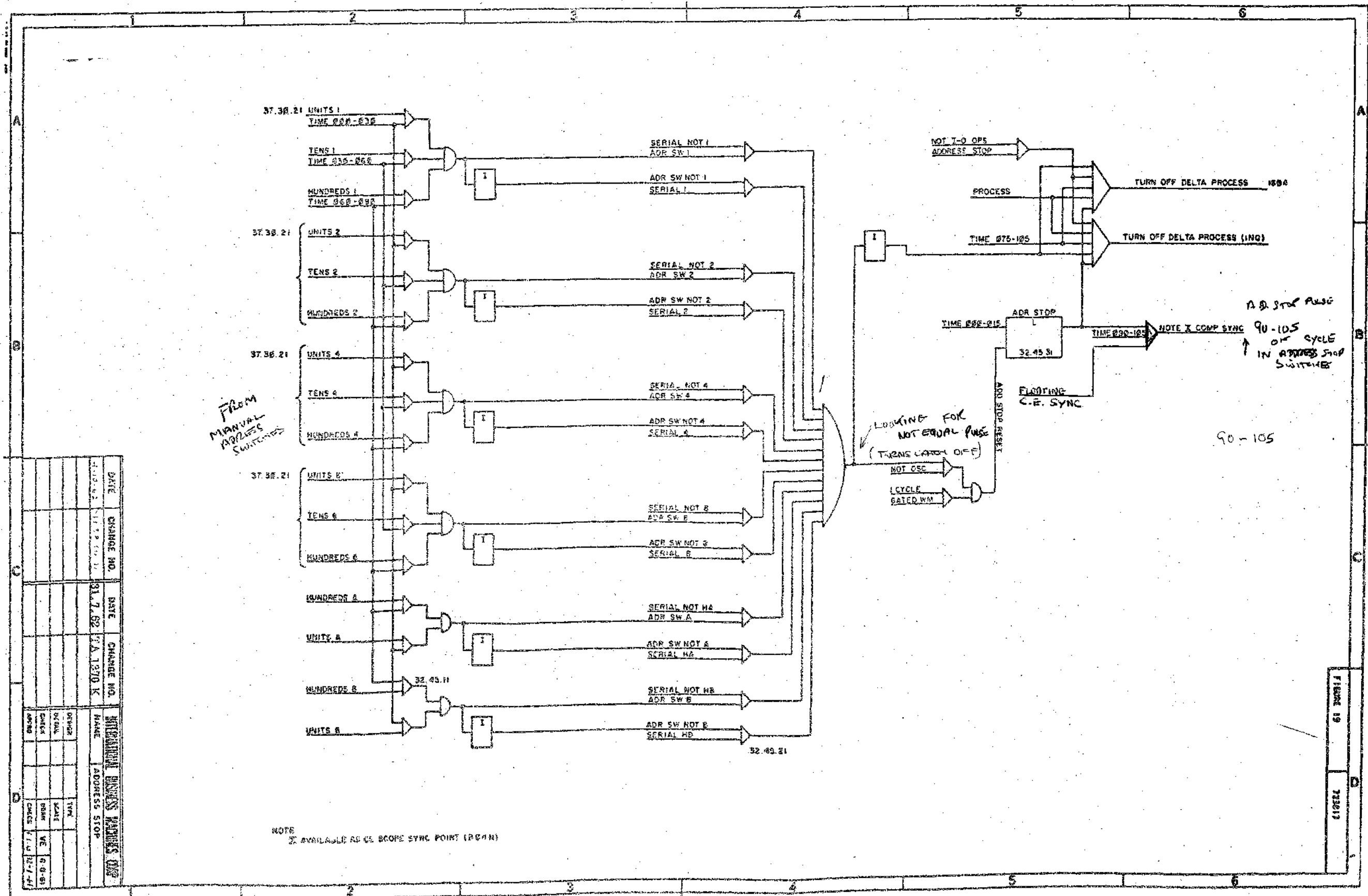


DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	115450 D	31.7.62	TA 1370 K

NAME	LOAD AND REVERSE SCAN CONTROLS
DESIGN	TYPE
CHECK	SCALE
DATE	DATE
BY	BY
CHKD	CHKD
DATE	DATE

FIGURE 17  
723815



FROM  
MANUAL  
ADDRESS  
SWITCHES

LOOKING FOR  
NOT EQUAL PULSE  
(TURNS LATCH OFF)

ADR STOP PULSE  
90-105  
OR  
CYCLE  
IN ADDRESS STOP  
SWITCH

90-105

ADDRESS STOP PULSE

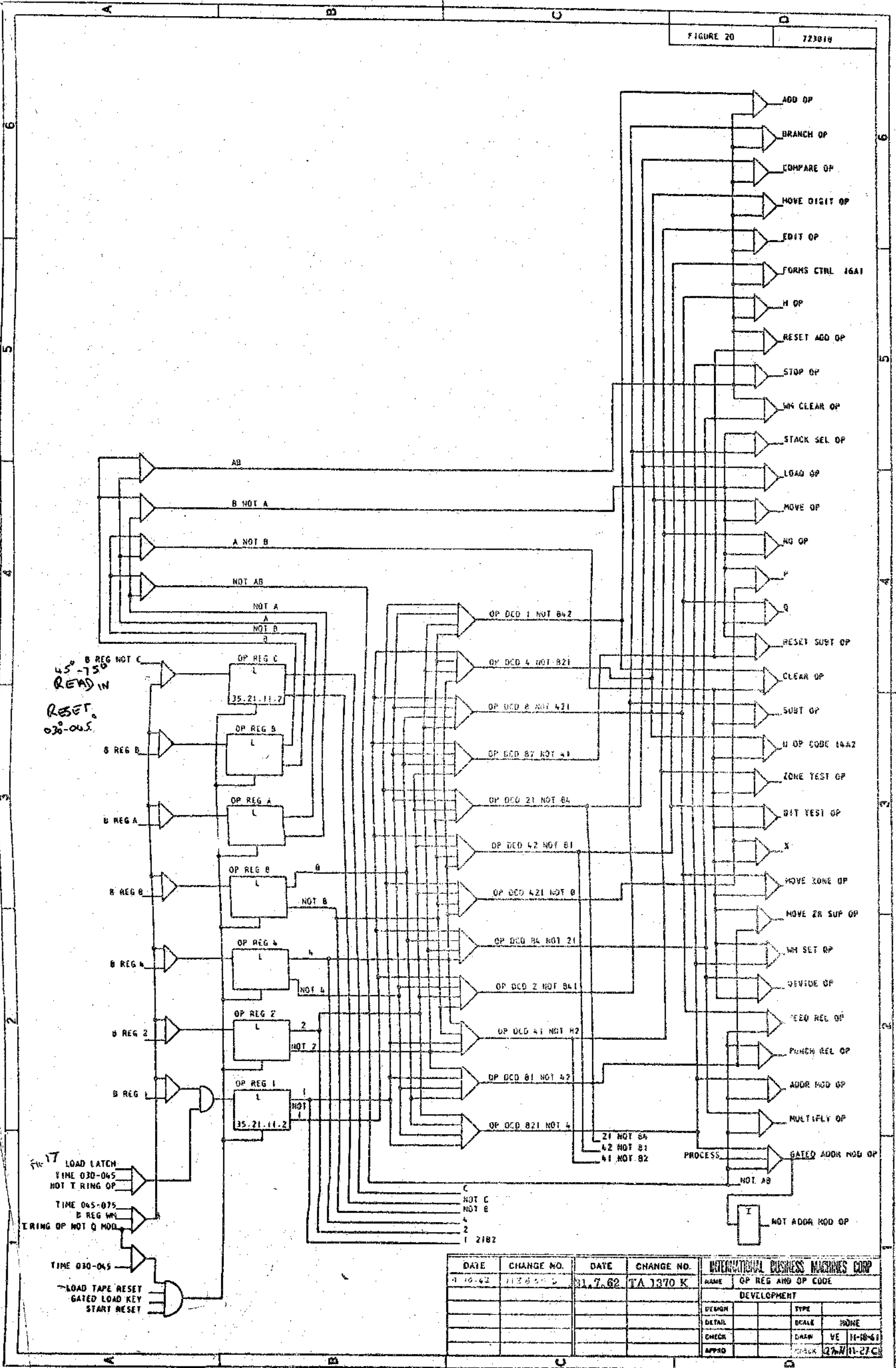
NOTE  
\* AVAILABLE AS CS SCOPE SYNC POINT (PCAN)

DATE	CHANGE NO.	DATE	CHANGE NO.
11-10-62	1172 (K)	81.7.62	77A.1370 K
INTERNATIONAL BUSINESS MACHINES CORP.			
NAME		ADDRESS STOP	
DESIGN	TYPE	DATE	VE
ORIGIN	SCALE	12-1-64	6-8-64
CHECK	DRWN		
APPROV	CHECK		

FIGURE 19  
738213

op Rec

FIGURE 20 723818

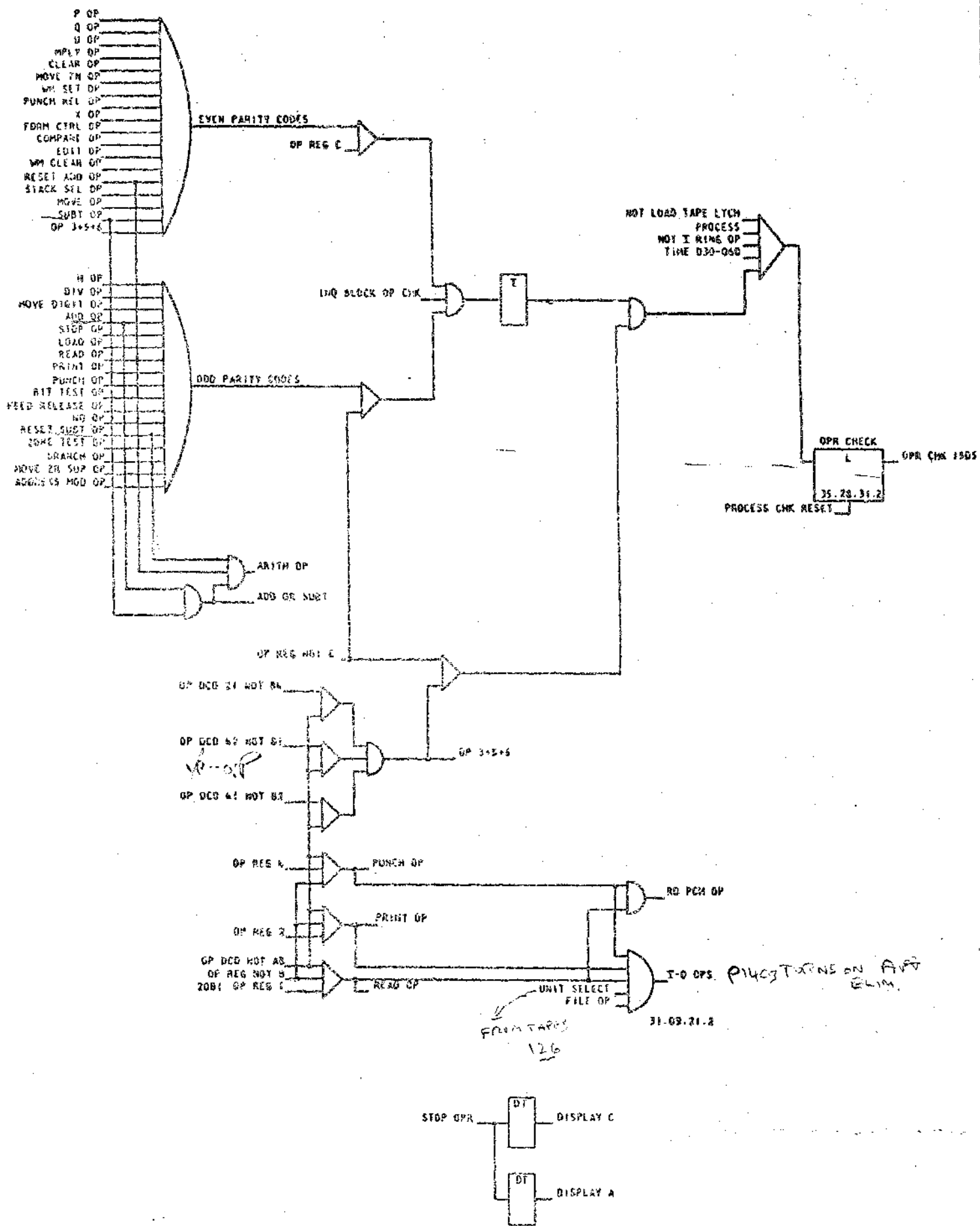


45° B REG NOT C  
750  
RESET  
030-045

FILE 17  
LOAD LATCH  
TIME 030-045  
NOT T RING OP  
TIME 045-075  
B REG WK  
T RING OP NOT Q MOD  
TIME 030-045  
LOAD TAPE RESET  
GATED LOAD KEY  
START RESET

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP		
11.10.62	1138510	11.7.62	TA 1370 K	NAME	OP REG AND OP CODE	
				DEVELOPMENT		
				DESIGN	TYPE	
				DETAIL	SCALE	NONE
				CHECK	DRAWN	VE 11-58-61
				APPRO	CHECK	27-N 11-27C





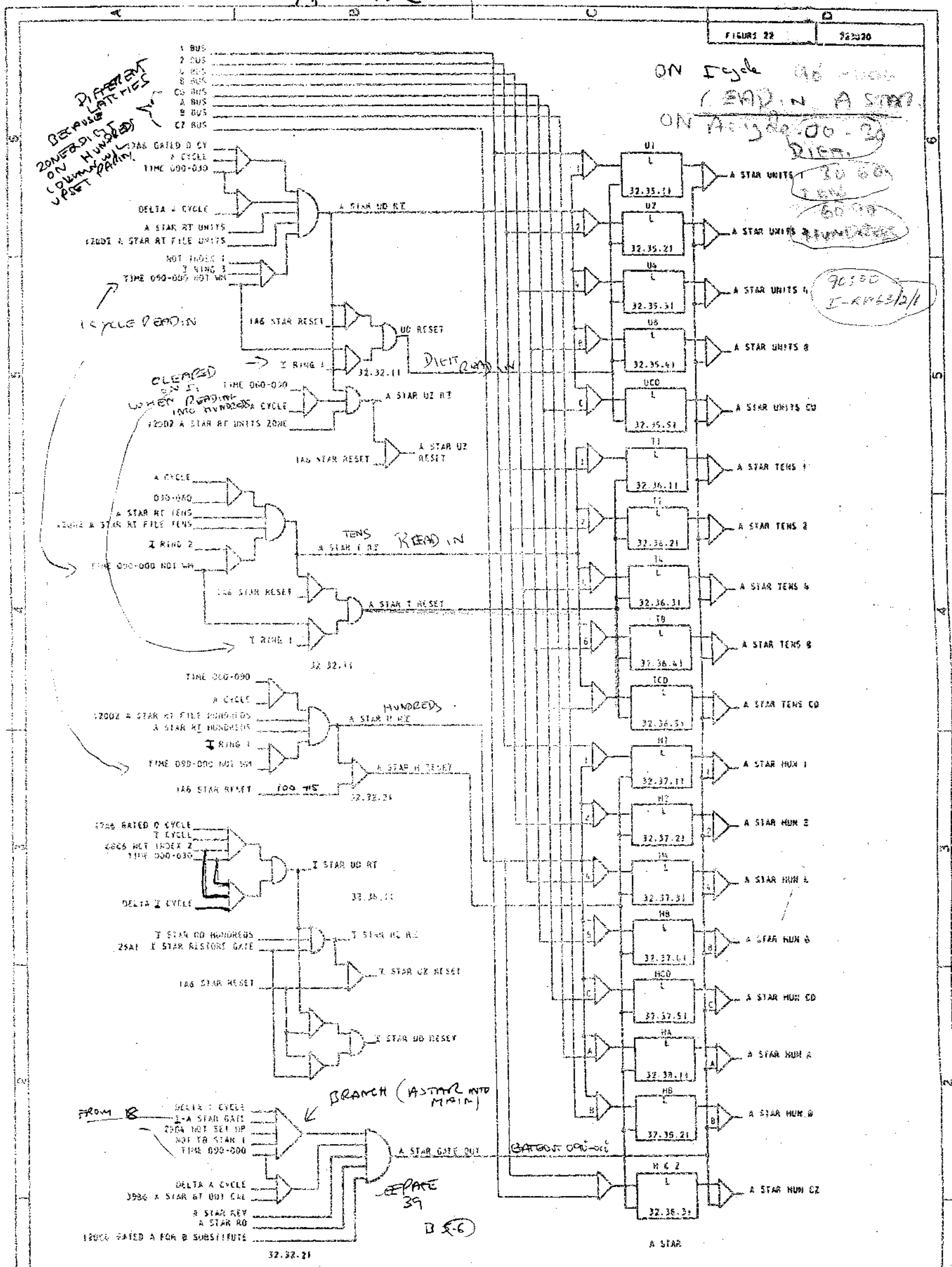
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
11-2-62	11-2-1-1	31-7-62	TA 187D K	NAME			
				OP CHECK			
				DESIGN		TYPE	
				DETAL		SCALE	NONE
				CHECK		DRAW	VE 11-28-61
				APPRO		CHECK	2707 11-27-61

00 1 25 30  
01 20

1/4 = 40  
1 cycle of 2 = 3M  
S0 - 00  
S1 = HUN  
IL = TENS  
I3 = UNITS

# A STAR

FIGURE 22 92320

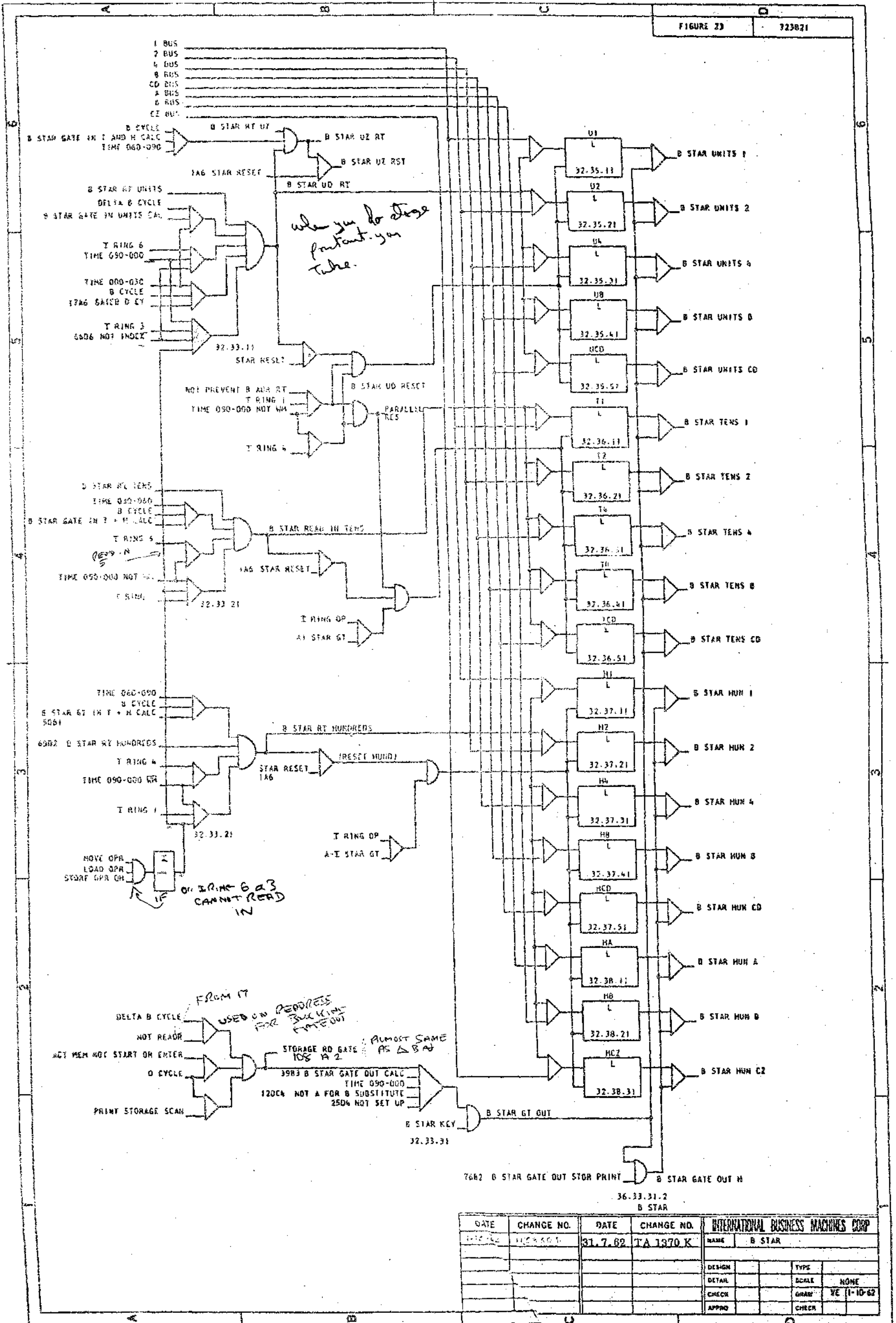


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.	
4.10.62	1175-500	31.7.62	TA 1870 K	NAME	A STAR
				DESIGN	
				DETAIL	SCALE NONE
				CHECK	DRAWN VE 8-10-62
				APPRO	CHECK

# B. STAR

FIGURE 23

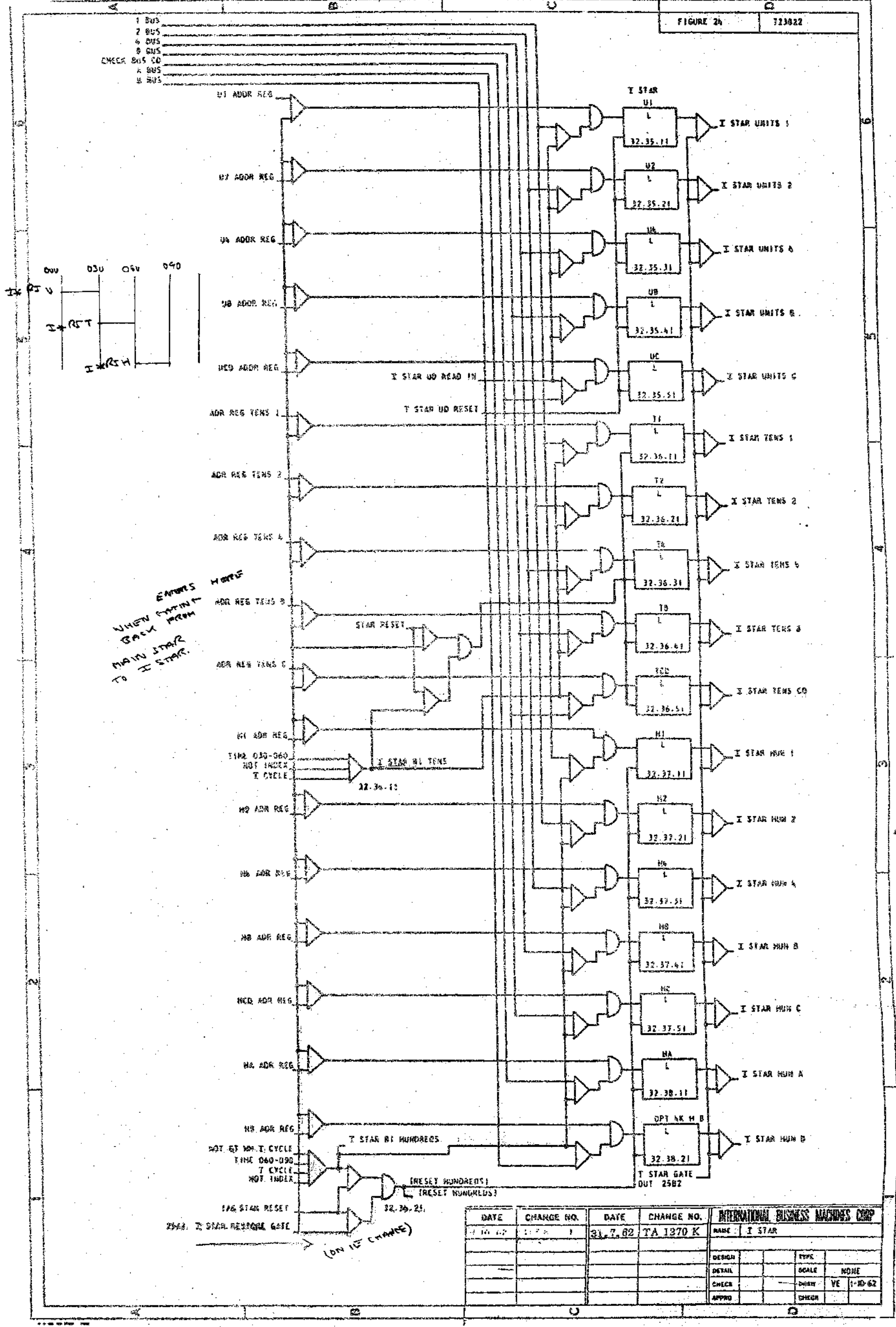
723871





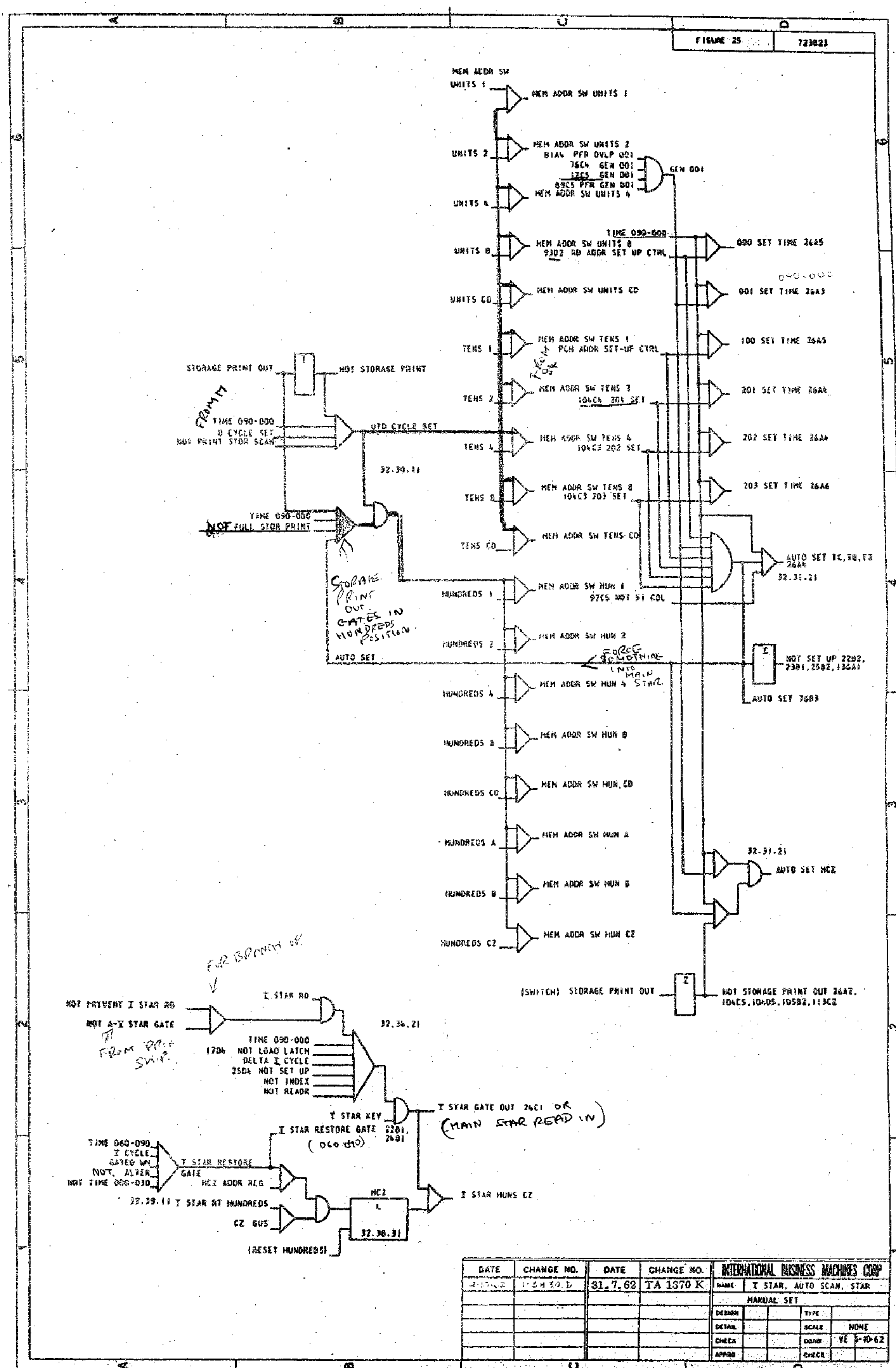
# I STAR

FIGURE 24 723022



WHEN STARTING  
MAIN STAR  
TO I STAR.

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP		
31.7.82	TA 1370 K			NAME: I STAR		
				DESIGN		TYPE
				DETAIL		SCALE
				CHECK		DATE
				APPRO		BY

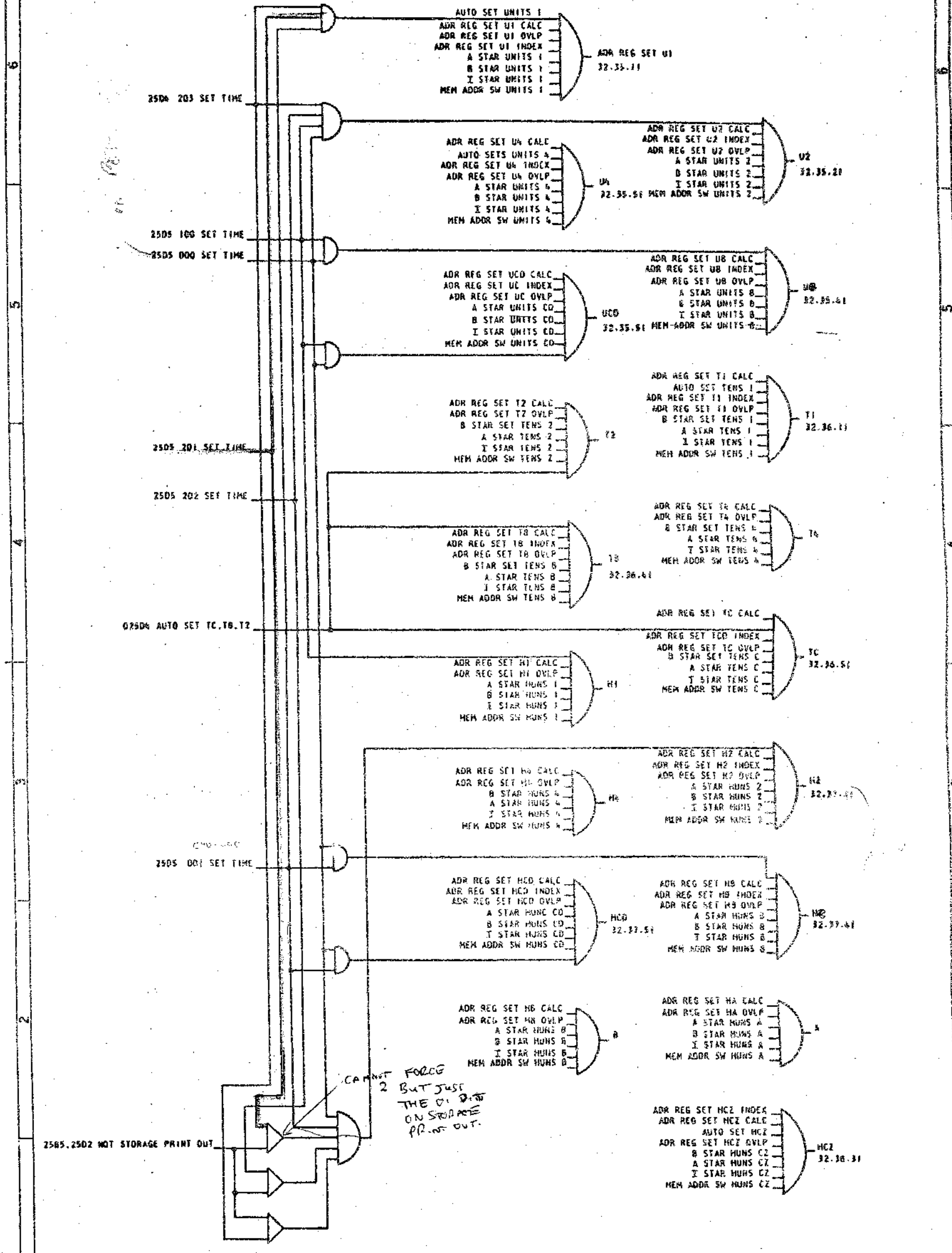


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.			
4-15-62	1-3-A-30-B	31-7-62	TA 1570 K	NAME	I STAR, AUTO SCAN, STAR		
				MANUAL SET			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	VE 5-10-62
				APPRO		CHECK	

I STAR.

FIGURE 76 723826

AUTO SCAN SET UP



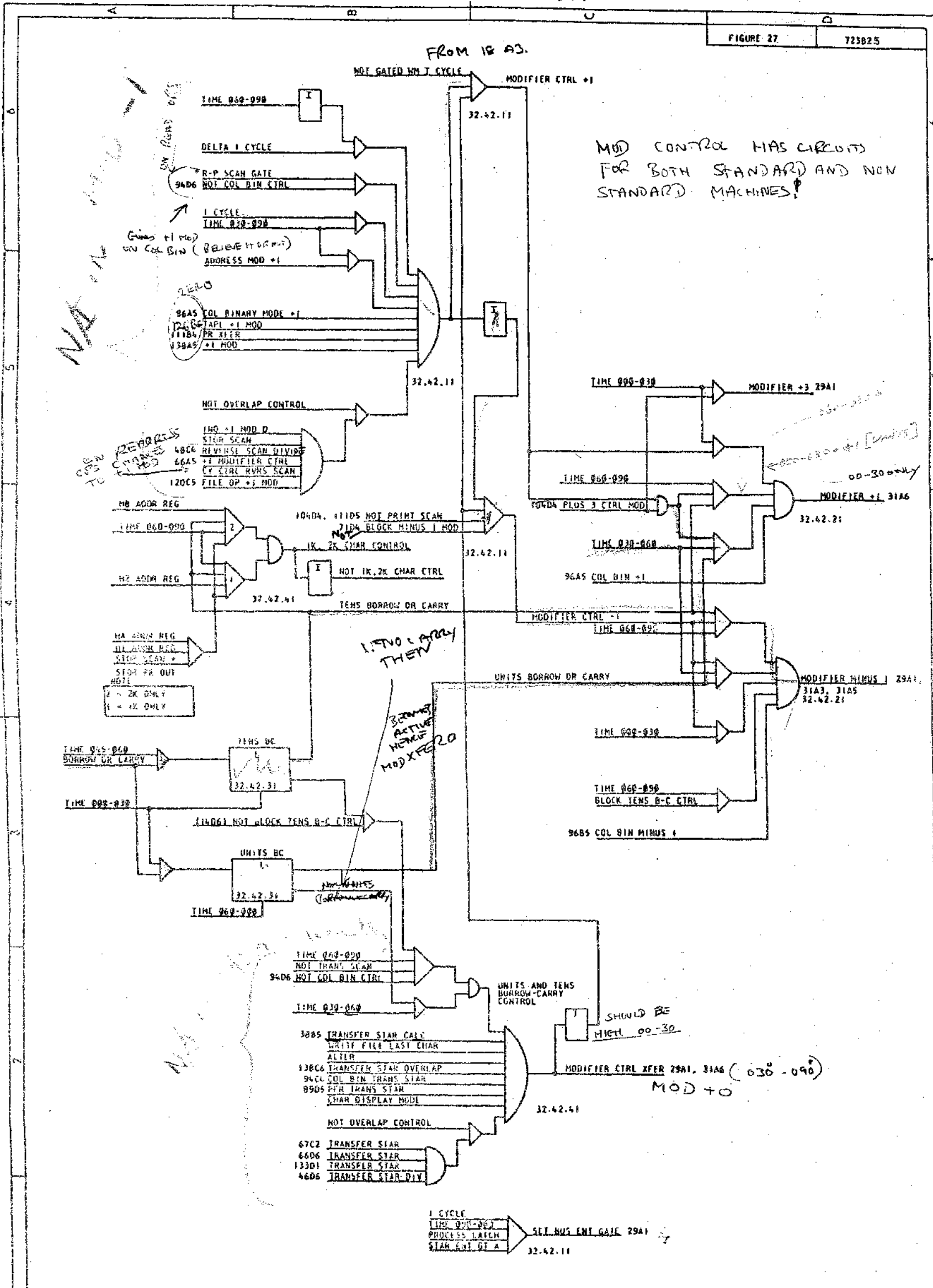
CANNOT FORCE 2 BUT JUST THE 01 BIT ON STORAGE PRINT OUT.

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.			
4-10-62	113440 L	31.7.62	TA 1370 K	NAME	I STAR, AUTO SCAN, STAR MANUAL SET		
				DESIGN		TYPE	
				ESTIM		SCALE	NONE
				CHECK		DRAW	VE 11-18-62
				APPRO		CHECK	

# MODIFIER CONTROL

FIGURE 27

723825



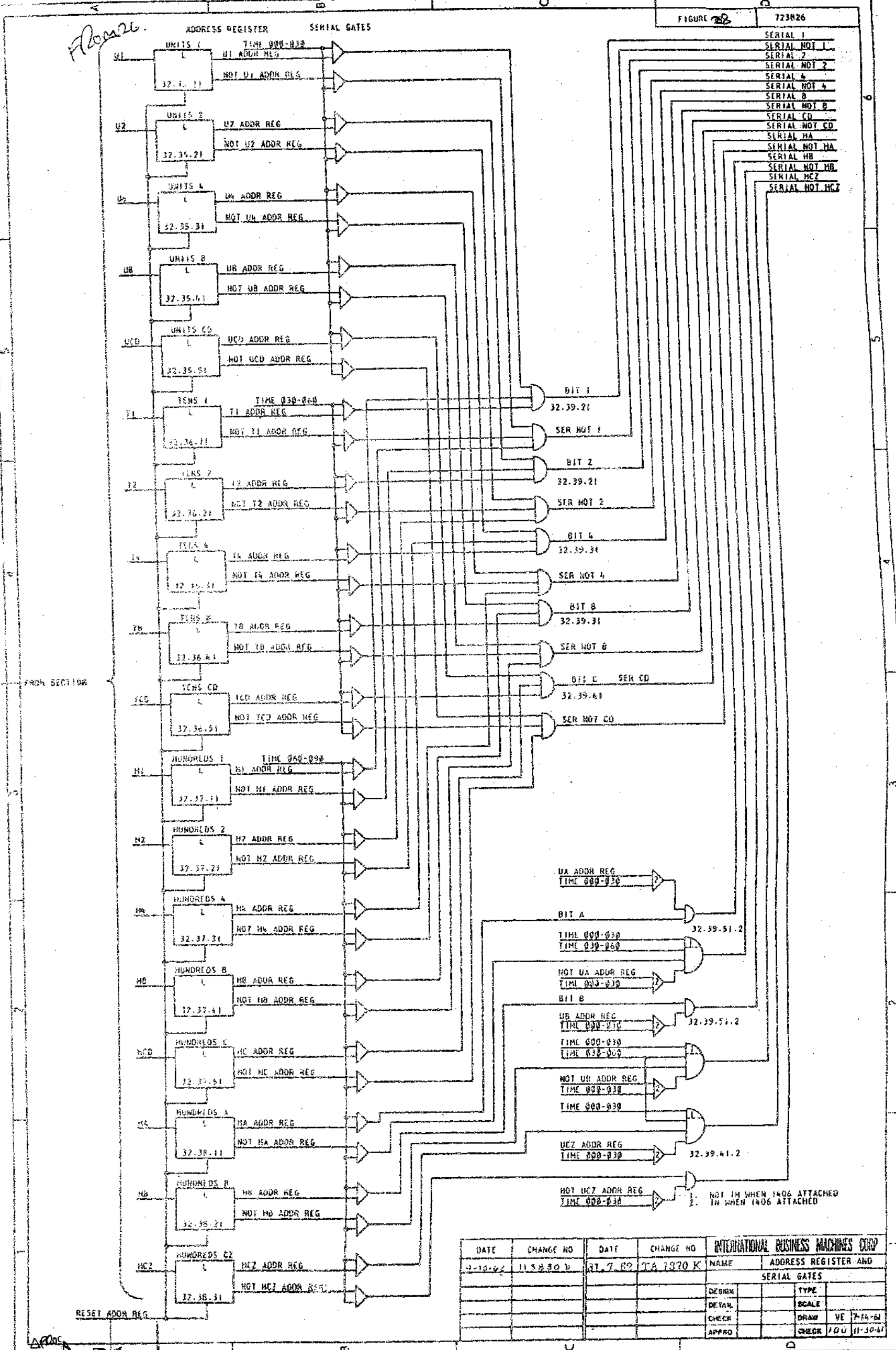
\*REMOVE WITH OVERLAP FEATURE

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.	
4-10-62	1154	31.7.62	TA 1370 K	NAME	MODIFIER CONTROLS
				DESIGN	TYPE
				DETAIL	SCALE
				CHECK	ORIGIN VE P-13-61
				APPRO	CHECK FOU 11-30-61



# MAIN STAR

FIGURE 28 723826



- SERIAL 1
- SERIAL NOT 1
- SERIAL 2
- SERIAL NOT 2
- SERIAL 4
- SERIAL NOT 4
- SERIAL 8
- SERIAL NOT 8
- SERIAL CD
- SERIAL NOT CD
- SERIAL HA
- SERIAL NOT HA
- SERIAL HB
- SERIAL NOT HB
- SERIAL HCZ
- SERIAL NOT HCZ

INTERNATIONAL BUSINESS MACHINES CORP					
DATE	CHANGE NO	DATE	CHANGE NO	NAME	ADDRESS REGISTER AND SERIAL GATES
2-10-62	11 S 2 50 D	31-7-62	TA 1370 K	DESIGN	TYPE
				DETAIL	SCALE
				CHECK	DRAW VE 7-14-61
				APPRO	CHECK JCU 11-30-61

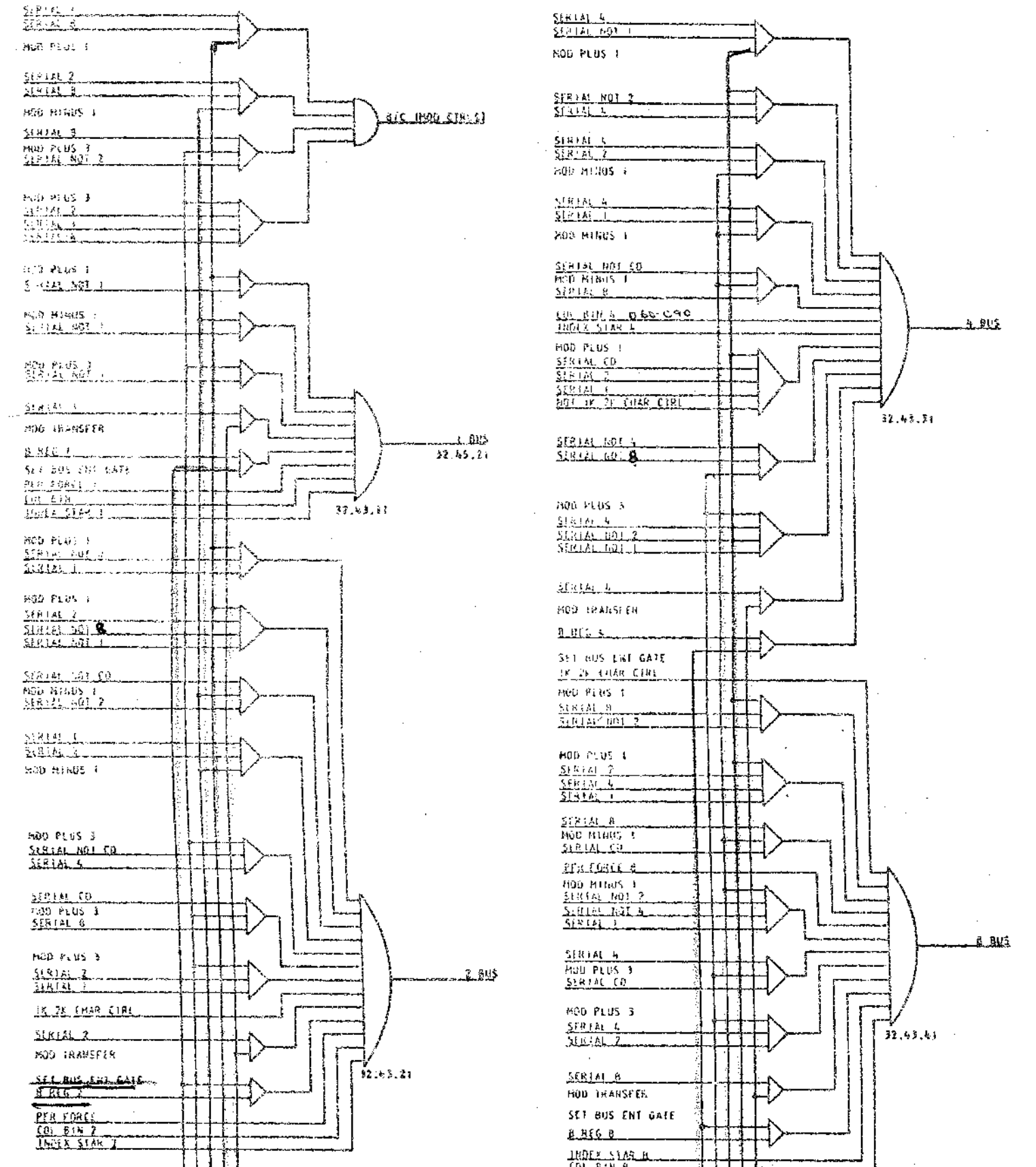
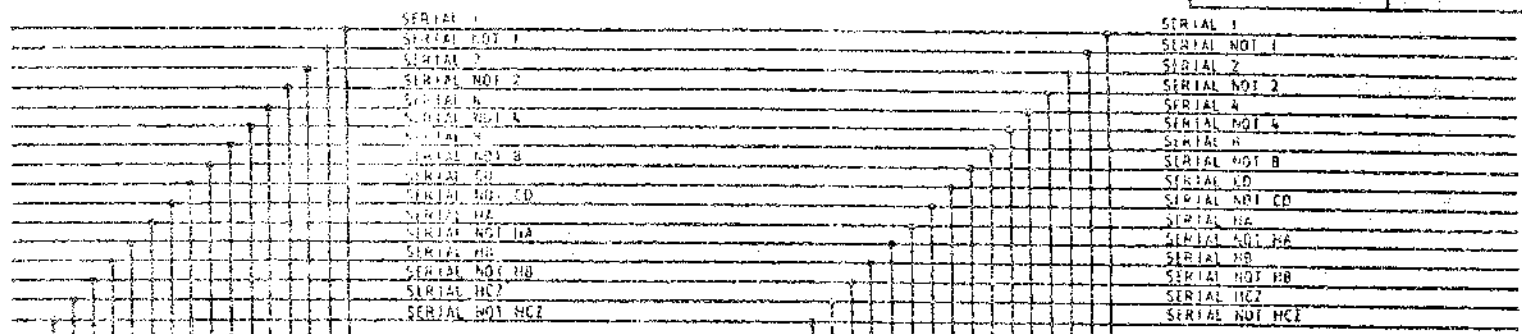
*Flow 26*

FROM SECTION

MAIN STAR RESET

*Spec  
D. 20-165  
Resistor*

FIGURE 29 723827



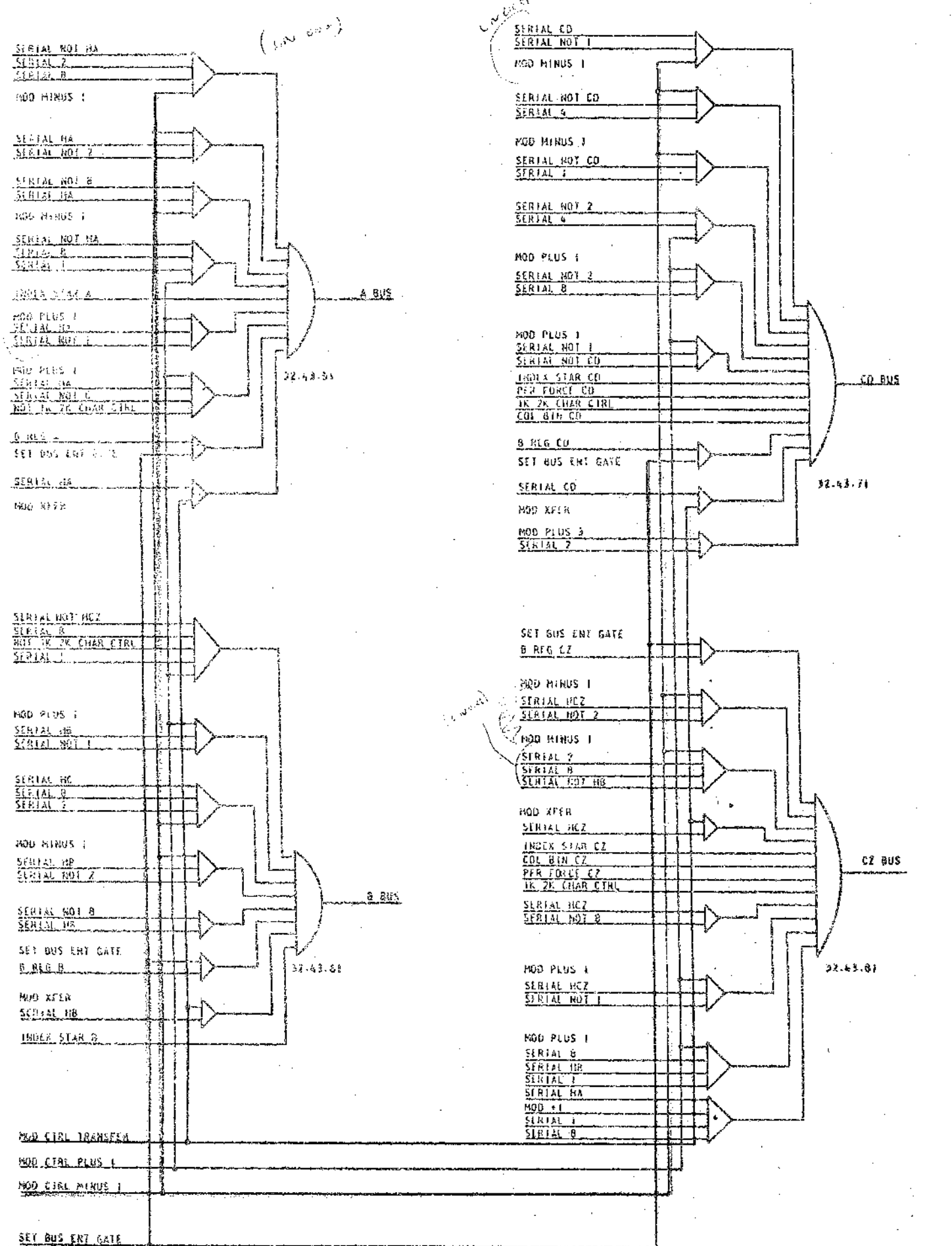
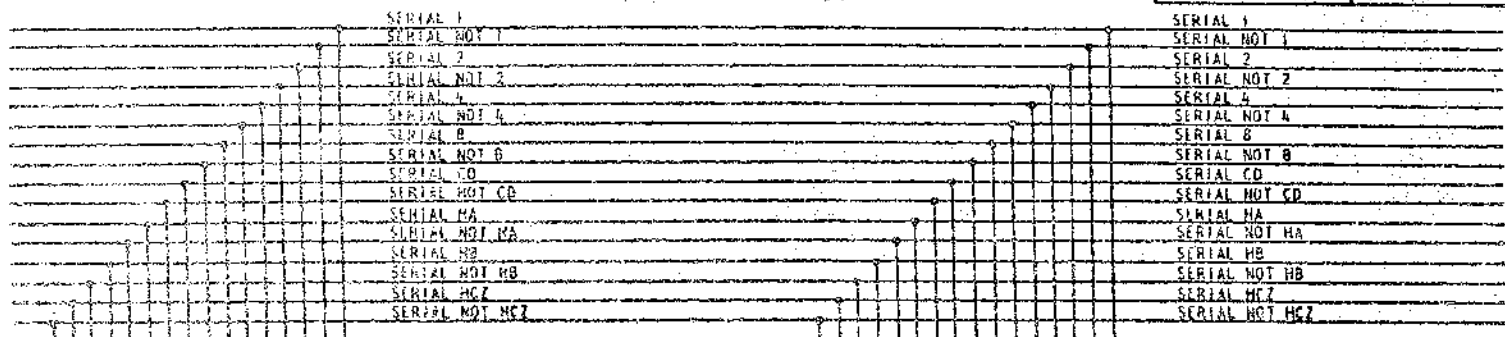
27C2 MOD CONTROL TRANSFER  
 27D4 MOD CONTROL PLUS 1  
 27D6 MOD CTRL MINUS 1  
 27D8 MOD CTRL PLUS 3  
 27D9  
 27E1 SET BUS ENT GATE

MOD CONTROL TRANSFER  
 MOD CONTROL PLUS 1  
 MOD CTRL MINUS 1  
 SET BUS ENT GATE

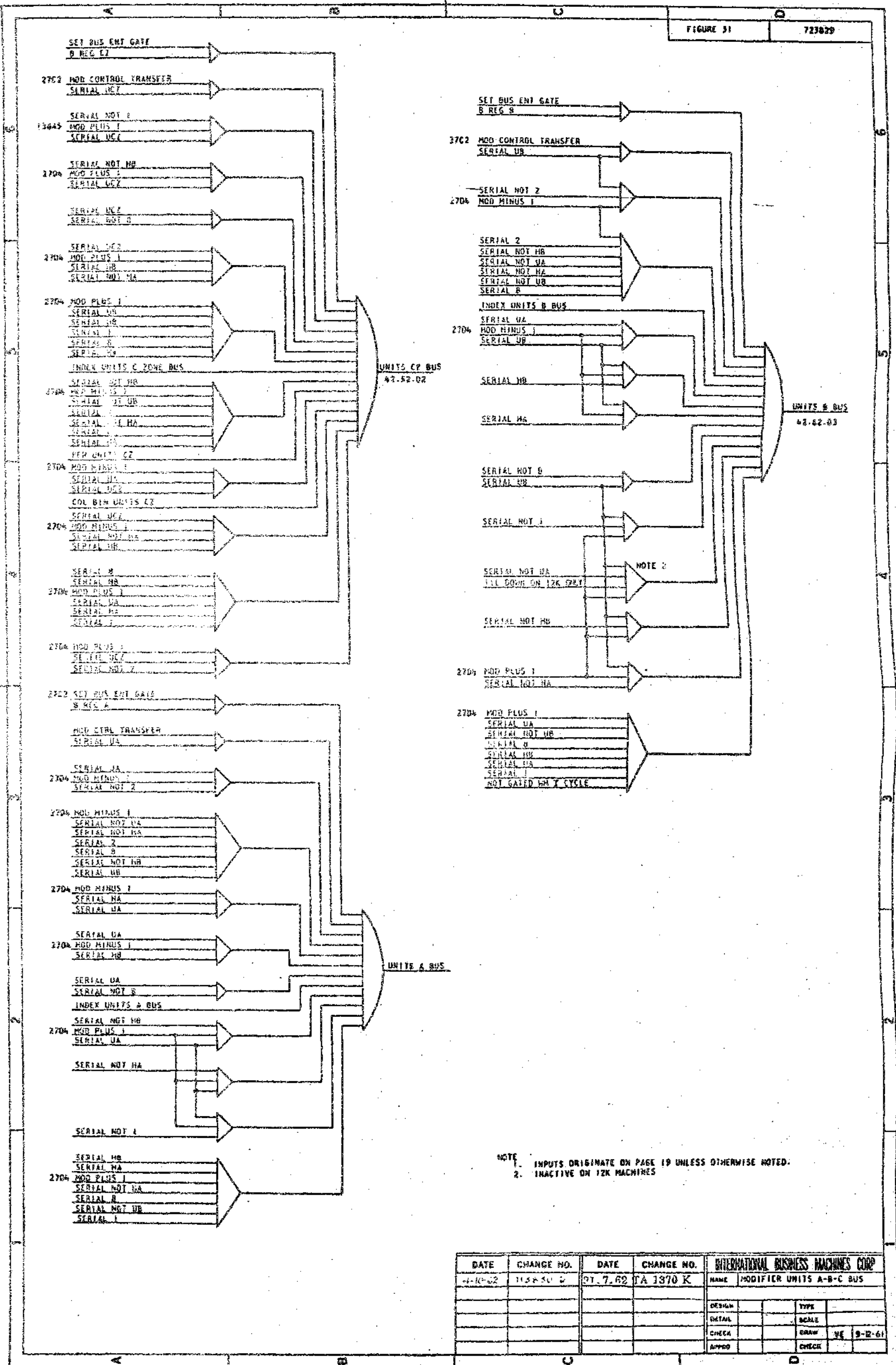
DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	1152 50 D	31-7-62	1A 1370 K	NAME	MODIFIER 1-2-4-8 BUS
				DESIGN	TYPE
				DETAIL	SCALE
				CHECK	DRAW VE 7-13-61
				APPRO	CHECK FOL 4-30-61

M01

FIGURE 30 723828



DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	1132 SO D	31.7.62	TA 1370 K	NAME	MODIFIER CO-A-B-CZ
				BUS	
				DESIGN	TYPE
				DETAIL	SCALE
				CHECK	DRAW VE 7-14-61
				APPROV	CHECK FOR H-30-21



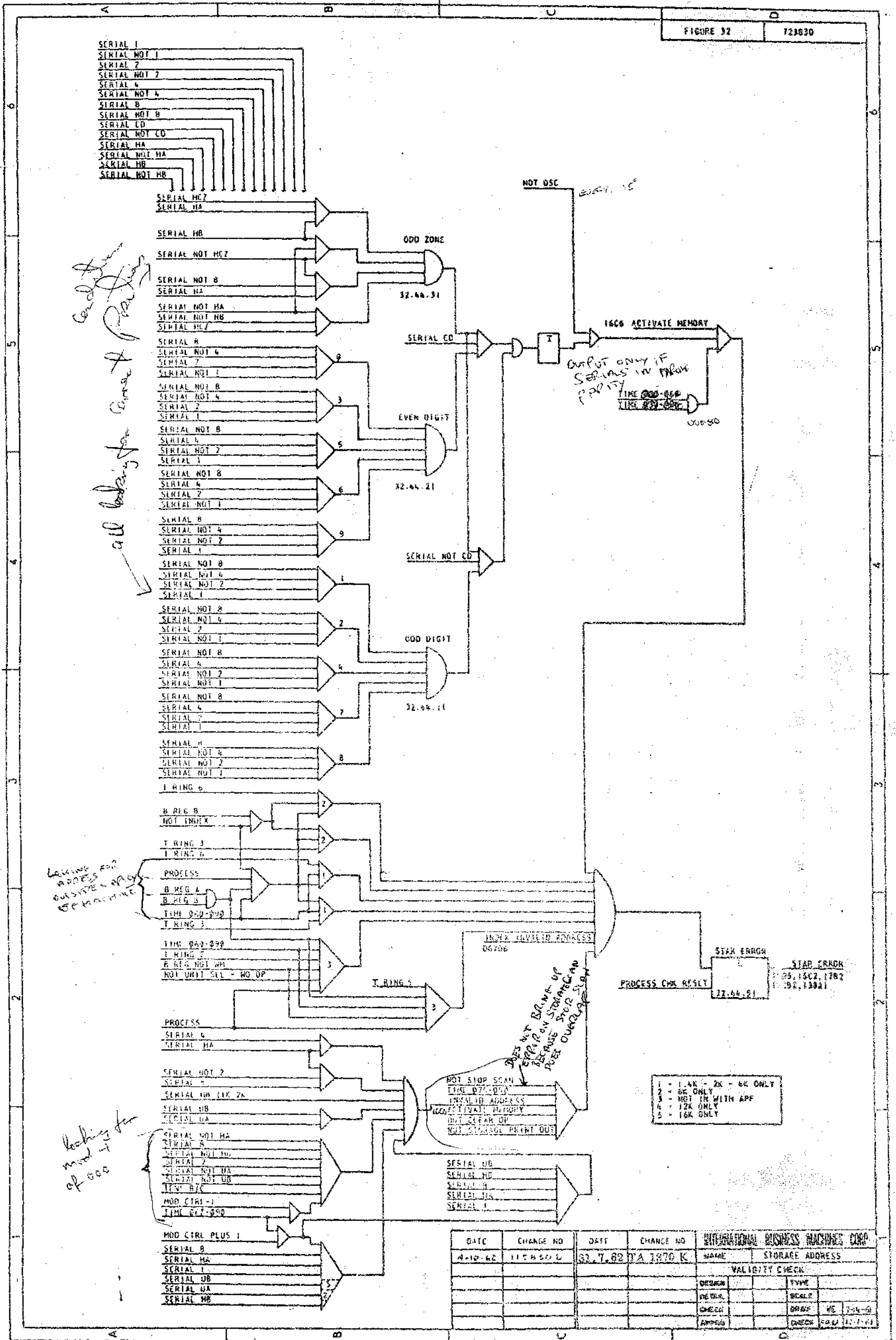
NOTE 1. INPUTS ORIGINATE ON PAGE 19 UNLESS OTHERWISE NOTED.  
 2. INACTIVE ON 12K MACHINES

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	11525U 2	07.7.62	TA 1370 K	NAME	MODIFIER	UNITS A-B-C BUS	
				DESIGN		TYPE	
				DETAIL		SCALE	
				CHECK		DRAW	VE 9-12-61
				APPROD		CHECK	



MODIFIED

FIGURE 32 723830



*all looking for correct parity*

*LOOKING FOR ADDRESS OUTSIDE RANGE OF MACHINE*

*looking for mod 10 of 000*

*DOES NOT SOUND OF ERROR ON STORAGE AND DOES NOT SOUND OF OVERFLOW*

- 1 - 12K - 2K - 8K ONLY
- 2 - 8K ONLY
- 3 - NOT IN WITH APF
- 4 - 12K ONLY
- 5 - 16K ONLY

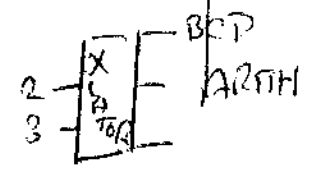
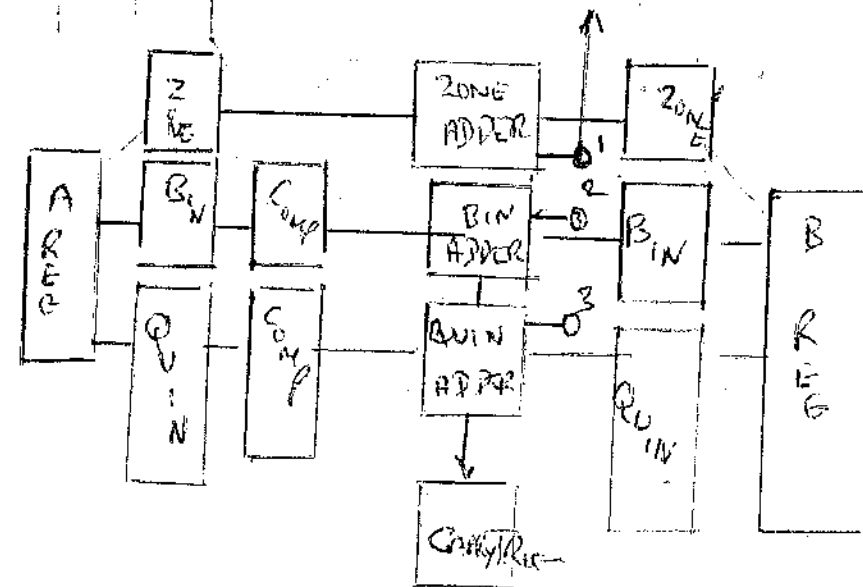
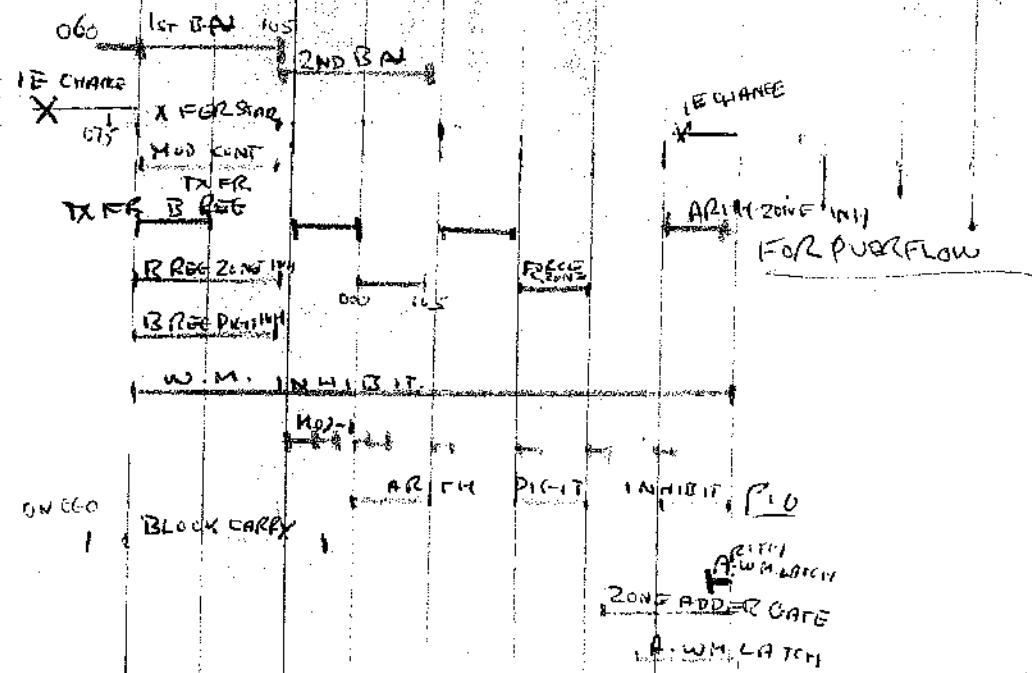
DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	117A 501 L	33.7.82	TA 1870 K	NAME	STORAGE ADDRESS
VALIDITY CHECK					
				DESIGN	TYPE
				DETAILED	SCALE
				CHECKED	DRAWN
				APPROVED	CHECKED

208 209 210  
 4 5 7  
 268 269 270  
 3 7 0

A 210 270 B 400

A LATCH	A	B	A	B	A	B	A	B
MAIN*	210	270	210	270	269	268	268	
B REG	7	0	7	0	5	7	4	3
A REG	7	7	7	7	5	5	4	4
CARRY						✓		
B REG INH	7	0	7	0	5		4	-
A REG INH								
ARITH INH			7		2		8	
A *	210		209		208		207	
B *		270		269		268		267

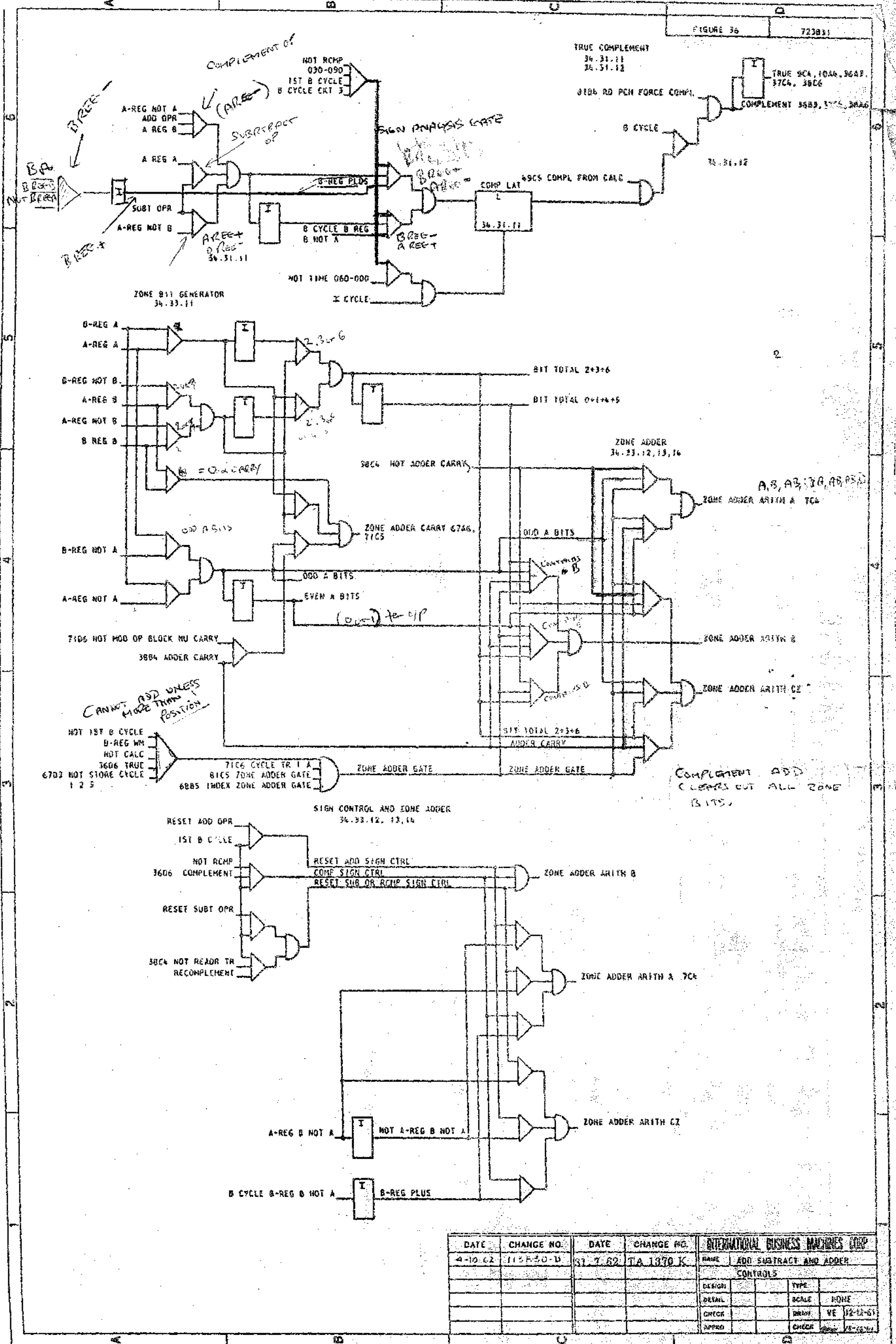
A 210 270



$A + A = 2 = B$   
 $B + A = 3 = AB$   
 $B + AB = 5 = A$   
 $AB + AB = 6 = B$

# ZONE ADDER

FIGURE 36 723831



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	115F-30-D	31-7-62	TA 1370 K	NAME ADD SUBTRACT AND ADDER
				CONTROLS
				DESIGN TYPE
				DETAIL SCALE NONE
				CHECK DRAWN VE 12-12-61
				APPRO CHECK VE-12-12-61

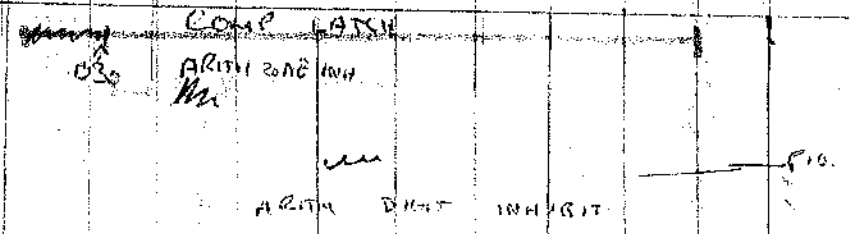
EXECUTE ELMH

A210 270

208 209 210  
~~3~~ 7 0

A LATCH	A	B	A	B	A	B	A	B
MAIN*	210	270	210	2070	209	207	205	208
B REG	0 <sup>B</sup>	7	0 <sup>B</sup>	7 <sup>B</sup>	7	5	3	4
A REG	0 <sup>B</sup>	0 <sup>B</sup>	0 <sup>B</sup>	0 <sup>B</sup>	7	7	3	8
CARRY	0 <sup>B</sup>	7	0 <sup>B</sup>	4 <sup>B</sup>	7	-	2	
B REG INH								
A REG INH	st		Force					
ARITHM	(0 <sup>B</sup> )		7	-	8	-	0	Edge
<del>A*</del>								
A*	210		209		208		207	
B*		270		209		208		207

FORCE ARITH FOR RECOMP



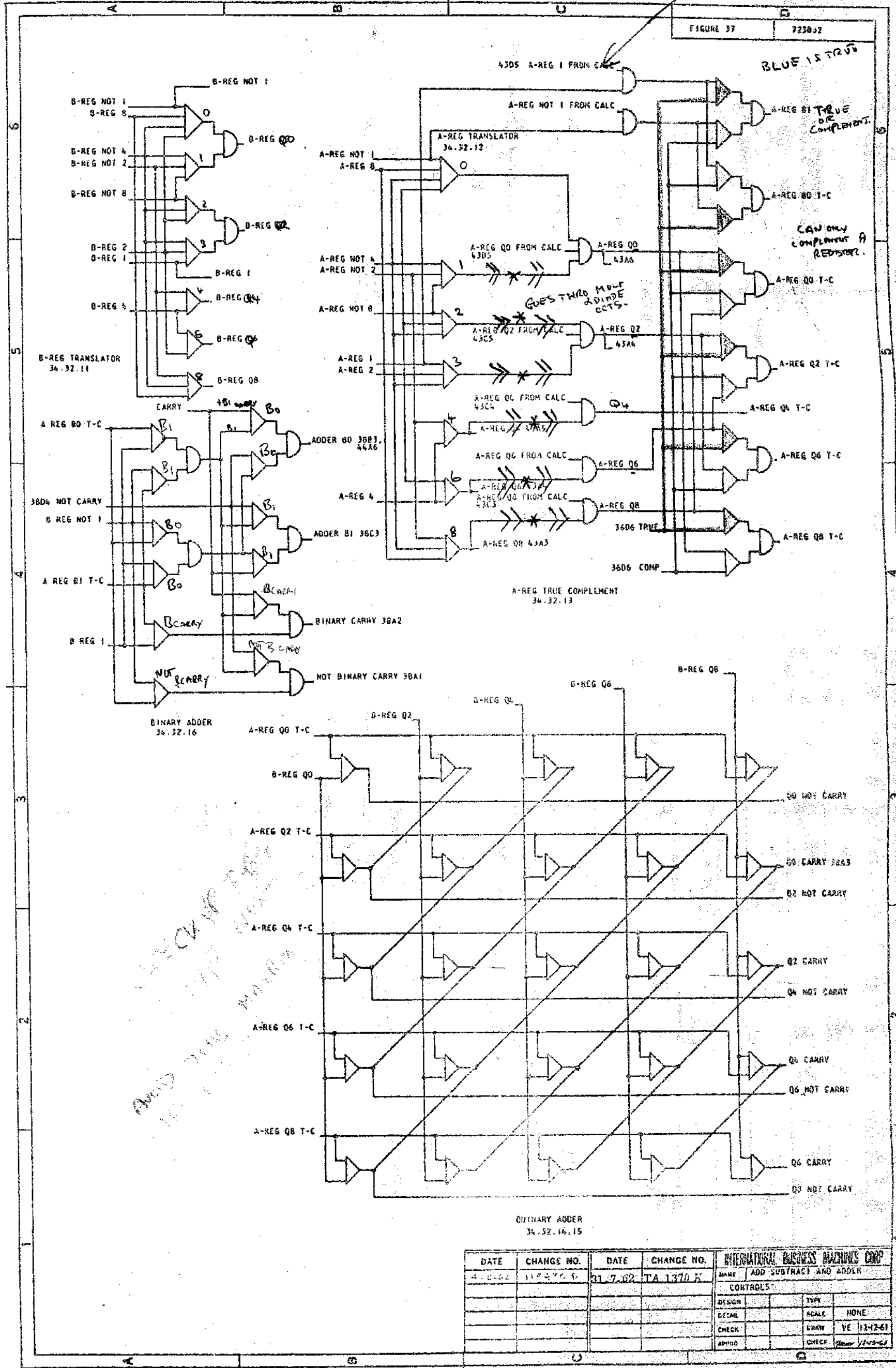
carry - complement  
 all out that are



4-11-BINARY

A. REGISTER

FIGURE 37 7238J2



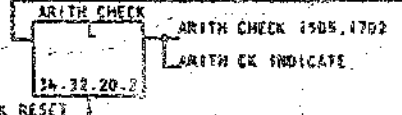
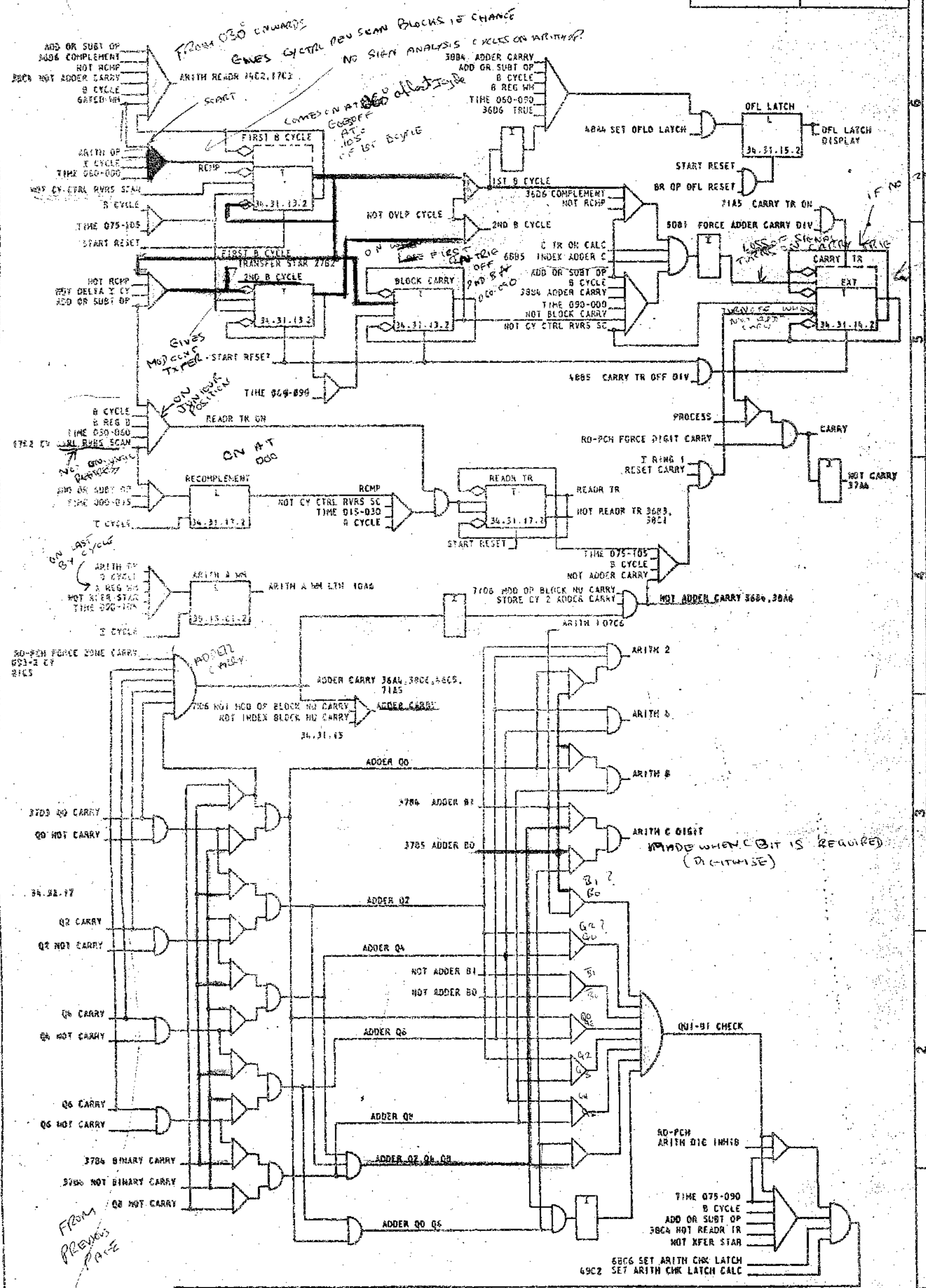
CHECKED BY  
 APPROVED BY  
 DATE

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	110270 9	01-7-62	TA 1370 5	NAME	ADD SUBTRACT AND ADDER		
				CONTROLS:			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		ENGR	VE 11-12-61
				AMING		CHECK	11-12-61

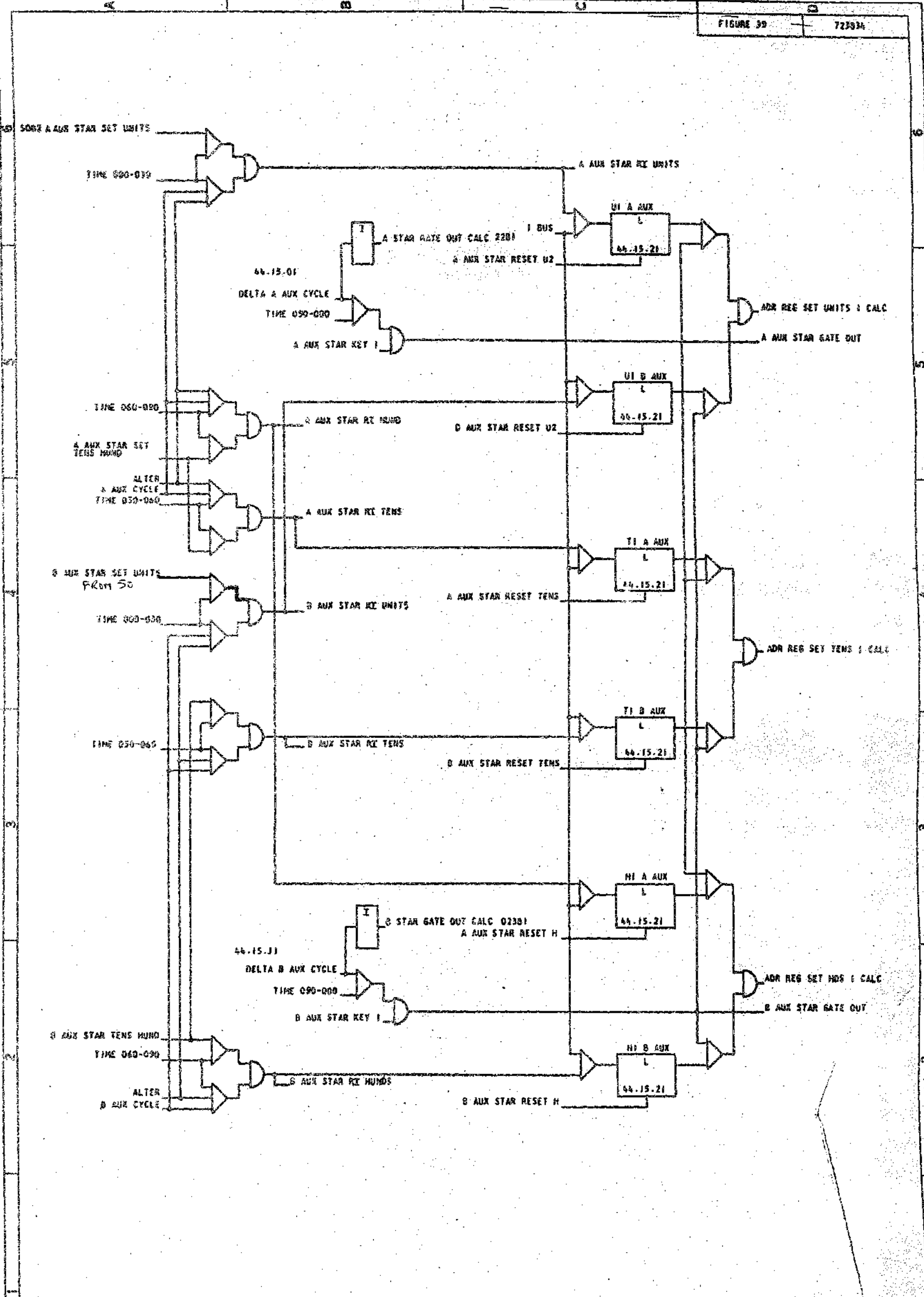
# ADDER CTRLS

FIGURE 38

723833



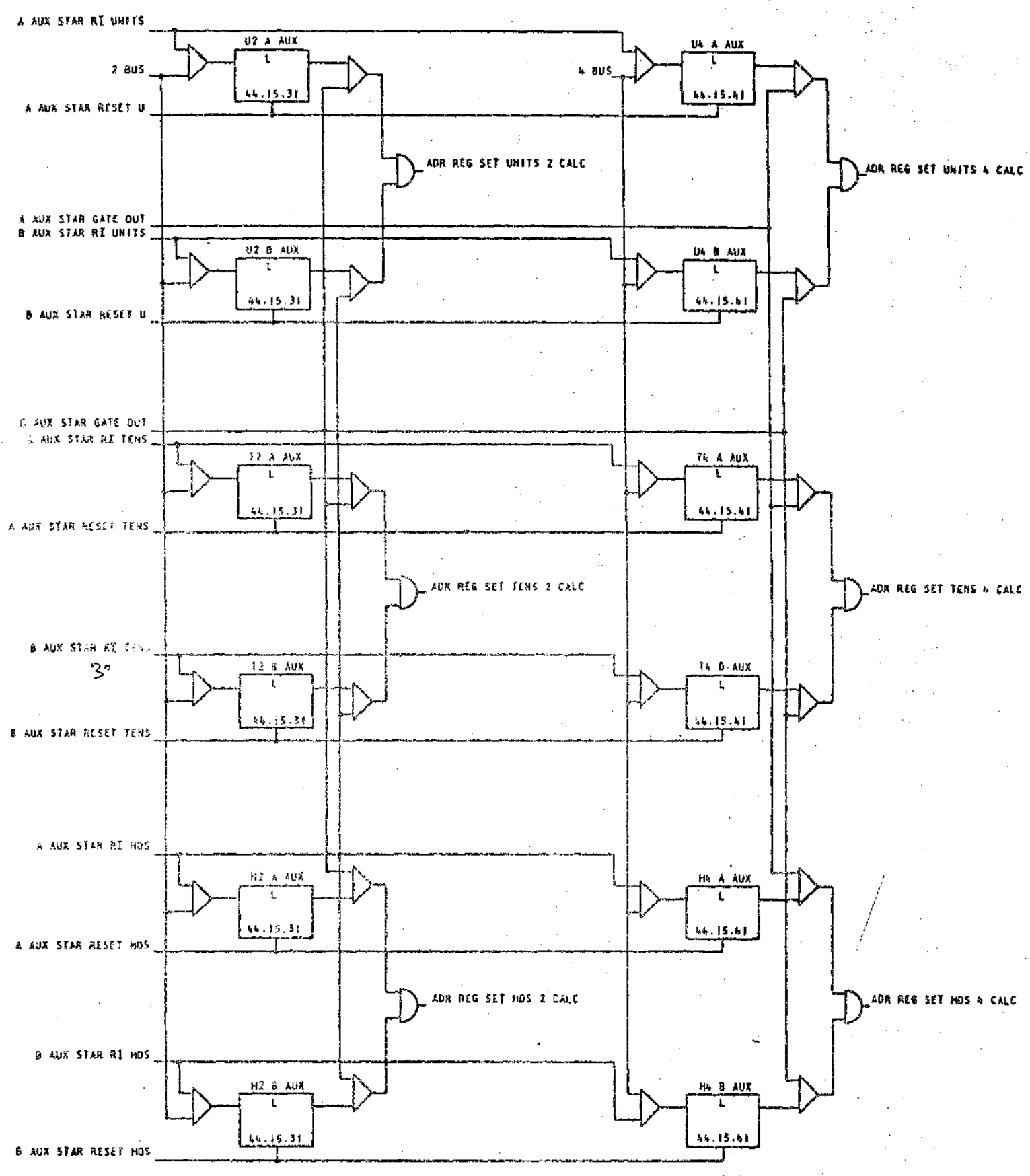
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	17230-D			NAME	ADD SUBT ADD		
6-21-62	116144B	01-7-62	TA 1370 K	ADDER CTRLS			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	VE 12-12-61
				APPROD		CHECKED	BY: [Signature]



INTERNATIONAL BUSINESS MACHINES CORP			
DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113230 D	7-11-62	113230 K
NAME: A AUX STAR AND B			
AUX STAR REG GATE IN AND OUT CTRLS			
DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DRAWN	VE 2-22-62
APPRO		CHECK	

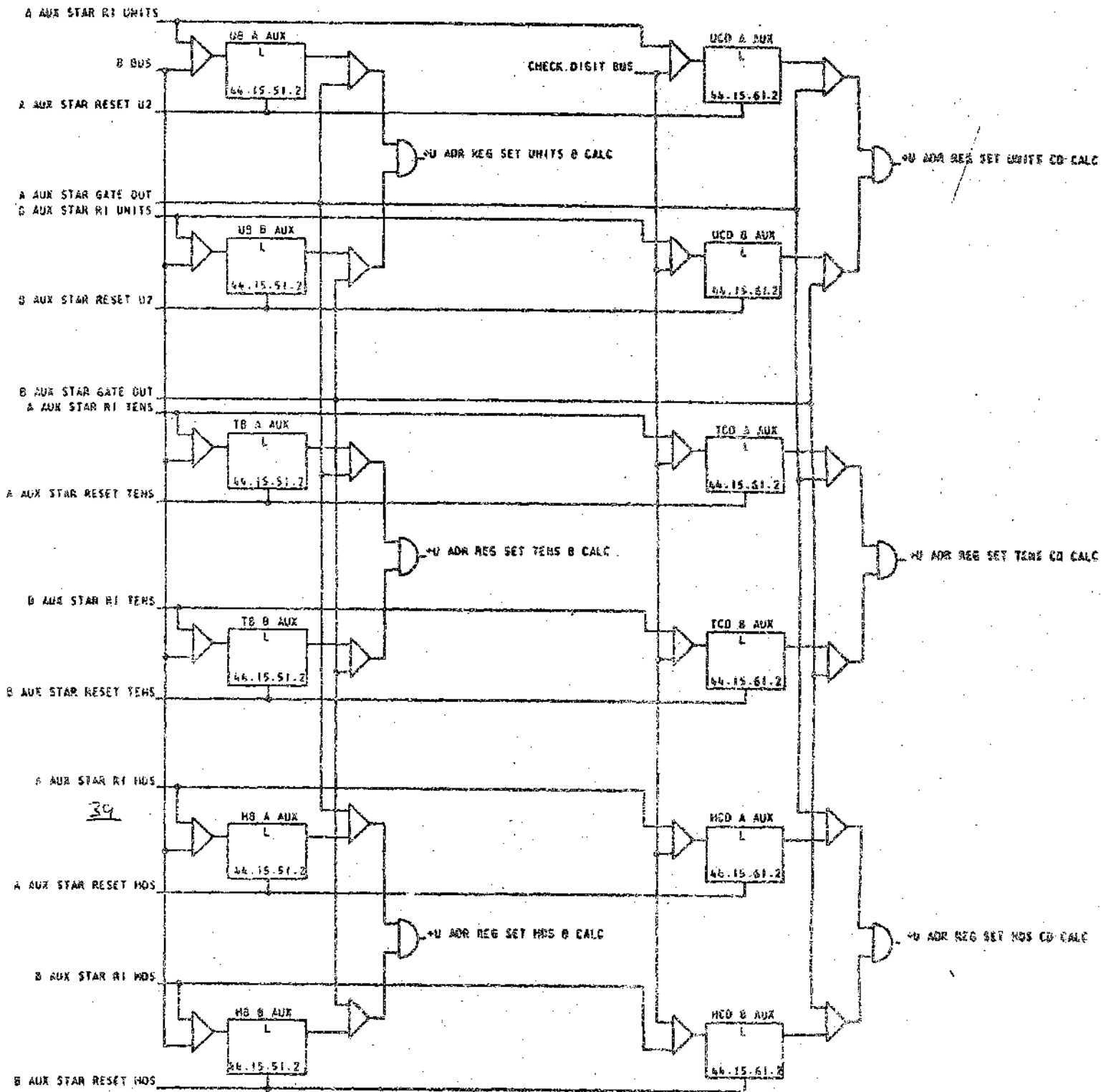
FIGURE 40

723872



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	1-2 P 30 V	31.7.62	TA 1370 K	NAME	A AUX STAR AND B		
				AUX STAR REG GATE IN AND OUT CTLS			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	VE 2-22-62
				APPRO		CHECK	

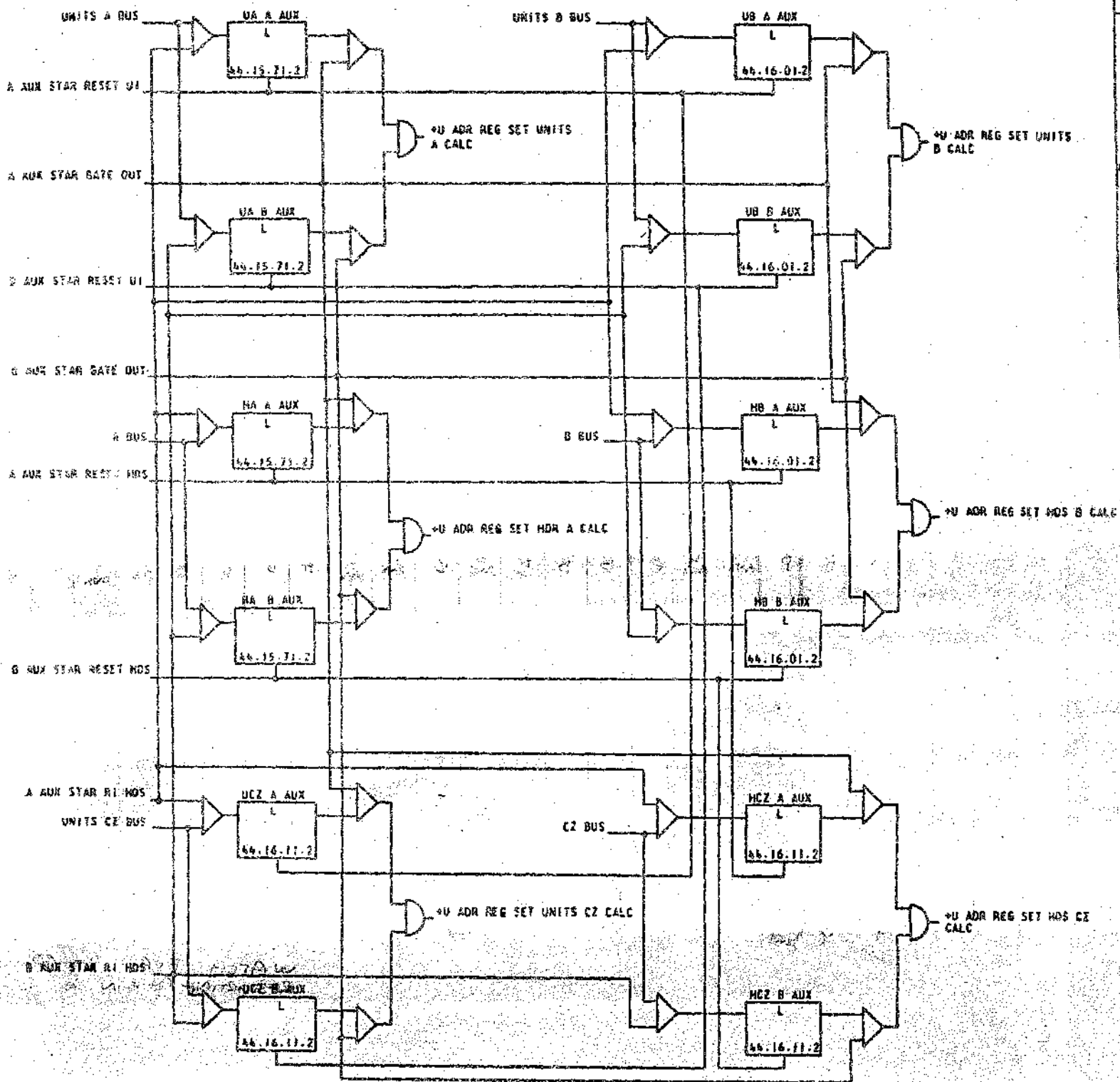




DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	115350 D	4-7-62	TA 1370 K	NAME D AUX STAR AND GATE
				CONTROLS
				DESIGN
				DETAIL
				CHECK
				APPRO
				TYPE
				SCALE
				GRAPH
				CHECK

FIGURE 42

723836



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	113450 D	31-7-62	1A 1970 K	NAME: B AUX STAR AND GATE
				CONTROLS
				DESIGN
				TYPE
				DETAIL
				DATE
				DRWN: VE 8-10-62
				APPR: CHECK

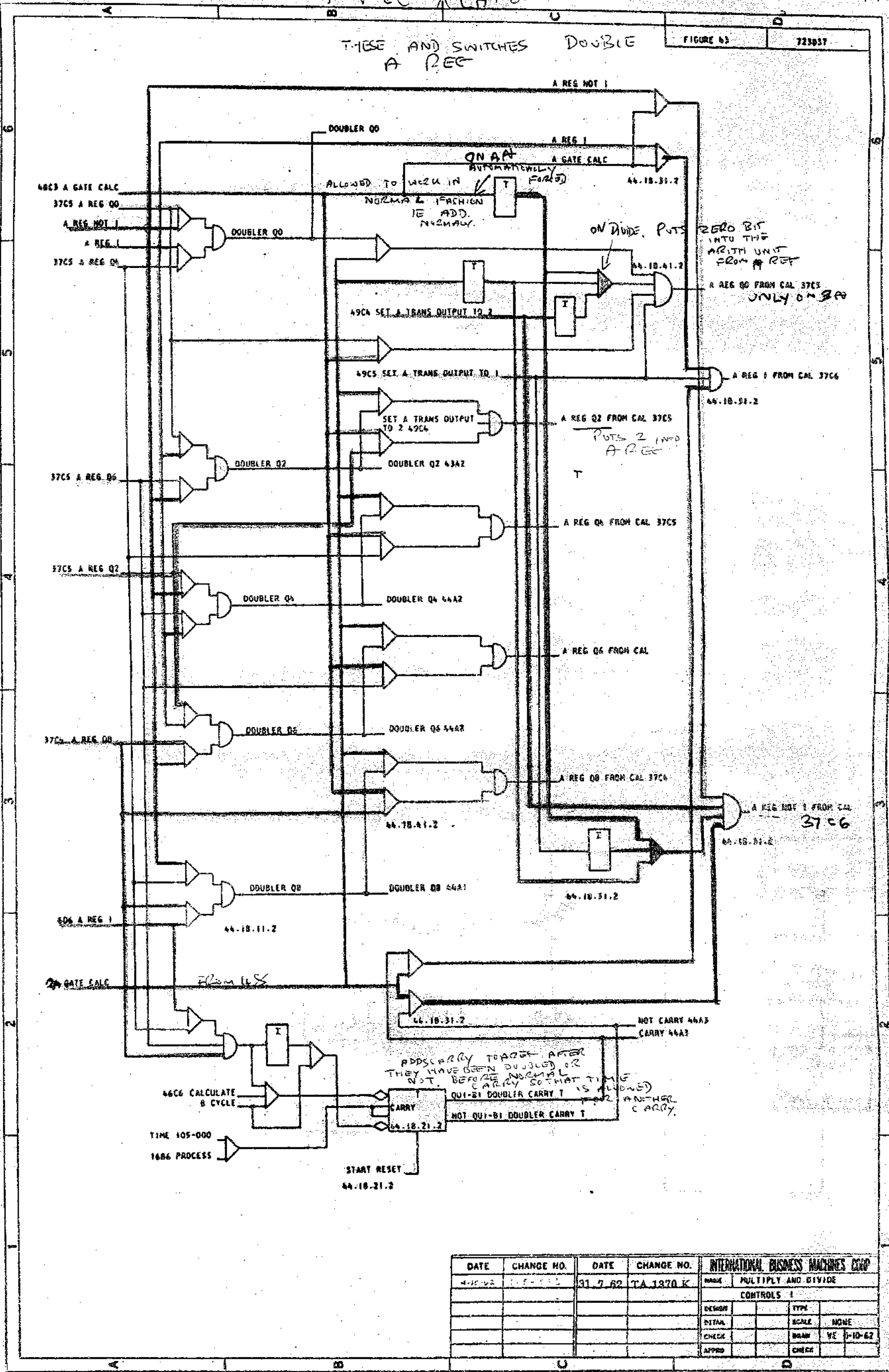
A REG XLATOR.

IF MULT FEATURE THEN IGNORE P37 A REG

THESE AND SWITCHES DOUBLE A REG

FIGURE 63

723037

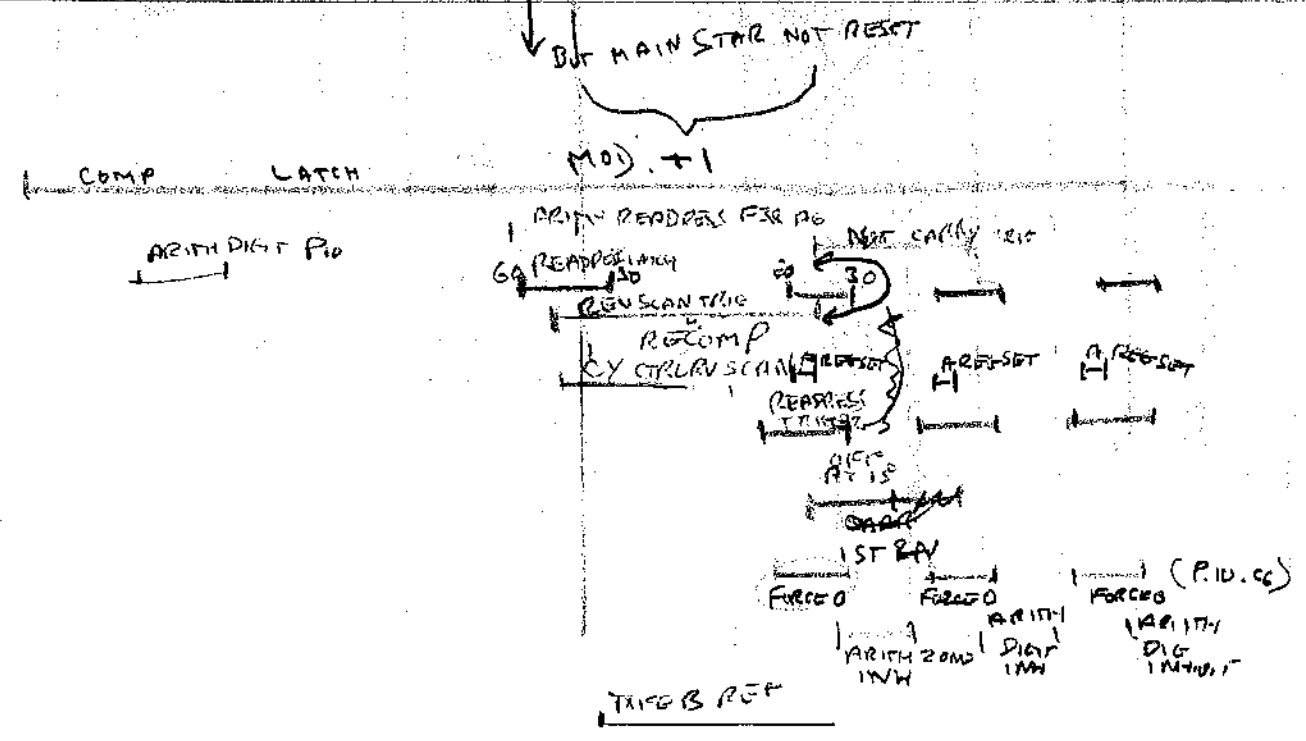


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-15-62	F-112	31-7-62	TA 1370 K	MULTIPLY AND DIVIDE			
				CONTROLS 1			
DESIGN		TYPE					
DRAW		SCALE	NONE				
CHECK		DATE	1-10-62				
APPROV		CHECK					



MAIN STAR 210 270 210

	A	B	A	B	A	B	A	B	B	B	B	B	B	B	B	B
W LATCH																
B REF	7B	0	7B	0	5	7	4	9	1	3	AB	3	AB	0	1	0
A REF	7B	7B	7B	7B	5	5	4	4				3	AB	1	1	9
INH B	7B	0	7B	AB	5		4	-	9	1	3	AB	B	B		
INHA																
CARRY					✓	✓	NO CARRY									
ARITH	AS		FORCED CARRY		1	9	4			FORCED BIT	0	7	0	8	0	0
IX																
AX																
BX	210	209	208	207												

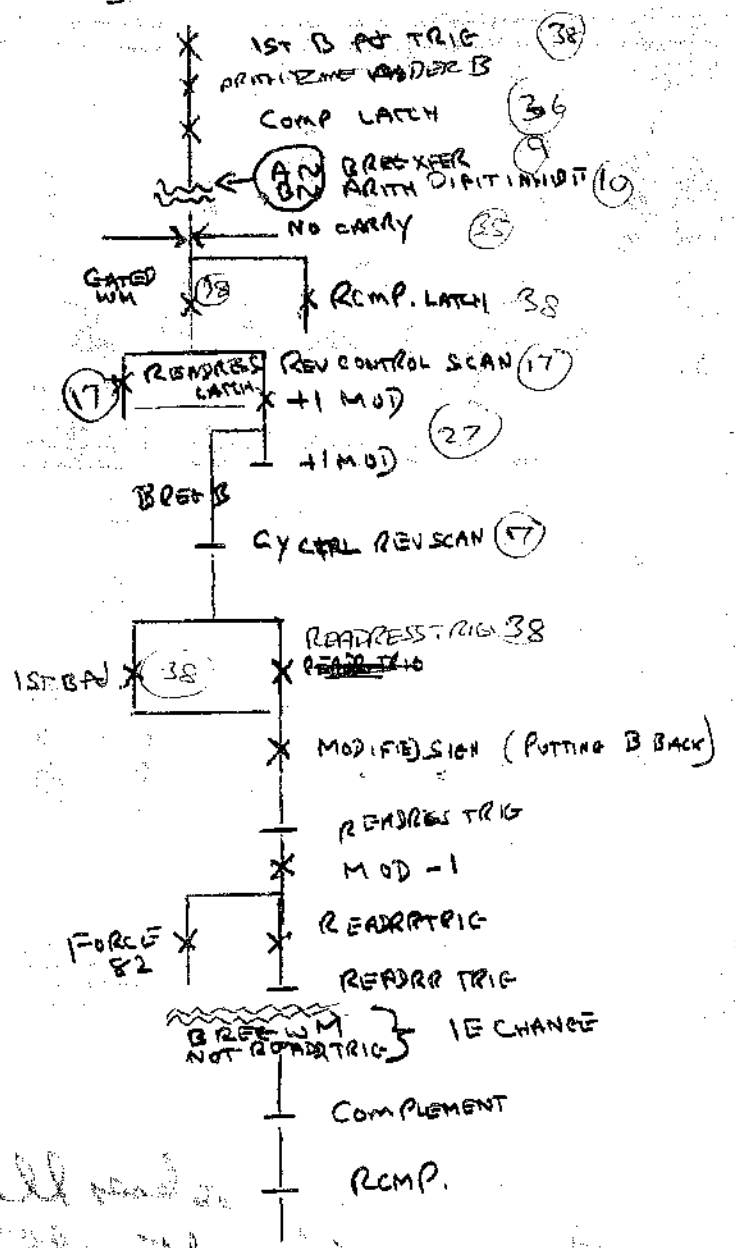


B H

268 269 270 208 209 210 - 087

3 7 0 4 5 7

9 1 3 2



*If it will read the first time... the second time... because you need to... if it will not start to read it... on the second time...*



INSTRUCTION WORD A 210 270 -

LOCATION

A-FIELD ADDRESS										208	209	210								
A-FIELD BEFORE OPERATION										4	5	7								
A-FIELD AFTER OPERATION																				
B-FIELD ADDRESS										268	269	270								
B-FIELD BEFORE OPERATION										3	7	0								
B-FIELD AFTER																				
B-FIELD AFTER																				
B-FIELD AFTER																				
~ LATCH	A	B	A	B	A	B	A	B												
MAINSTAR	210	270	210	270	209	269	208	268												
B-REG	7	0	7	0	5	7	4	3												
A-REG	7	7	7	7	5	5	4	4												
INHIBIT B	7	0	7		5		4													
INHIBIT A	}																			
CARRY →	SIGN.								✓	✓										
INHIBIT ARITH	ANALYSIS								7	2	8									
I-STAR	}																			
A-STAR	210		209		208		207													
B-STAR		210		269		268		267												

1401 GENERAL OPERATION WORK SHEET

INSTRUCTION WORD A 210 270

LOCATION

A-FIELD ADDRESS										208	209	210								
A-FIELD BEFORE OPERATION										3	7	1*								
A-FIELD AFTER OPERATION																				
B-FIELD ADDRESS										268	269	270								
B-FIELD BEFORE OPERATION										3	6	9								
B-FIELD AFTER																				
B-FIELD AFTER																				
B-FIELD AFTER																				
~ LATCH	A	B	A	B	A	B	A	B	B <sub>REF</sub>	B	B	B <sub>REF</sub>	B	B	B <sub>REF</sub>	B	B	B <sub>REF</sub>	B	B
MAINSTAR	210	270	210	270	209	269	208	268	268	269	270	270	270	269	269	268	268	268	268	268
B-REG	1 <sup>B</sup>	9	1 <sup>B</sup>	9	7	6	3	3	9	9	8 <sup>B</sup>	8 <sup>B</sup>	0	0 <sup>B</sup>	0	9	0			
A-REG	1 <sup>B</sup>	1 <sup>B</sup>	1 <sup>B</sup>	1 <sup>B</sup>	7	7	3	3			8 <sup>B</sup>	8 <sup>B</sup>	9 <sup>B</sup>	9	9	9	9			
INHIBIT B	1 <sup>B</sup>	9	1 <sup>B</sup>		7		3		9	9	8 <sup>B</sup>									
INHIBIT A																				
CARRY →			✓						No CARRY											
INHIBIT ARITH	}		8		9		9				0	2 <sup>B</sup>	0	0	0	0				
I-STAR																				
A-STAR	210		209		208		207													
B-STAR		210		269		268		267	269	270	271	269	269	268	268	267	267			
MOD)	←		←		←		←		←		←		←		←		←		←	

1401 GENERAL OPERATION WORK SHEET

INSTRUCTION WORD A210270

LOCATION

A-FIELD ADDRESS		208	209	210								
A-FIELD BEFORE OPERATION		3	6	9								
A-FIELD AFTER OPERATION												
B-FIELD ADDRESS		268	269	270								
B-FIELD BEFORE OPERATION		3	7	1								
B-FIELD AFTER												
B-FIELD AFTER												
B-FIELD AFTER												
~ LATCH	A	B	A	B	A	B	A	B				
MAINSTAR	210	270	210	270	209	269	208	268				
B-REG	9 <sup>B</sup>	1	9 <sup>B</sup>	1 <sup>B</sup>	6 <sup>B</sup>	7	3 <sup>B</sup>	3			371	
A-REG	9 <sup>B</sup>	9 <sup>B</sup>	9 <sup>B</sup>	9 <sup>B</sup>	6 <sup>B</sup>	6 <sup>B</sup>	3 <sup>B</sup>	3			-369	
INHIBIT B	9 <sup>B</sup>	1	9 <sup>B</sup>	1 <sup>B</sup>	6 <sup>B</sup>	7	3 <sup>B</sup>	3				
INHIBIT A												
CARRY →				X		✓		✓				
INHIBIT ARITH		8		2		0		0				
I-STAR											ans = +2	
A-STAR	210		209		208		207					
B-STAR		270		269		268		267				

1401 GENERAL OPERATION WORK SHEET

SE 1  
719

V

INSTRUCTION WORD A210270

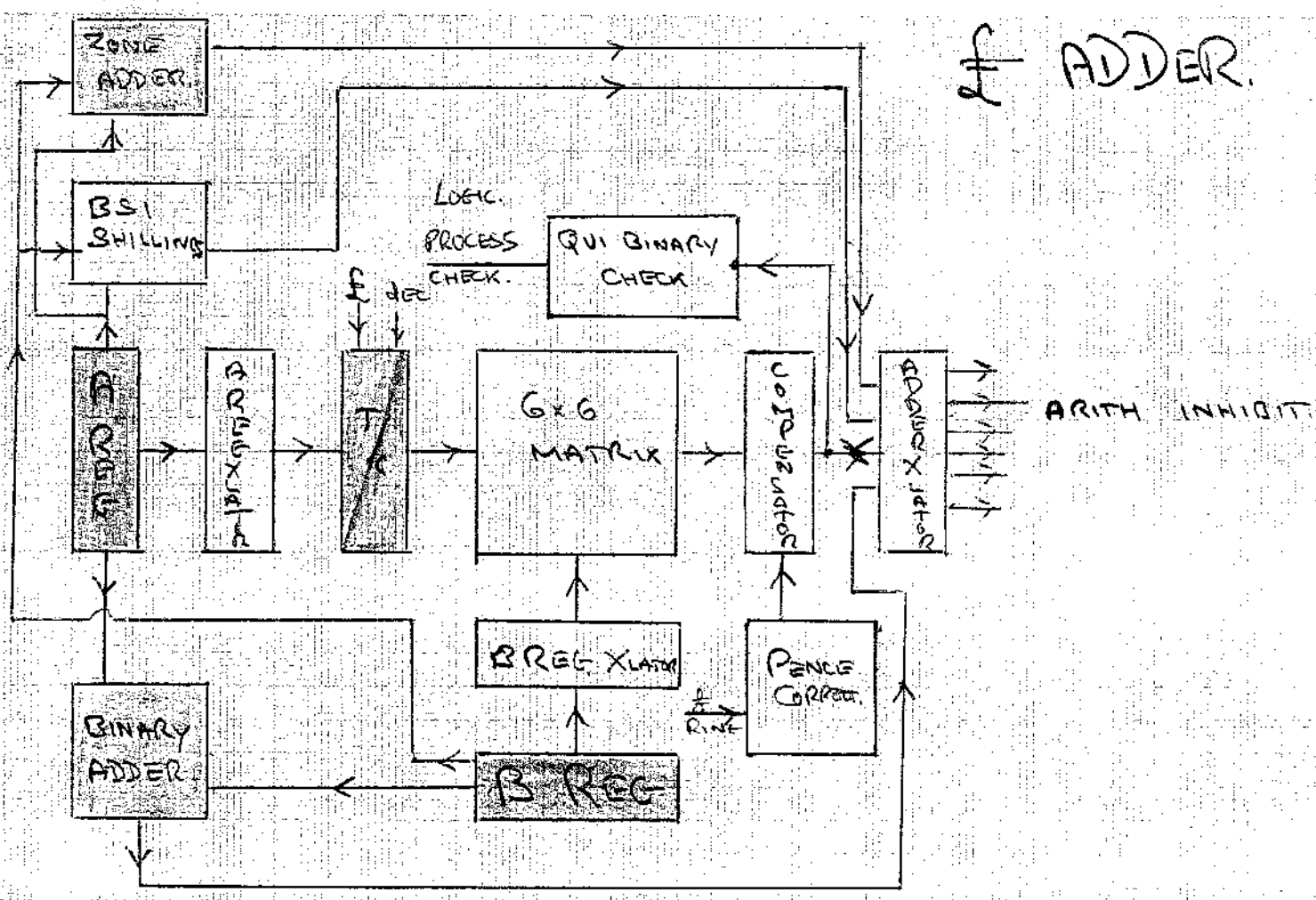
LOCATION

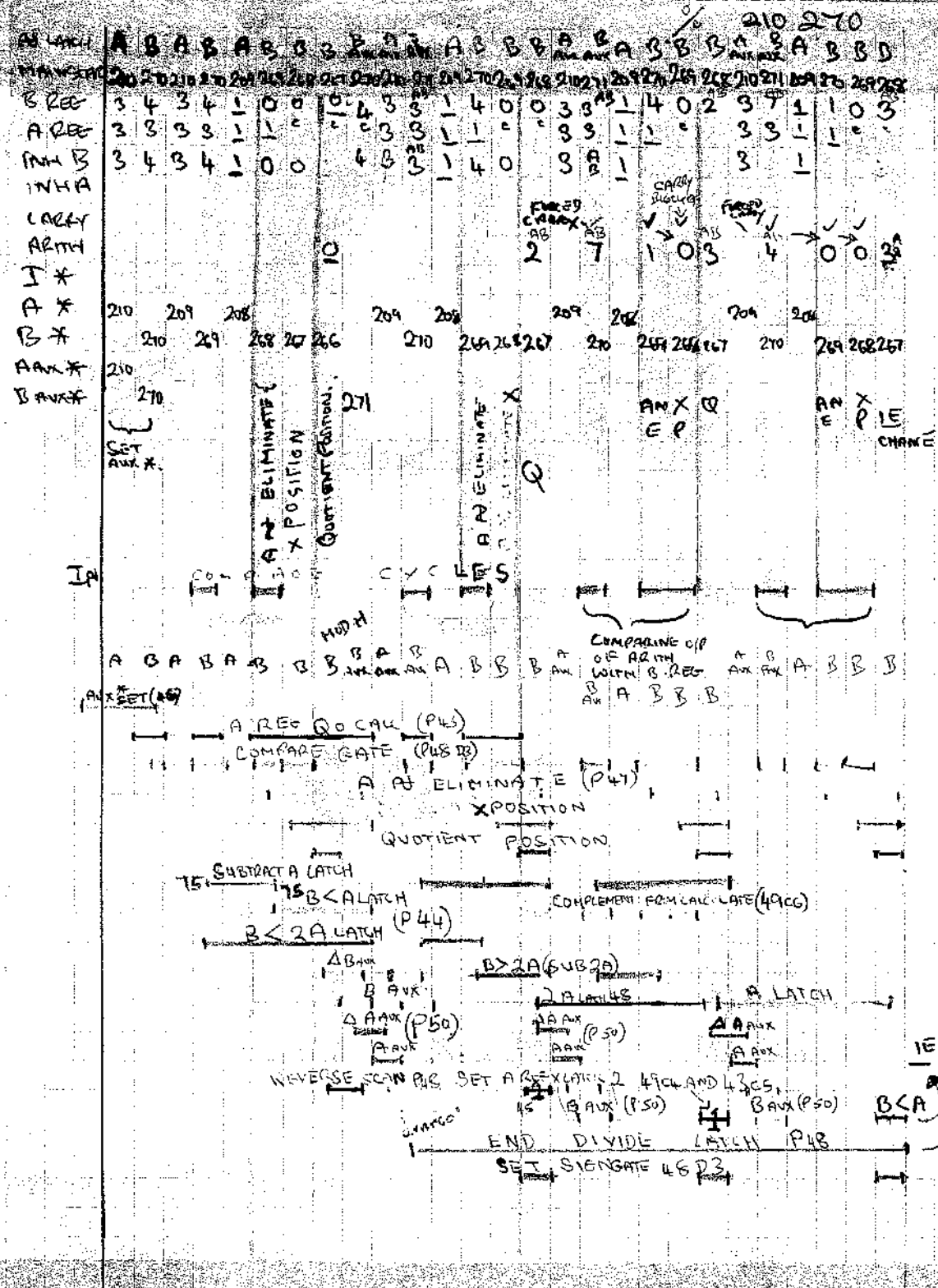
A-FIELD ADDRESS		208	209	210								
A-FIELD BEFORE OPERATION		3	7	0								
A-FIELD AFTER OPERATION												
B-FIELD ADDRESS		268	269	270								
B-FIELD BEFORE OPERATION		4	5	7								
B-FIELD AFTER												
B-FIELD AFTER												
B-FIELD AFTER												
~ LATCH	A	B	A	B	A	B	A	B				
MAINSTAR	210	270	210	270	209	269	208	268				
B-REG	0 <sup>B</sup>	7	0 <sup>B</sup>	7 <sup>B</sup>	7	5	3	4				
A-REG	0 <sup>B</sup>	0 <sup>B</sup>	0 <sup>B</sup>	0 <sup>B</sup>	7	7	3	3				
INHIBIT B	0 <sup>B</sup>	7	0 <sup>B</sup>	7 <sup>B</sup>	7	5	3	4			457	
INHIBIT A											-370	
CARRY →				✓	✓			✓				
INHIBIT ARITH		8		7		8	8	0				
I-STAR												
A-STAR	210		209		208		207				ans + 87	
B-STAR		270		269		268		267				
M/D	←	0	→	←		→	←	→				

1401 GENERAL OPERATION WORK SHEET



ADDER.



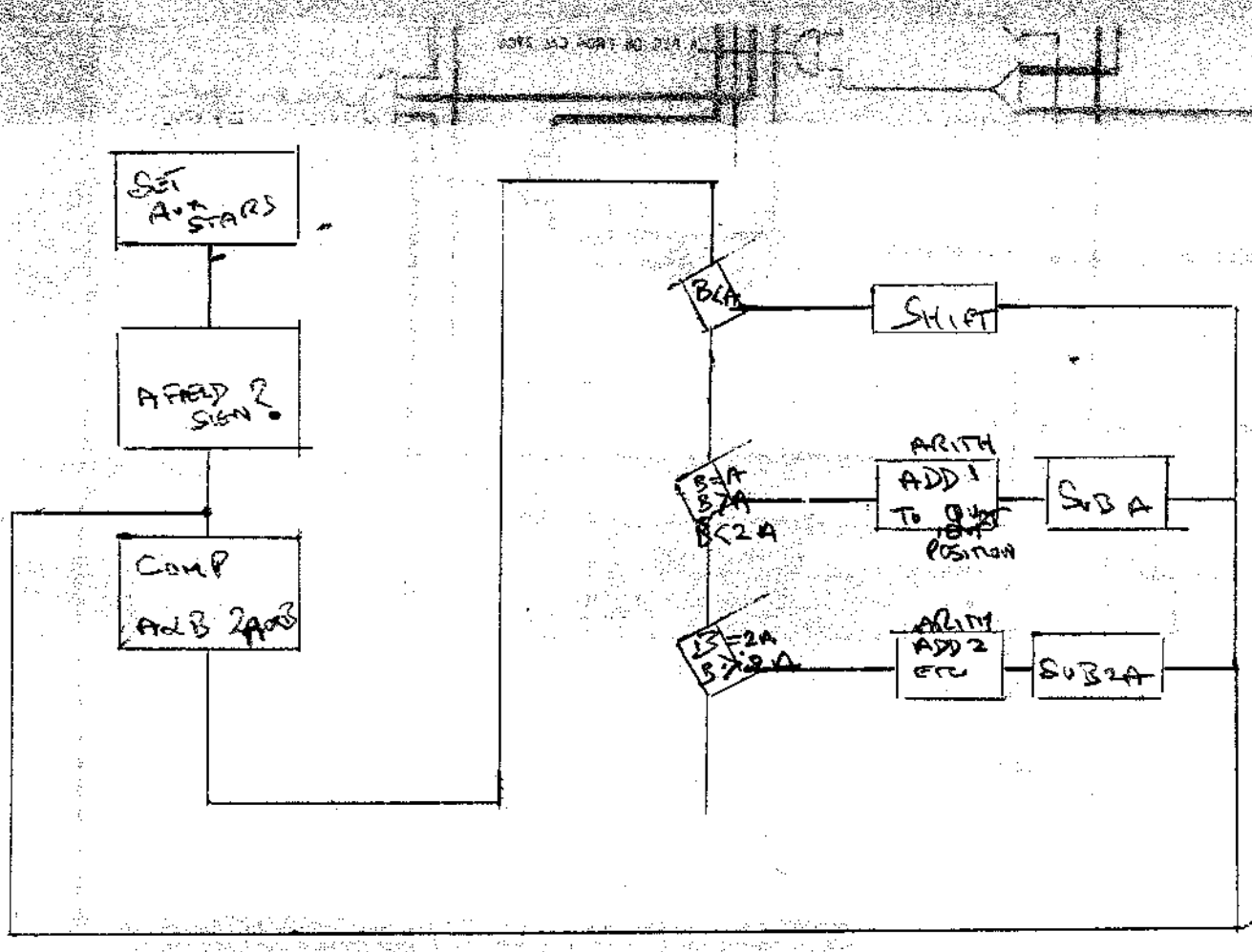


B FIELD 1072  
 A FIELD 208  
 MUST RESET ADD BEFORE DIVIDE

00043  
 02019  
 03004

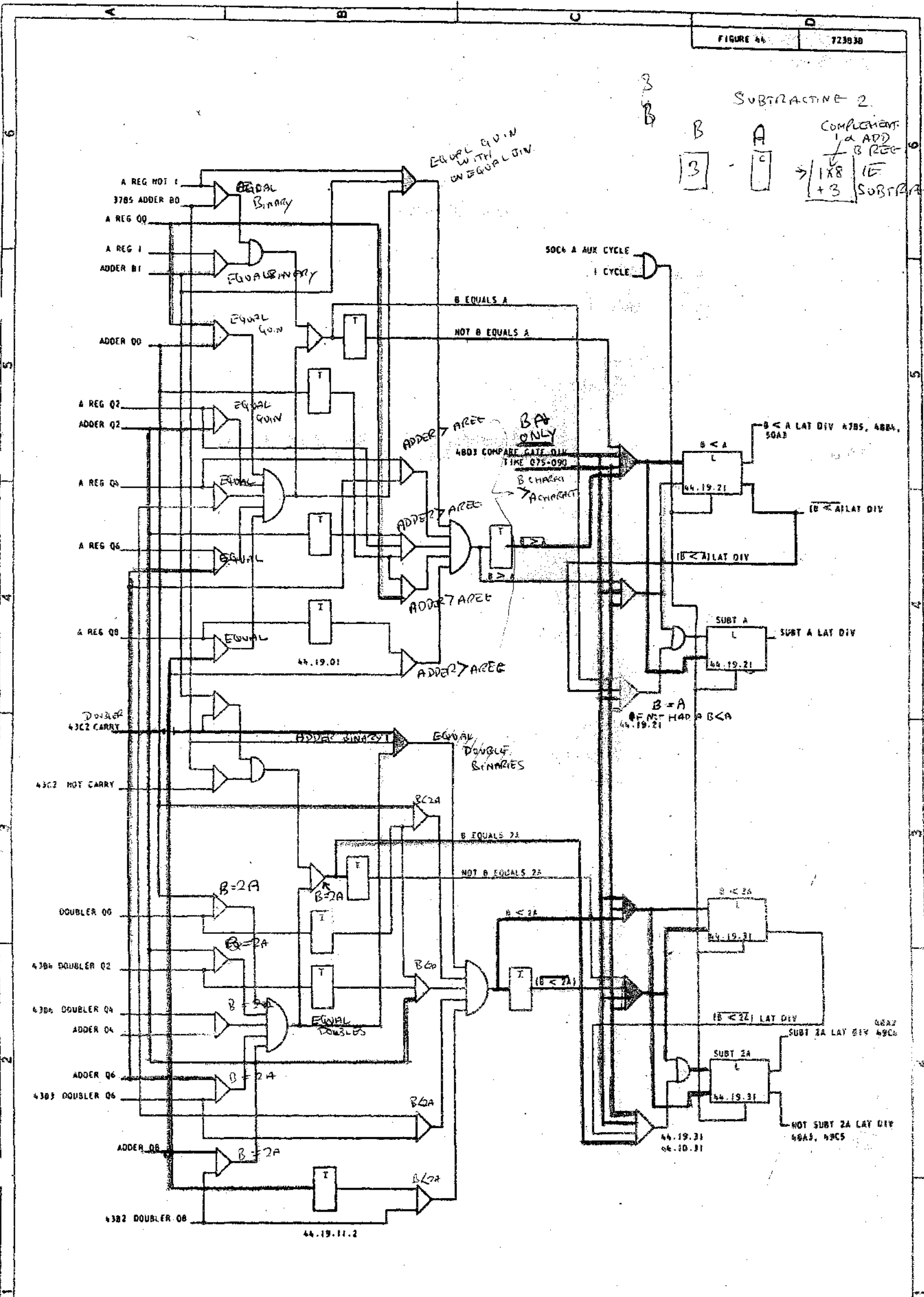
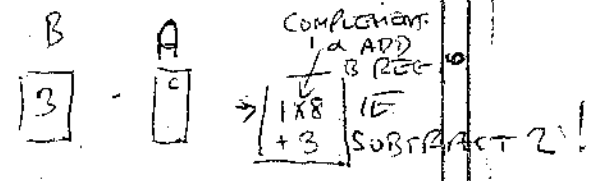
WHEN PROGRAMMING TAKE JUNIOR POSITION OF A FIELD AS 210 SENIOR POSITION OF B FIELD AS 270

4  
 4  
 4 5 6 7 8 9 0 1 2 3 4 5 6 7  
 555271 % 2 0270  
 90 6  
 B 4 4 4  
 2 ? ?  
 6 7 7  
 7 8 9 0 1  
 00043  
 222  
 001  
 890  
 018





SUBTRACTIVE 2



Handwritten notes on the right margin:

- B < A
- B < 2A
- B < 2A
- B < 2A
- B < 2A

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4.10.62	1-1	31.7.62	TA 1370 K	NAME MULTIPLY AND DIVIDE
				CONTROLS 2
				DESIGN
				SCALE NONE
				CHECK DRAW VE 1-10-62
				APPRO CHECK

A - FIELD BEFORE OPERATION	2	7 <sup>A</sup>
A - FIELD AFTER OPERATION	2	7 <sup>B</sup>

INSTRUCTIONS: (900)  $\frac{1}{2}$  783 678  
 (907)  $\frac{1}{6}$  458 676  
 (914)  $\frac{1}{8}$  900

FIELD BEFORE OPERATION	0	0	1	3	4	0 <sup>A</sup>
B-F. AFTER DIVIDE - COMPARE	0	1	0	3	4	0 <sup>B</sup>
B-F. AFTER DIVIDE - COMPARE	0	1	0	3	4	0 <sup>B</sup>
B-F. AFTER SUBT. A & DIV. COMP.	0	1	0	0	7	0 <sup>B</sup>
B-F. AFTER DIVIDE - COMPARE	0	1	2 <sup>AB</sup>	0	7	0 <sup>B</sup>
B-F. AFTER SUBT. 2A & DIV. COMP.	0	1	2 <sup>AB</sup>	0	1	6 <sup>B</sup>

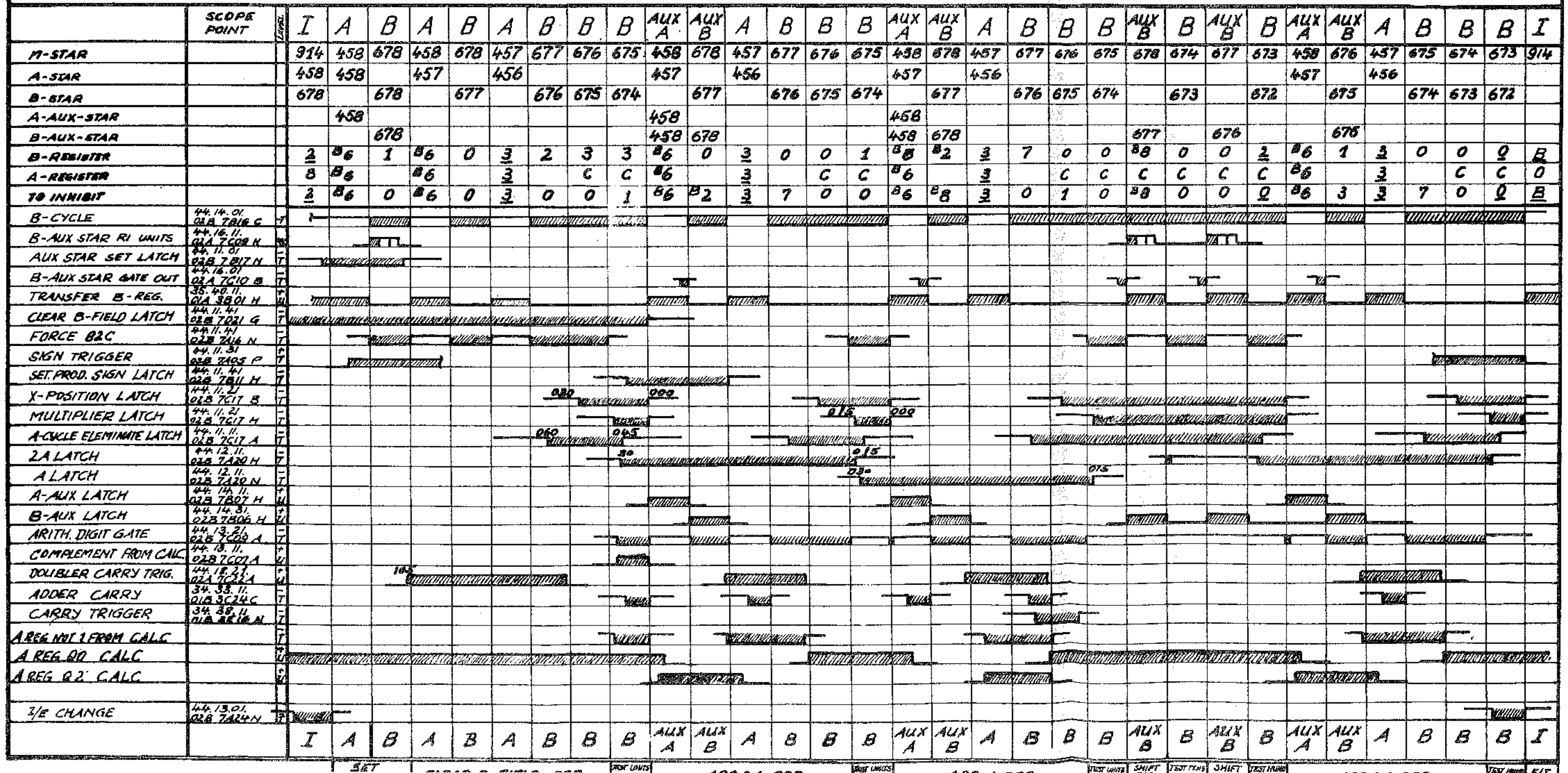
SCOPE TRIGGER POINT	02 B7 BIT N AUX STAR SET LATCH	T	I <sub>7</sub>	A	B	A	B	A	B	B	B	AUX B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	AUX A	AUX B	A	B	B	B	I <sub>op</sub>	
M - STAR			914	458	676	458	676	457	675	674	673	676	458	677	457	676	675	674	458	677	457	676	675	674	458	678	457	677	676	675	458	678	457	677	676	675	914	
A - STAR			458	458		457		456				457		456					457		456				457		456											
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 <sup>B</sup>	3	7 <sup>B</sup>	3	2	0	0	0	3	7 <sup>B</sup>	4	2	3	0	0	7 <sup>B</sup>	4	2	3	0	1	7	7 <sup>B</sup>	0 <sup>B</sup>	2	7	0	0	7 <sup>B</sup>	0 <sup>B</sup>	2	7	0	2 <sup>AB</sup>	B
A - REGISTER			8	7 <sup>B</sup>	7 <sup>B</sup>	7 <sup>B</sup>		2	2	C	C	C	7 <sup>B</sup>		2		C	C	7 <sup>B</sup>		2		C	C	7 <sup>B</sup>		2		C	C	7 <sup>B</sup>		2		C	C	0	
TO INHIBIT			2	7 <sup>B</sup>	3	7 <sup>B</sup>	3	2	0	0	0	3	7 <sup>B</sup>	4	2	3	0	1	7 <sup>B</sup>	7	2	0	0	1	7	7 <sup>B</sup>	0 <sup>B</sup>	2	7	0	2 <sup>AB</sup>	7 <sup>B</sup>	0 <sup>B</sup>	2	1	0	2 <sup>AB</sup>	B
B - CYCLE	44.11.01 02 B 7 B16C	T	[Timing diagram for B-Cycle]																																			
B-AUX STAR RI. UNITS	44.16.01 02 A 7 C09H	U	[Timing diagram for B-Aux Star Ri. Units]																																			
AUX STAR SET LATCH	44.11.01 02 B 7 B17N	T	[Timing diagram for Aux Star Set Latch]																																			
B-AUX STAR GATE OUT	44.16.01 02 A 7 C10B	T	[Timing diagram for B-Aux Star Gate Out]																																			
TRANSFER B-REG	35.40.11 01 A 7 B01H	U	[Timing diagram for Transfer B-Reg]																																			
SET A-REG C-BIT	44.11.11 02 B 7 D03A	T	[Timing diagram for Set A-Reg C-Bit]																																			
X POS. LATCH	44.11.21 02 B 7 C17B	T	[Timing diagram for X Pos. Latch]																																			
A #ELIM. LATCH	44.11.11 02 B 7 C17A	T	[Timing diagram for A #Elim. Latch]																																			
SIGN TRIGGER	44.11.31 02 B 7 A05P	T	[Timing diagram for Sign Trigger]																																			
SET SIGN GATE	44.12.01 02 B 7 D08D	T	[Timing diagram for Set Sign Gate]																																			
QUOT. TRIGGER	44.12.01 02 B 7 A13N	T	[Timing diagram for Quot. Trigger]																																			
COMPARE GATE	44.13.01 02 B 7 A22N	U	[Timing diagram for Compare Gate]																																			
A LATCH	44.12.11 02 B 7 C08P	U	[Timing diagram for A Latch]																																			
2A LATCH	44.12.11 02 B 7 C08A	U	[Timing diagram for 2A Latch]																																			
B<A LATCH	44.19.21 02 A 7 E12N	T	[Timing diagram for B<A Latch]																																			
B<2A LATCH	44.19.31 02 A 7 E13N	T	[Timing diagram for B<2A Latch]																																			
COMPLEMENT GATE	44.18.11 02 B 7 B03N	T	[Timing diagram for Complement Gate]																																			
SUBT. A LATCH	44.19.21 02 A 7 E12H	T	[Timing diagram for Subt. A Latch]																																			
SUBT. 2 A LATCH	44.19.31 02 A 7 E15H	T	[Timing diagram for Subt. 2 A Latch]																																			
END DIVIDE LATCH	44.12.01 02 B 7 B11F	U	[Timing diagram for End Divide Latch]																																			
FORCE B0	44.18.31 02 A 7 D03H	U	[Timing diagram for Force B0]																																			
FORCE B1	44.18.31 02 A 7 C24D	T	[Timing diagram for Force B1]																																			
FORCE Q0	44.18.31 02 A 7 D09N	U	[Timing diagram for Force Q0]																																			
FORCE Q2	44.18.31 02 A 7 D10P	T	[Timing diagram for Force Q2]																																			
MOD. CONTR. +1	32.44.11 01 A 7 F20N	U	[Timing diagram for Mod. Contr. +1]																																			
CARRY	34.38.11 01 E 7 E16N	T	[Timing diagram for Carry]																																			

A-FIELD ADDRESS			457	458
A-FIELD BEFORE OPERATION			3	B6
A-FIELD AFTER OPERATION			3	B6

### MULTIPLY OPERATION

INSTRUKTIONEN: (800) L 783 678  
 (907) @ 458 678  
 (914) B900

B-FIELD ADDRESS			673	674	675	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	B2
B-FIELD AFTER ADD A OPER.			0	0	0	1	0	B8
B-FIELD AFTER ADD 2A OPER.			0	0	7	3	0	B8



A-FIELD ADDRESS			457	458
A-FIELD BEFORE OPERATION			3	B6
A-FIELD AFTER OPERATION			3	B6

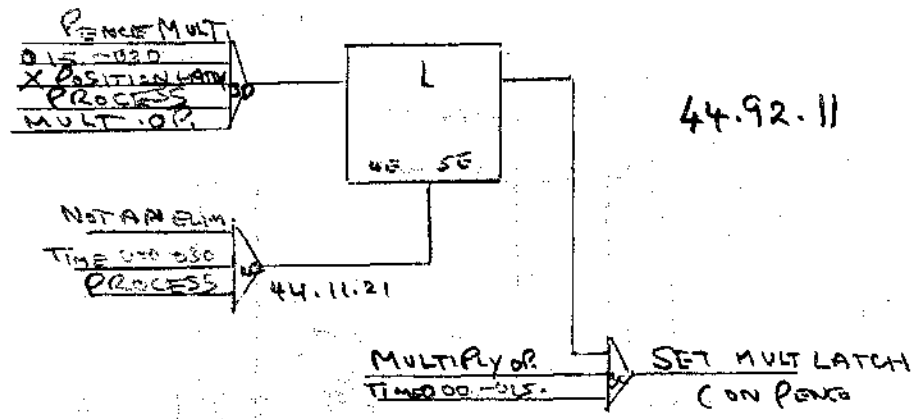
MULTIPLY OPERATION

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

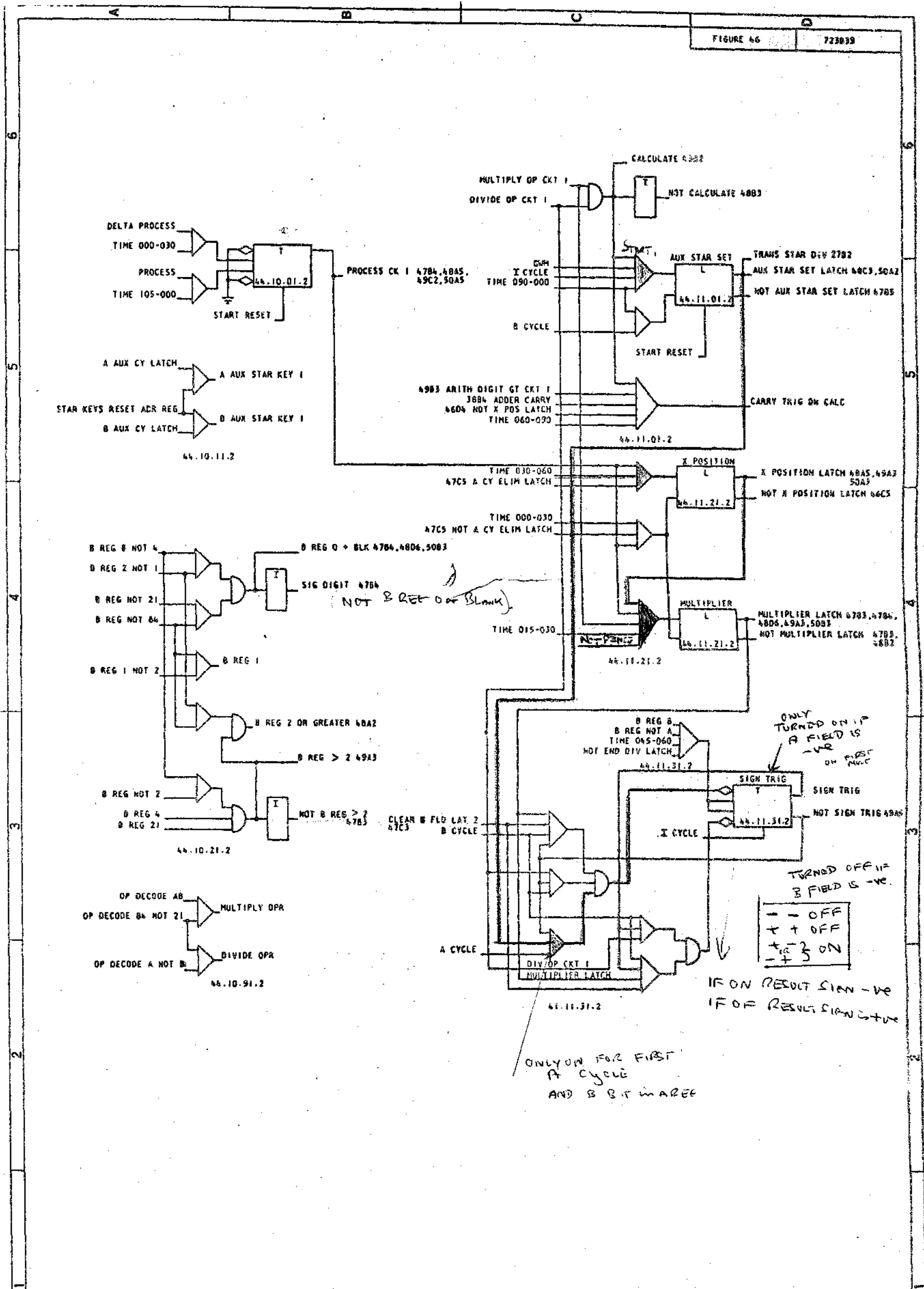
B-FIELD ADDRESS			673	674	675	676	677	678
B-FIELD BEFORE OPERATION			2	0	3	3	2	1
B-FIELD AFTER CLEAR OPER.					1	0	0	0
B-FIELD AFTER ADD 2A OPER.					0	0	7	B2
B-FIELD AFTER ADD A OPER.			0	0	0	1	0	B8
B-FIELD AFTER ADD 2A OPER.			0	0	7	3	0	B8

SCOPE POINT	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		678							
B-REGISTER	2	B6	1	B6	0	3	2	3	3	B6	0	3	0	0	1	B8	B2	3	7	0	0	B8	0	0	2	B6	1	3	0	0	0	B	
A-REGISTER	3	B6		B6		3		C	C	B6		3		C	C	B6		3		C	C	C	C	C	C	B6		3		C	C	0	
TO INHIBIT	2	B6	0	B6	0	3	0	0	1	B6	B2	3	7	0	0	B6	B8	3	0	1	0	B8	0	0	0	B6	3	3	7	0	0	B	
B-CYCLE	44.14.01 02A 7816 C	[Timing Diagram]																															
B-AUX STAR RI UNITS	44.16.11 02A 7809 H	[Timing Diagram]																															
AUX STAR SET LATCH	44.11.01 02B 7817 H	[Timing Diagram]																															
B-AUX STAR GATE OUT	44.16.01 02A 7810 B	[Timing Diagram]																															
TRANSFER B-REG.	35.40.11 02A 3801 H	[Timing Diagram]																															
CLEAR B-FIELD LATCH	44.11.41 02B 7021 G	[Timing Diagram]																															
FORCE B2C	44.11.41 02B 7416 N	[Timing Diagram]																															
SIGN TRIGGER	44.11.31 02B 7405 P	[Timing Diagram]																															
SET PROD. SIGN LATCH	44.11.41 02B 7811 H	[Timing Diagram]																															
X-POSITION LATCH	44.11.21 02B 7817 B	[Timing Diagram]																															
MULTIPLIER LATCH	44.11.21 02B 7817 H	[Timing Diagram]																															
A-CYCLE ELEMENT LATCH	44.11.11 02B 7817 A	[Timing Diagram]																															
2A LATCH	44.12.11 02B 7820 H	[Timing Diagram]																															
A LATCH	44.12.11 02B 7820 N	[Timing Diagram]																															
A-AUX LATCH	44.14.11 02B 7807 H	[Timing Diagram]																															
B-AUX LATCH	44.14.31 02B 7806 H	[Timing Diagram]																															
ARITH. DIGIT GATE	44.13.21 02B 7809 A	[Timing Diagram]																															
COMPLEMENT FROM CALC	44.15.11 02B 7807 A	[Timing Diagram]																															
DOUBLER CARRY TRIG.	44.15.21 02A 7821 A	[Timing Diagram]																															
ADDER CARRY	34.33.11 02B 3C24 C	[Timing Diagram]																															
CARRY TRIGGER	34.33.11 02B 3E16 N	[Timing Diagram]																															
A REG NOT 1 FROM CALC		[Timing Diagram]																															
A REG 00 CALC		[Timing Diagram]																															
A REG 02 CALC		[Timing Diagram]																															
3/E CHANGE	44.13.01 02B 7814 N	[Timing Diagram]																															

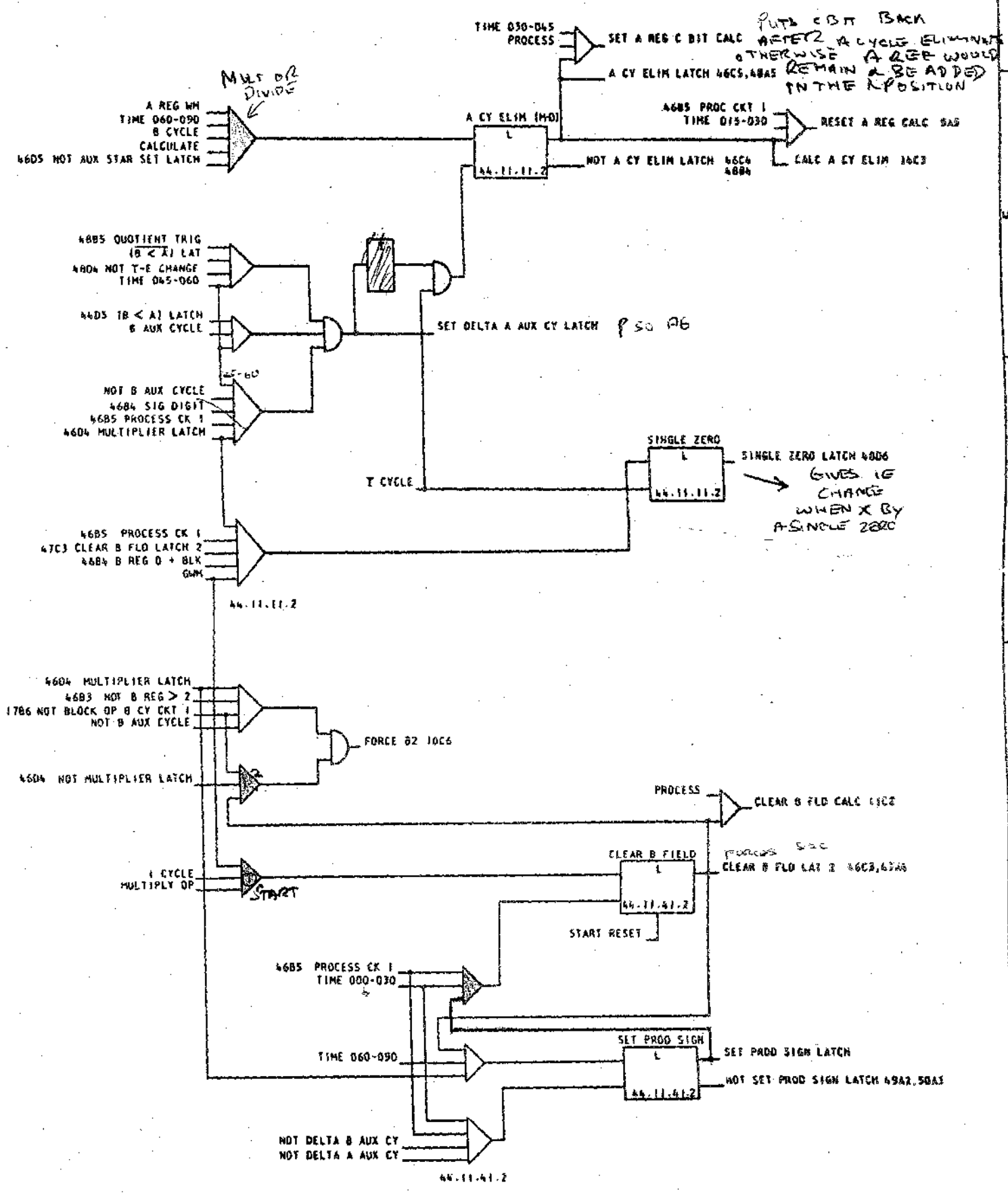
4th Bcycle



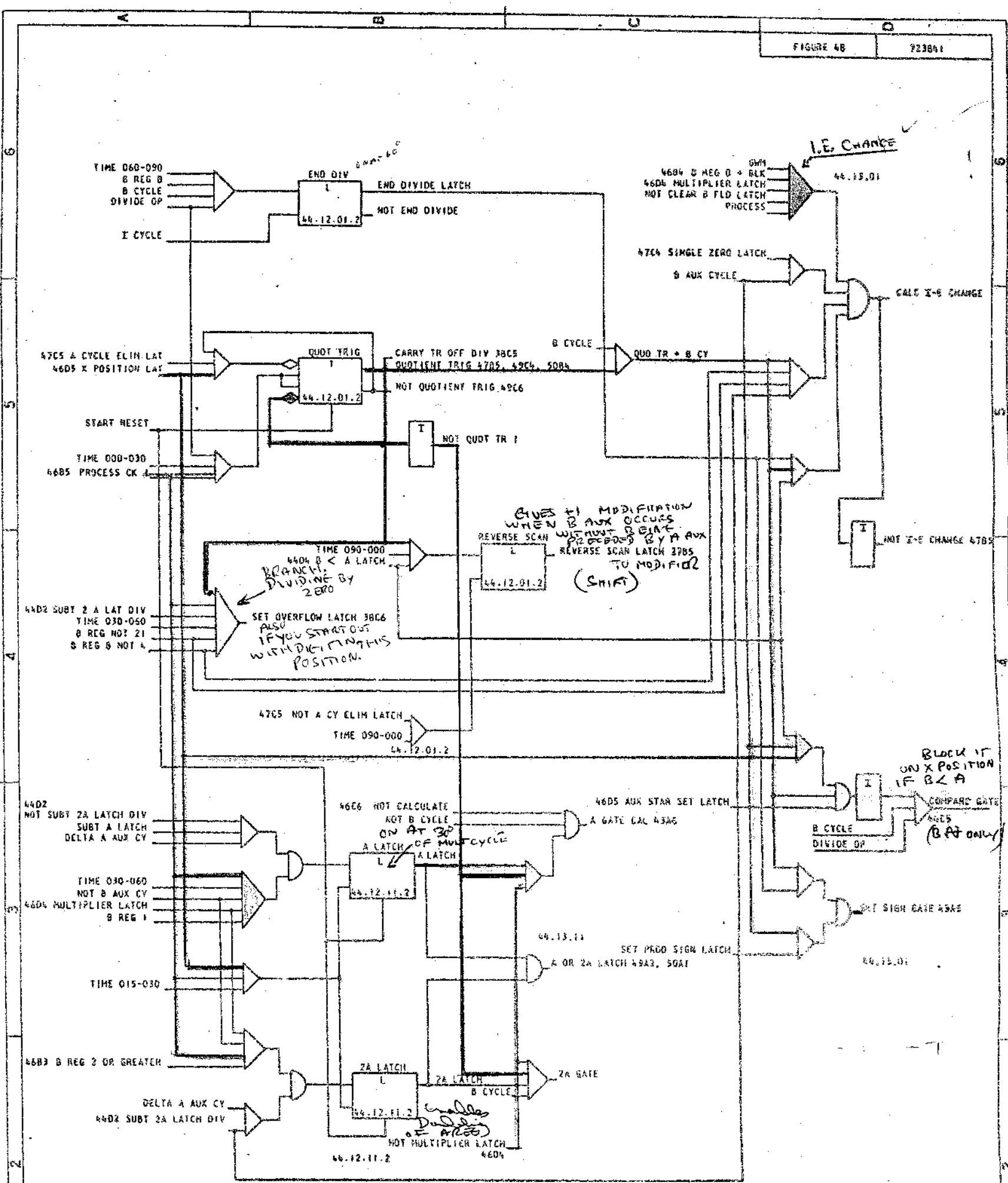




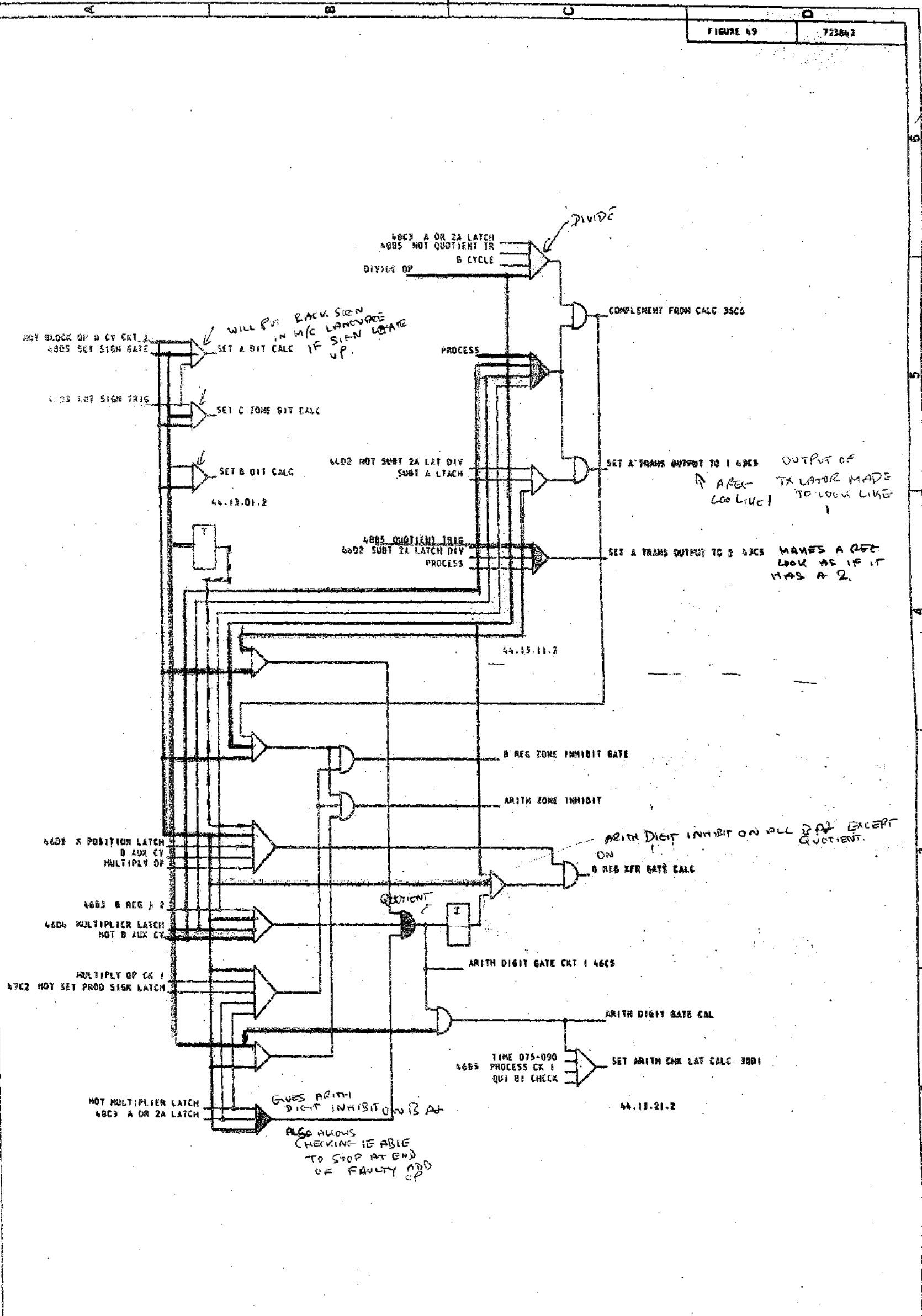
DATE		CHANGE NO.		INTERNATIONAL BUSINESS MACHINES CORP	
4-16-62	115430L	31-7-62	TA 1970 K	NAME	MULTIPLY AND DIVIDE
				CONTROLS 3	
				DESIGN	TYPE
				DETAIL	SCALE NONE
				CHECK	DATE VE 11-9-61
				APPROV	CHECK 787 12-16-61



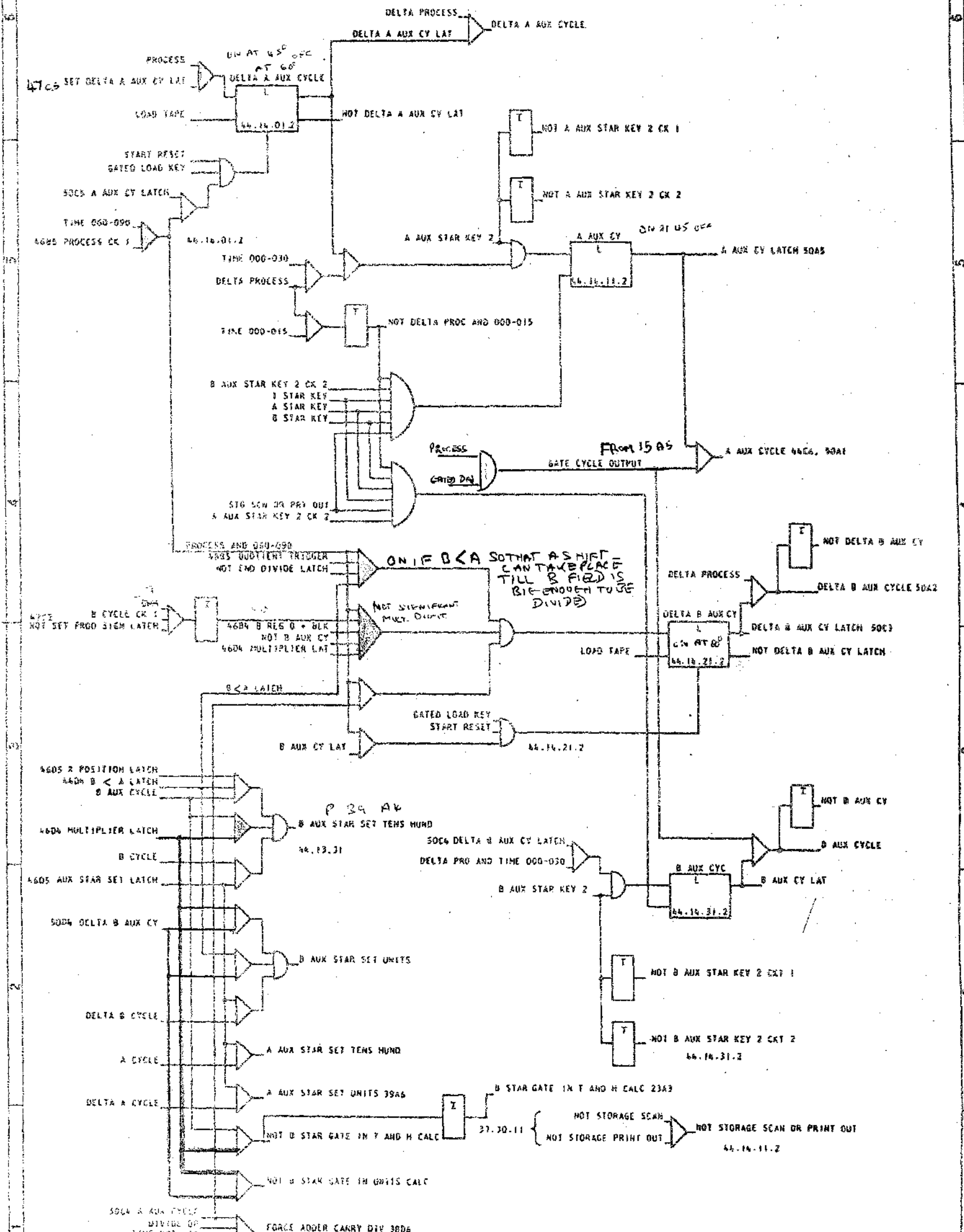
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	112220 D	31-7-62	TA 1370 K	NAME	MULTIPLY AND DIVIDE		
				CONTROLS 4			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 12-9-61
				APPRO		CHECK	TVI 12-16-61



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP	
4-12-62	13250 D	81-7-69	TA 1370 K	NAME	MULTIPLY AND
				DIVIDE CONTROLS S	
				DESIGN	TYPE
				DRAWN	SCALE NONE
				CHECKED	DATE VE 12-9-61
				APPROVED	CHECKED DATE 12-20-62



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113-70 R	31.7.62	TA 1370 K	NAME	MULTIPLY AND DIVIDE CONTROLS 6		
				DESIGN	TYPE		
				DETAIL	SCALE	NONE	
				CHECK	DATE	VE 12-9-61	
				APPRO	CHECK	12-20-61	



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	1-1-62-3	31.7.62	TA 1870 K	NAME	MULTIPLY AND DIVIDE CONTROLS 7		
				DESIGN	TYPE		
				DETAIL	SCALE	NONE	
				CHECK	DRAWN	VE	12-9-61
				APPROV	CHECK	TBI	12-14-61



MPLY

BS1

@ AAA BBB

A: 02401210

B: 125B:0XXX

	£	£	s	d	:	D			
LINE 1	1	2	5	B	:	0	x	x	x
LINE 2						M	x	1	0
LINE 3						M			
LINE 4						M			
LINE 5						M	4 <sup>th</sup>	x	1 0
LINE 7A						M	x	0	1 2
LINE 8A						M	x	0	2 4
LINE 9A						M	x	0	2 4

NORMAL B FIELD SHIFT. SET SIGN  
 B<sup>2</sup>, B<sup>1</sup>, NOT A OR 2A. BZR OR BLK, No.  
 SHIFT STER MK, STILL A-ELIM. B<sup>2</sup>, S2C  
 SET TR1, INSERT 4<sup>th</sup> B<sup>2</sup>, A & B FIELD SHIFTS  
 SET TR2, No. 4<sup>th</sup> B<sup>2</sup>, LAST ADD LAT, A & B  
 FIELD SHIFTS.  
 SET TR3, B FIELD SHIFT.  
 NO SHIFT IE CHNG.

B. BS1 CODING

The programming is a normal multiply command. The A field has 024 012 10 pre-stored, the B field has the sterling value with at least one decimal position of pence. The same rules of programming apply as with IBM coding.

DIV.

BS1 %AAA BBB

A: 1 12 24

B: 00024 : 260

	f	E	E	s	d	D		
LINE 1	0	0	0	2	4	:	2	6 <sup>0</sup>
LINE 2	Q	x	<u>2</u>	4				
LINE 3	Q	x	<u>2</u>	4				
LINE 4								
LINE 5		Q	x	<u>2</u>	4			
LINE 6A			Q	4 <sup>th</sup>	x	<u>1</u>	2	
LINE 8				Q	4 <sup>th</sup>	x	<u>1</u>	
LINE 9						<sup>A</sup> Q	x	<u>1</u>

STERLING MARKER B FIELD SHIFT

1st STAGE AND 2nd STAGE SET

SHIFT CALLED WITH 2nd STAGE A FIELD SHIFT, FOLLOWED BY B FIELD SHIFT SET TR2

SHIFT CALLED WITH TR2, A FIELD SHIFT ONLY, SET TR3

SHIFT CALLED, NORMAL B FIELD SHIFT RESET TR3 SET DIV END

SHIFT CALLED, NO SHIFT, IE CHANGE.

B. BS1 CODING

The programming is a normal divide command. The A field has 1 12 24 pre-stored, the B field has the pence value, with at least one decimal position, and the sterling marker pre-stored. The rest of the programming is done as with IBM coding.

DIV.

IBM % AAA BBB

A: 1 12024 B: 000024 : 260

	£	£	E	s	s	d	:	D	
LINE 1	0	0	0	0	2	4	:	2	60
LINE 2	Q	x	0	2	4				
LINE 3	Q	x	0	2	4				
LINE 4									
LINE 5		Q	x	0	2			4	
LINE 6		Q	x	1	2			2	
LINE 7				Q	4 <sup>th</sup>	x		1	2
LINE 8				Q	4 <sup>th</sup>	x		1	1
LINE 9								Q	x 1

STERLING MARKER B FIELD SHIFT

1st STAGE AND 2nd STAGE SET

SHIFT CALLED WITH 2nd STAGE, A FIELD SHIFT ONLY. SET TR1.

SHIFT CALLED NORMAL B FIELD SHIFT SET TR2

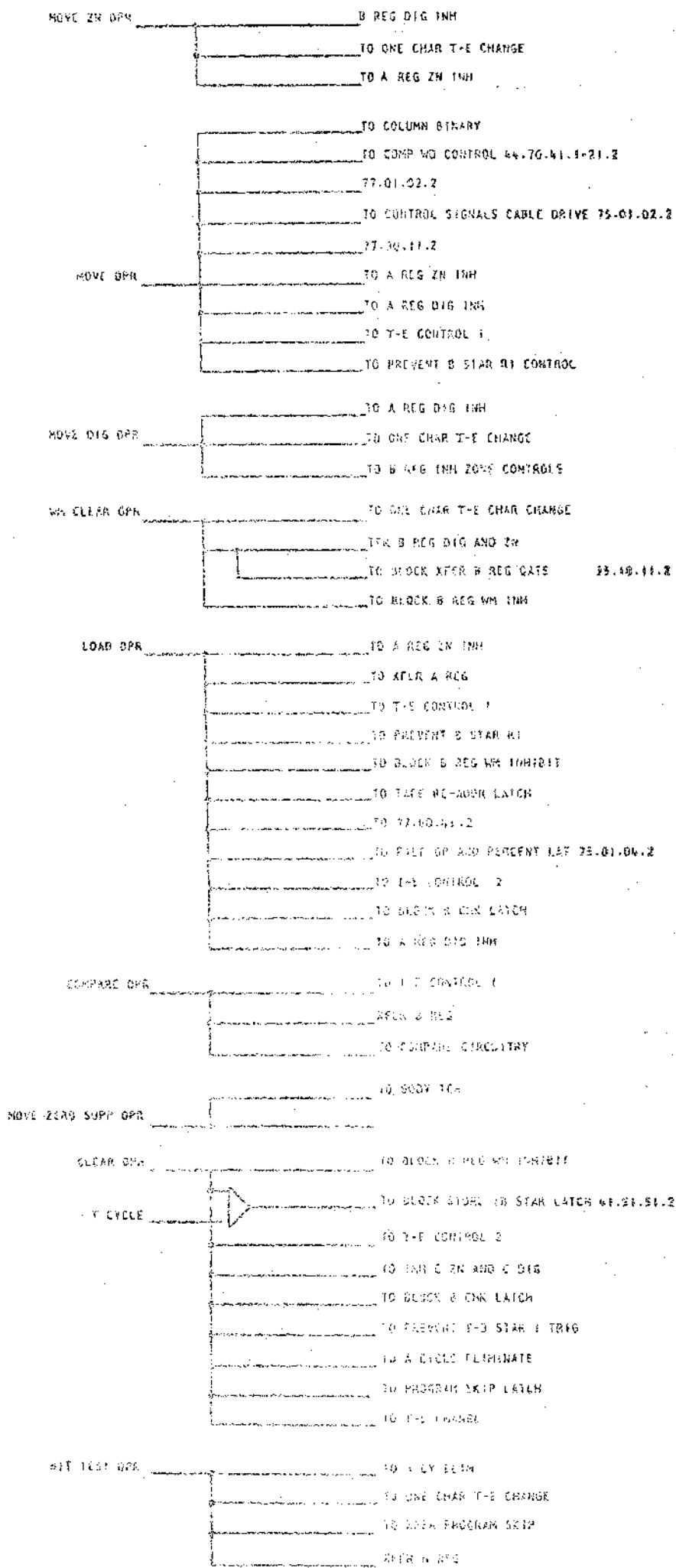
SHIFT CALLED WITH TR2, A FIELD SHIFT ONLY SET TR3.

SHIFT CALLED, NORMAL B FIELD SHIFT. RESET TR3. SET DIV END

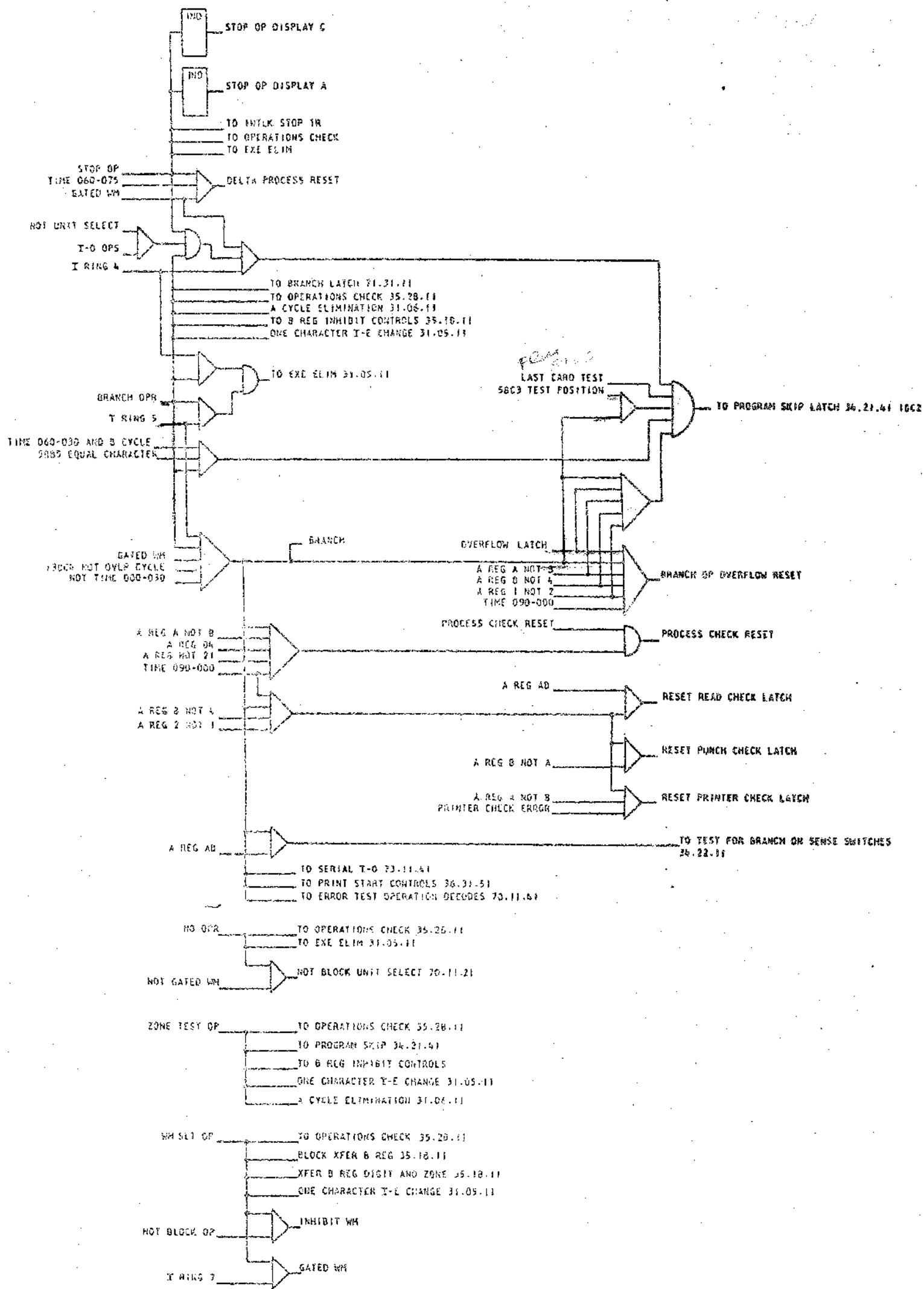
SHIFT CALLED, NO SHIFT, IE CHANGE

A. IBM CODING

The programming is a normal divide command. The A field has 1 12024 pre-stored, the B field has the pence value, with at least one decimal position, and the sterling marker pre-stored. The normal rules apply the B field length. i. e. length of dividend (including marker and decimal places) plus divisor (lowest order factor) plus one. The location of the marker is determined by length of divisor highest order factor, plus number of decimal positions, plus 2. Normally it is loaded in the appropriate position of the B field, and the pence value, with decimal positions, is reset added on top if desired. A sign may be placed over the units position of the high order factor of the A field. If negative this will cause a change of sign as well as a reconversion of the pence value. As in normal divide the B field must have a standard sign (the above reset add will achieve this), and the B address must be the high order position of the dividend.



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.			
12-1-52	12321	01-1-52	TA 1070 K	NAME	MOVE, LOAD, CLEAR		
					AND BIT TEST		
				SECTION	TYPE		
				DRAWN	SCALE	NOISE	
				CHECKED	DRAWN	VC	12-12-52
				APPROV	CHECKED		



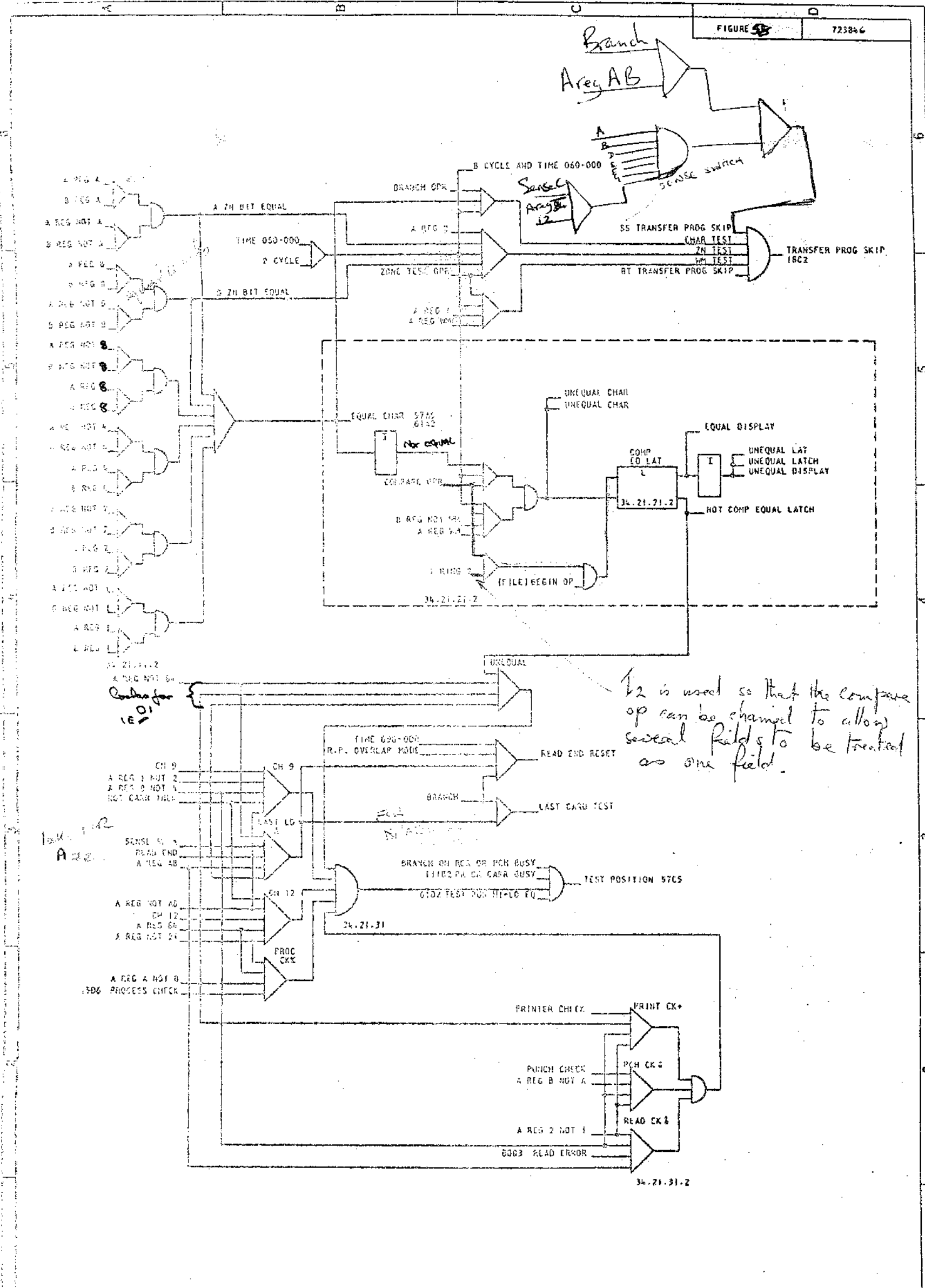
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-22-62	113830 D	31.7.62	TA 1370 K	NAME	STOP, BRANCH, NO DP, WM		
				SET, ZONE TEST			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	VE 12-12-61
				APPRO		CHECK	



# Compare

FIGURE 5

723846



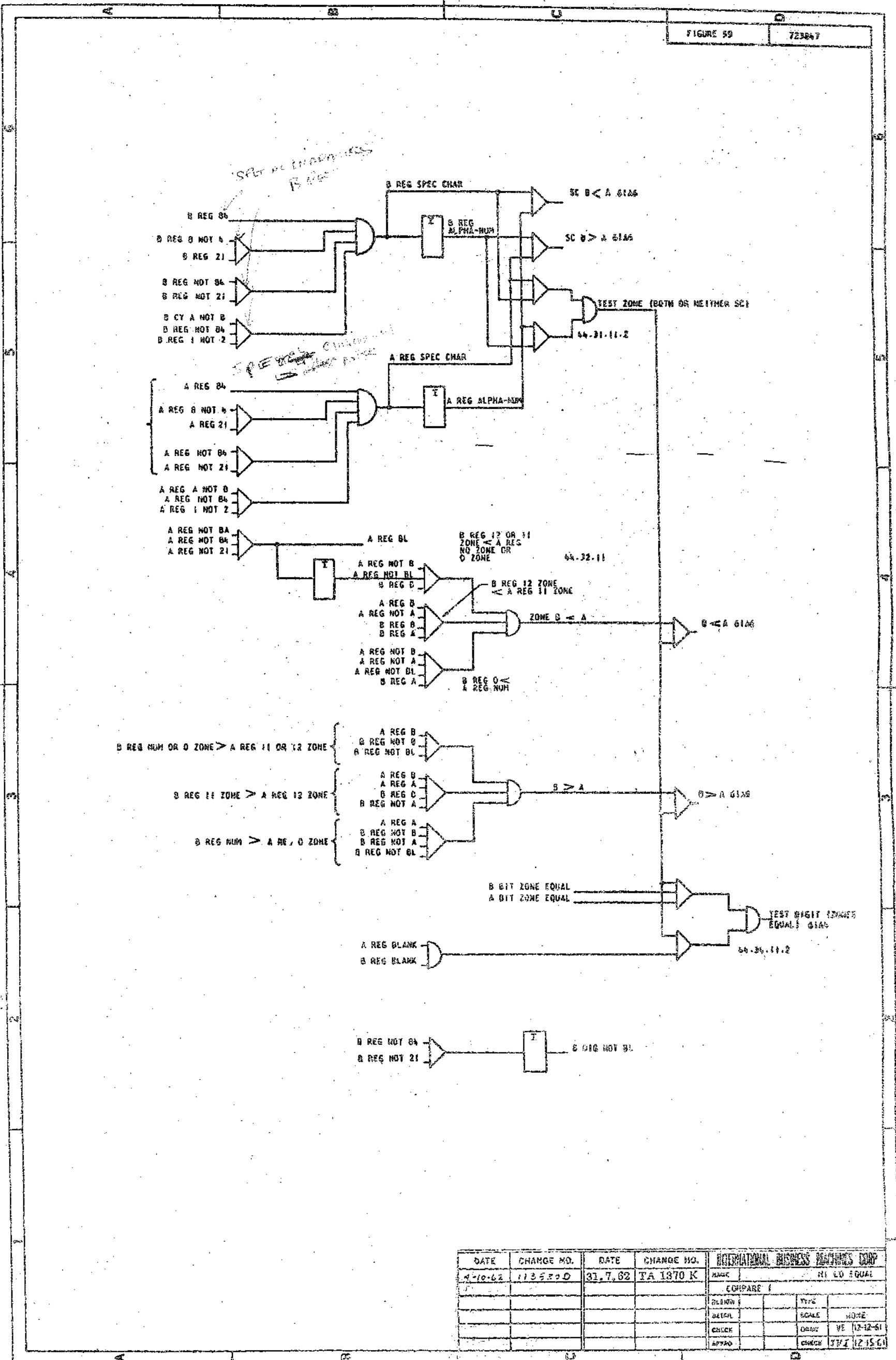
*Condition for 1501 for*

*12 is used so that the compare op can be changed to allow several fields to be treated as one field.*

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP	
		31.7.62	TA 1370 K	NAME	COMPARE OPR
				DESIGN	TYPE
				DETAIL	SCALE NONE
				CHECK	DRAW VE 1-9-62
				APPRO	CHECK

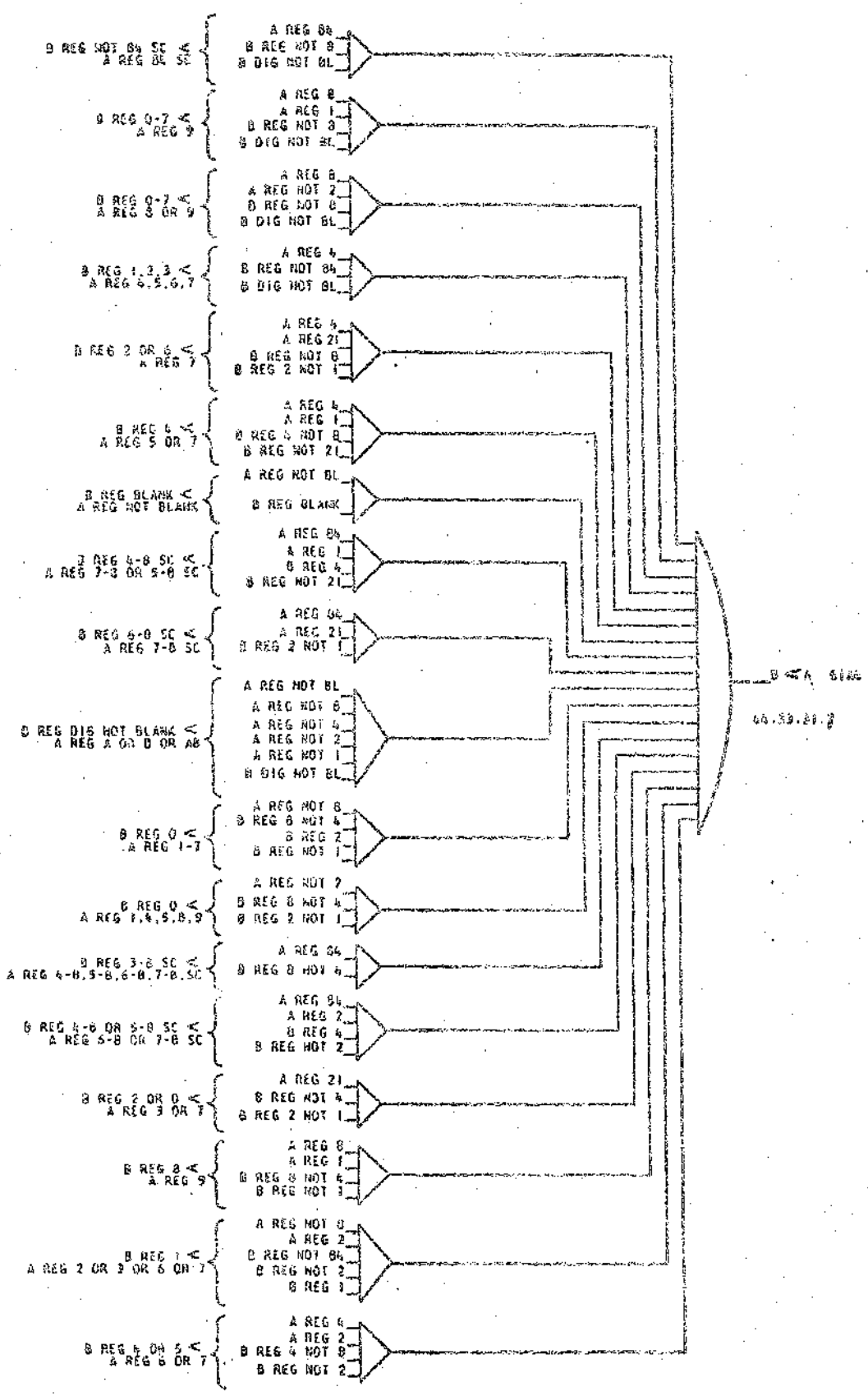
B7A B6A B-1

FIGURE 59 723847

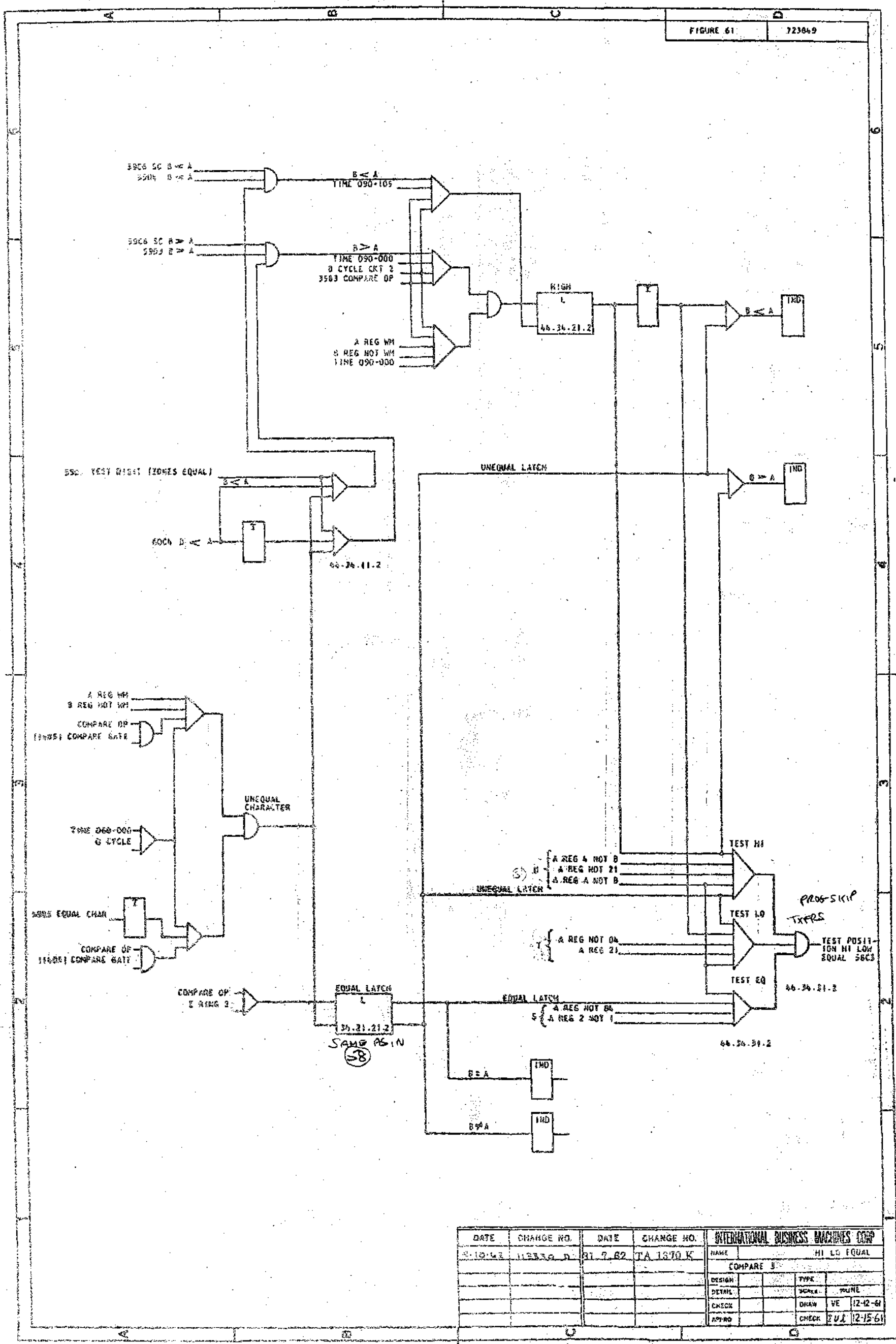


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	1135500 D	31, 7, 62	TA 1370 K	NAME: NI CO EQUAL
COMPARE 1				
DESIGN		TYPE		
DETAIL		SCALE		NOTE
CHECK		DATE	VE	12-12-61
APPRO		CHNGR	TRZ	12-15-61

FIGURE 28 723848



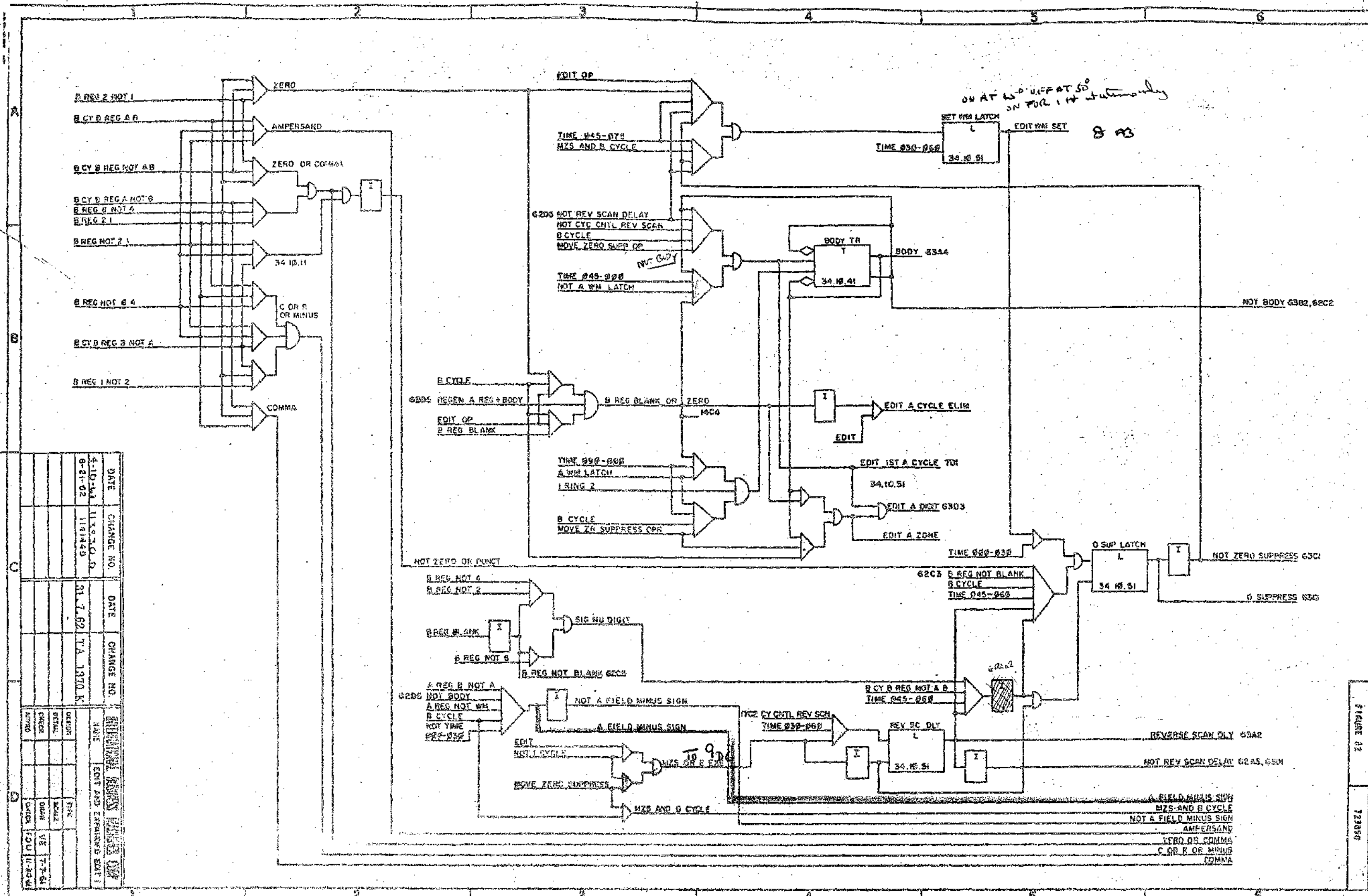
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.			
4-10-62	113830 D	21-7-62	TA 1370 K	NAME	HI LO EQUAL		
				COMPARE 2			
				DESIGN		TYPE	
				DETAL		SCALE	NONE
				CHECK		DRAW	VE 12-12-61
				APPRO		CHECK	STJ 12-15-61



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
8-10-62	11330 J	8-9-62	TA 1870 K	NAME HI LG EQUAL
				COMPARE J
				DESIGN
				DETAIL
				CHECK
				APPRO
				TYPE
				SCALE
				PLANE
				DRAW
				VE
				12-12-61
				CHECK
				FUL
				12-15-61





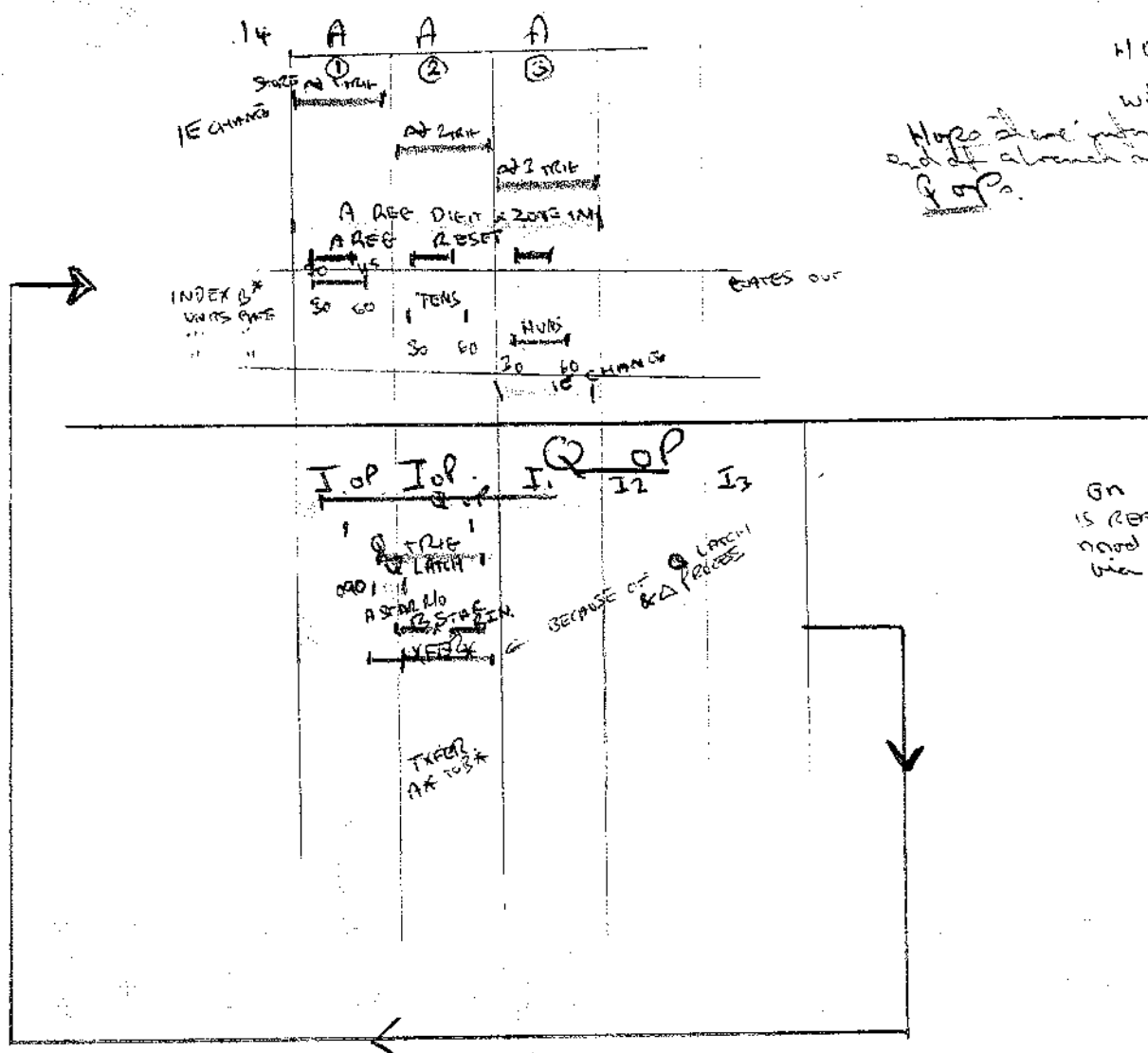


DATE	CHANGE NO.	DATE	CHANGE NO.	NAME	REVISION
4-10-61	1175-30-0	31.7.62	T.A. 1370 X	EDIT AND EXPANDED EDIT 1	1
8-21-62	1175-30-0				2
	1175-30-0				3
					4
					5
					6
					7
					8
					9
					10

FIGURE 22  
72386

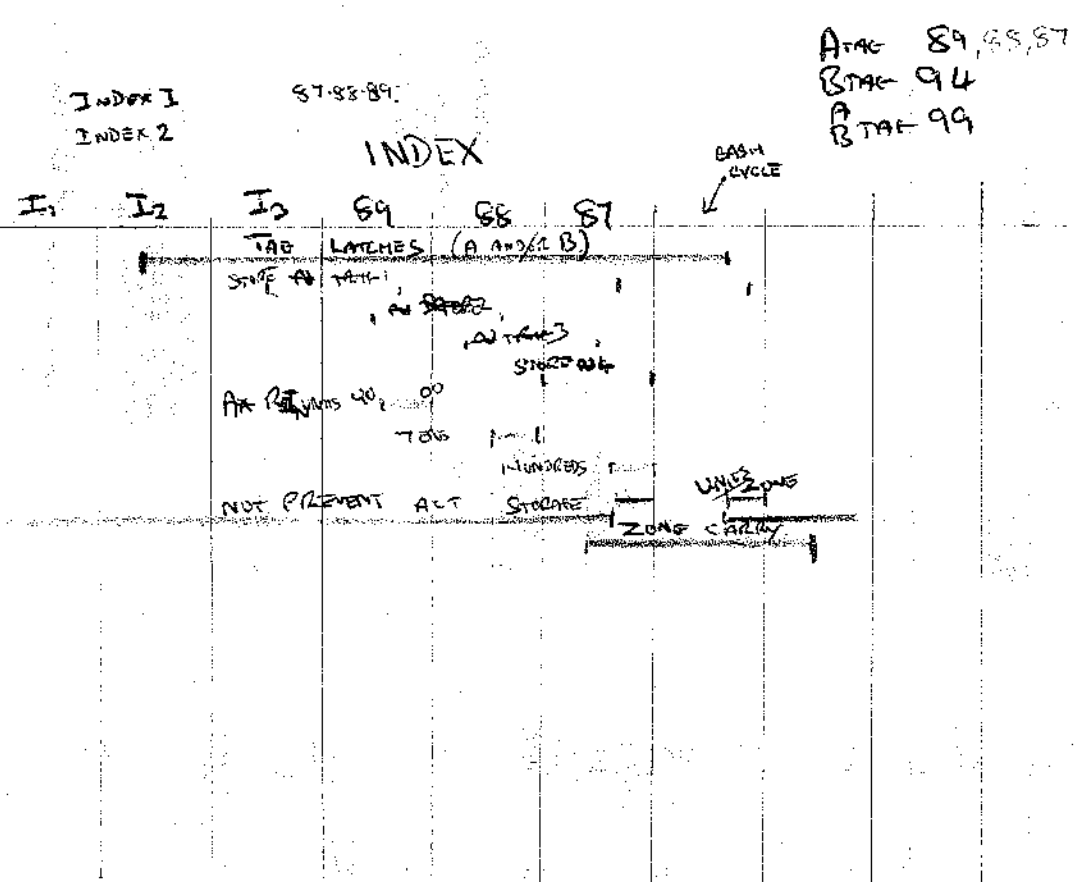


# HOP. (SBR)



11080111  
will put III in II.  
Hope some information left in B star at the  
end of branch operation into aster phase  
having previously loaded  
into B \* from I\*

On 2nd IOP A STAR IS  
IS READ TO MAIN - we then have  
need control \* a feed of lines  
via MOD LINES TO B\*



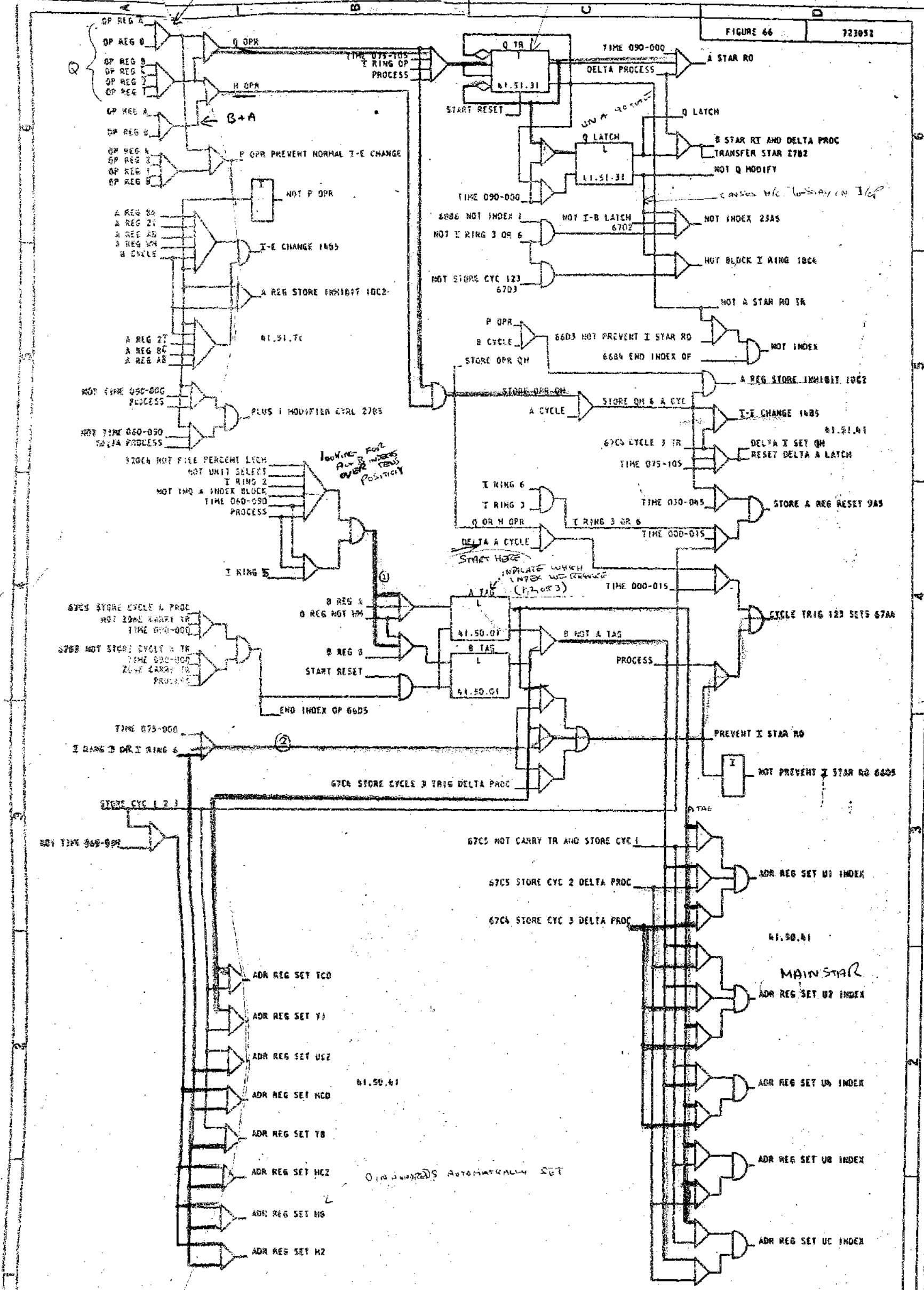
ATAE 89, 88, 87,  
BTAE 94  
BTAE 99

ALL ADDRESSES MUST BE  
FORCED BECAUSE ALL STARS  
ARE OCCUPIED.

Index allows an  
address to be modified  
by one of three indexes  
chosen by a one bit above  
the tens position in either  
A or B fields

with  
A M444 all in storage will  
remain unaltered.

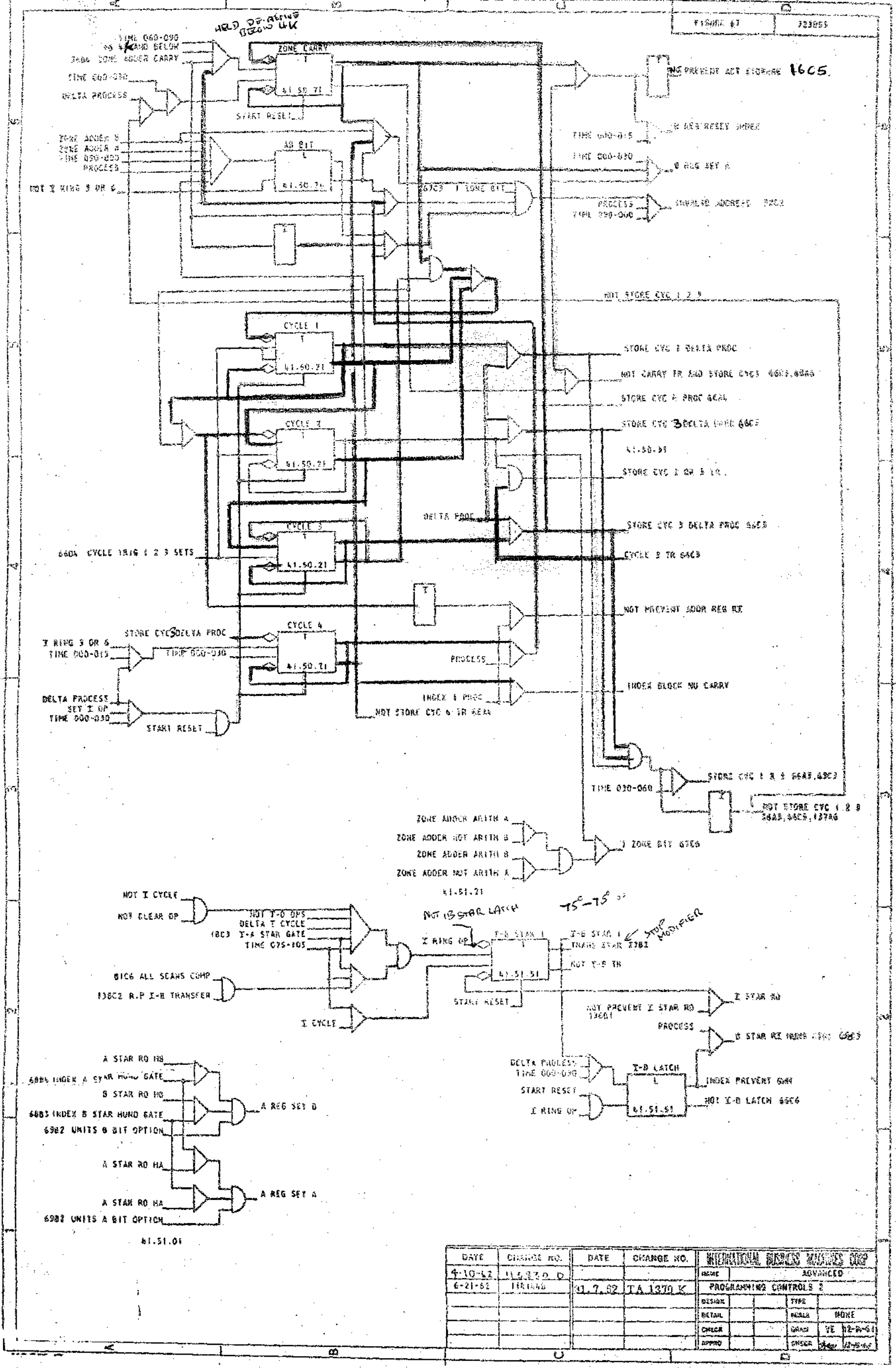
*INDEX Q & H*  
*TOMAS RASH A STAR OPS*  
*CYCLE PUTS A STAR*  
*3 STAR*



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4-30-62	113950 0			NAME ADVANCED PROGRAMMING
6-21-62	114148	31.7.62	TA 1370 K	CONTROLS I
				DESIGN
				DETAIL
				CHECK
				APPRO

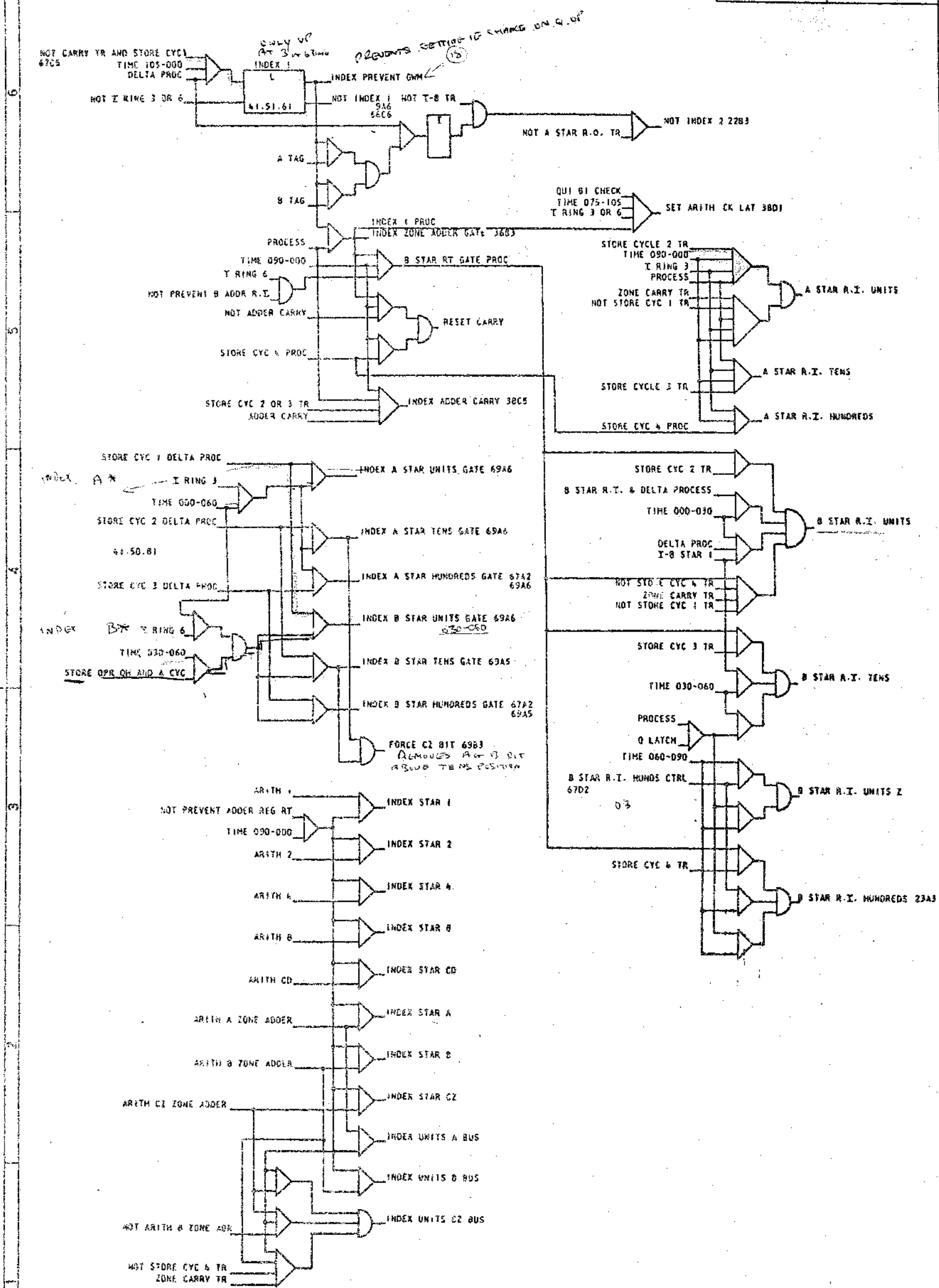
# INDEXING

FIGURE 47  
723855

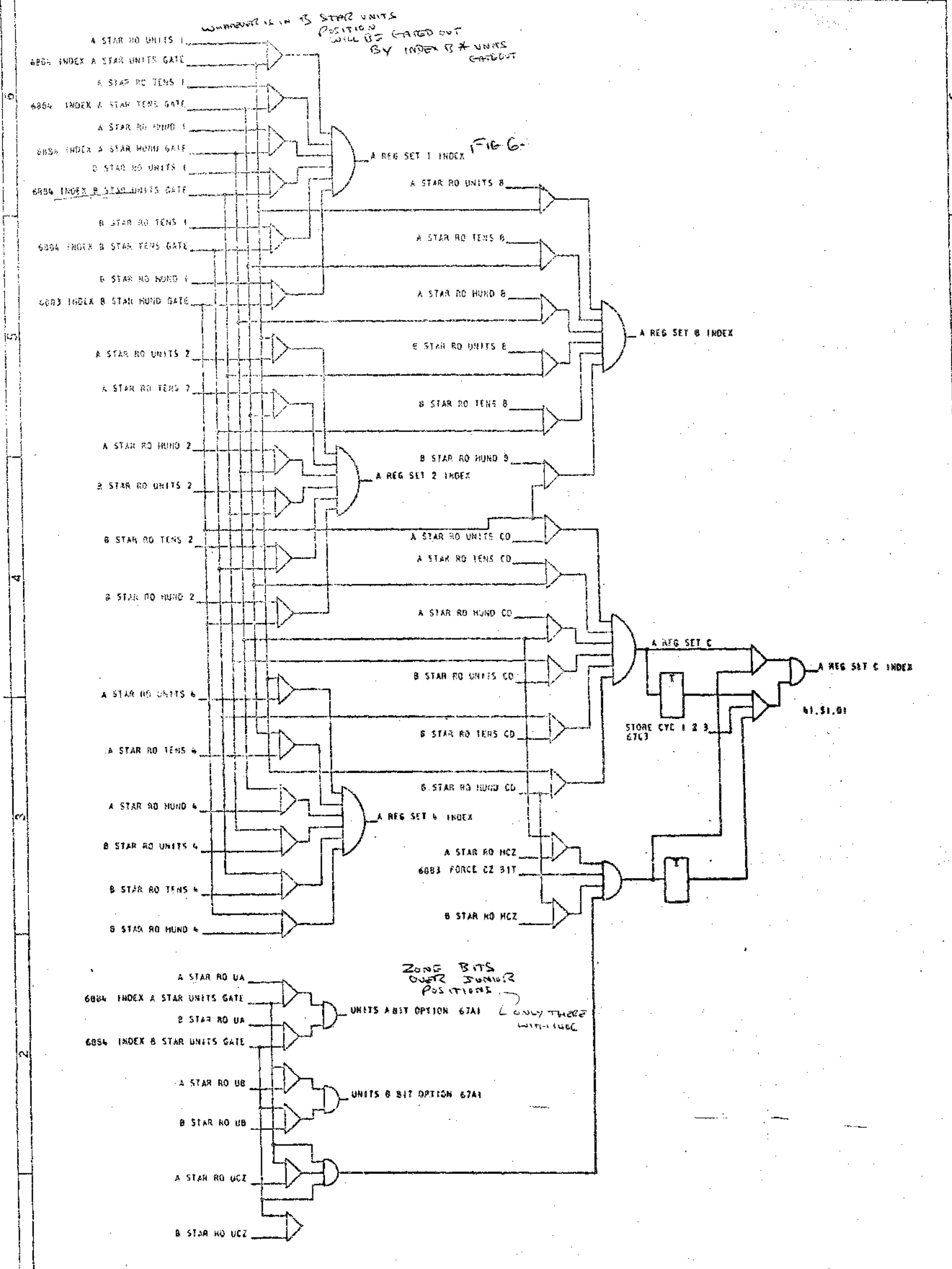


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	115 830 D			HOME ADVANCED
6-21-62	118144	7-7-62	TA 1370 K	PROGRAMMING CONTROLS 2
				DESIGN
				DRAW
				CHECK
				APPRO



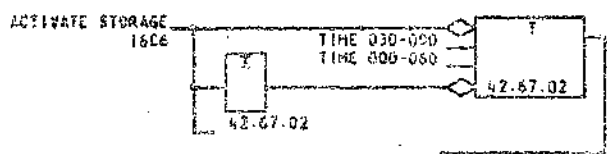
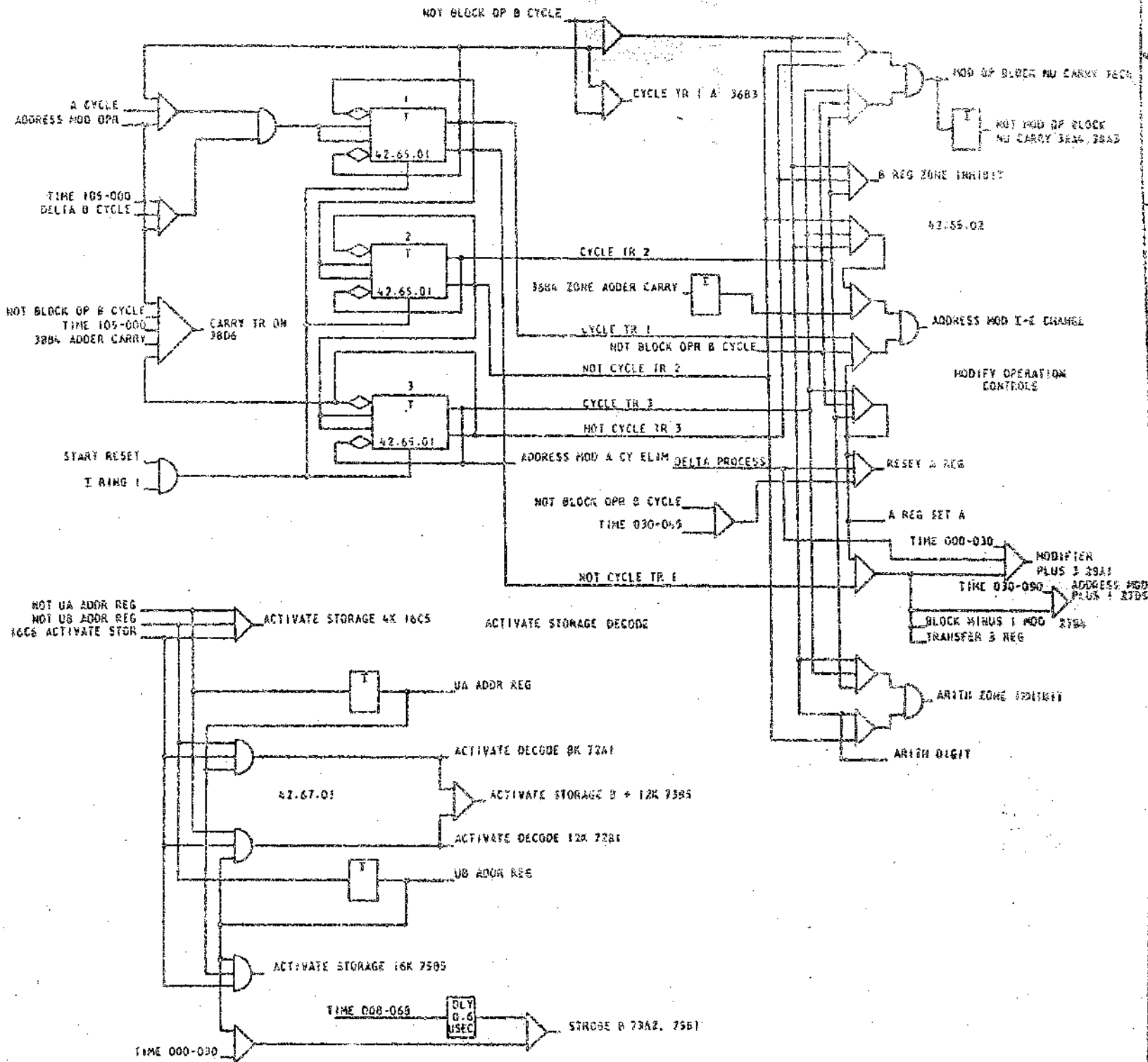


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-63	11583G D	7-7-62	TA 1370 K	NAME	ADVANCED PROGRAMMING		
				CONTROLS 3			
				DESIGN	TYPE		
				DETAIL	SCALE	NONE	
				CHECK	DRAW	VE	12-16-61
				APPRO	CHECK	dp	4/1/62

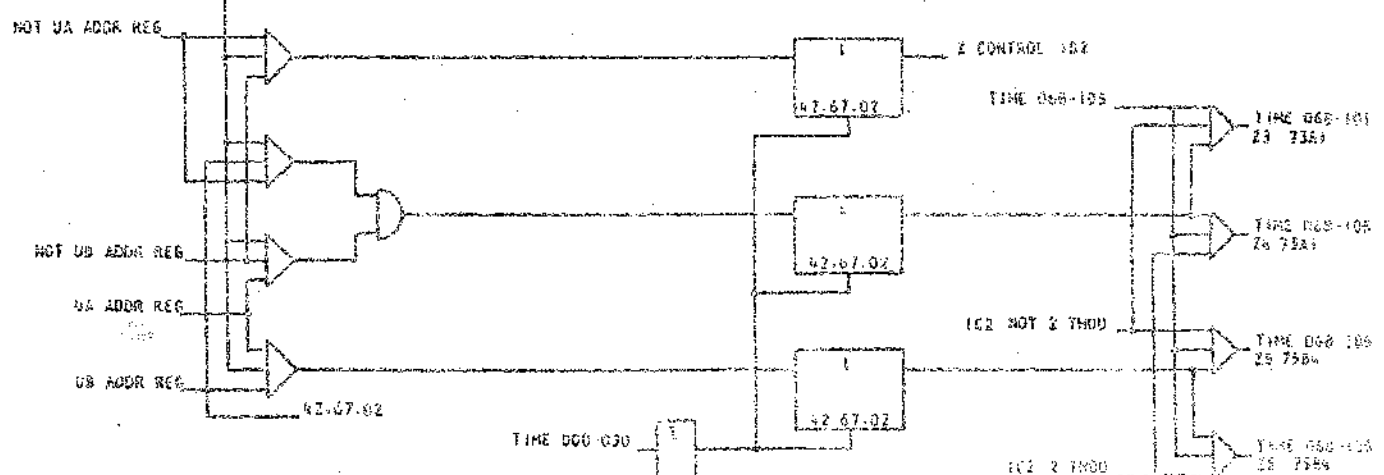


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
SEP 20 1962	1598	31 7 62	TA 1970 K	NAME ADVANCED PROGRAMMING			
				CONTROLS 4			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 72-14-61
				APPRO		CHECK	72-14-61

ARITHMETIC MODIFY CONTROLS GEN

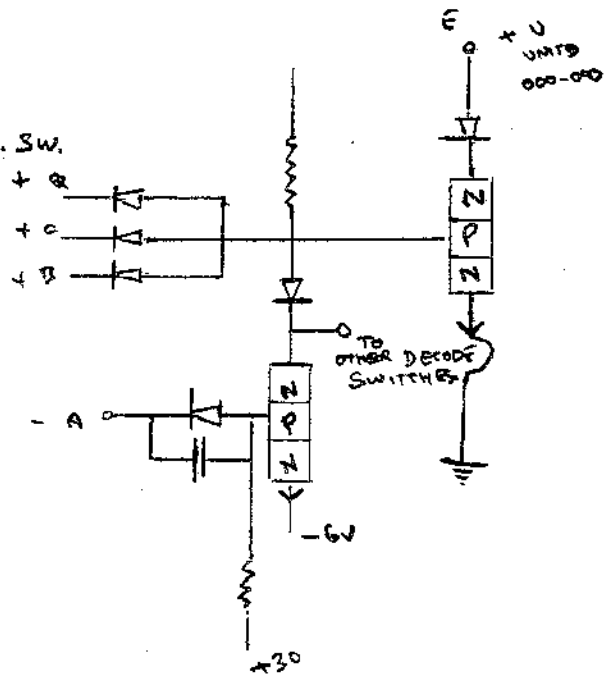


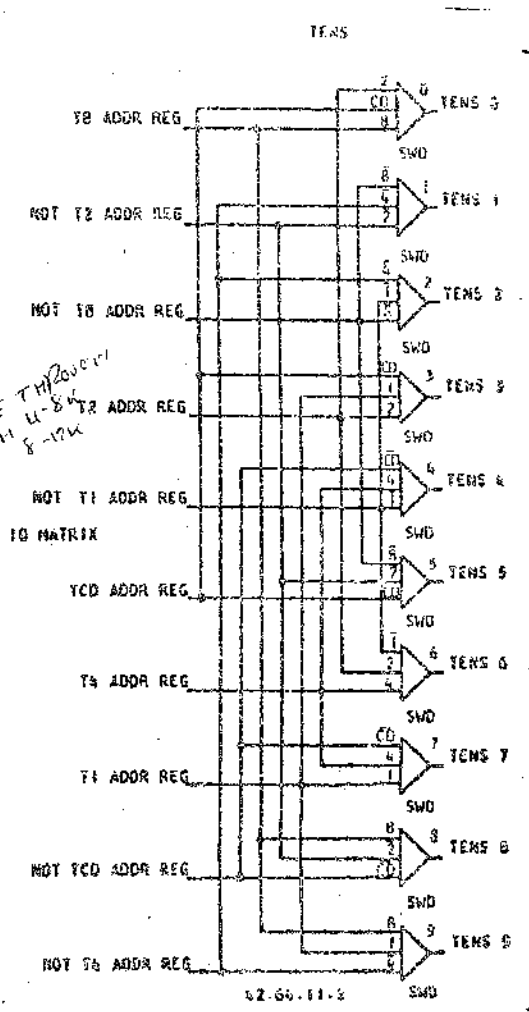
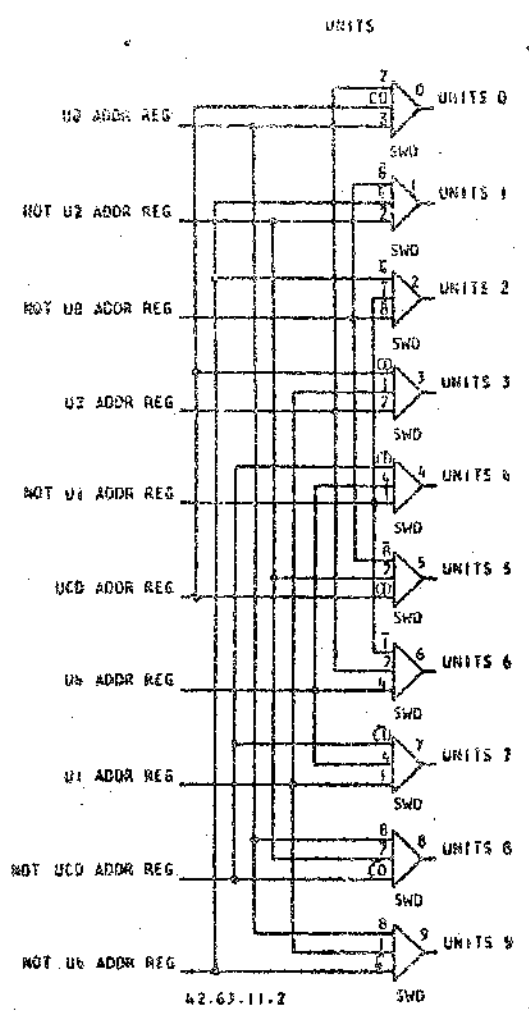
STORAGE CONTROL PULSE GENERATION



DATE	CHANGE NO.	DATE	CHANGE NO.	INITIATOR	APPROVED
4-15-67	118330-0	31-7-67	TA 1470 K	TA 1470 K	TA 1470 K

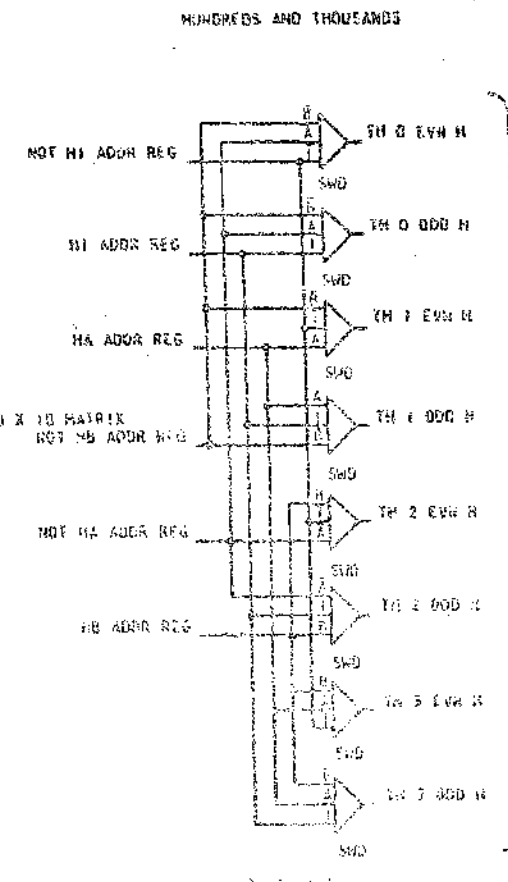
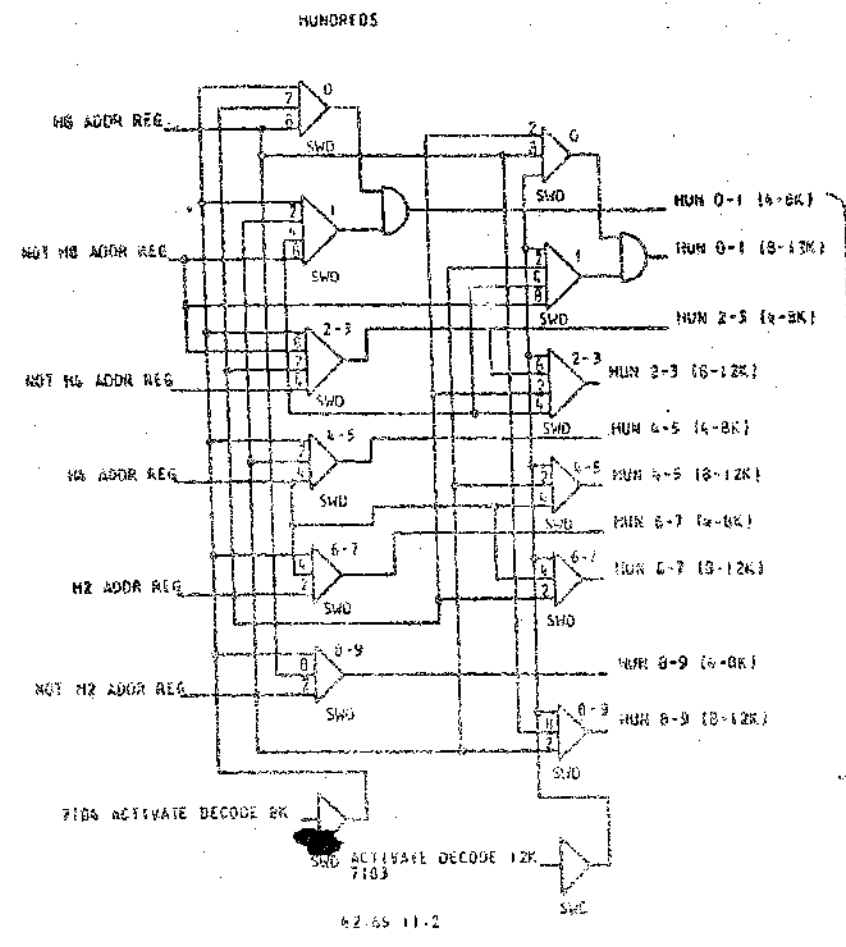
DECODE SW.





*DRIVE THE 200V/100V BOTH 8-17K*

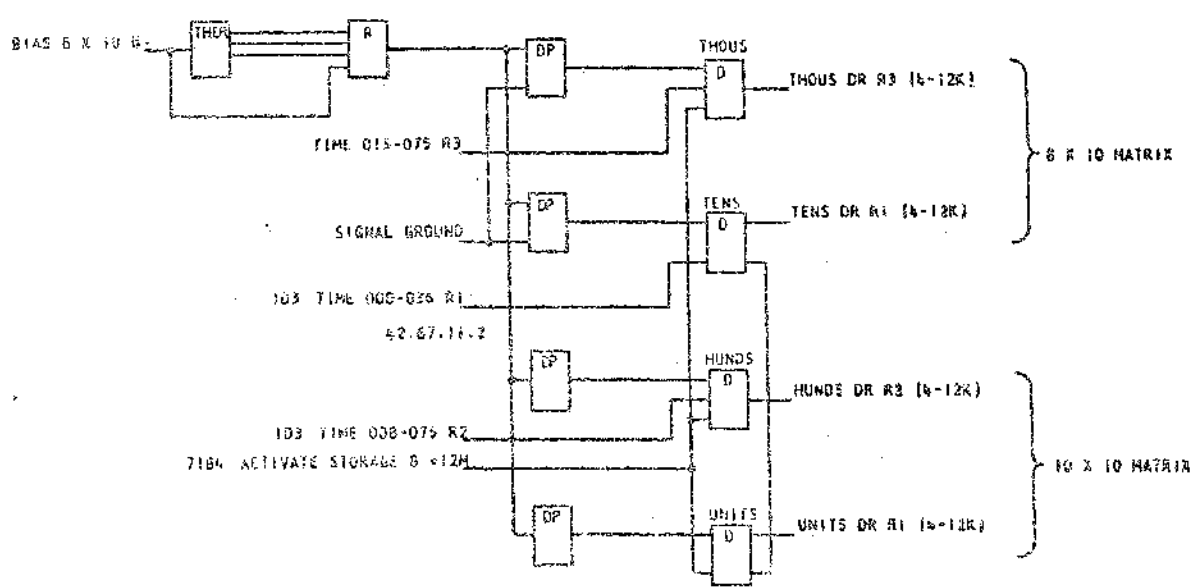
ALL IN 1406



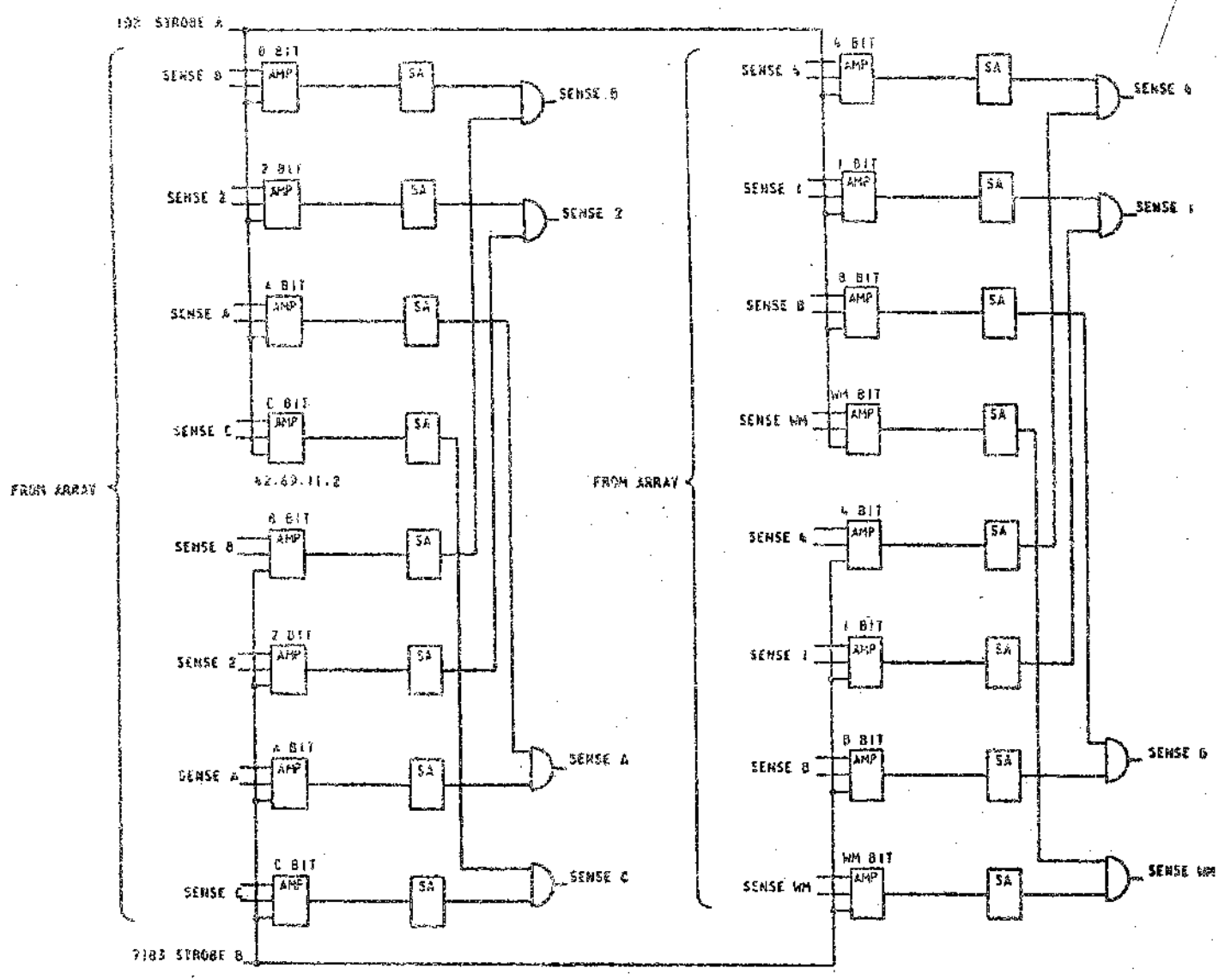
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
1-10-62	13330	31-7-62	TA 1370 K	STORAGE DECODE
				SWITCHES AK TO 12K
				OPTION
				DETAIL
				CHECK
				DATE
				ONCE



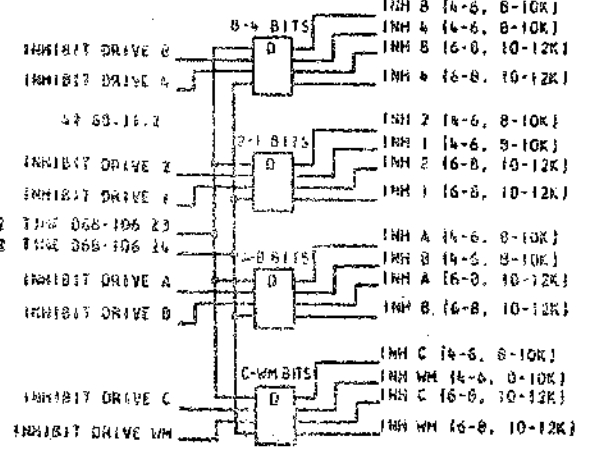
CURRENT DRIVERS AND CURRENT SOURCES



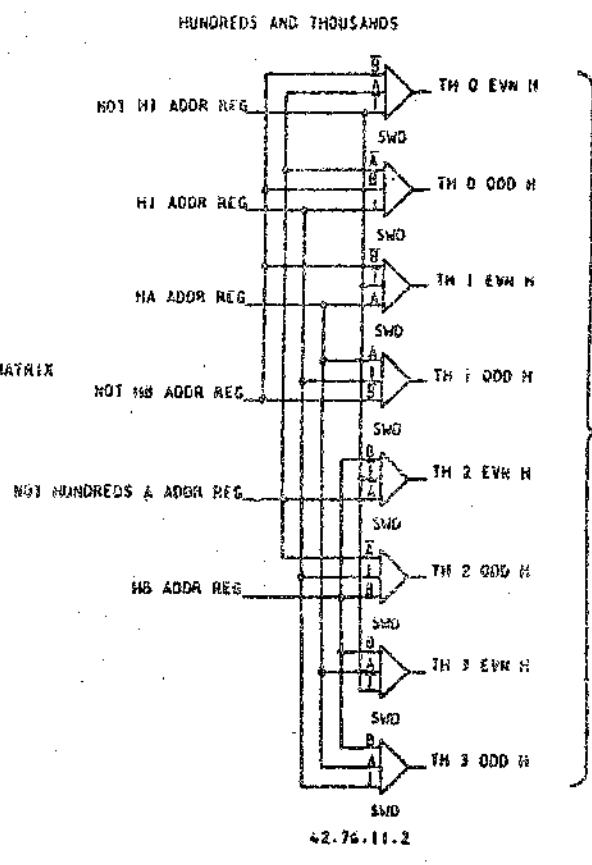
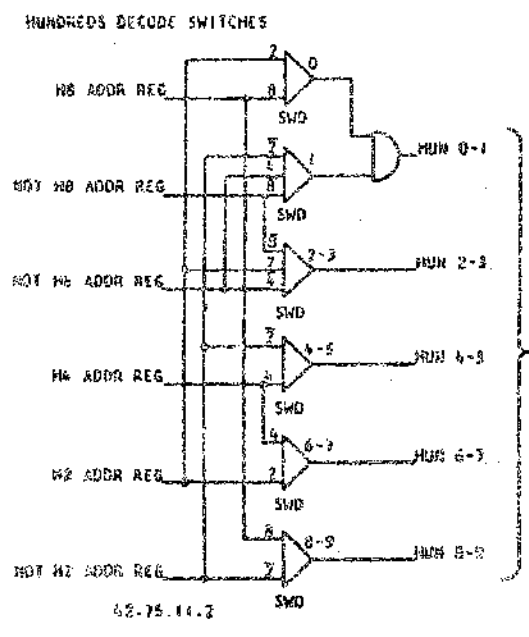
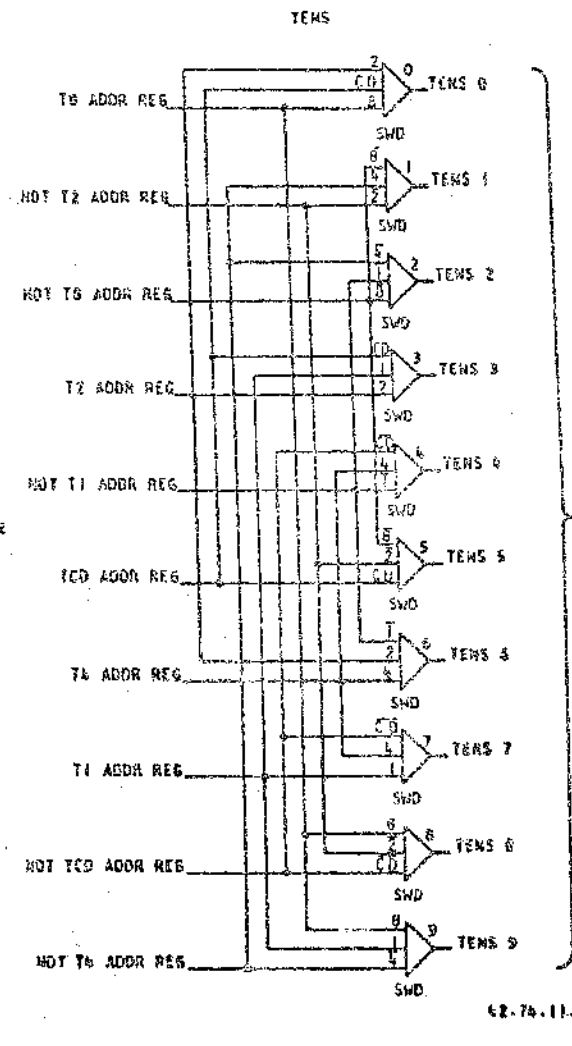
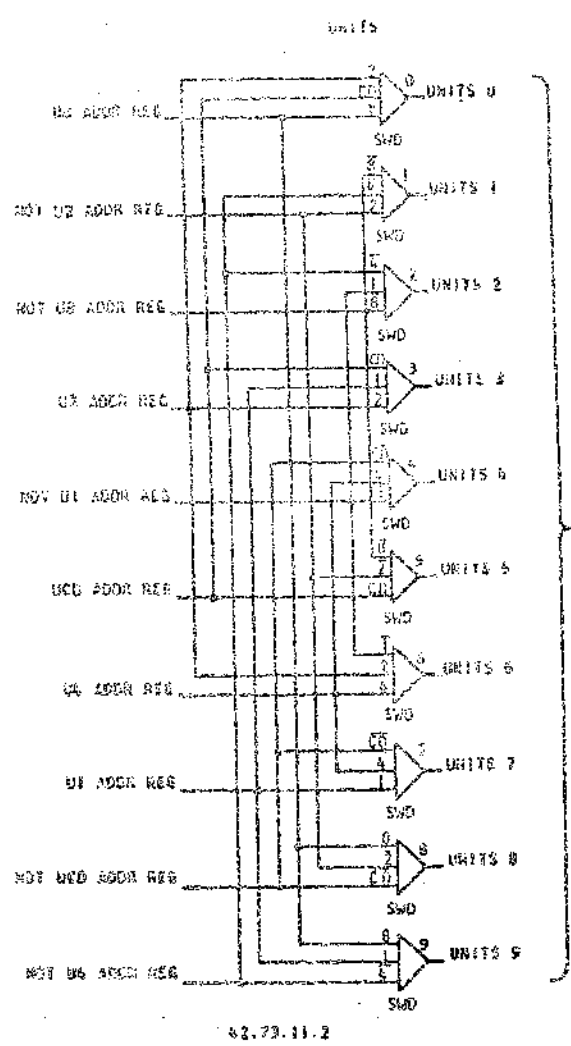
PRESENSE AND SENSE AMPLIFIERS



INHIBIT DRIVERS

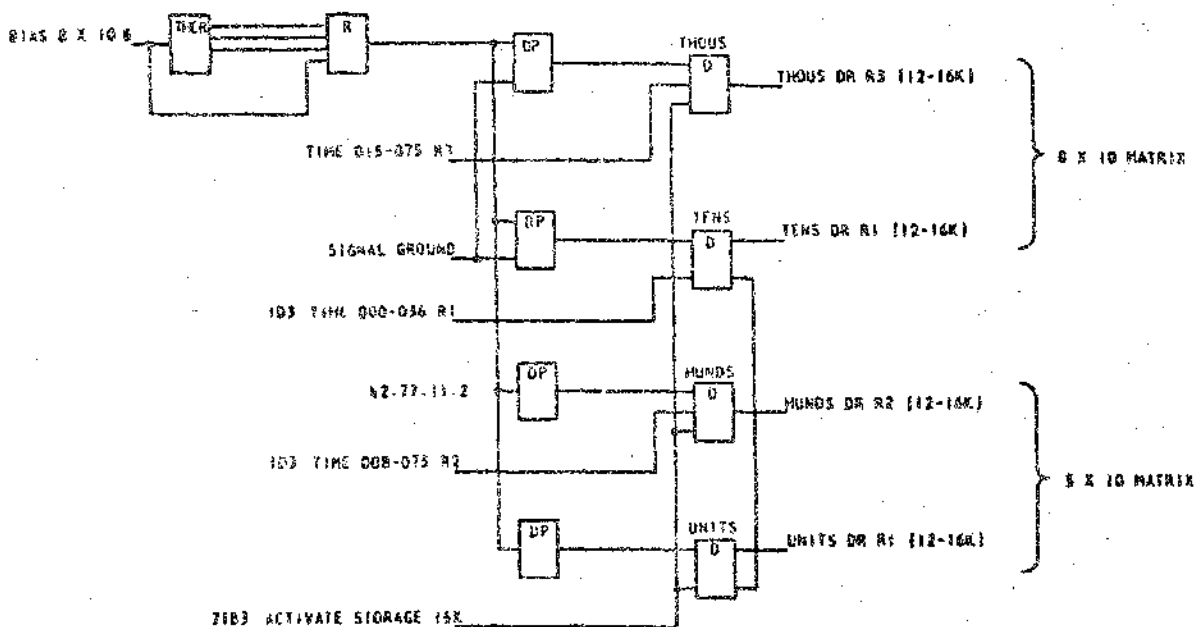


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4-10-62	11330 D	31-7-62	TA 1370 K	NAME CORE STORAGE
				DRIVE CKTS AND SENSE CKTS 4K 1012K
				DESIGN TYPE
				DETAIL SCALE NONE
				CHECK DRAW VE 10-28-61
				APPRO CHECK AMM 11-1-61

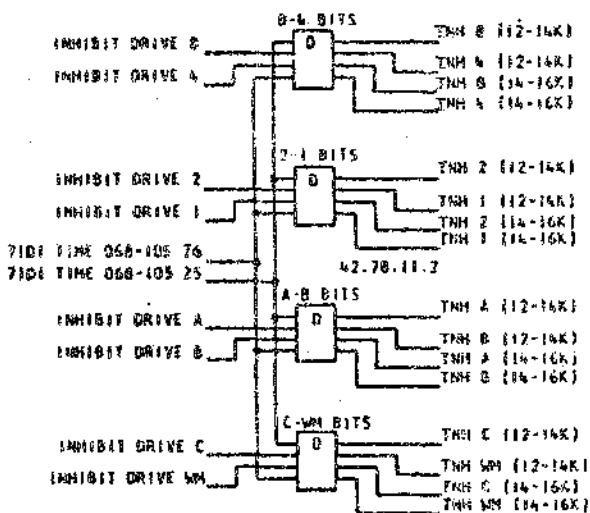


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	112470	8-17-62	TA 1370 K	NAME	STORAGE DECODE		
				SWITCHES 12K TO 16K			
				DESIGN		TYPE	
				DETAIL		SCALE	DATE
				CHECK		DRAW	VE 10-20-61
				APPRO		DESCR	DATE 11-1-61

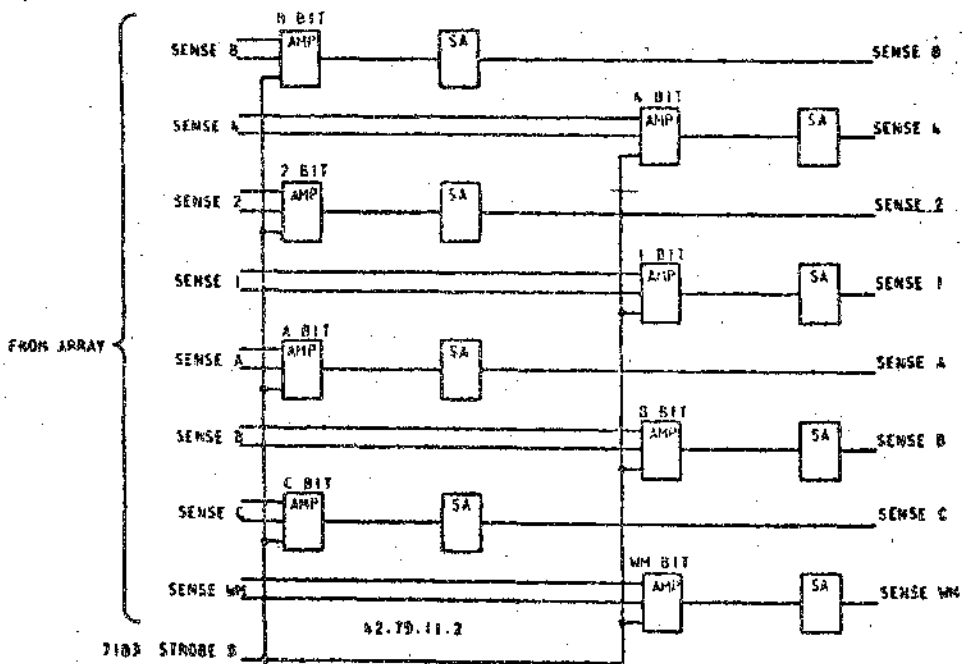
CURRENT DRIVERS AND CURRENT SOURCES



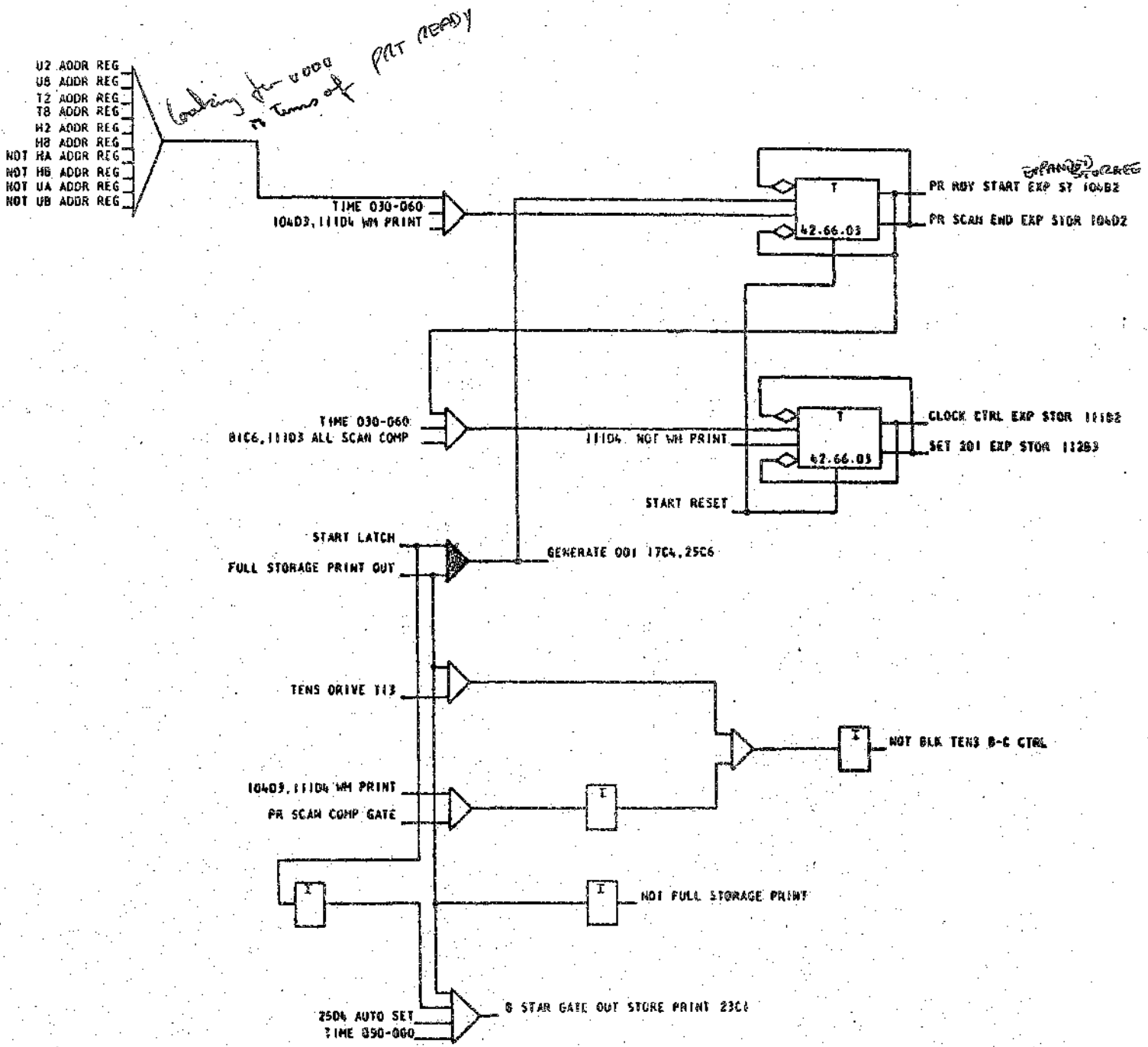
INHIBIT DRIVERS



PRE-SENSE AND SENSE AMPLIFIERS



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
5-10-62	112330 D	31.7.62	TA 1370 K	NAME CORE STORAGE
				DRIVE CRTS AND SENSE CRTS 12K TO 16K
				DESIGN TYPE
				DETAIL SCALE NONE
				CHECK DRAWN VE 10-28-61
				APPRO CMCN PAMM 11-1-61

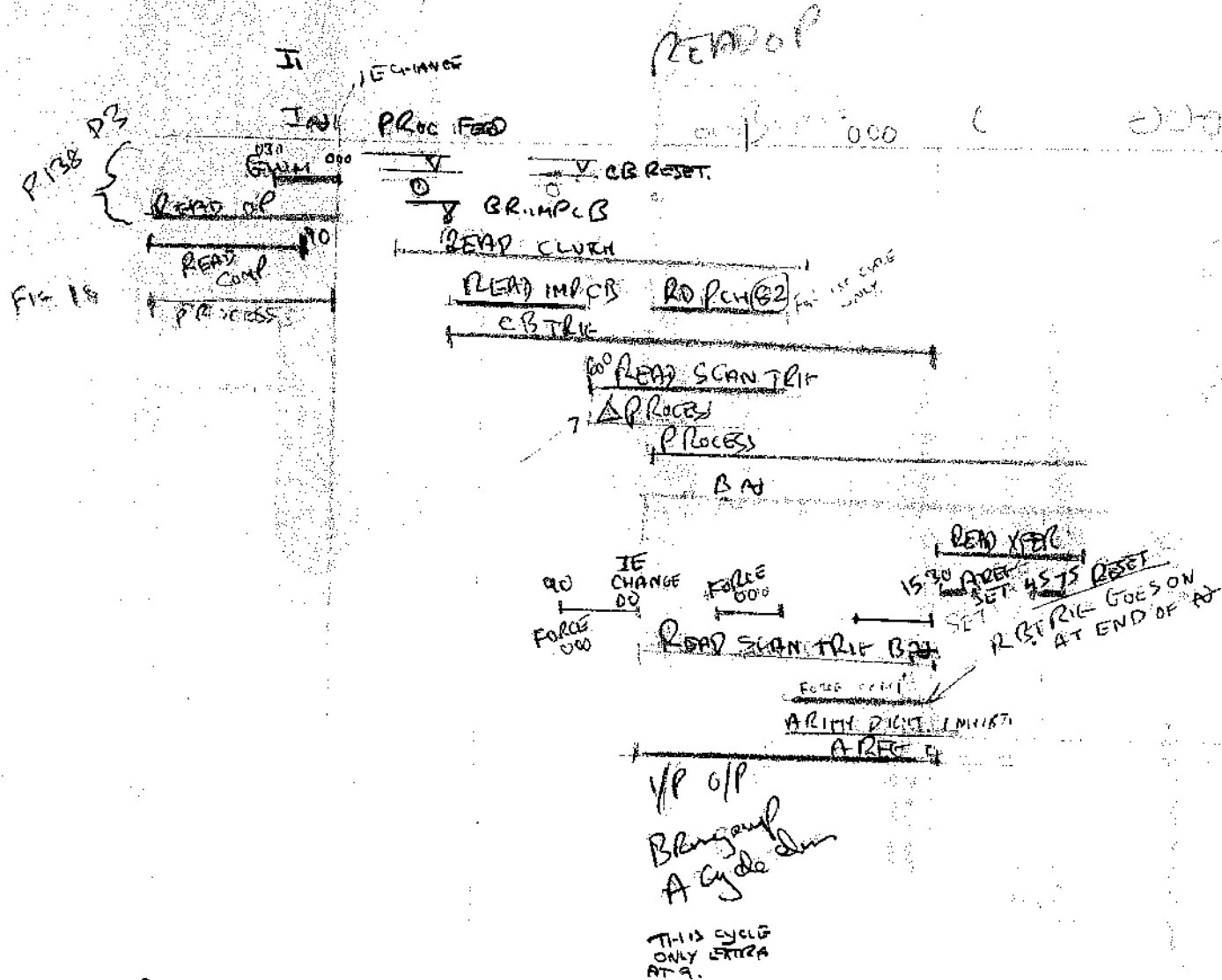


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-67	115430 D	31-7-68	TA 1370 K	NAME FULL STORAGE PRINT OUT
				DESIGN
				DETAILS
				CHECK
				APPROV

# READ A CARD

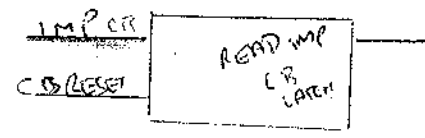
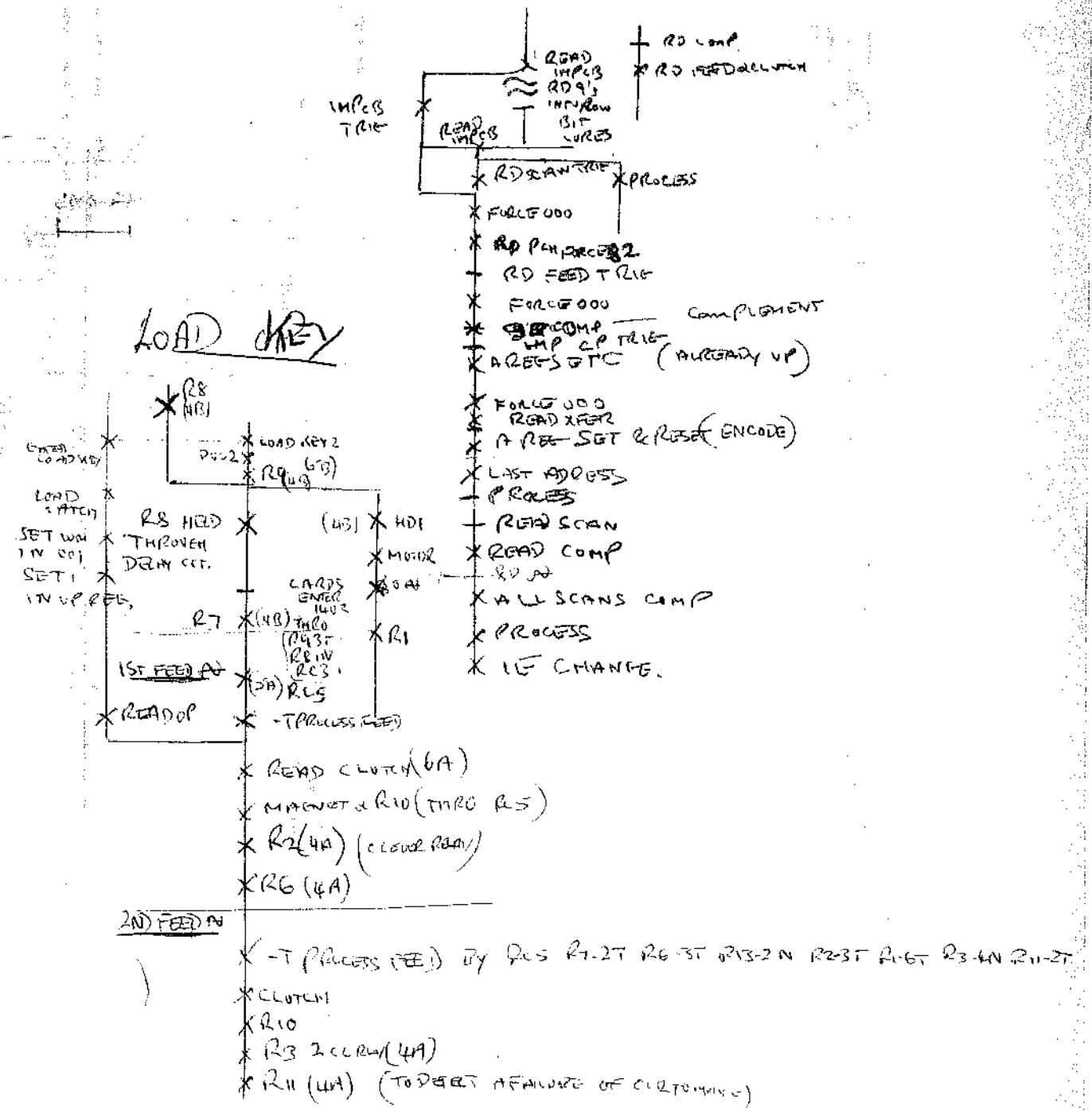
3 BA on Ram

reads for RDZ from end of bundles



READOP

## LOAD KEY



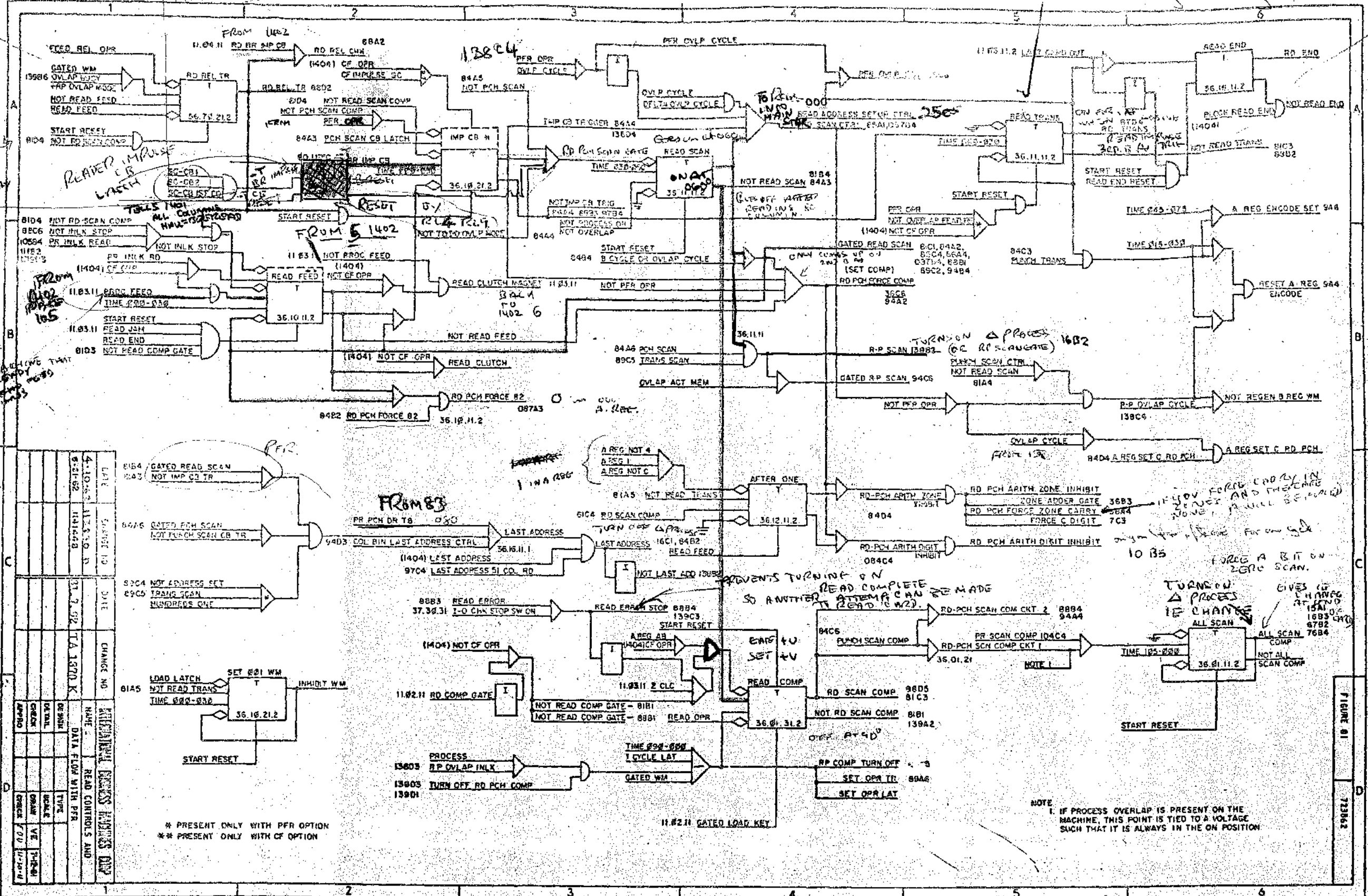
VP OP  
Blangamp  
A cycle down

THIS CYCLE ONLY EXTRA AT 9.

MAIN CR5

Enables reading into 8 reg

SOLAR CELL MACHINES FITTED WITH DBA



DATE	CHANGE NO.	PREPARED BY	REVISION
4-10-63	1	W.A. GIBSON	1
9-11-62	2	W.A. GIBSON	2
11-1-62	3	W.A. GIBSON	3
11-1-62	4	W.A. GIBSON	4
11-1-62	5	W.A. GIBSON	5
11-1-62	6	W.A. GIBSON	6
11-1-62	7	W.A. GIBSON	7
11-1-62	8	W.A. GIBSON	8
11-1-62	9	W.A. GIBSON	9
11-1-62	10	W.A. GIBSON	10
11-1-62	11	W.A. GIBSON	11
11-1-62	12	W.A. GIBSON	12
11-1-62	13	W.A. GIBSON	13
11-1-62	14	W.A. GIBSON	14
11-1-62	15	W.A. GIBSON	15
11-1-62	16	W.A. GIBSON	16
11-1-62	17	W.A. GIBSON	17
11-1-62	18	W.A. GIBSON	18
11-1-62	19	W.A. GIBSON	19
11-1-62	20	W.A. GIBSON	20

\* PRESENT ONLY WITH PFR OPTION  
 \*\* PRESENT ONLY WITH CF OPTION

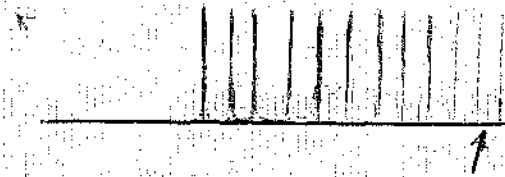
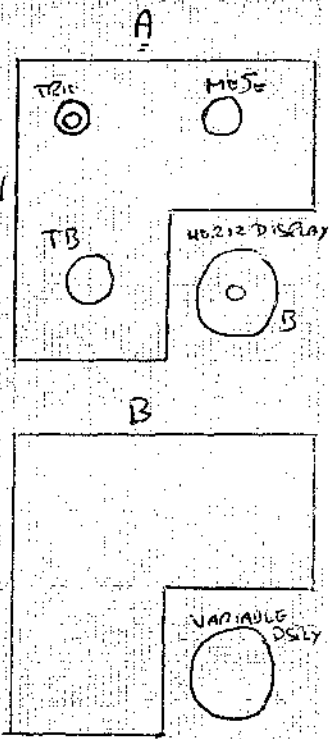
NOTE  
 1. IF PROCESS OVERLAP IS PRESENT ON THE MACHINE, THIS POINT IS TIED TO A VOLTAGE SUCH THAT IT IS ALWAYS IN THE ON POSITION

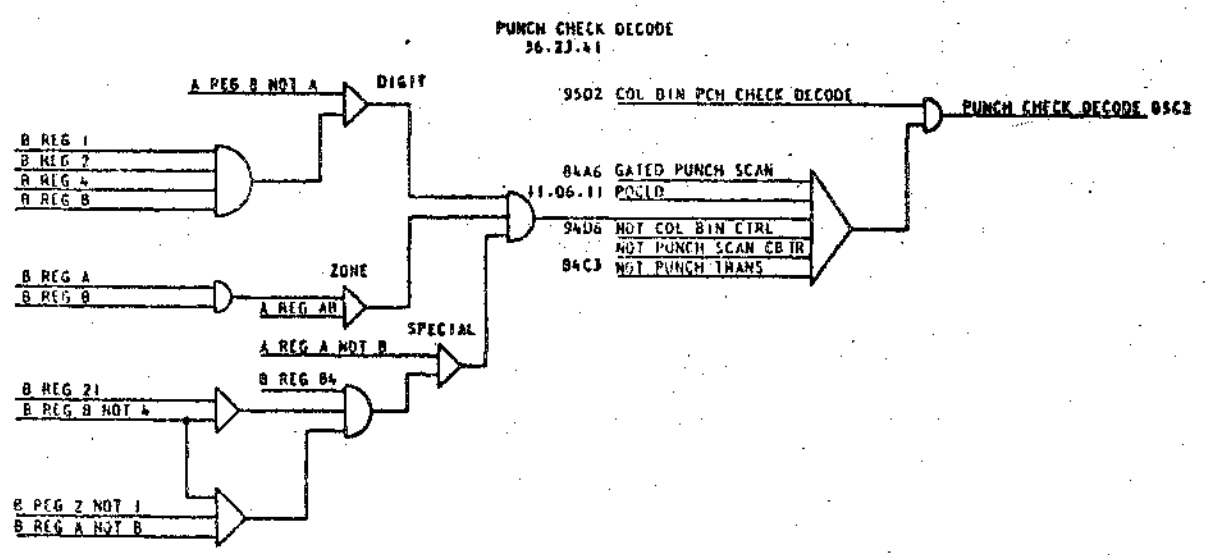
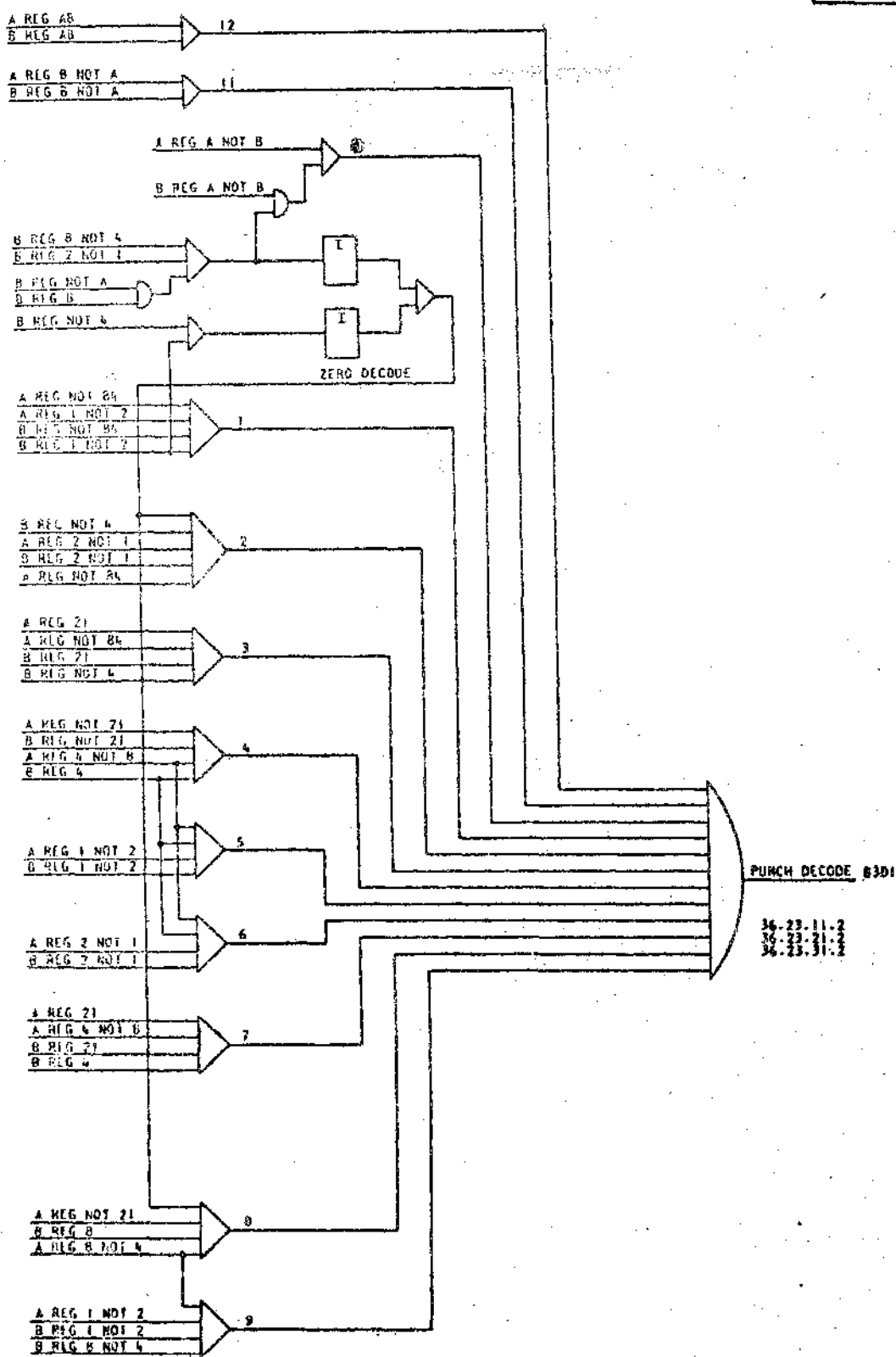
FIGURE 81  
 72862



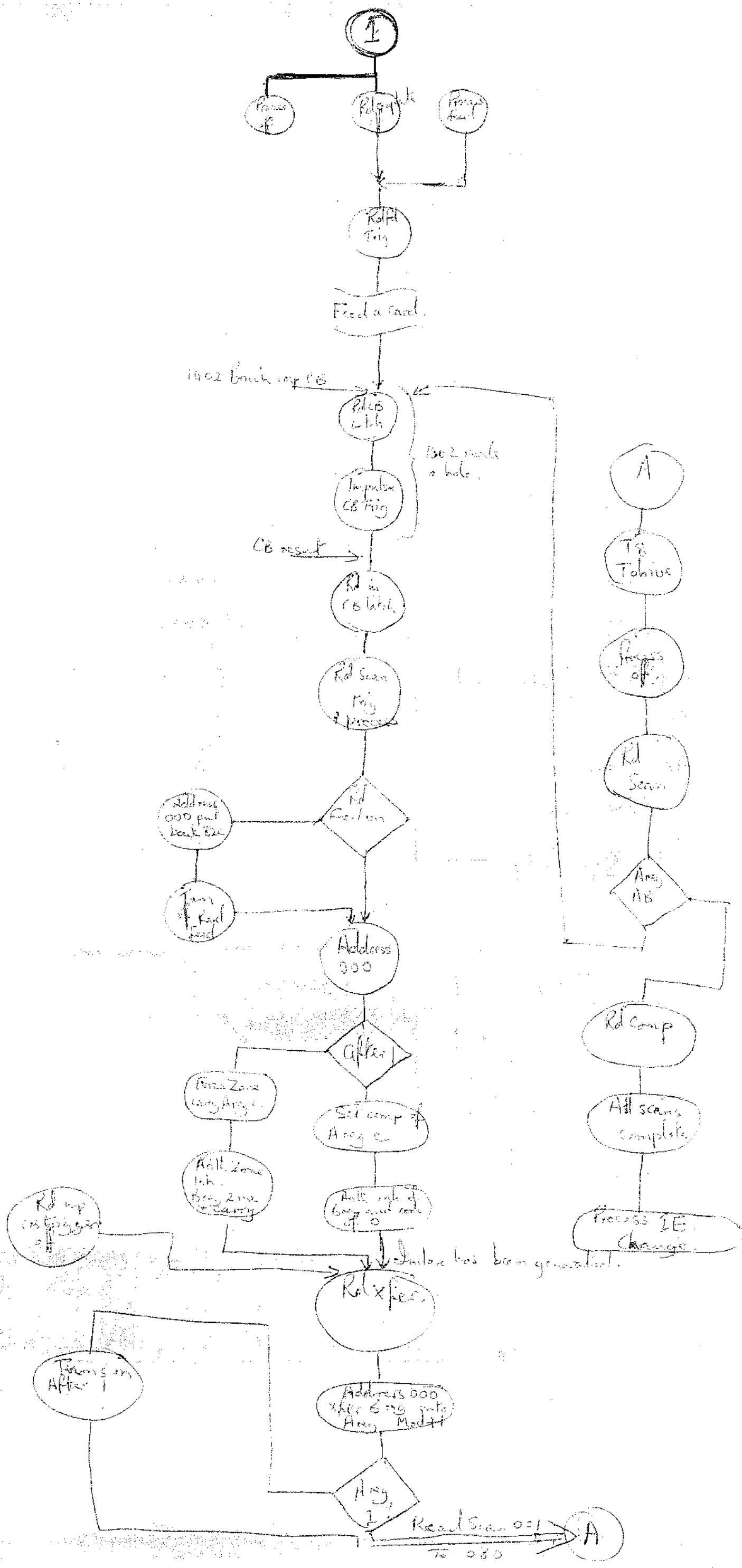
## SETTING UP 535 ON DELAYED SWEEP

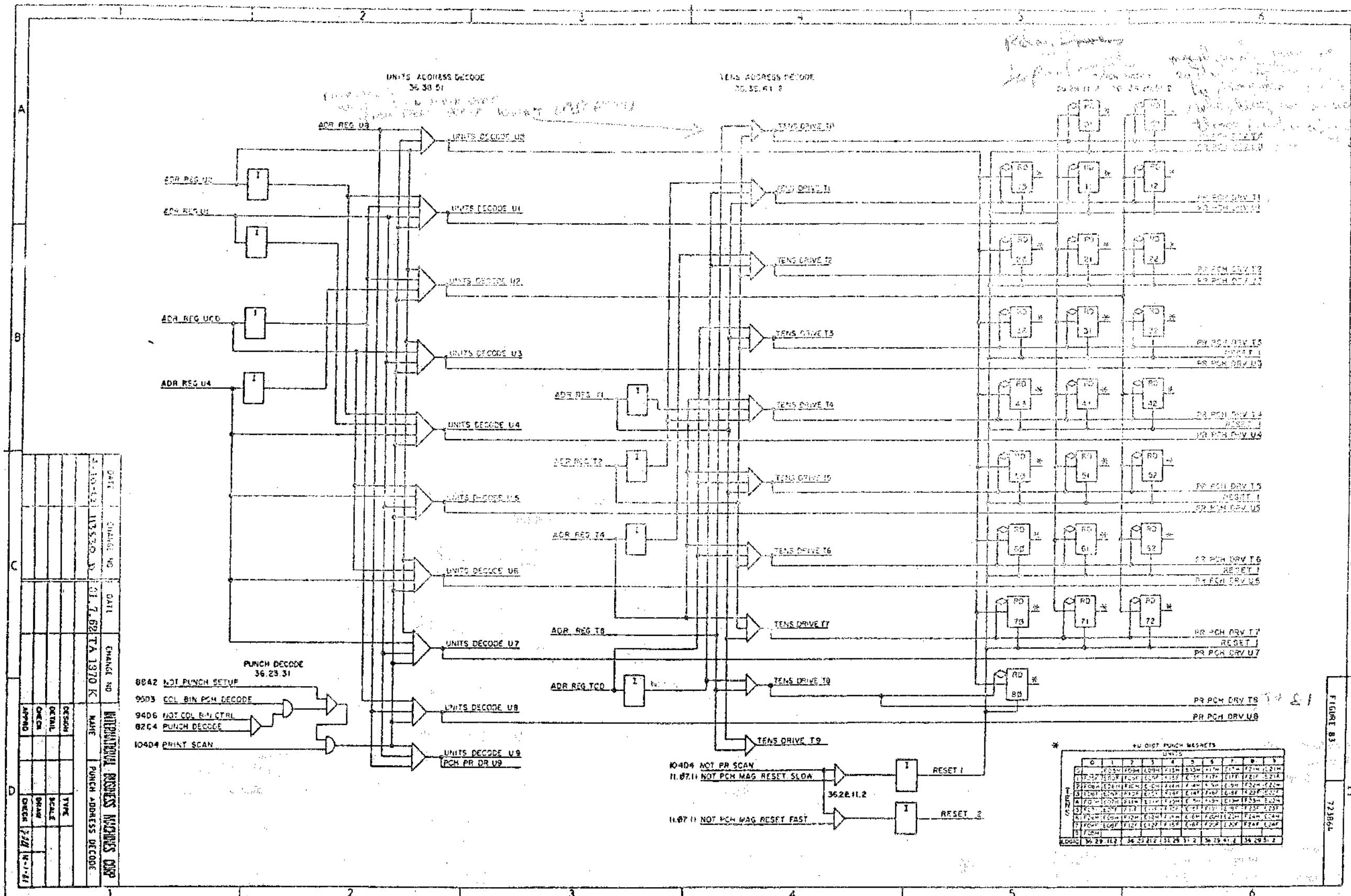
- ① Set up A First trigger level at zero
- ② Set B Trig level.
- ③ Sync off + v Xgate ADJUST FOR 1 READ SCAN
- ④ Dial to 3 intensity by A ADJUST BRIGHT SPOT
- ⑤ ADDRESS STOP ON 000 & REPEAT
- ⑥ ADJUST spot to lie where you need to see  
i.e. between 11-12 for 12 scans \*
- ⑦ Turn to A Delayed by B & set A triggering for steady picture





DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113810 P	31,7,62	TA 1970 K	NAME	PUNCH A REG DECODE		
				AND PUNCH CHECK DECODE			
				DESIGN		TYPE	
				DETAIL		SCALE	
				CHECK		DRAWN	VE 7-11-61
				APPRO		CHECK	





DATE	CHANGE NO.	DATE	CHANGE NO.
1-10-63	10530	1-7-62	TA 1370 K
DESIGN		NAME	
DETAIL		PUNCH ADDRESS DECODE	
APP'D	CHK'D	SCALE	TYPE
2/21/63	10-1-63		

INTERNATIONAL BUSINESS MACHINES CORP.

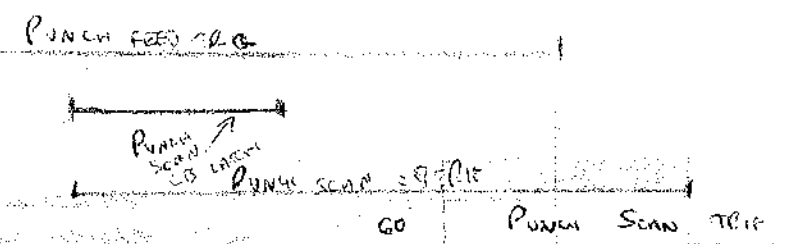
- 8842 NOT PUNCH SETUP
- 9503 COL BIN PCH DECODE
- 9406 NOT COL B/A CTRL
- 8204 PUNCH DECODE
- IO404 PRINT SCAN

PU 0107 PUNCH WESNETS

UNITS	0	1	2	3	4	5	6	7	8	9
0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001
1	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011
2	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100
3	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101
4	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110
5	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
6	0111	1000	1001	1010	1011	1100	1101	1110	1111	
7	1000	1001	1010	1011	1100	1101	1110	1111		
8	1001	1010	1011	1100	1101	1110	1111			
9	1010	1011	1100	1101	1110	1111				
10	1011	1100	1101	1110	1111					
11	1100	1101	1110	1111						
12	1101	1110	1111							
13	1110	1111								
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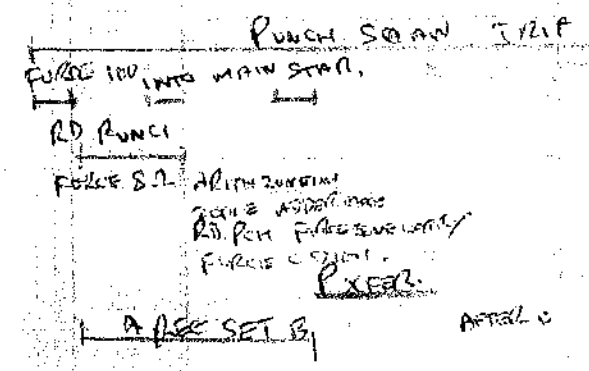
FIGURE B3  
723864

Proc Punch CB    Punch Scan CB    Brush Imp CB    BPT    SA    SAH



PCH complete  
1602 Δ Process

GO    PUNCH SCAN TRIP  
(PS)    Δ Process



ALIGN ZEROS  
ZCH & ADJUST  
RD PCH FUTURE WORK  
FUTURE WORK  
EXECS

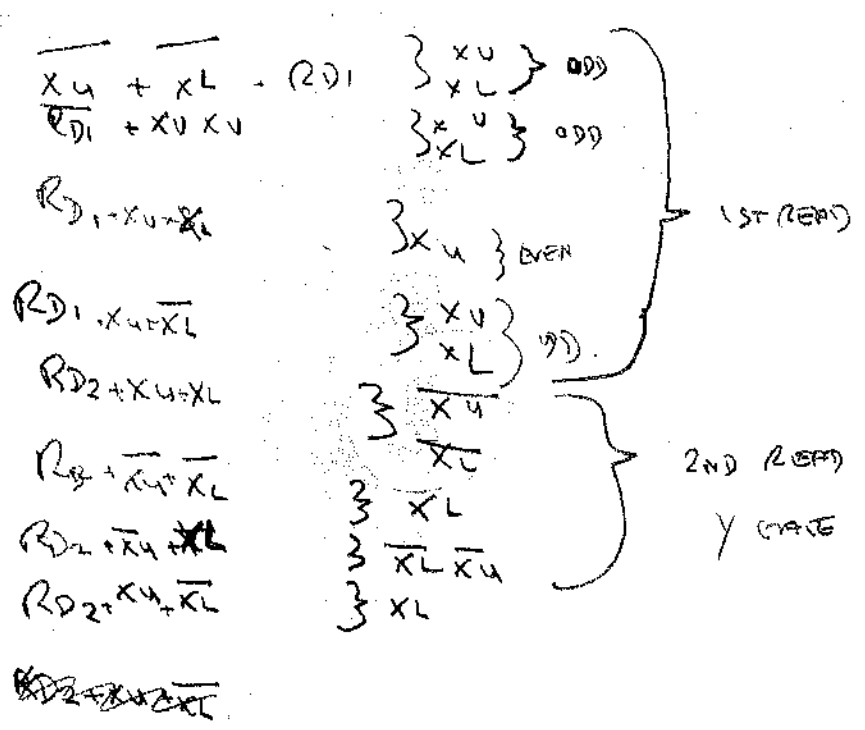
AFTER C

RS9 \*  
TAPER BRUSHES FROM PFD 2 TO PFF

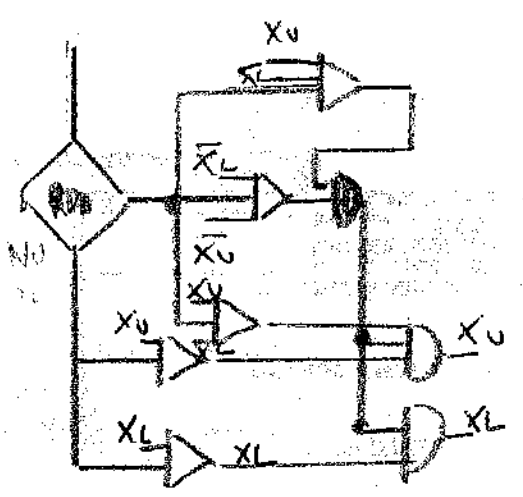
BRUSH IMP CB    READ  
READ SCAN (CLOSES CHECK PLATES)  
PUNCH SCAN  
SET UP PUNCH MAGNETS  
PUNCH  
BRUSH IMP CB  
READ SCAN (READS INTO CODE 1-80)  
PUNCH SCAN 101-180  
SETS UP PUNCH MAGNETS



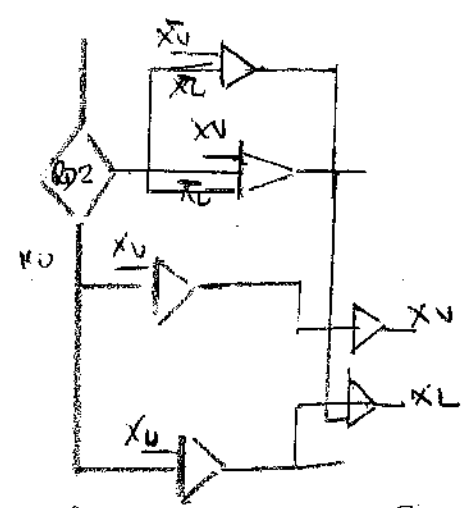




1st Reading X Gate



2nd Reading Y Gate



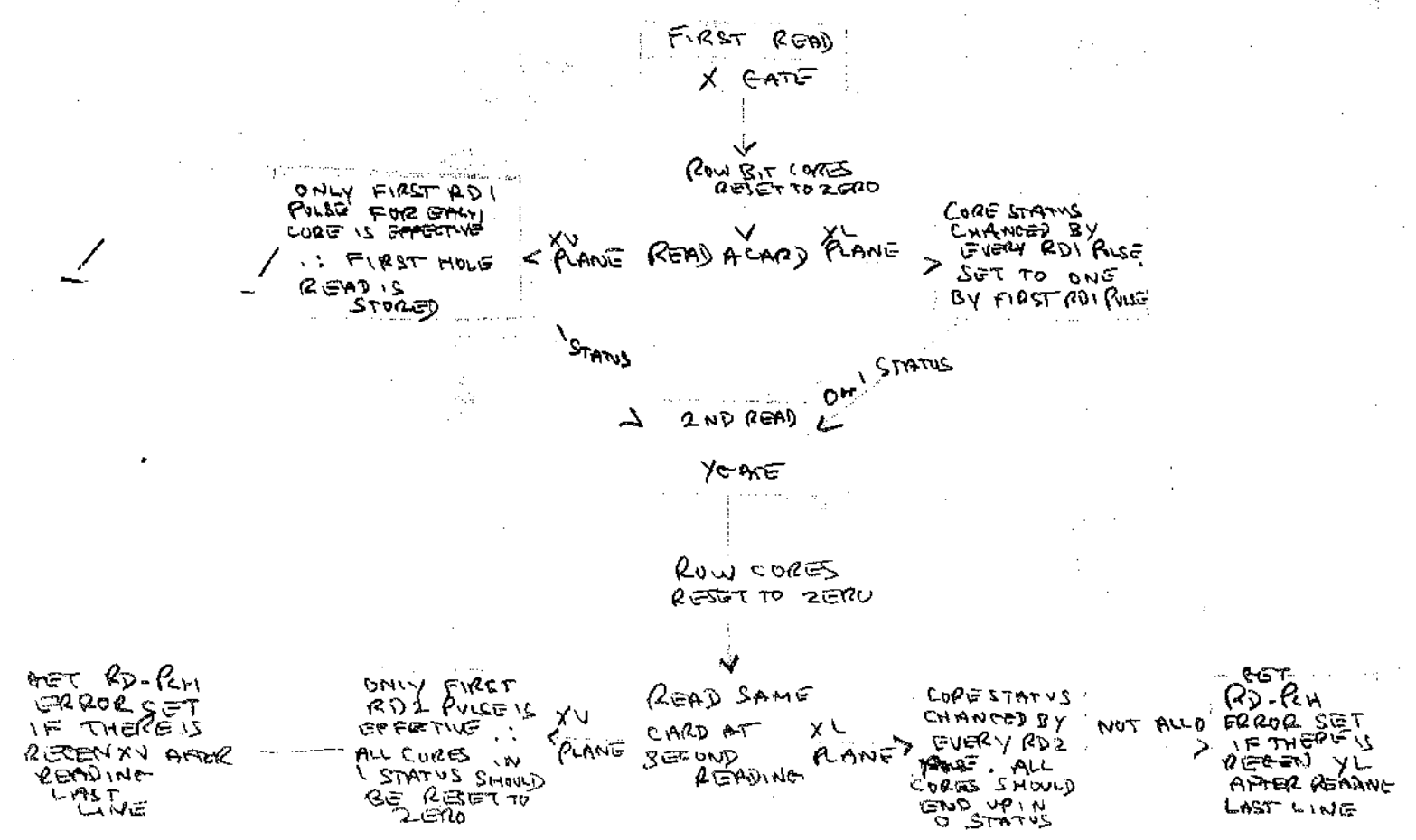
Deal with RD1 cell sensitive as RD2.

Core	Ce	RD1
X <sub>U</sub>	X <sub>L</sub>	STARTING STATE
0	0	1st hole
1	0	2nd hole
1	1	3rd hole

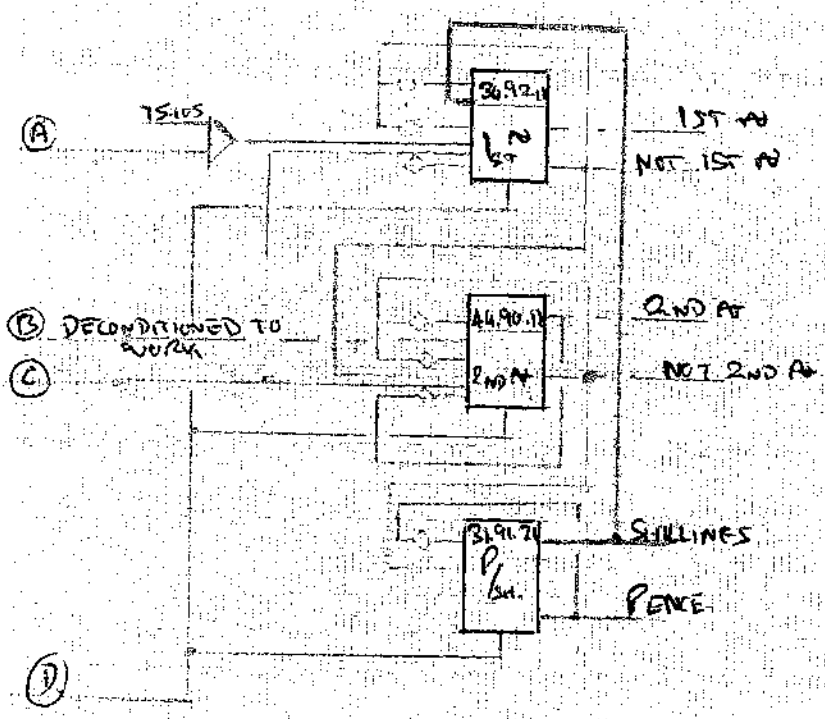
  

X <sub>U</sub>	X <sub>L</sub>	RD2
1	1	STARTING STATE
0	0	1st hole
0	1	2nd hole
0	0	3rd hole

READ HOLE COUNT CHECK



if a hole is read then Row bit core is required when core is flipped by reverse pulses in address point throughout storage are flipped

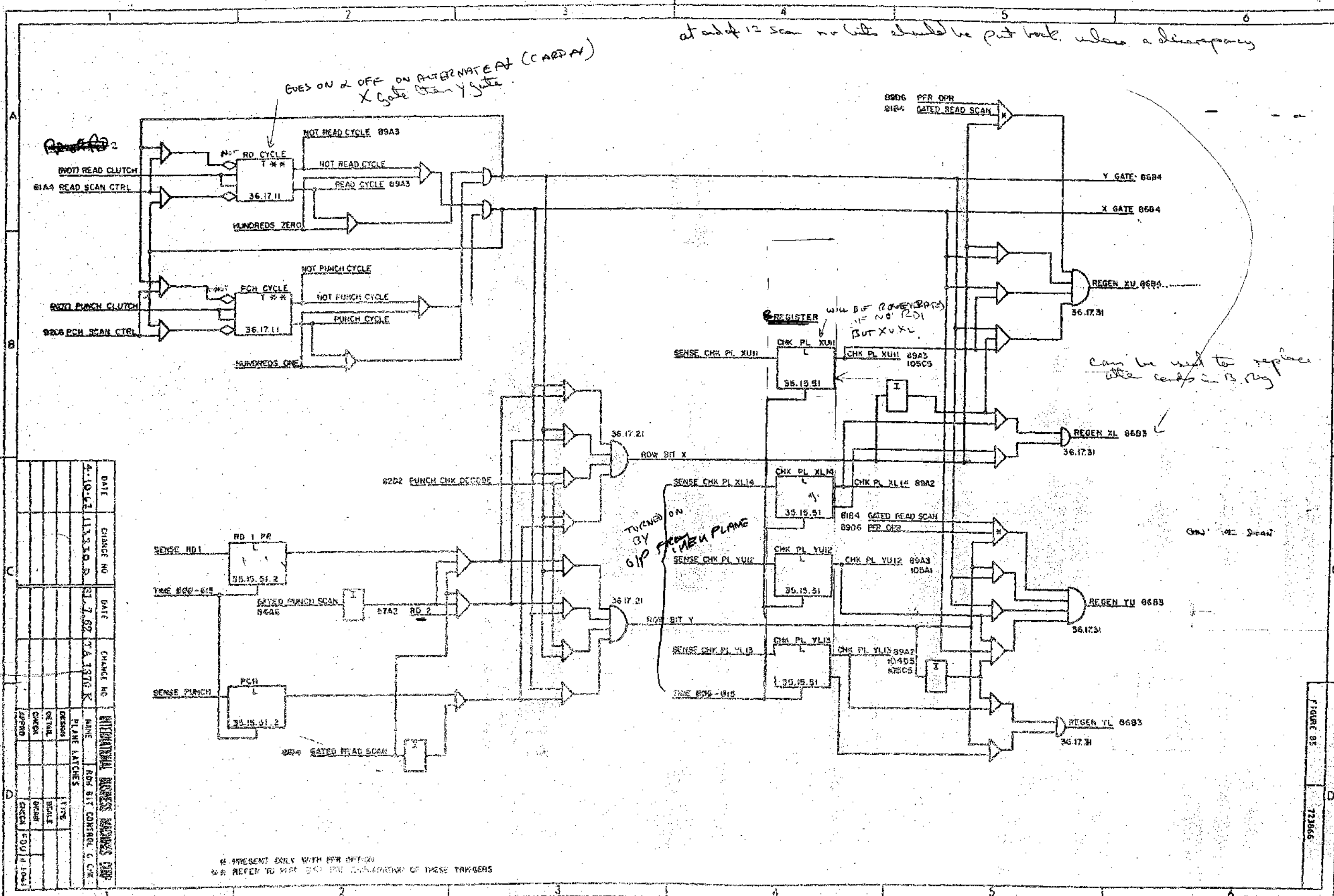


36.96.11.



at end of 12 scan no bits should be put back unless a discrepancy

GOES ON & OFF ON ALTERNATE A1 (CARD A)  
X Gate than Y Gate



RD1 pulse  
ably affect  
check planes  
RD2 pulse is  
the same as a  
normal read.

can be used to replace  
other cards in B. Reg

HOLE COUNT CHECK.

DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-62	113310 D	5-7-62	TA1370 K
INTERNATIONAL BUSINESS MACHINES CORP.			
NAME: ROM BIT CONTROL C. CIR.			
PLANE LATCHES			
DESIGN	TYPE	BRIDGE	TYPE
CONTROL	CONTROL	BRIDGE	CONTROL
APPD	APPD	CHKD	CHKD

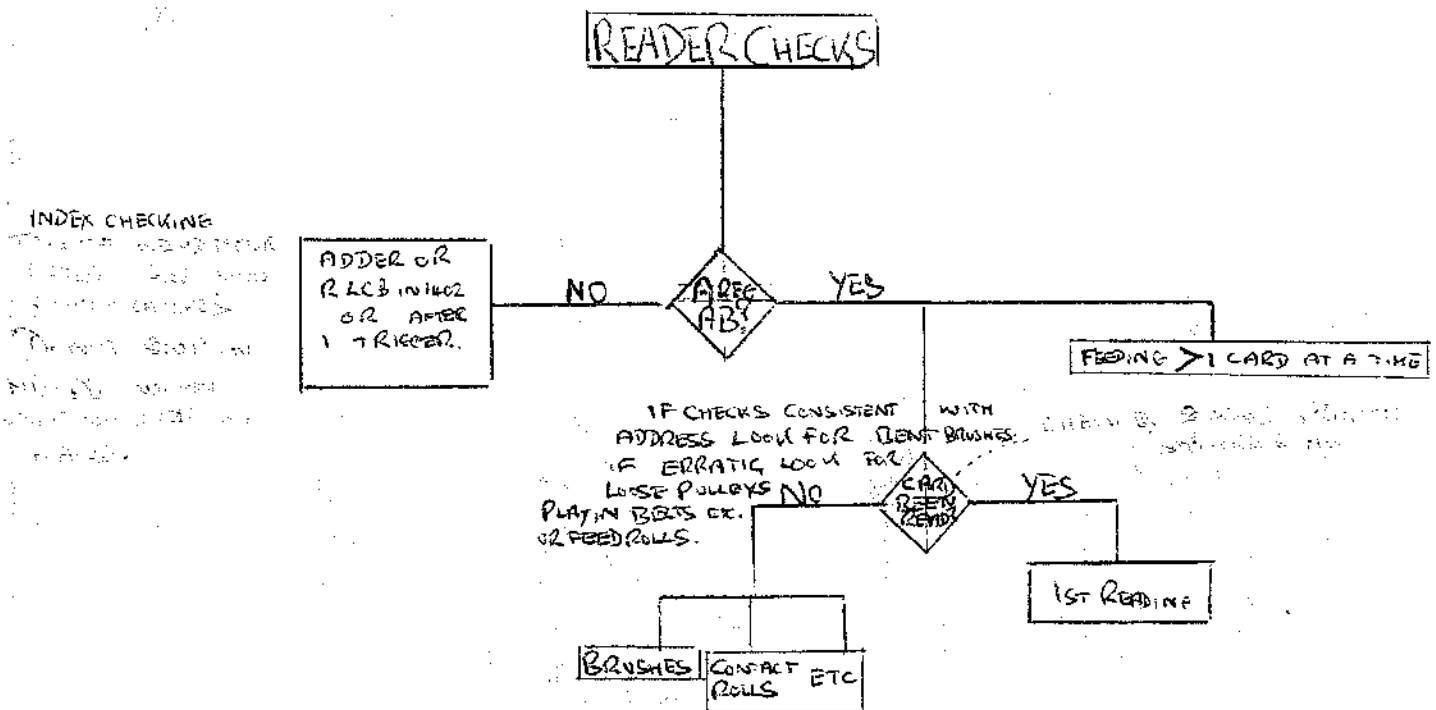
8 PRESENT ONLY WITH RFR OPTION  
8B REFER TO PART 200 FOR DESCRIPTION OF THESE TRIGGERS

FIGURE 85  
723866

# READER CHECKS

# PUNCH CHECKS

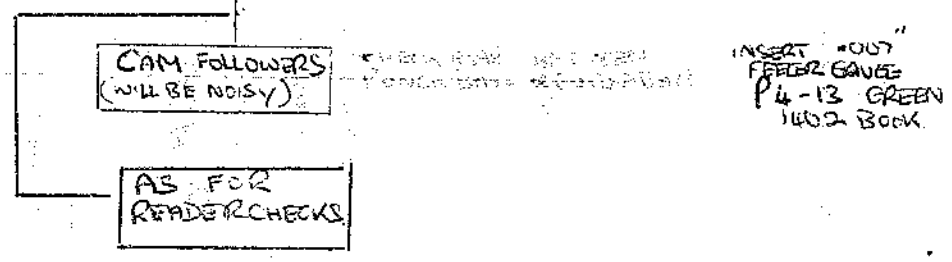
# READER STOPS



## STOPS

CAN BE CAUSED BY CLUTCH (WILL MAKE EXCESS NOISE)  
 OR CARD LEVERS

## PUNCH CHECKS

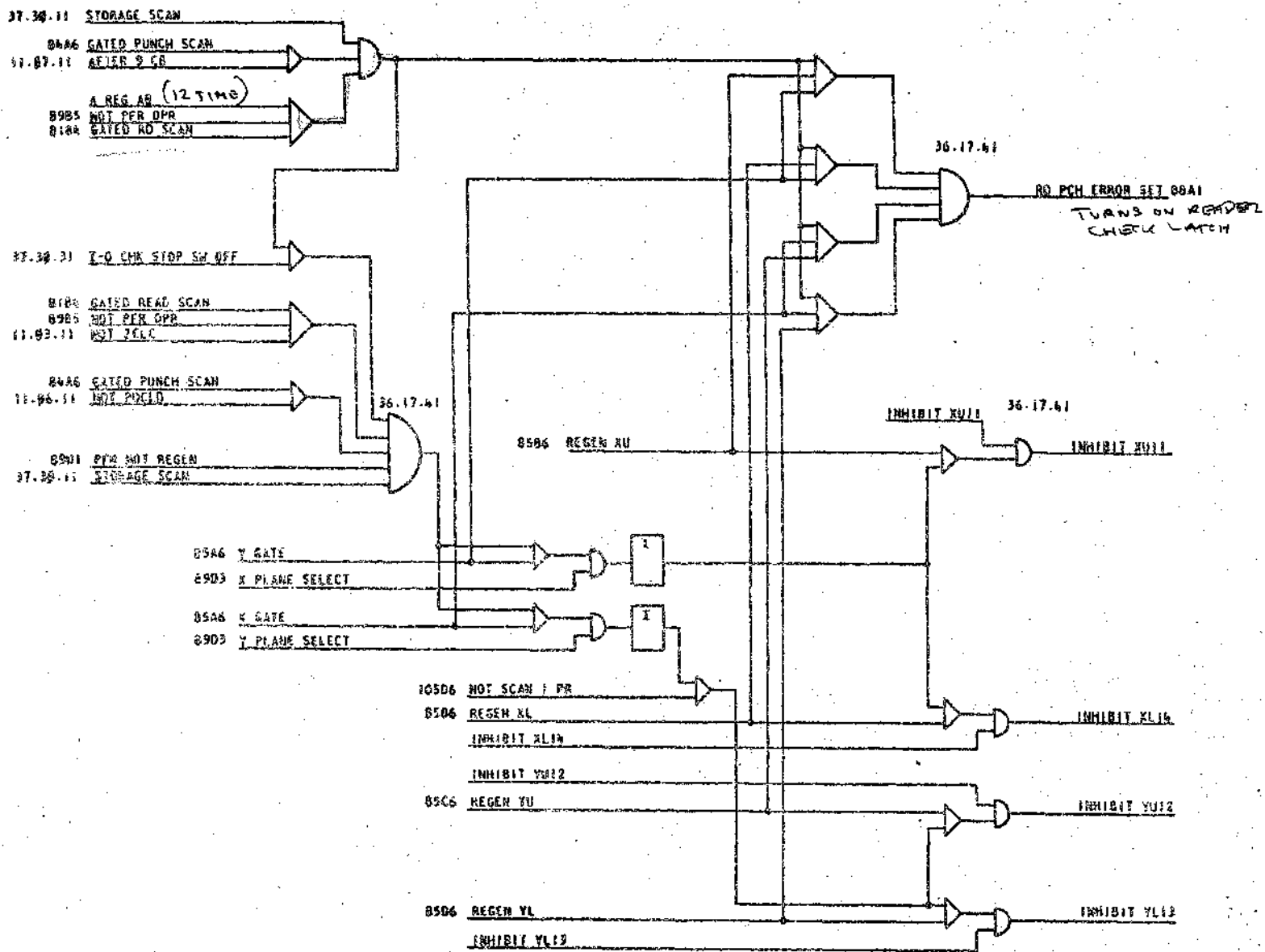


## PFR

SEE IF CHECKS ARE BEING CAUSED BY PUNCH CHECK BRUSHES OR PFR CIRCUITS OR RELAY SWAPPING RD2 UPR. (STORAGE SCAN)

FIGURE 86

723867



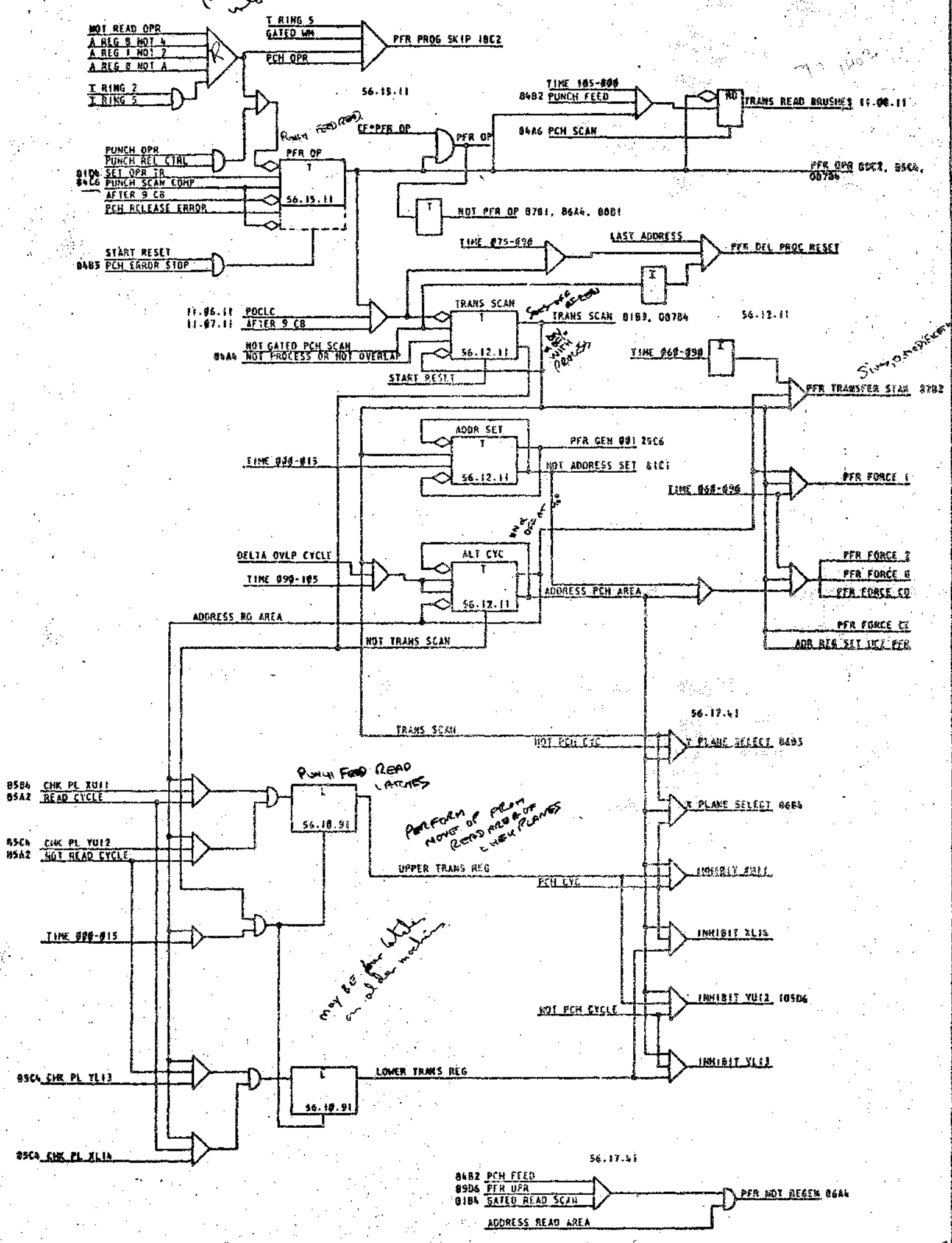
DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-42	113830 D	31.7.62	TA 1370 K	NAME	READ PUNCH ERROR SET		
					AND CHECK PLANE INHIBIT		
				DESIGN		TYPE	
				DETAIL		SCALE	
				CHECK		DRAW VE	7-8-61
				APPRO		CHECK FDU	11-30-61



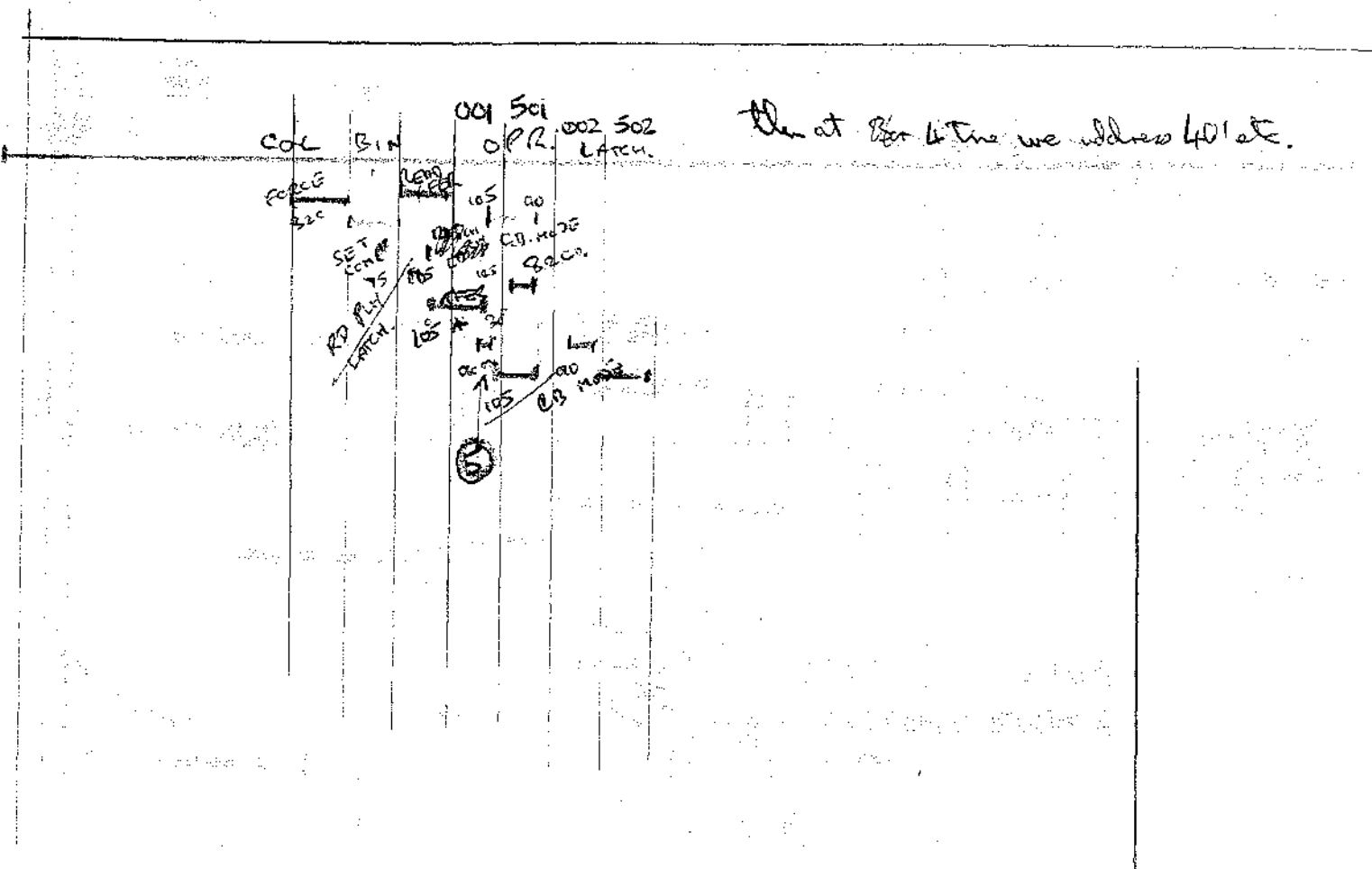




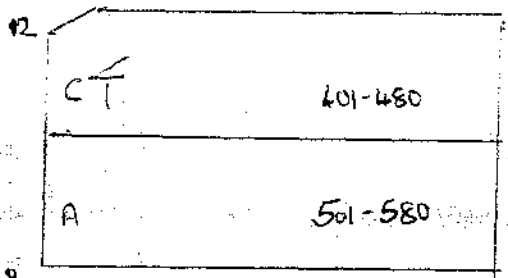




DATE	CHANGE NO	DATE	CHANGE NO	INITIALS	REVISION NUMBER	DESCRIPTION
4-10-62	113330 D					NAME PFR CONTROLS
6-21-62	114148 B	31-7-62	TA 1970 K			
				DESIGN		TYPE
				DESK		SCALE
				CHECK		DRAWN VE 7-6-61
				APPROV		DATE FOR 11-30-61



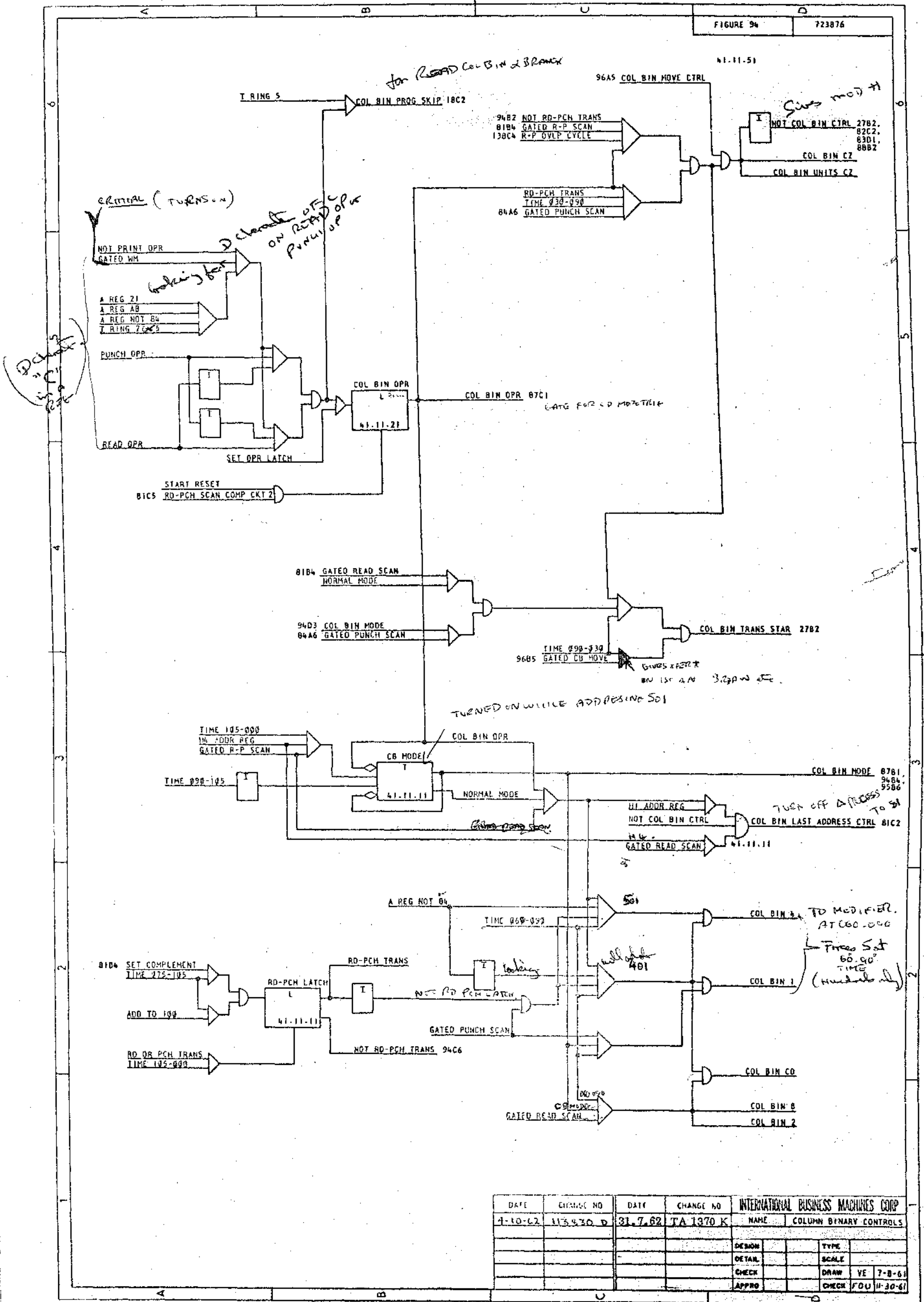
NORM MODE	CS MODE
12	B
11	A
0	8
1	4
2	2
3	1
4	B
5	A
6	B
7	4
8	2
9	1



M 580 BBB. A - (move & assemble)

ADDRESS MOVE TO	ADDRESS MOVE TO
580	BBB
480	BBB-1
579	BBB-2

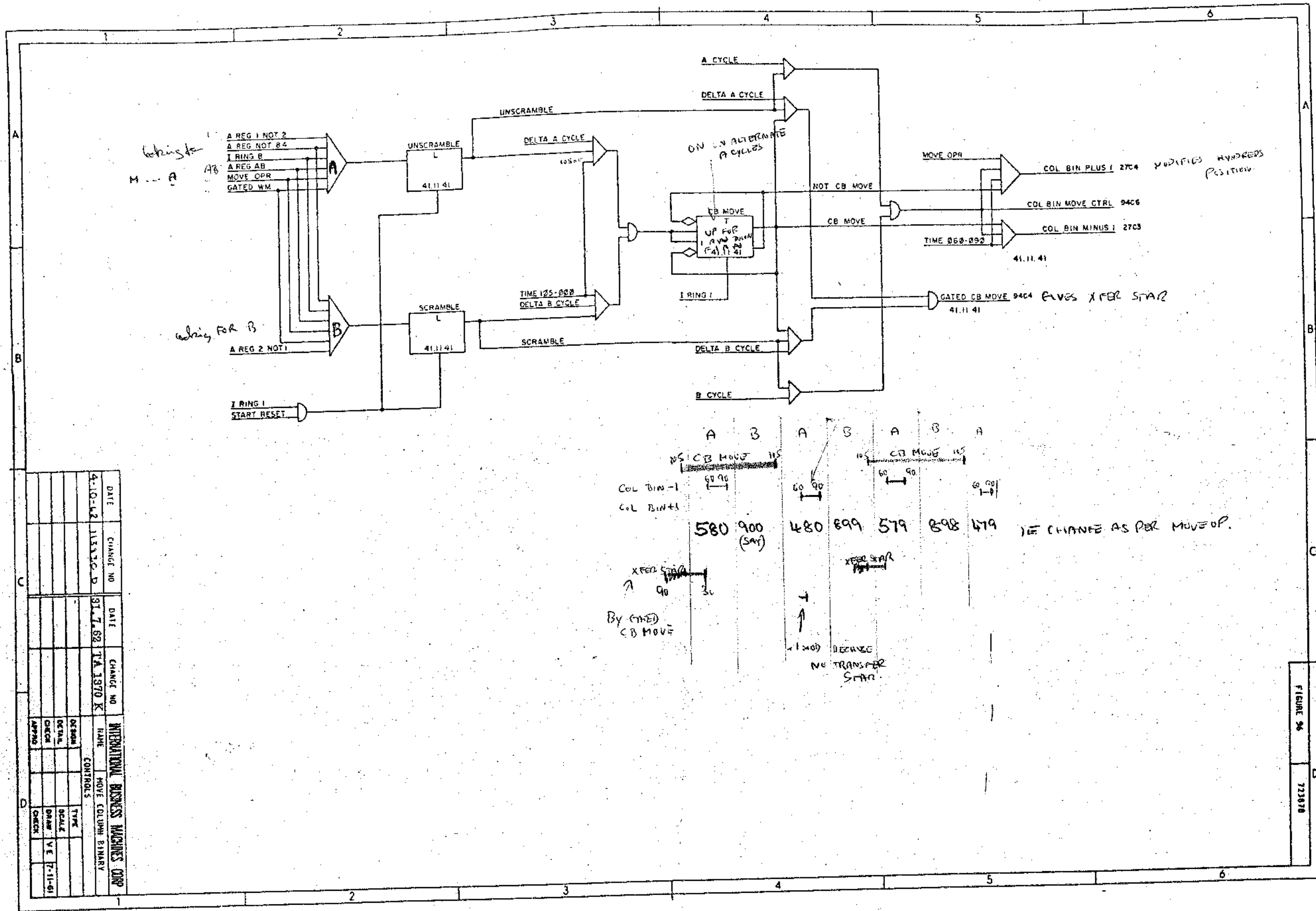
# Col Bin



DATE		CHANGE NO		INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	113430 D	31.7.62	TA 1370 K	NAME	COLUMN BINARY CONTROLS
				DESIGN	TYPE
				DETAIL	SCALE
				CHECK	DRAW VE 7-8-61
				APPRO	CHECK FOU 11-30-61



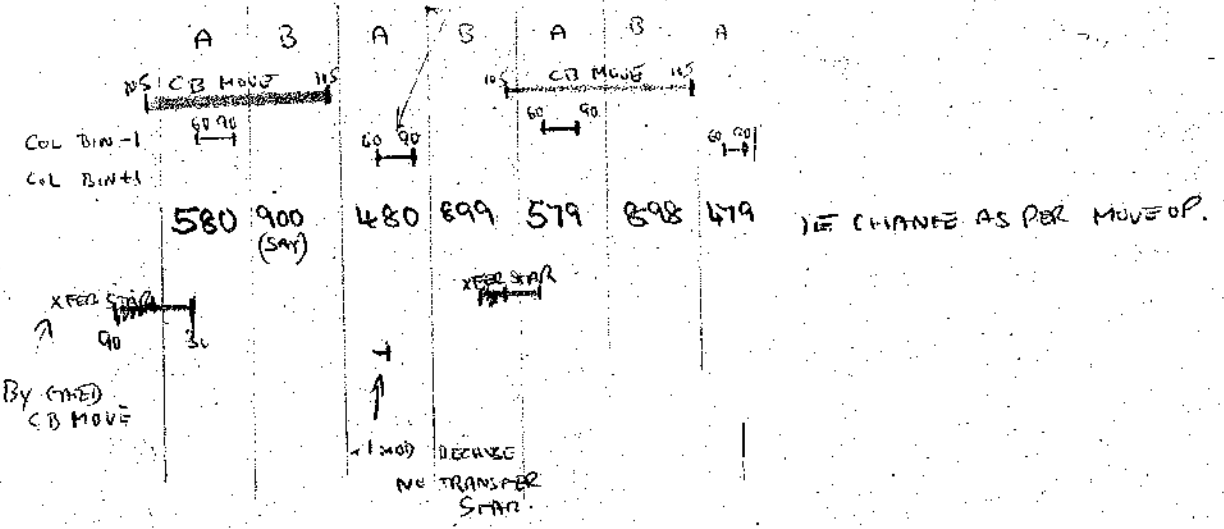




580 } \* FEED  
 900 }  
 480 }  
 899 } MOD -1  
 579 }  
 898 } \* XFEED  
 479 }

MODIFIES ADDRESS POSITION

ELVES XFER STAR

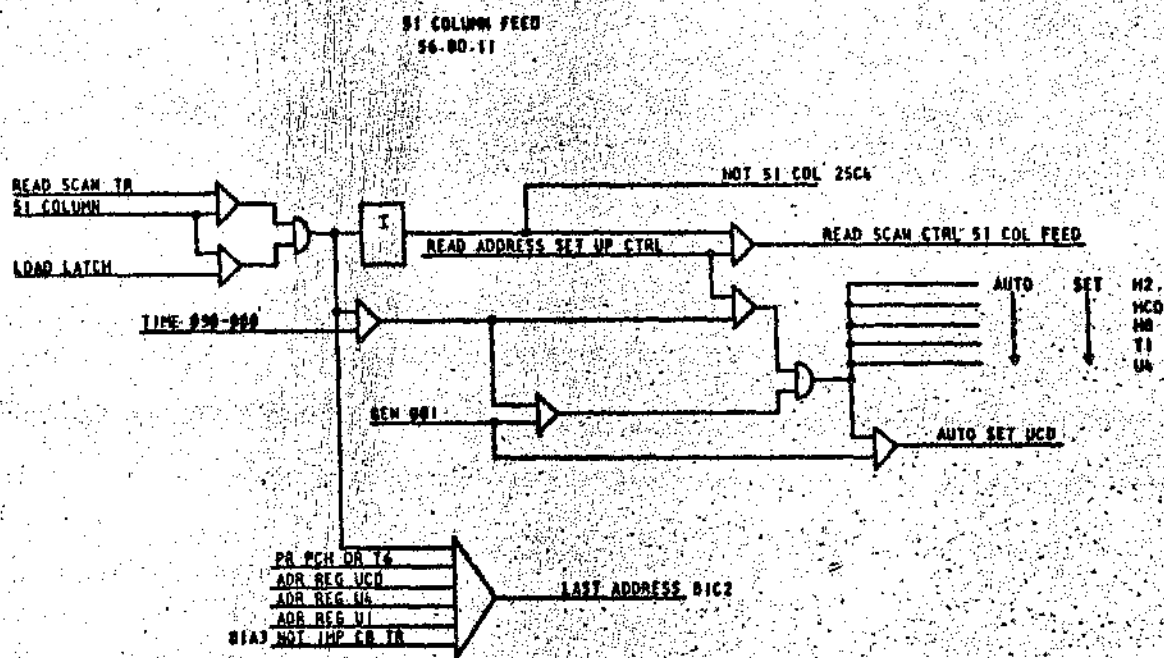


DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP
4-10-62	11330 D	31-7-62	TA 1370 K	HAIR
				MOVE COLUMN BINARY
				CONTROLS
				TYPE
				SCALE
				DRAW
				CHECK
				VE 7-11-61

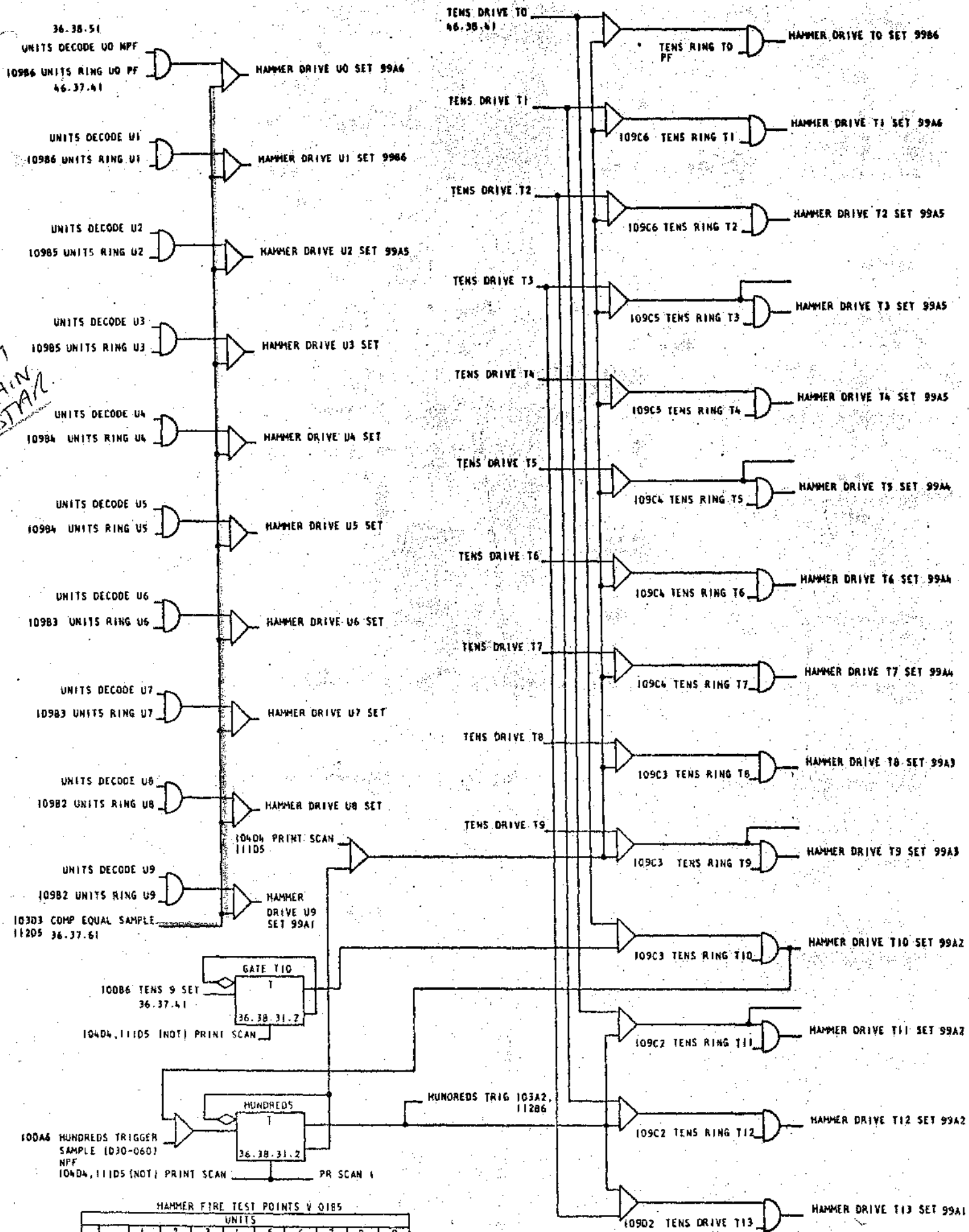
FIGURE 96 723878

FIGURE 97

723879



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	113930	51.7.62	TA 1370K	NAME	51 COLUMN FEED
				DESIGN	TYPE
				DETAIL	SCALE
				CHECK	DRAW VE 9-12-61
				APPRO	CHECK



HAMMER FIRE TEST POINTS V Q185

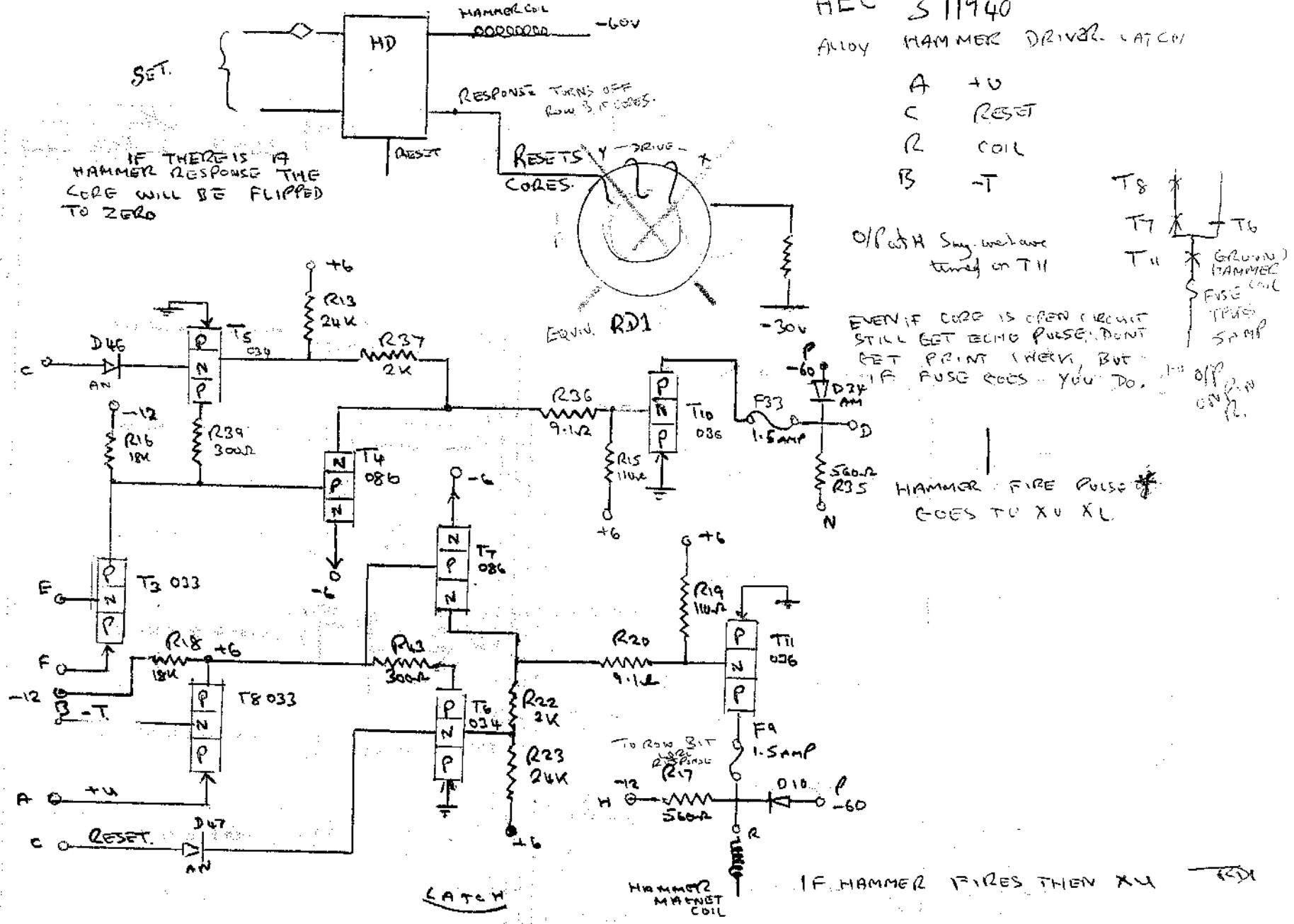
	UNITS								
	1	2	3	4	5	6	7	8	9
0	B05D	C05R	D05D	B05R	C05D	D05R	B06D	C06R	D06D
1	B06R	C06D	D06R	B07D	C07R	D07D	B07R	C07D	D07R
2	C08R	D08D	B08R	C08D	D08R	B09D	C09R	D09D	B09R
3	D09R	B10D	C10R	D10D	B10R	C10D	D10R	B11D	C11R
4	B11R	C11D	D11R	B12D	C12R	D12D	B12R	C12D	D12R
5	C13R	D13D	B13R	C13D	D13R	B14D	C14R	D14D	B14R
6	D14R	B15D	C15R	D15D	B15R	C15D	D15R	B16D	C16R
7	D16R	C16D	D16R	B17D	C17R	D17D	B17R	C17D	D17R
8	C18R	D18D	B18R	C18D	D18R	B19D	C19R	D19D	B19R
9	D19R	B20D	C20R	D20D	B20R	C20D	D20R	B21D	C21R
10	B21R	C21D	D21R	B22D	C22R	D22D	B22R	C22D	D22R
11	C23R	D23D	B23R	C23D	D23R	B24D	C24R	D24D	B24R
12	D24R	B25D	C25R	D25D	B25R	C25D	D25R	B26D	C26R
13	B26R	C26D	D26R						

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	113330 D	31-7-62	TA 1870 K	NAME	PRINT HAMMER DRIVE LINES
				DESIGN	TYPE
				DETAIL	SCALE NONE
				CHECK	DRAW VE
				APPRO	CHECK

AEC 371940  
 Alloy HAMMER DRIVER LATCH

- A +V
- C RESET
- R COIL
- B -T

IF THERE IS A HAMMER RESPONSE THE CORE WILL BE FLIPPED TO ZERO

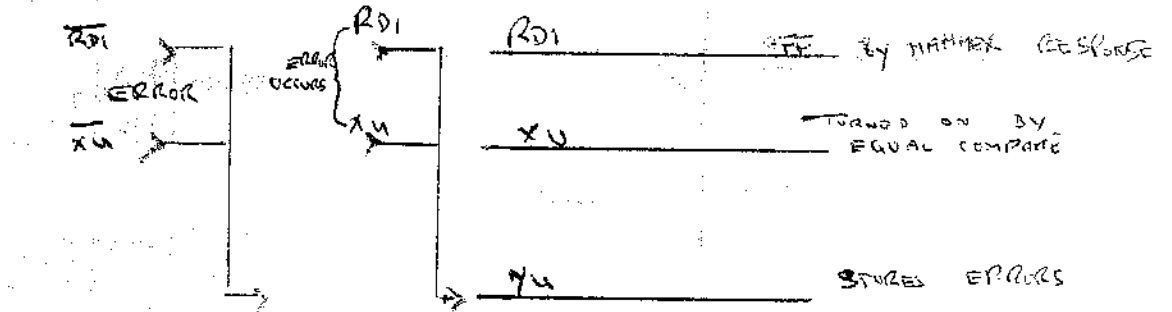


O/P with Sny. web are timed on T11

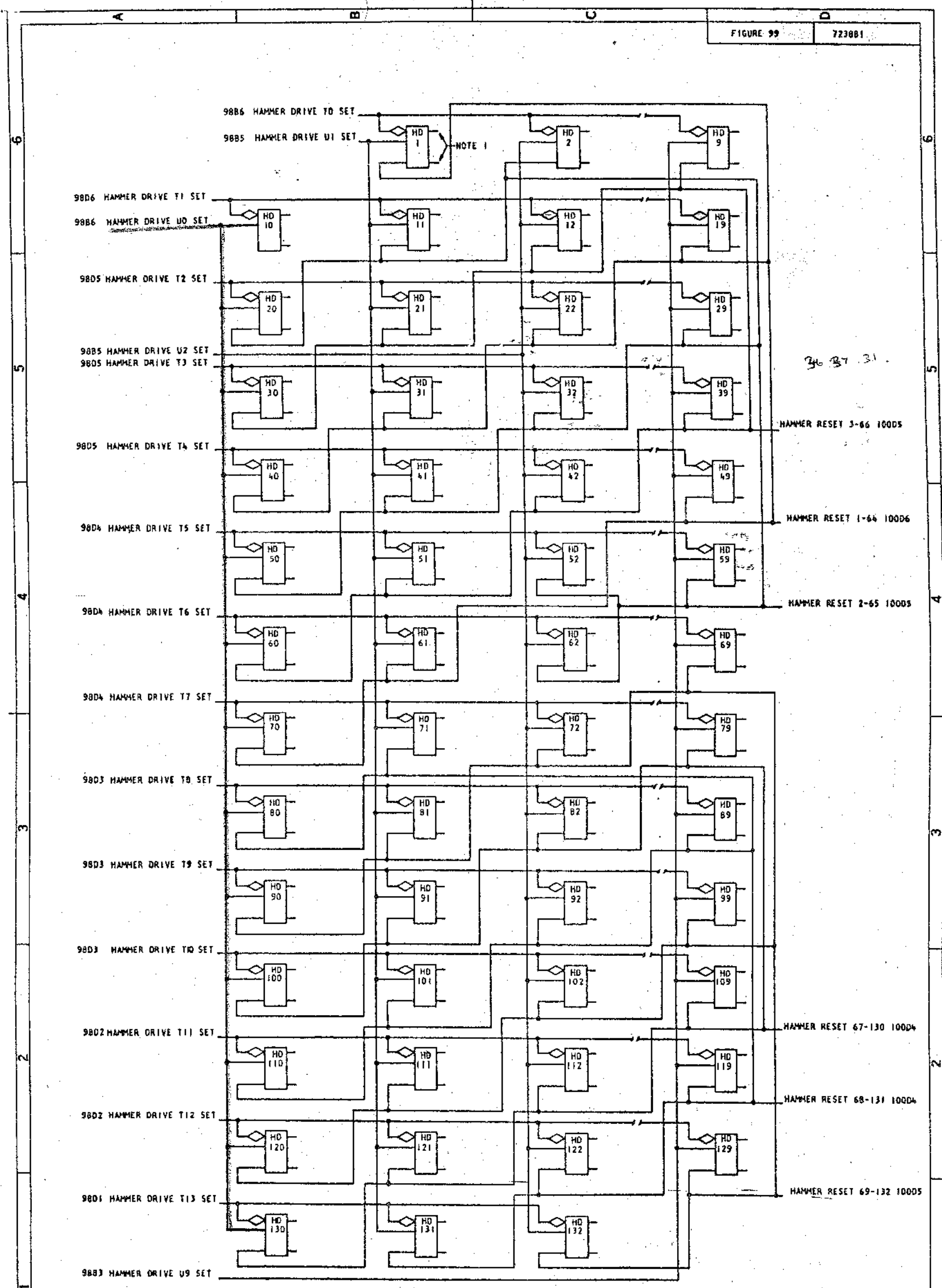
EVEN IF CORE IS OPEN CIRCUIT STILL GET BEING PULSE. DONT GET PRINT THERE, BUT IF FUSE GOES - YOU DO.

HAMMER FIRE PULSE GOES TO XU XL

IF HAMMER FIRES THEN XU



YL (OR PRINT LINE COMPLETE) TURNED ON BY  
 1) EQUAL COMPARE  
 2) UNPRINTABLES  
 YL SHOULD HAVE ALL CORES TURNED ON BY END OF PRINT SCAN.



36 37 31

HAMMER RESET 3-66 100D5

HAMMER RESET 1-66 100D6

HAMMER RESET 2-65 100D5

HAMMER RESET 67-130 100D4

HAMMER RESET 68-131 100D4

HAMMER RESET 69-132 100D5

NOTE 1 - TOP HALF OF HD'S GOES TO HAMMER COILS. BOTTOM HALF OF HD'S GOES OUT AS RESPONSE LINES

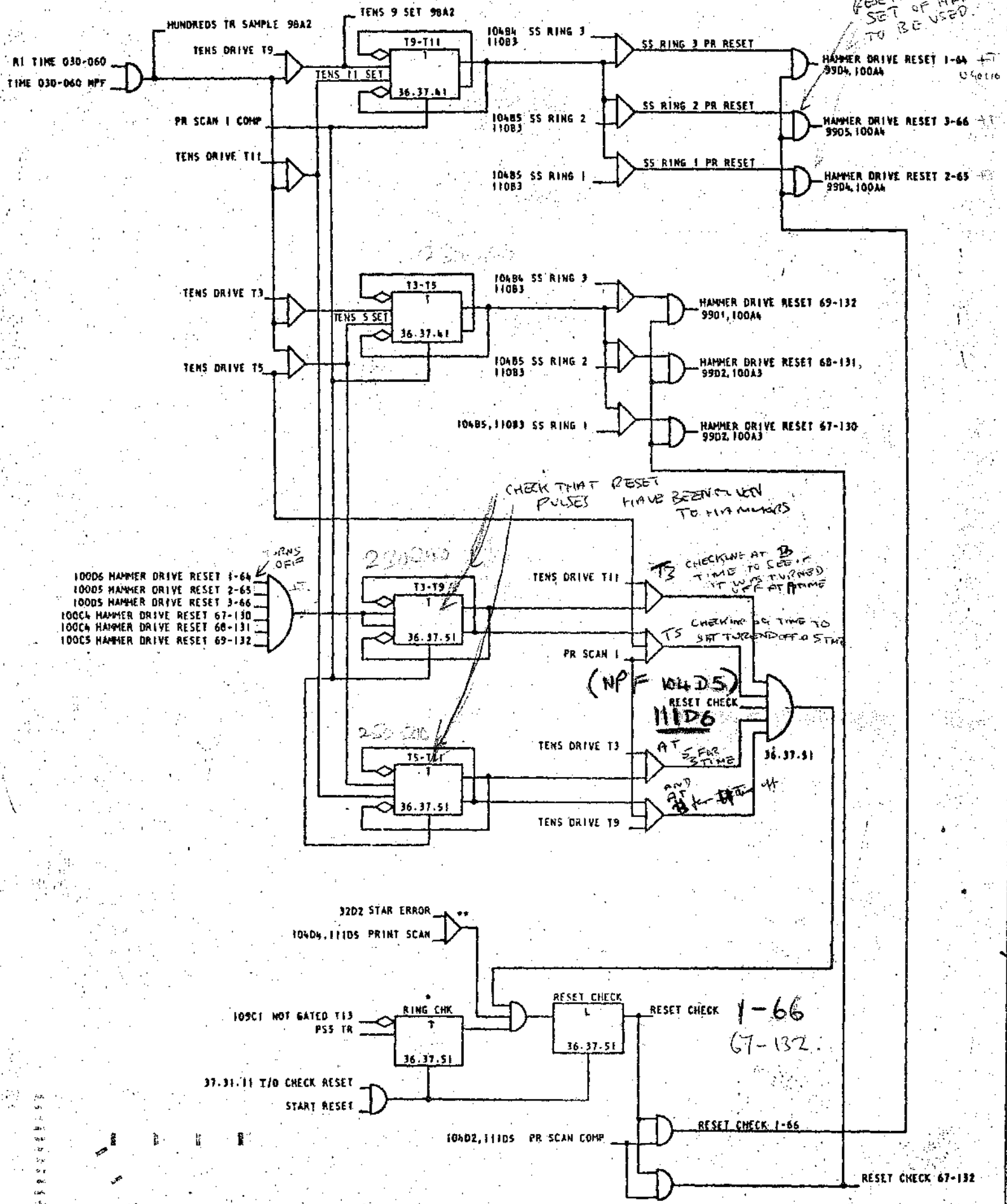
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113830 D	7-7-62	TA 1870 K	NAME HAMMER DRIVERS			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 3-8-62
				APPRO		CHECK	



HAMMERS RESET IN 2 GROUPS PER SUB SCAN.

ON 200 S/C

RESETS NEXT SET OF HAMMERS TO BE USED.



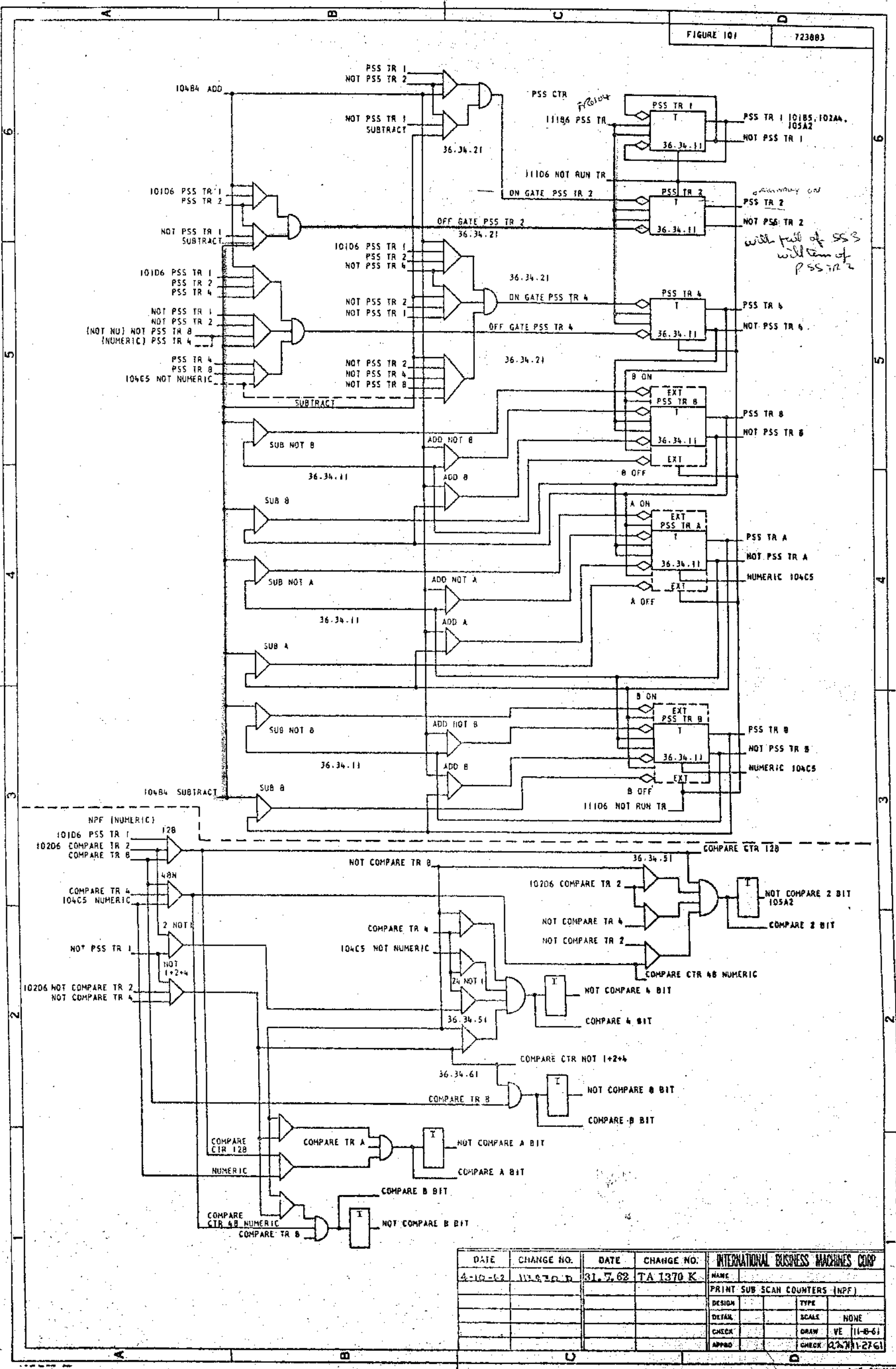
- 10006 HAMMER DRIVE RESET 1-64
- 10005 HAMMER DRIVE RESET 2-65
- 10005 HAMMER DRIVE RESET 3-66
- 10004 HAMMER DRIVE RESET 67-130
- 10004 HAMMER DRIVE RESET 68-131
- 10005 HAMMER DRIVE RESET 69-132

\*PRESENT WITH PF OPTION ONLY  
 \*\*PRESENT WITH NPF OPTION ONLY

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113330 D			NAME	HAMMER DRIVE RESET		
6-21-62	114144B	31.7.62	TA 1370 K	REGION		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DATE	YE 11-9-62
				APPRO		CHECK	

# P.S.S. Counter

FIGURE 101 723883



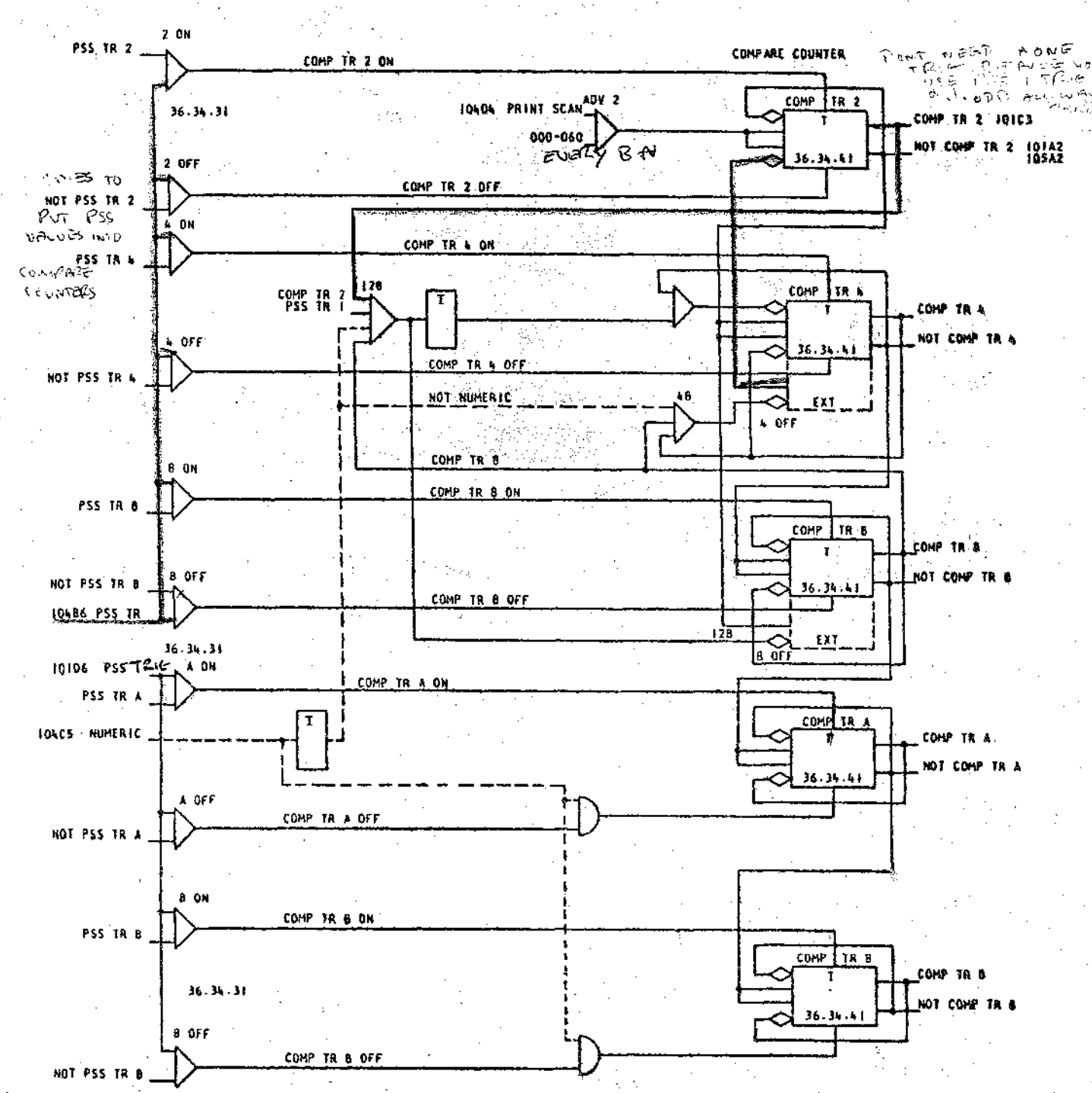
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	11370 K	31.7.62	TA 1370 K	NAME			
				PRINT SUB SCAN COUNTERS (NPF)			
				DESIGN	TYPE		
				DETAIL	SCALE	NONE	
				CHECK	DRAW	VE	11-8-61
				APPRO	CHECK	2711-2761	

Compare Counter

(NPF)  
NOT PRINT BUFFER

FIGURE 102 723884

ONLY ON M/C WITHOUT PRINT BUFFER



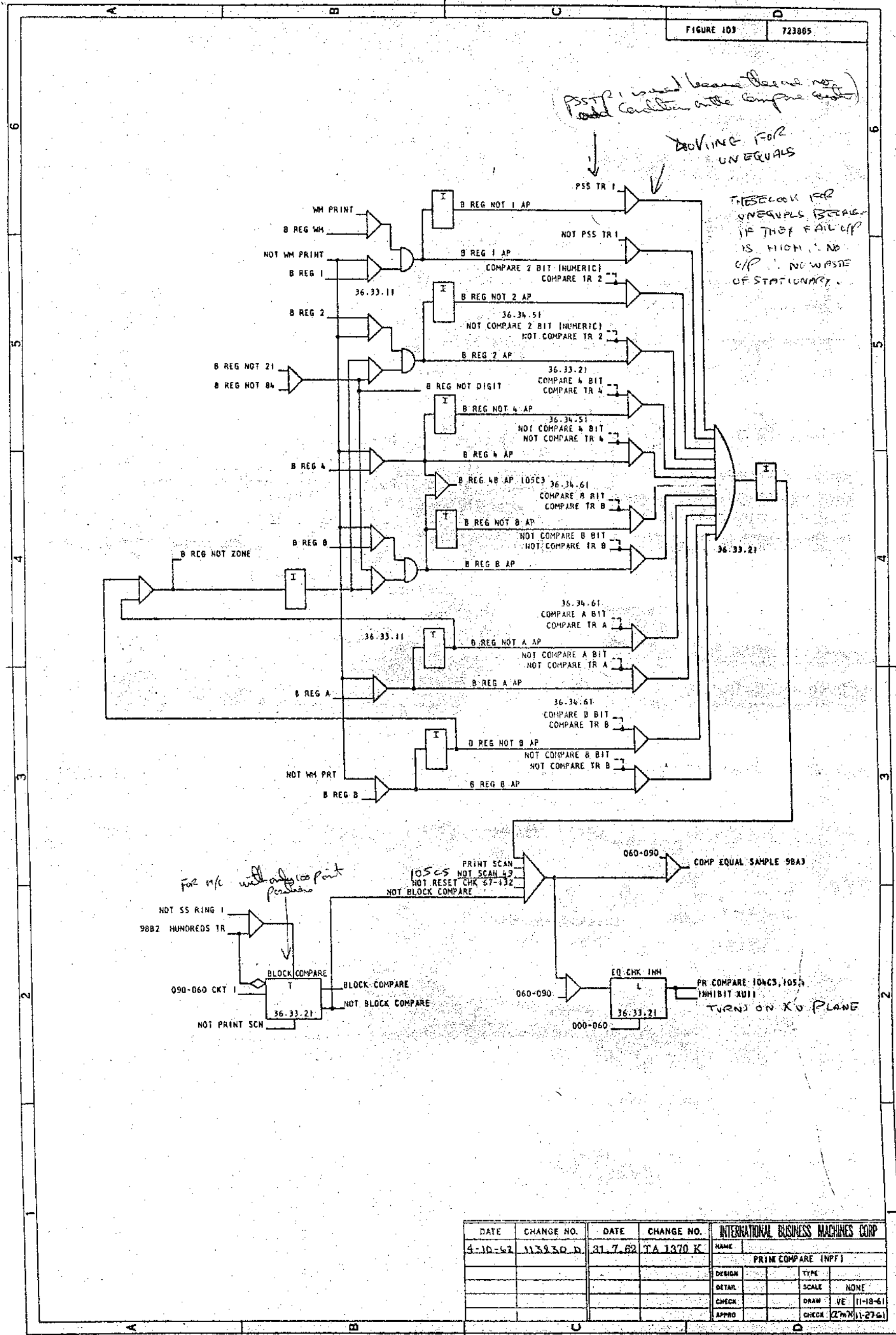
COMPARE COUNTER ACTUALLY CONTAINS BIT COUNT FOR NEXT CHARACTER WITH OPTION TO PRINT.

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113930 D	31.7.62	TA 1370 K	COMPARE COUNTERS (NPF)			
				NAME			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 11-18-61
				APPRO		CHECK	11-27-61



Print COMPARE 118 1/4 NPF

FIGURE 103 723865



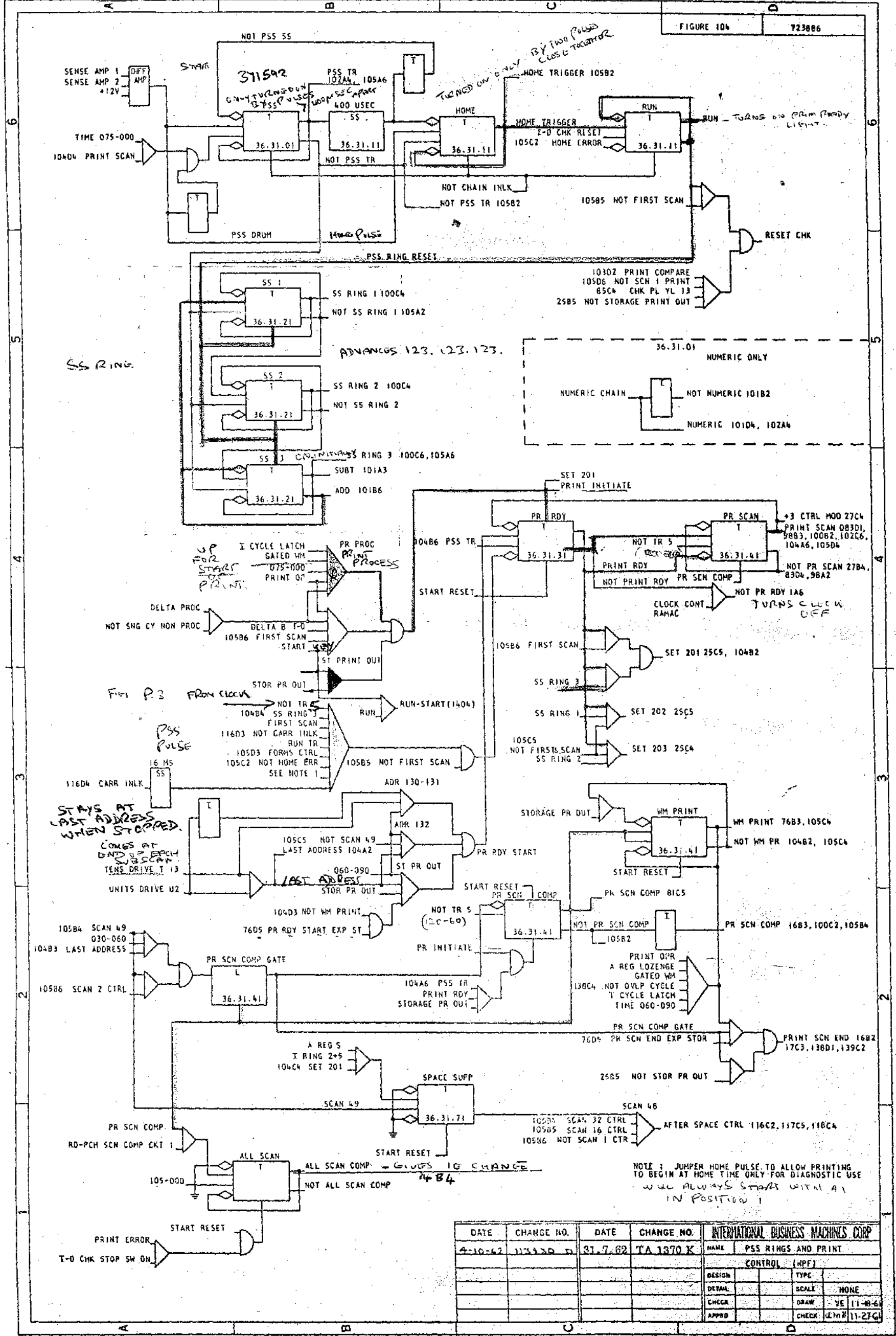
INTERNATIONAL BUSINESS MACHINES CORP			
DATE	CHANGE NO.	DATE	CHANGE NO.
4-10-67	113930 D	31.7.62	TA 1370 K
NAME: PRINT COMPARE (NPF)			
DESIGN		TYPE	
DETAIL		SCALE	NONE
CHECK		DRAW	VE 11-18-61
APPRO		CHECK	276N 11-27-61





NOTE ON  
**PRINTER CONTROLS** NPF

FIGURE 104 723886



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	112320	31-7-62	TA 1370 K	NAME	PSS RINGS AND PRINT CONTROL (NPF)
				DESIGN	TYPE
				DETAIL	SCALE NONE
				CHECK	DRAW YE 11-10-61
				APPD	CHECK 11-27-61

T. SCAN 69

NPF

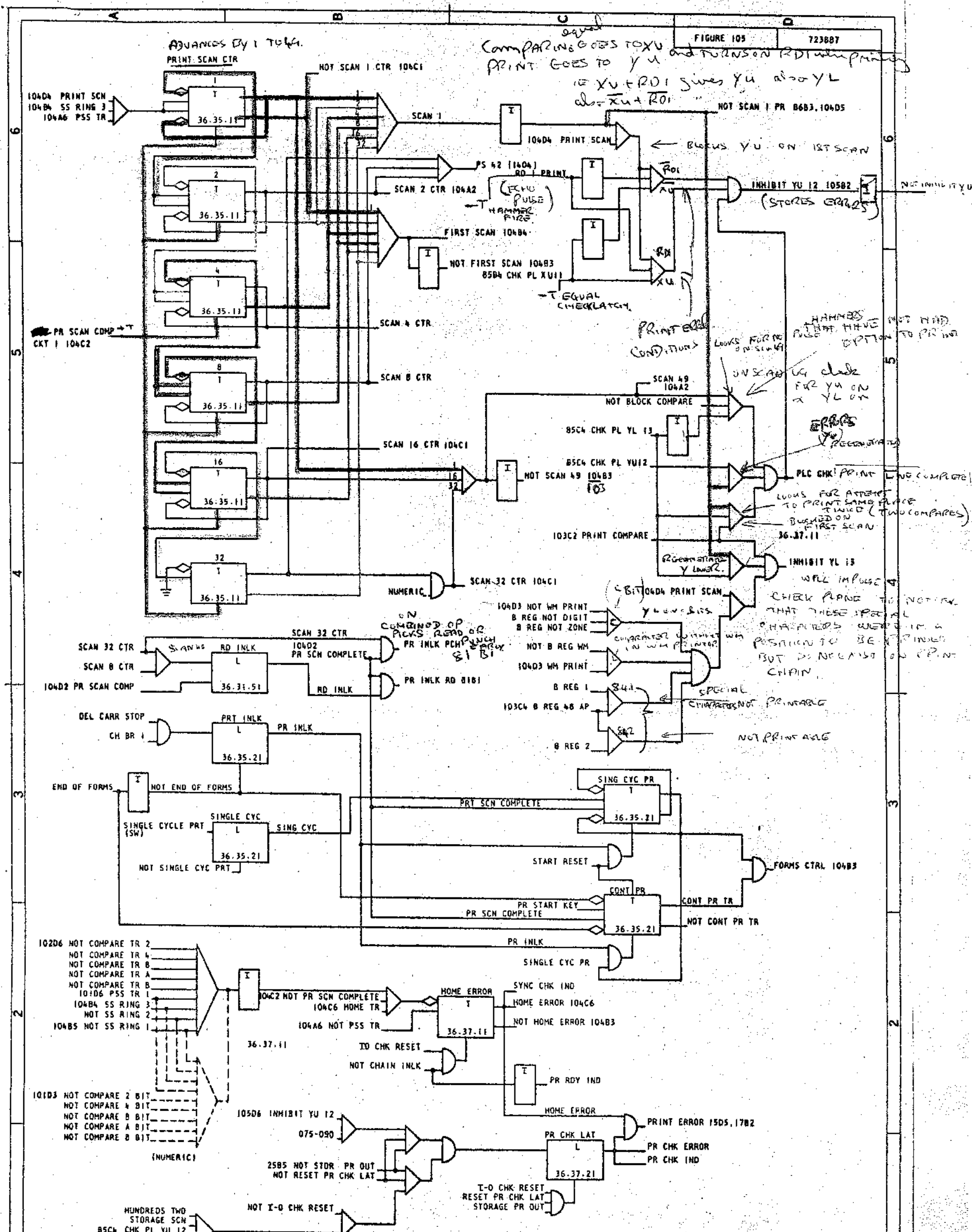
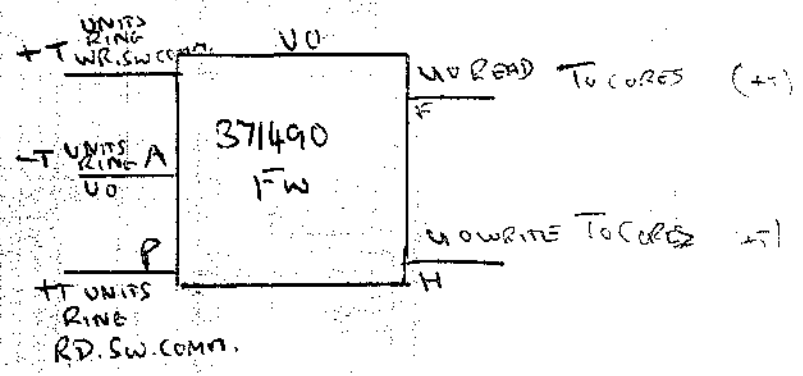
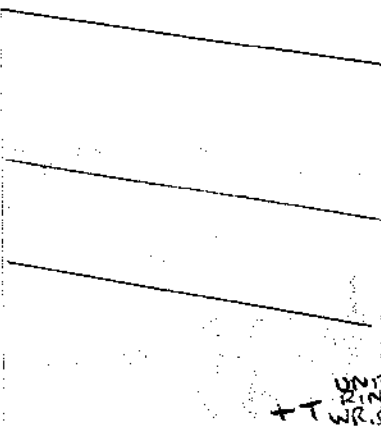
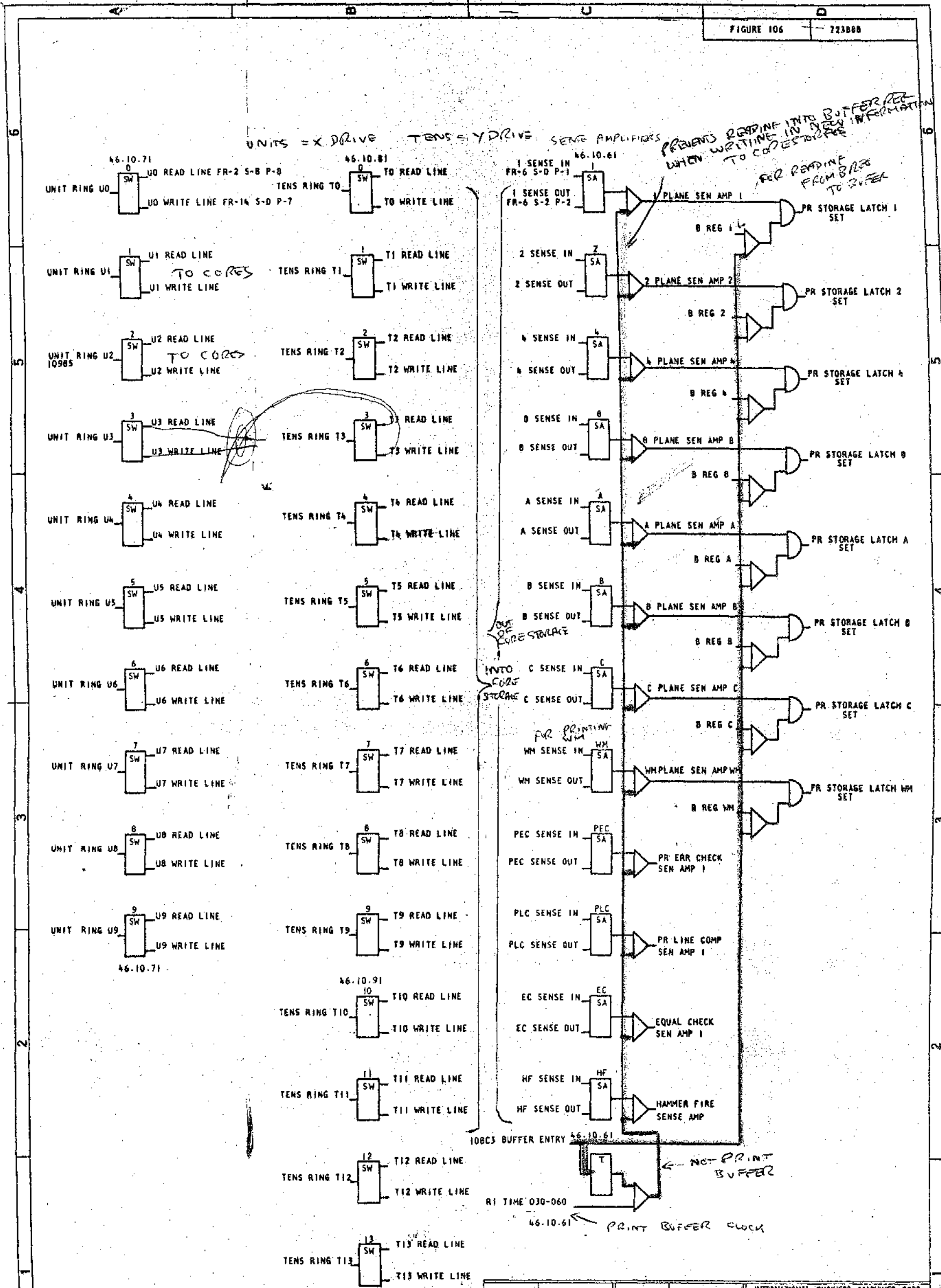


FIGURE 109 723887

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	11330-D	31.7.62	TA 1370 K	NAME	PRINT SCAN COUNTERS		
				(NPF)			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	VE 11-8-61
				APPROD		CHECK	03/11-27-61

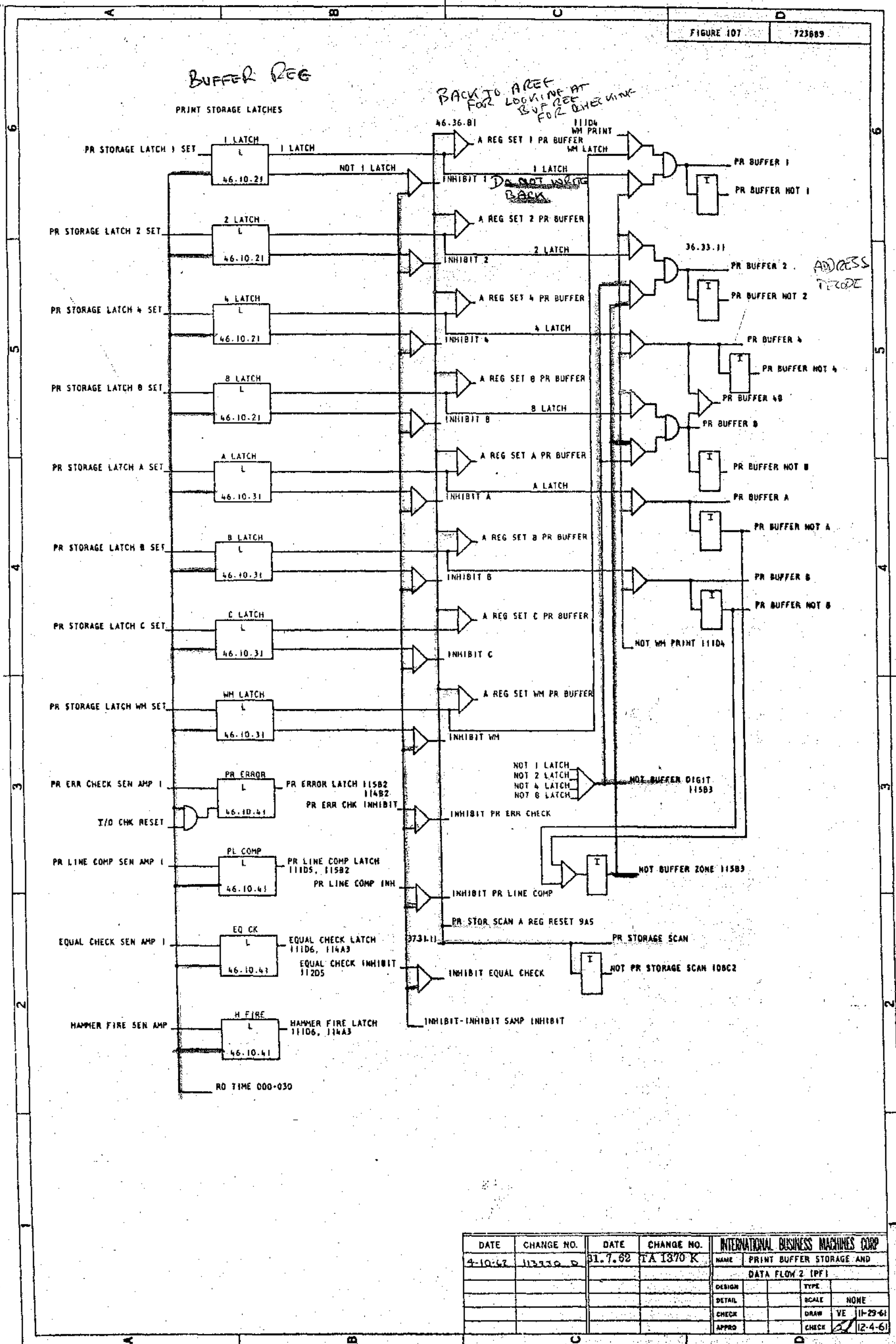




DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	11330 D	31-7-62	TA 1370 K	NAME PRINT BUFFER STORAGE AND DATA FLOW I (PF)			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAWN	YE 11-29-61
				APPRO		CHECK	112-4-61

# BUFFER REG

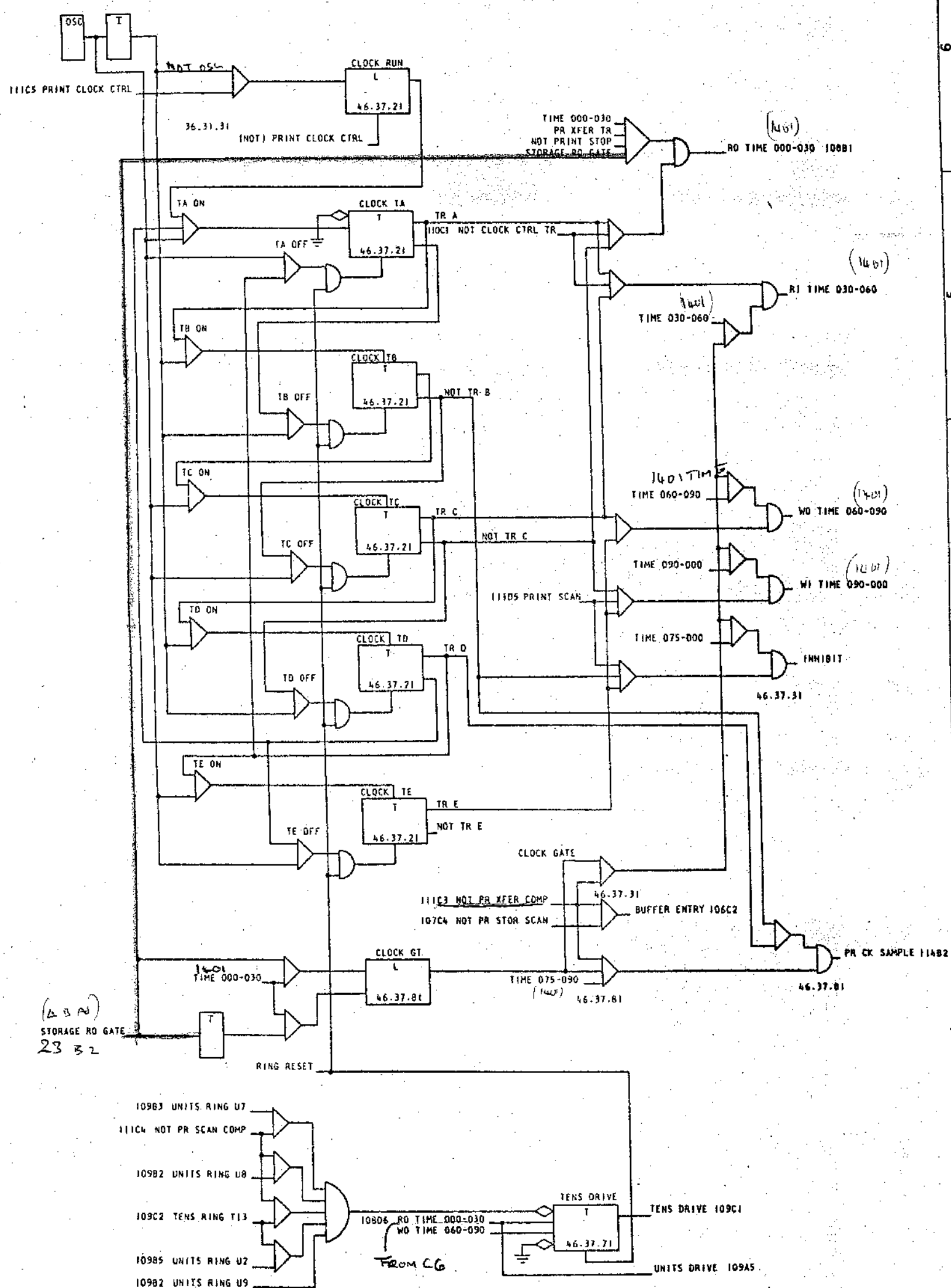
FIGURE 107 723889



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	11330 D	31.7.62	TA 1370 K	NAME	PRINT BUFFER STORAGE AND DATA FLOW 2 (PF)		
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 11-29-61
				APPRO		CHECK	12-4-61

# BUFFER CLOCK

FIGURE 108 723890



(A B A)  
STORAGE NO GATE  
23 B 2

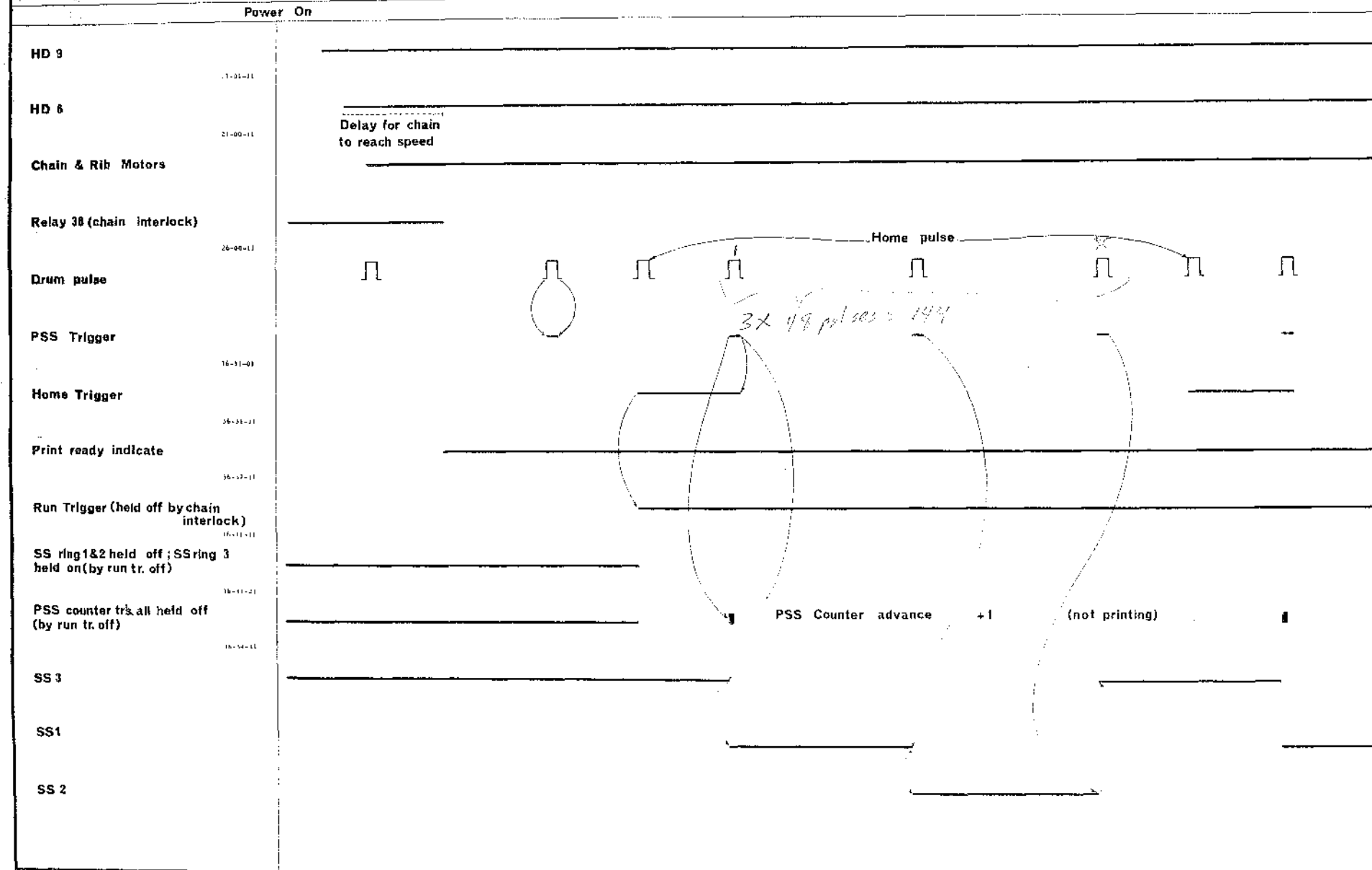
DATE		CHANGE NO.		INTERNATIONAL BUSINESS MACHINES CORP			
4-10-67		113930 D		31 7 62		TA 1870 X	
				NAME PRINT BUFFER CLOCK (PP1)			
				DESIGN		TYPE	
				DETAIL		SCALE NONE	
				CHECK		DRAW VE 1-10-62	
				APPRO		CHECK	







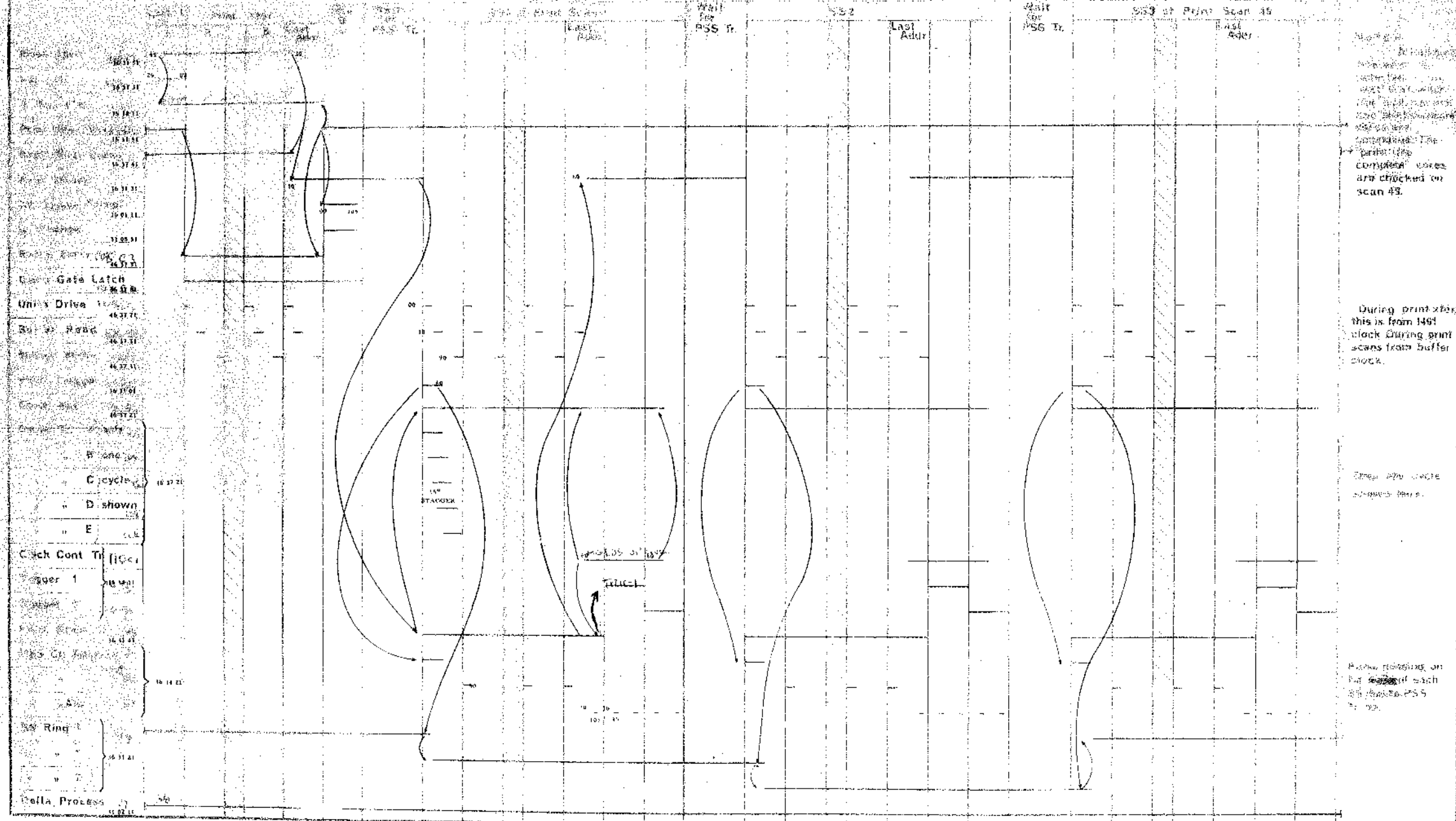
# CHAIN SYNC.



During printing a check is made, at the end of the "PSS Tr." signal following a Home pulse, that :-

- (a) SS ring 3 Tr. is on, SS ring 1 & 2 off.
- (b) "1" and only "1" is in the PSS counter.

# PRINT BUFFER CONTROLS



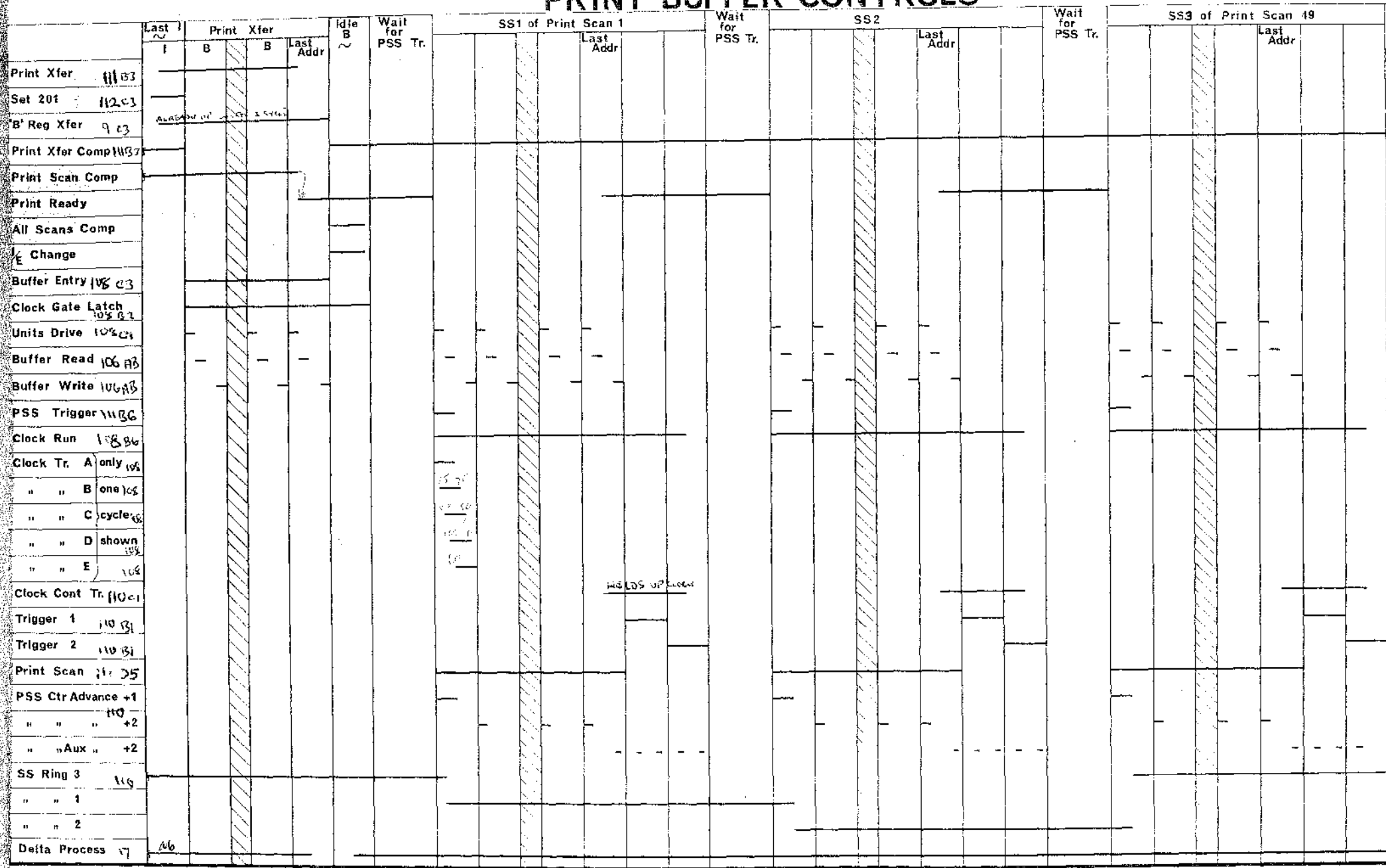
During print the  
clock driving print  
scans from buffer  
clock.

During print the  
clock driving print  
scans from buffer  
clock.

During print the  
clock driving print  
scans from buffer  
clock.

During print the  
clock driving print  
scans from buffer  
clock.

# PRINT BUFFER CONTROLS

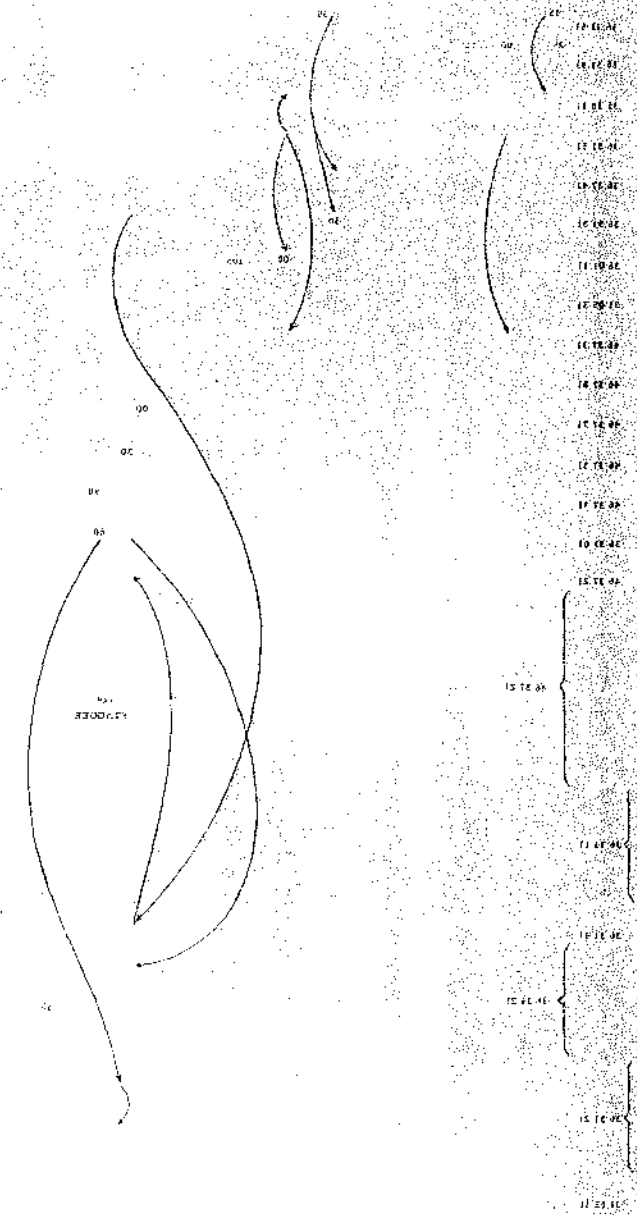


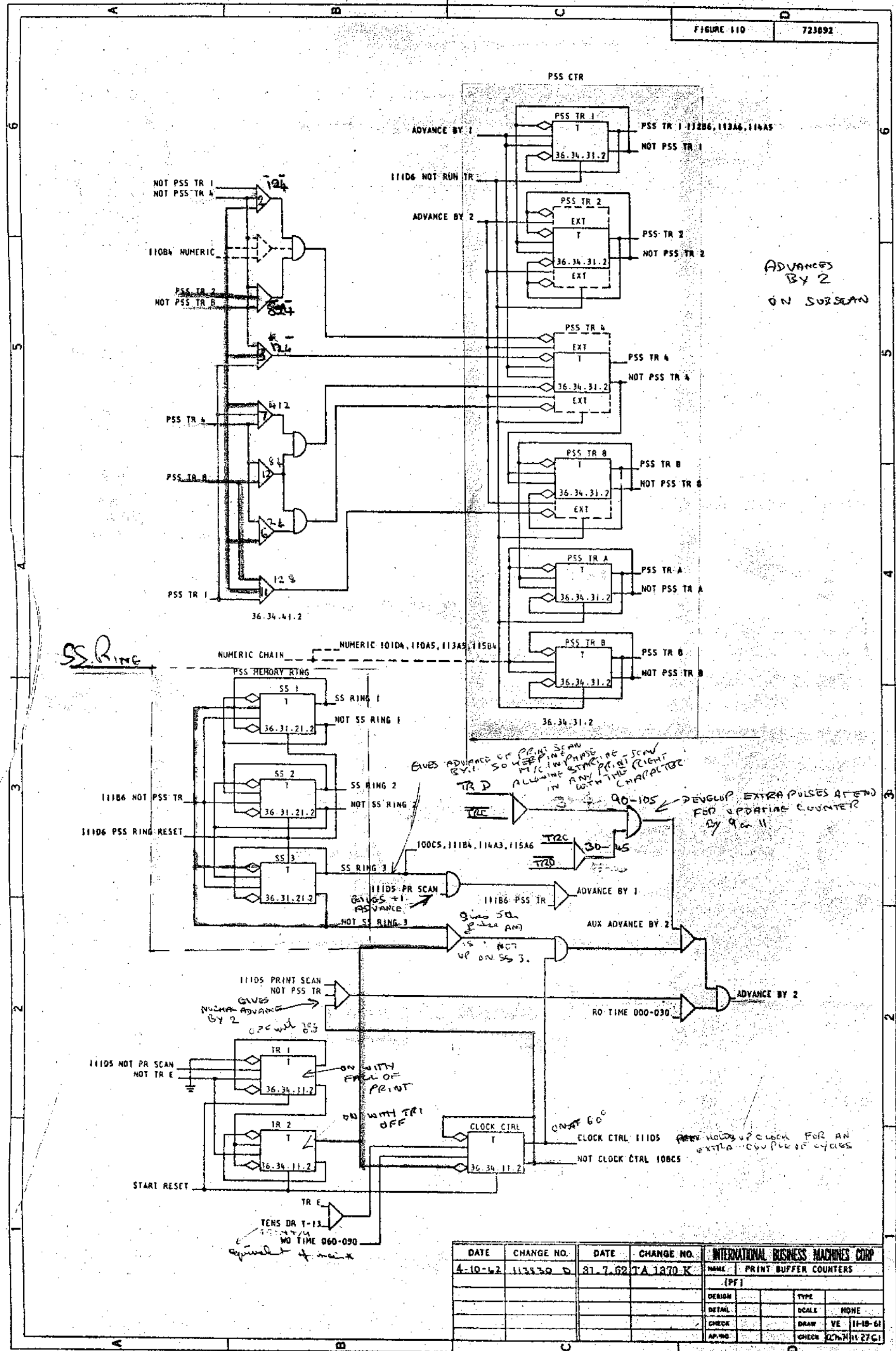
**NOTE:-**  
A hammer fire error is detected in the next scan, when the "hammer fire" and "print compare" cores are compared. The "print line complete" cores are checked on scan 49.

During print xfer, this is from 140f clock. During print scans from buffer clock.

Only one cycle shown here.

Pulse missing on 1st of each SS due to PSS Tr. on.





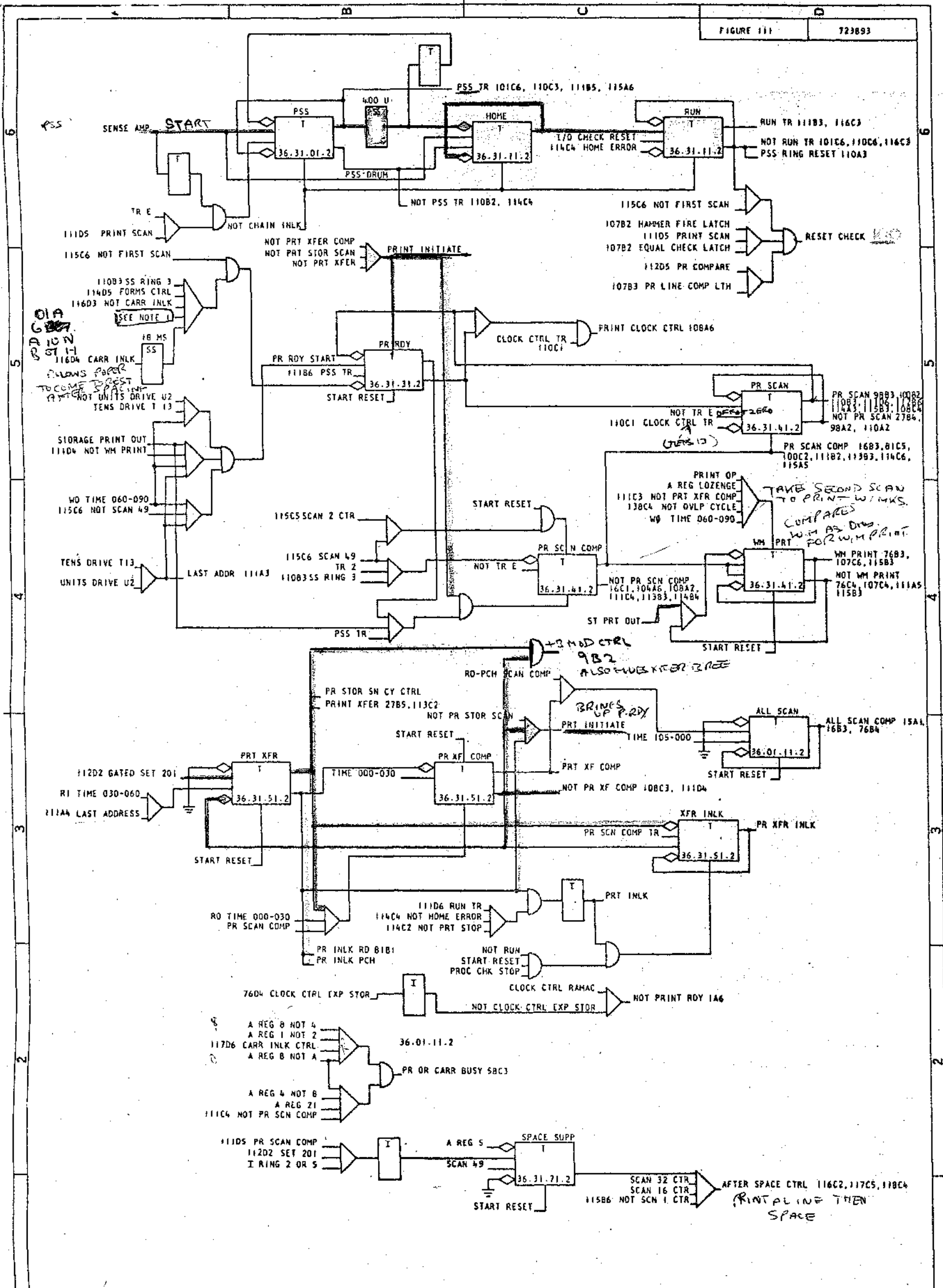
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4-10-62	11330 D	8-7-62	TA 1370 K	NAME: PRINT BUFFER COUNTERS (PF)
				DESIGN:                      TYPE:
				DETAIL:                     SCALE: NONE
				CHECK:                    DRAW: VE 11-18-61
				APPRO:                    CHECK: 11-27-61





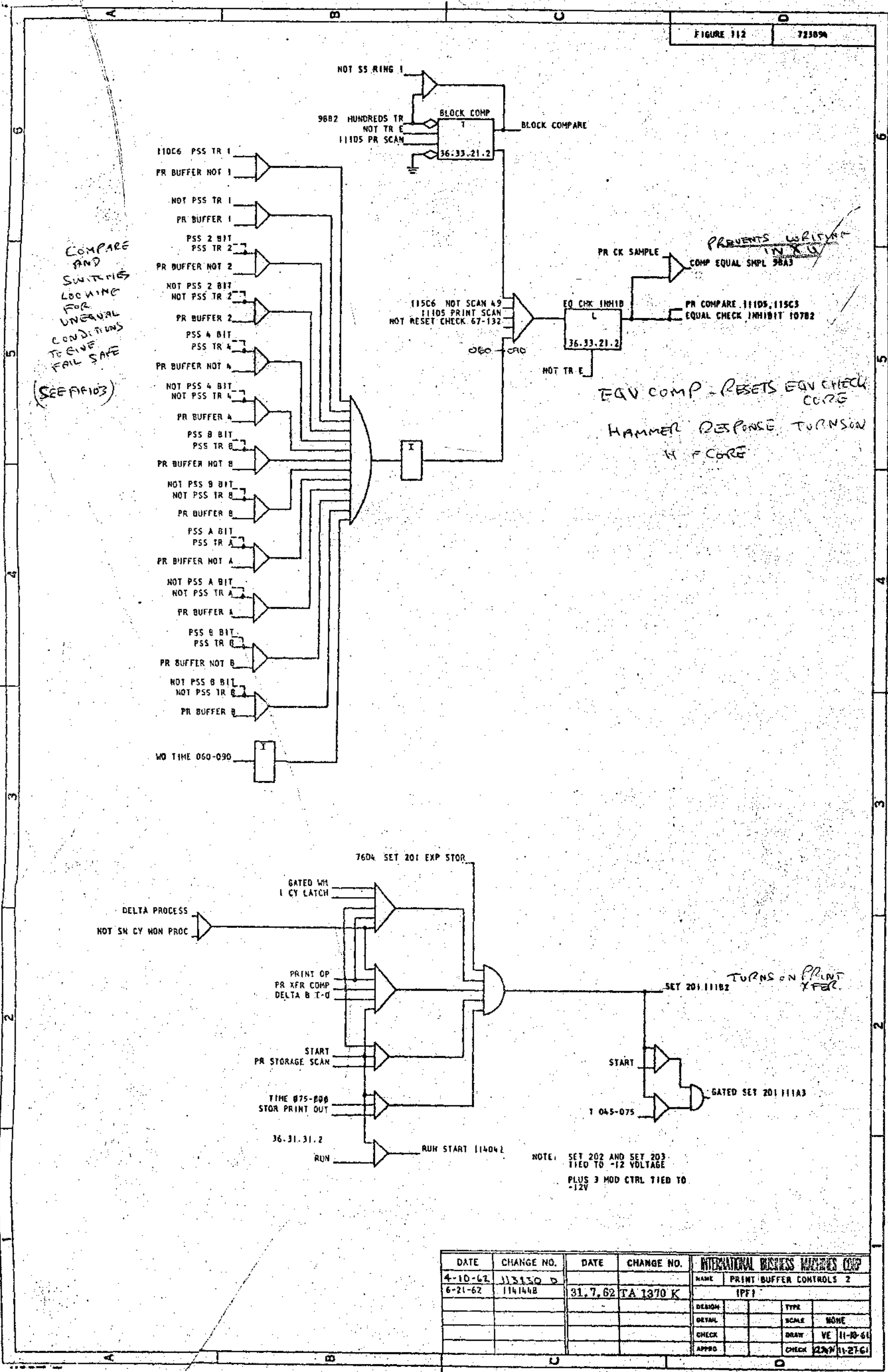
# PRINT BUFFER CONTROLS

FIGURE 111 723893



NOTE 1. JUMPER HOME PULSE TO ALLOW PRINTING TO BEGIN AT HOME TIME ONLY FOR DIAGNOSTIC USE

DATE		CHANGE NO.		INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	11330 D	31.7.62	TA 1970 K	NAME	PRINT BUFFER CONTROLS 1
				(PF)	
				DESIGN	
				DETAIL	SCALE NONE
				CHECK	DATE VE 1148-61
				APPRO	CHECK 27M 1127-61



COMPARE AND SWITCHES LOCKING FOR UNUSUAL CONDITIONS TO GIVE FAIL SAFE (SEE FIG 103)

PREVENTS WRITING IN CORE

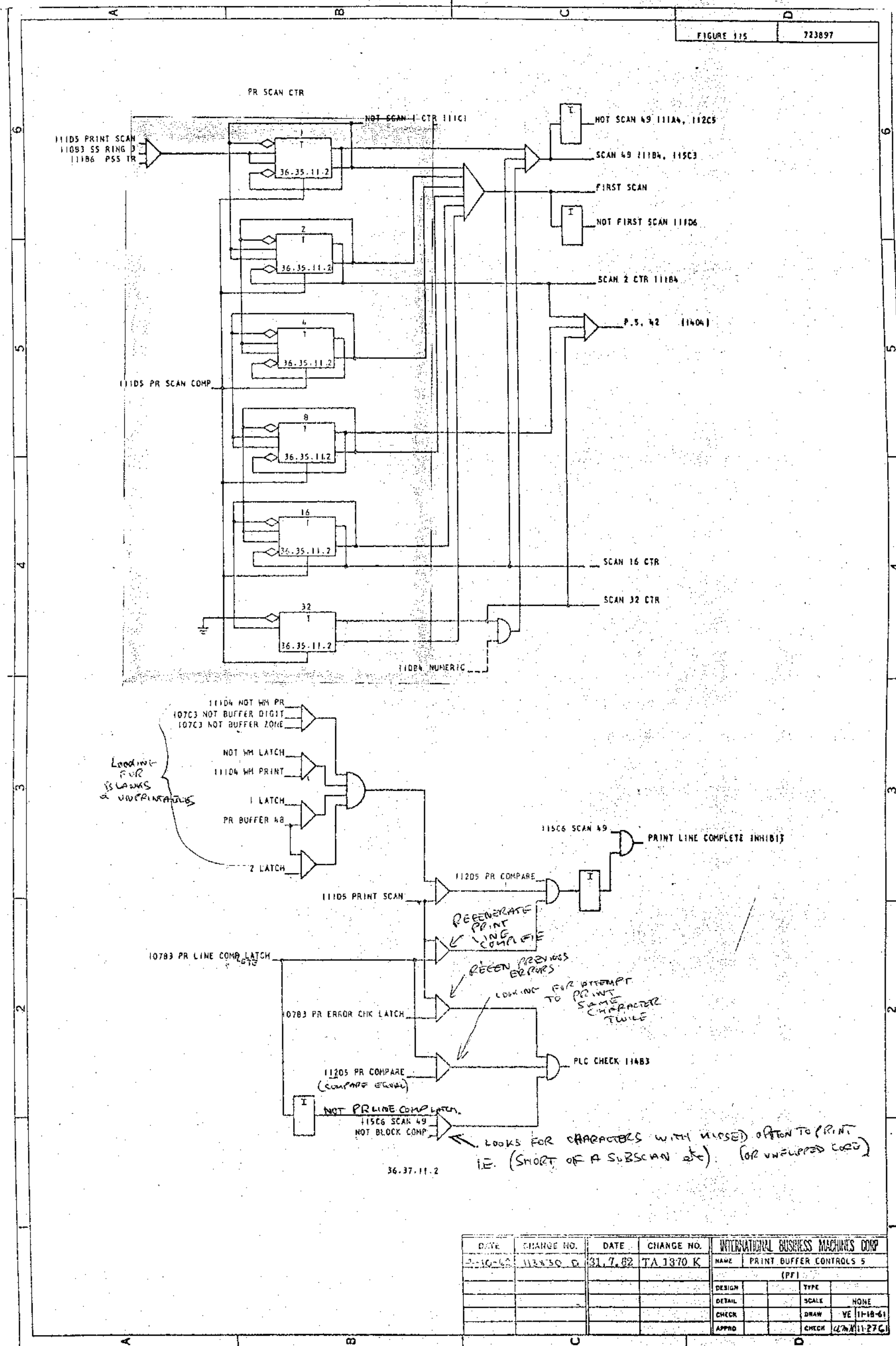
EQV COMP - RESETS EQV CHECK CORE  
HAMMER RESPONSE TURNSON IN CORE

NOTE: SET 202 AND SET 203 TIED TO -12 VOLTAGE PLUS 3 MOD CTRL TIED TO -12V

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4-10-62	113150 D			NAME PRINT BUFFER CONTROLS 2
6-21-62	114144B	31.7.62	TA 1370 K	IPF1
				DESIGN
				DETAIL
				CHECK
				APPRO
				TYPE
				SCALE NONE
				DRAW VE 11-10-61
				CHECK 22/11-27-61

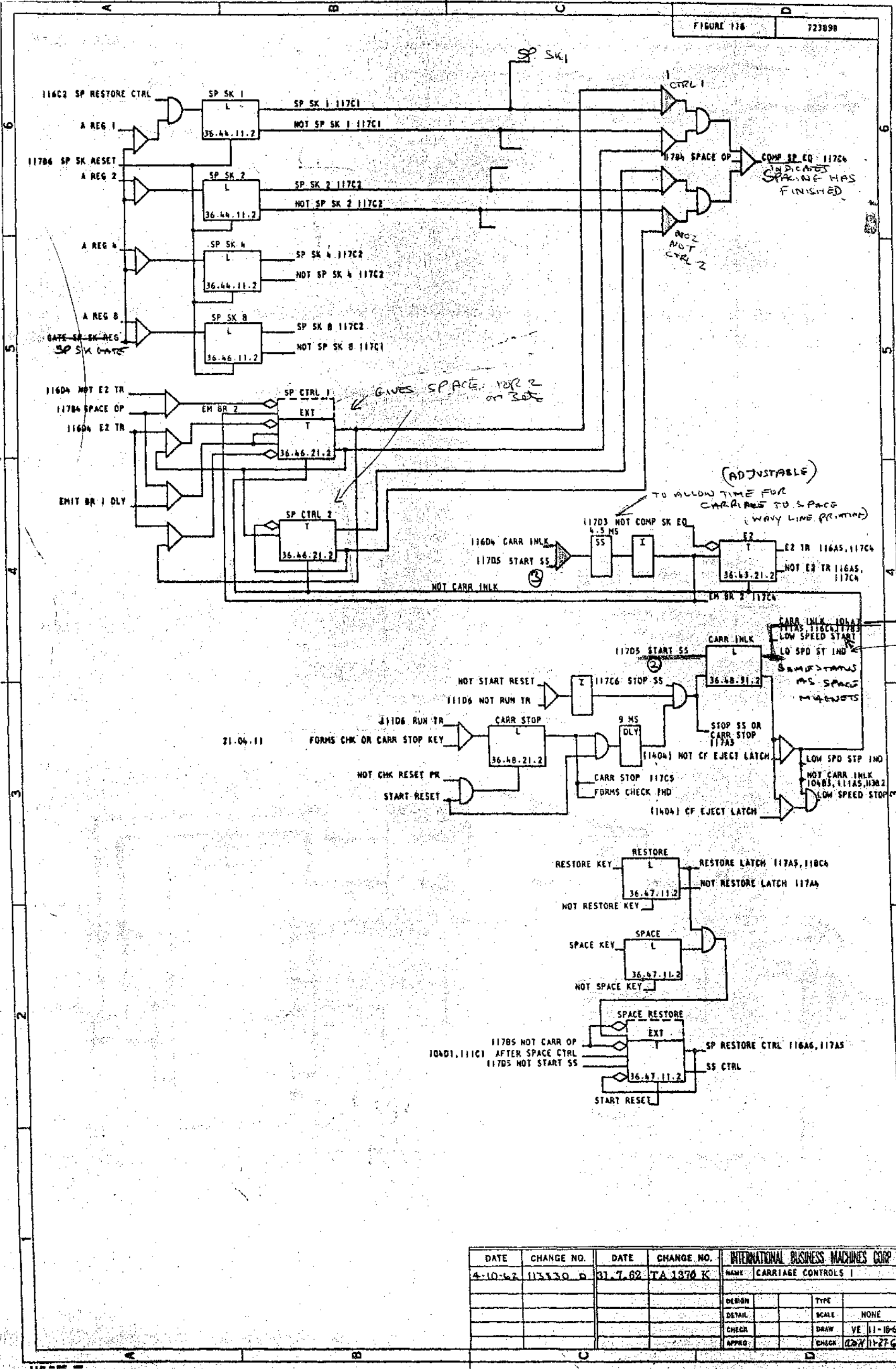






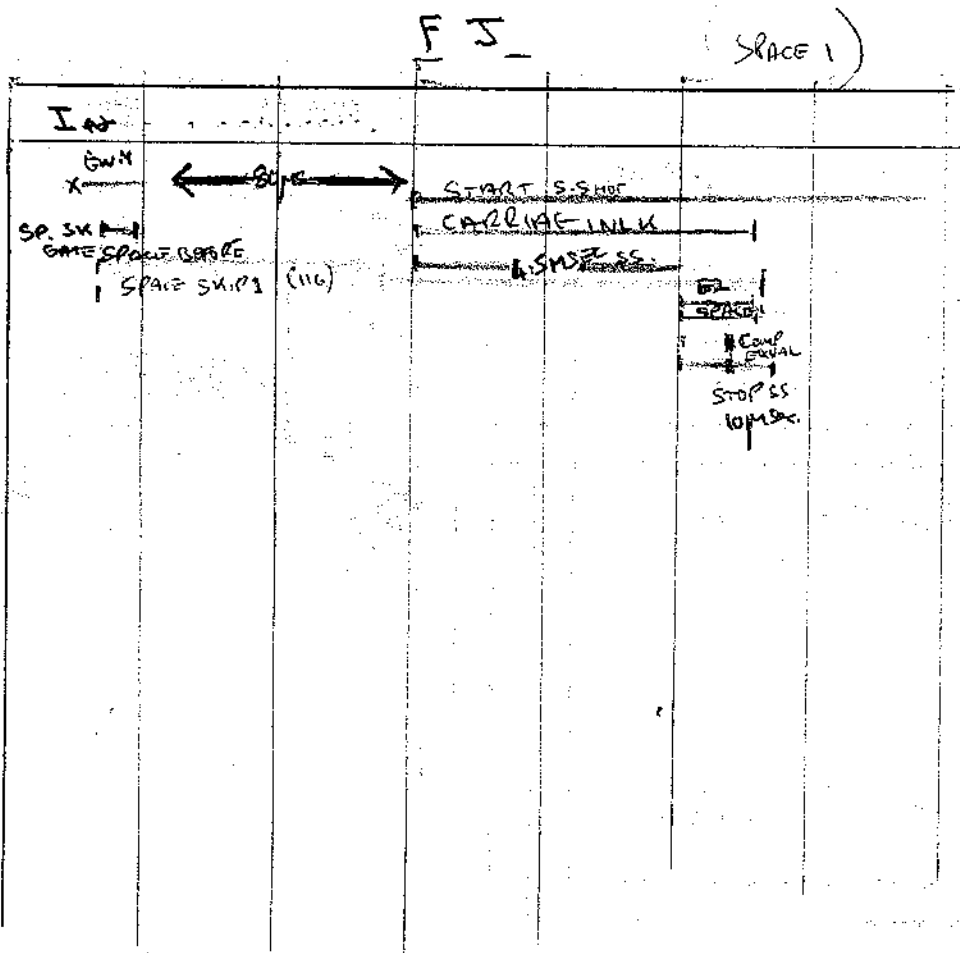
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP		
2-10-62	11230 D	31.7.62	TA 1370 K	NAME	PRINT BUFFER CONTROLS 5	
					(PFI)	
				DESIGN		TYPE
				DETAIL		SCALE NONE
				CHECK		DRAW VE 11-18-61
				APPRO		CHECK 4/2/11-27-61





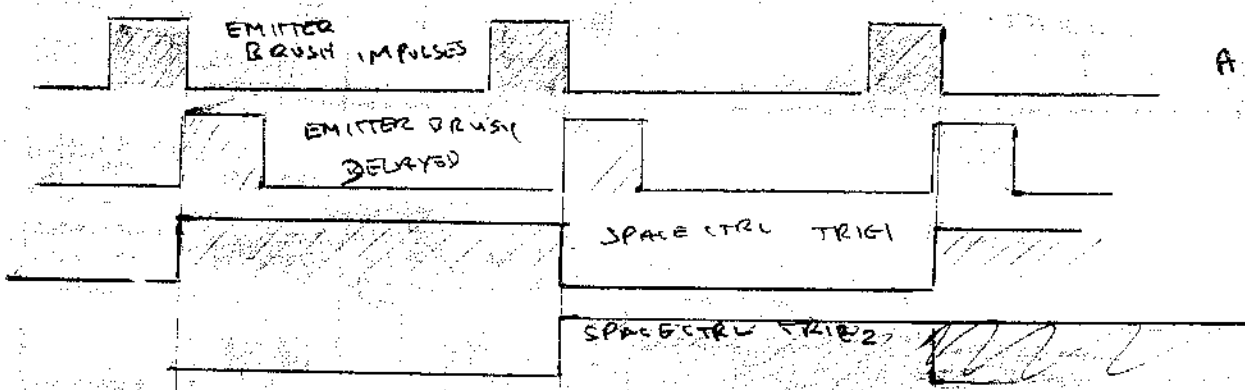
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP.
4-10-62	113330 D	31-7-62	TA 1370 K	NAME: CARRIAGE CONTROLS I
				DESIGN
				TYPE
				DETAIL
				SCALE NONE
				CHECK
				DRAW VE 11-18-61
				APPRO
				CHECK 22X 11-27-61

1711



	SPACE	SKIP
(IMMEDIATE) BEFORE	B	
AFTER	A	AB

BEWARE OF -U LEVELS BEING USED AS ACTIVE



A4 117

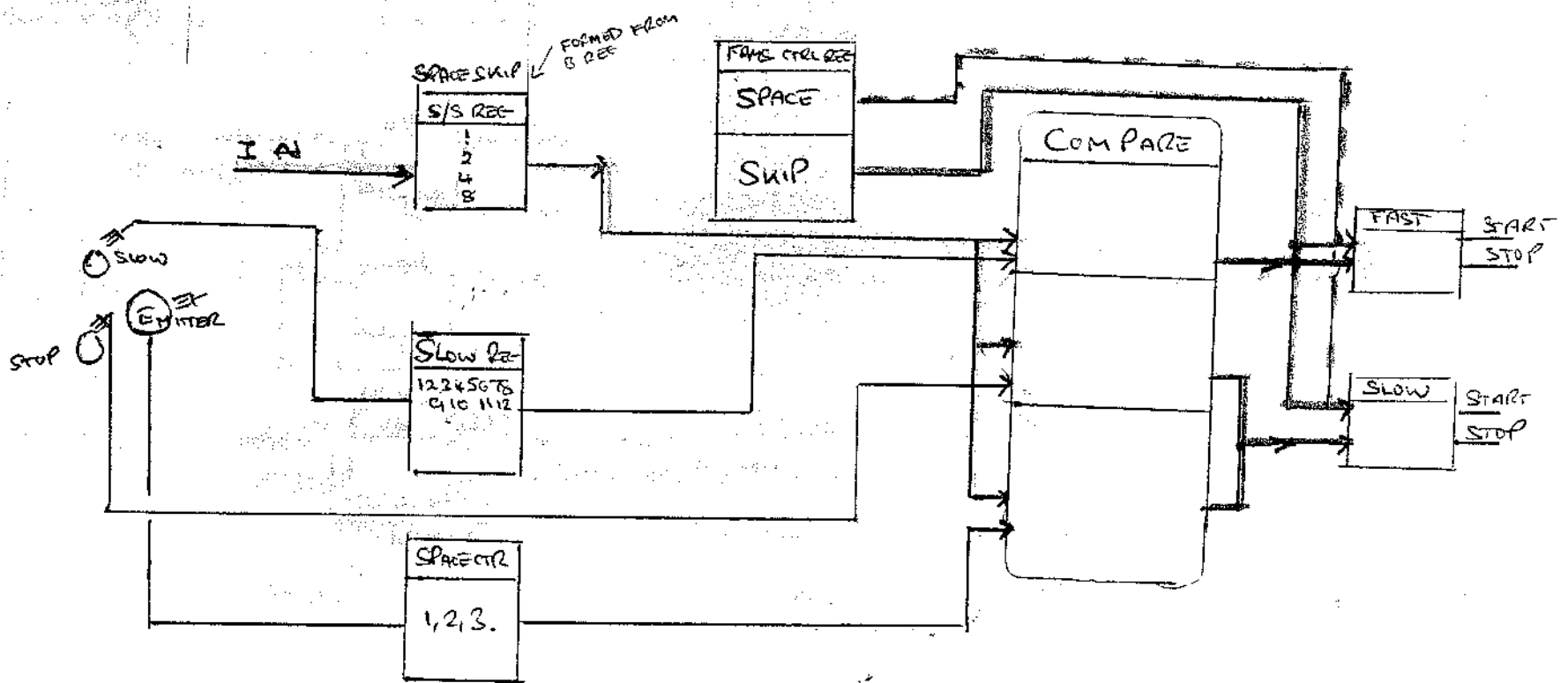
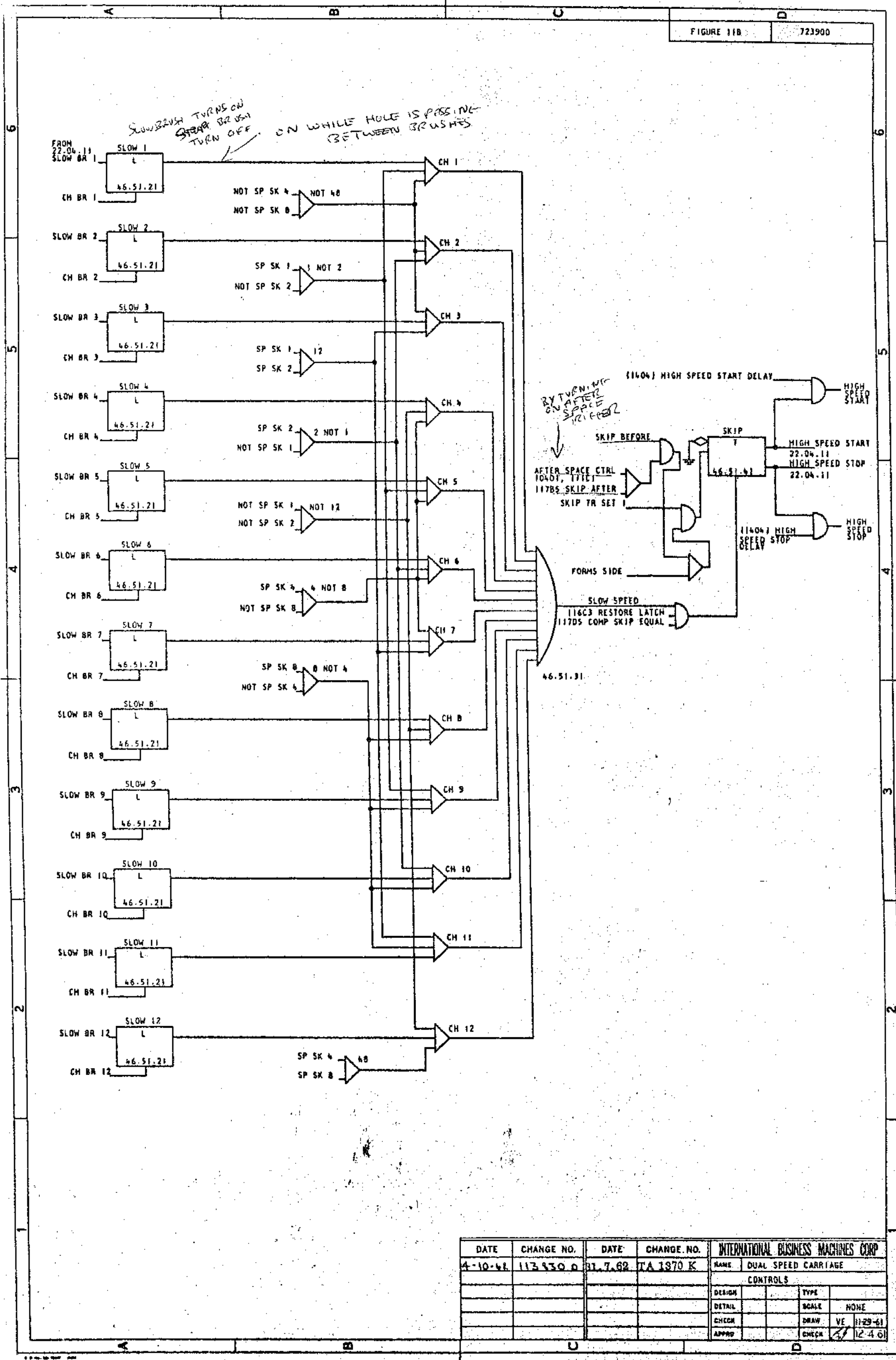
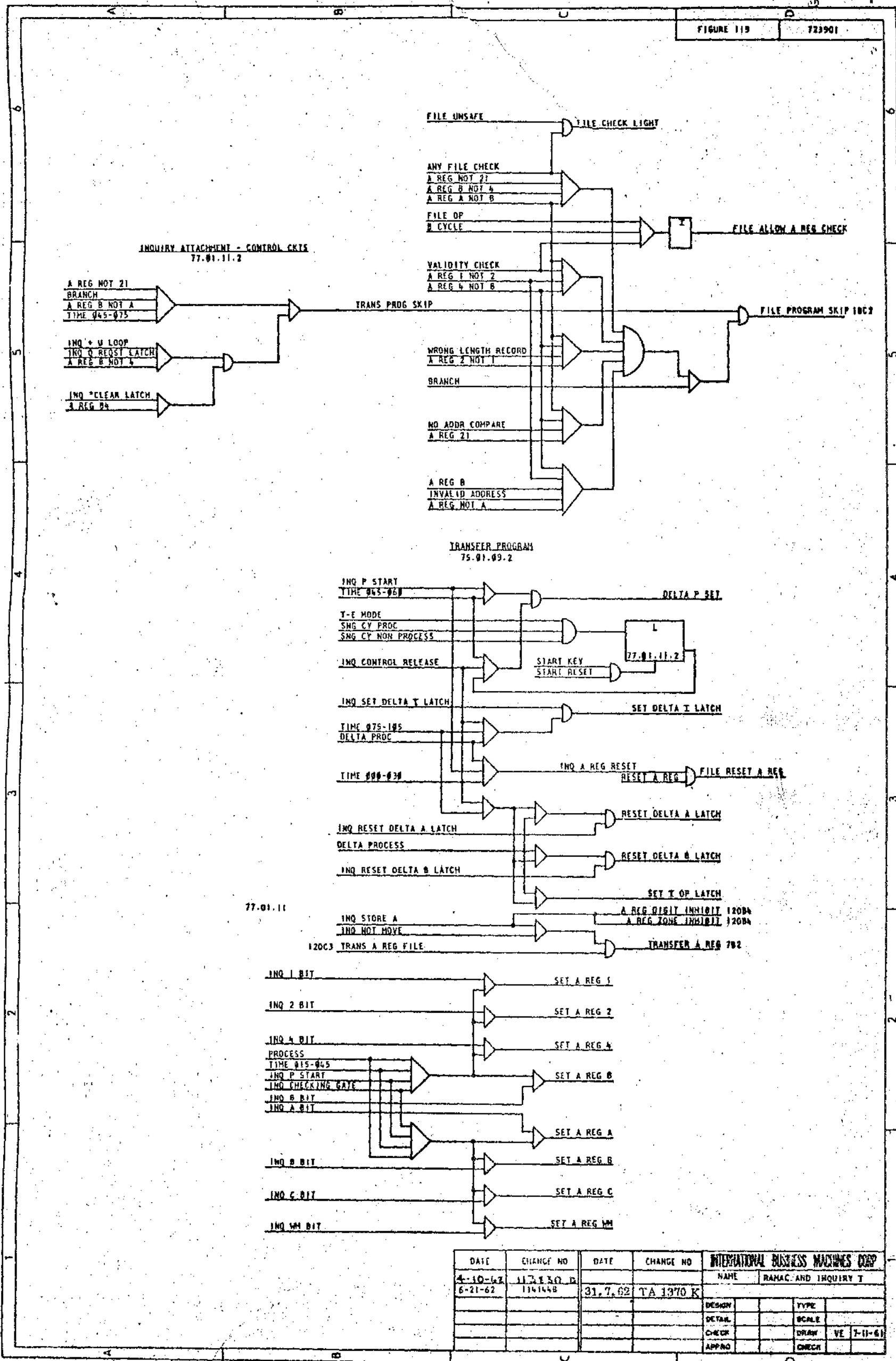


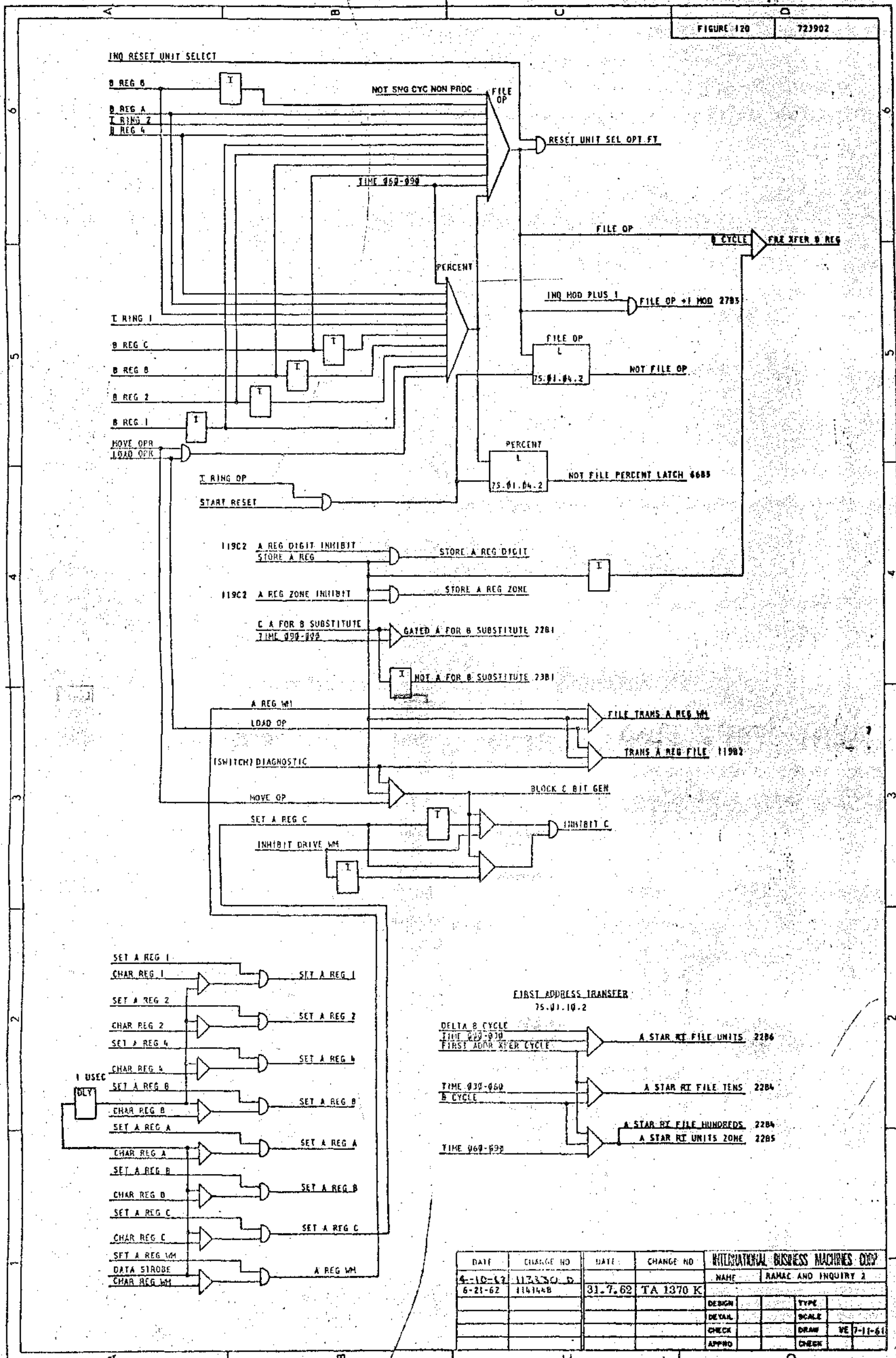


FIGURE 11B 723900



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-61	113 930 D	31.7.62	TA 1870 K	NAME	DUAL SPEED CARRIAGE		
				CONTROLS			
				DESIGN	TYPE		
				DETAIL	SCALE	NONE	
				CHECK	DRAW	VE	11-29-61
				APPROV	CHECK		12-4-61

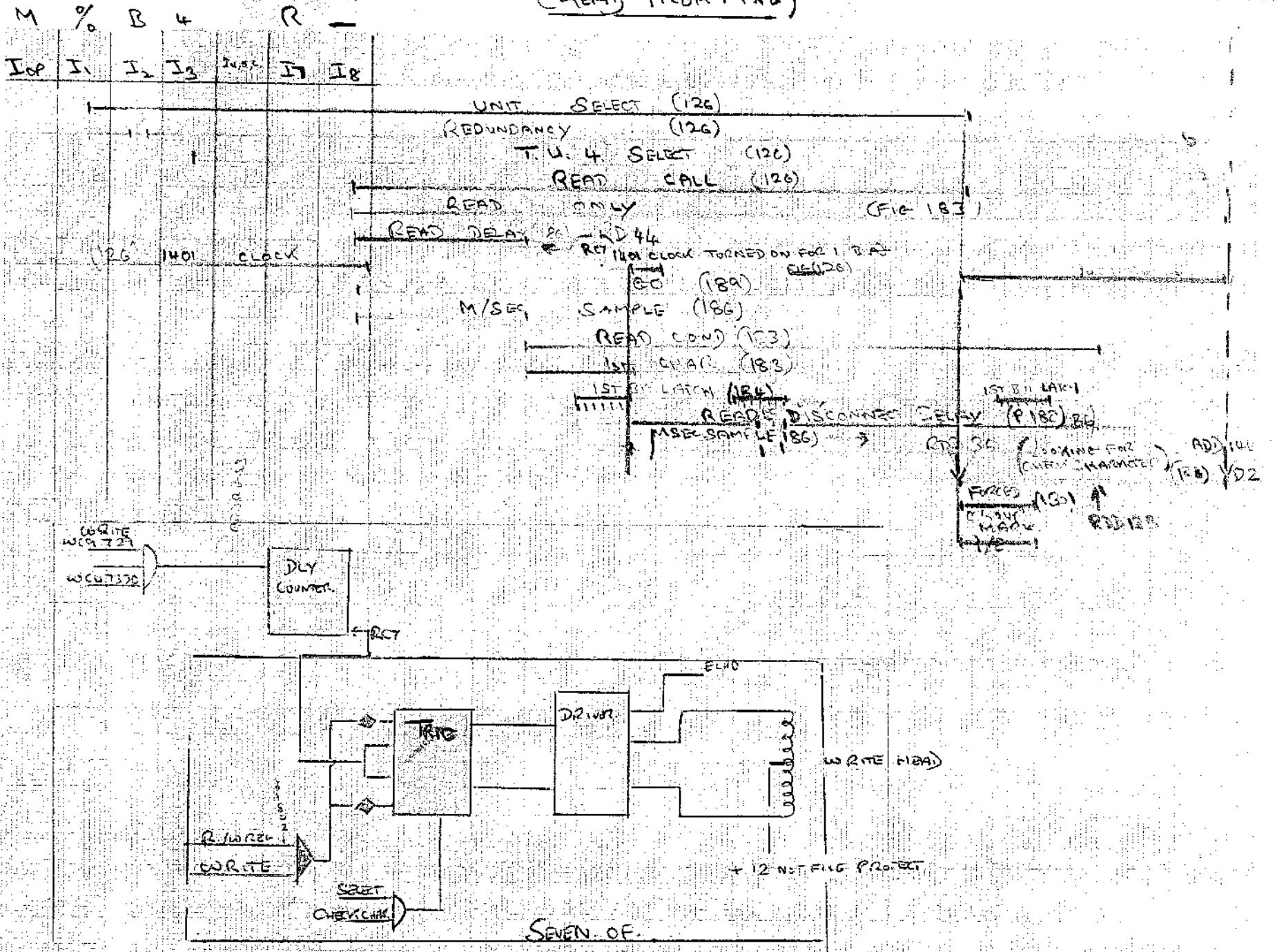




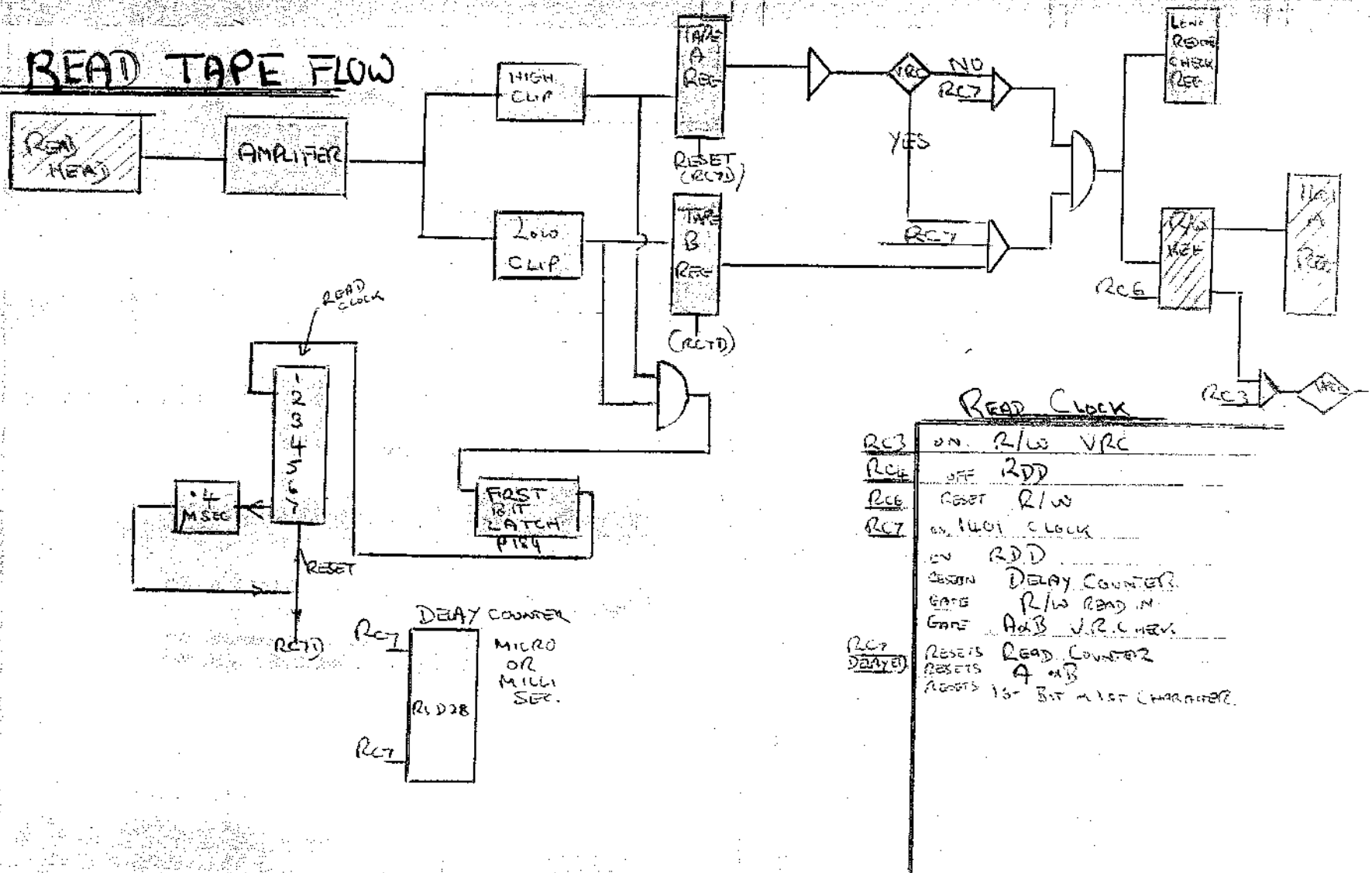
DATE	CHANGE NO	DATE	CHANGE NO	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-62	113330 D	31.7.62	TA 1370 K	NAME	RAMAC AND INQUIRY 2
6-21-62	116144B			DESIGN	TYPE
				DETAIL	SCALE
				CHECK	DRAW VE 7-11-61
				APPROV	CHECK



(READ FROM TAPE)

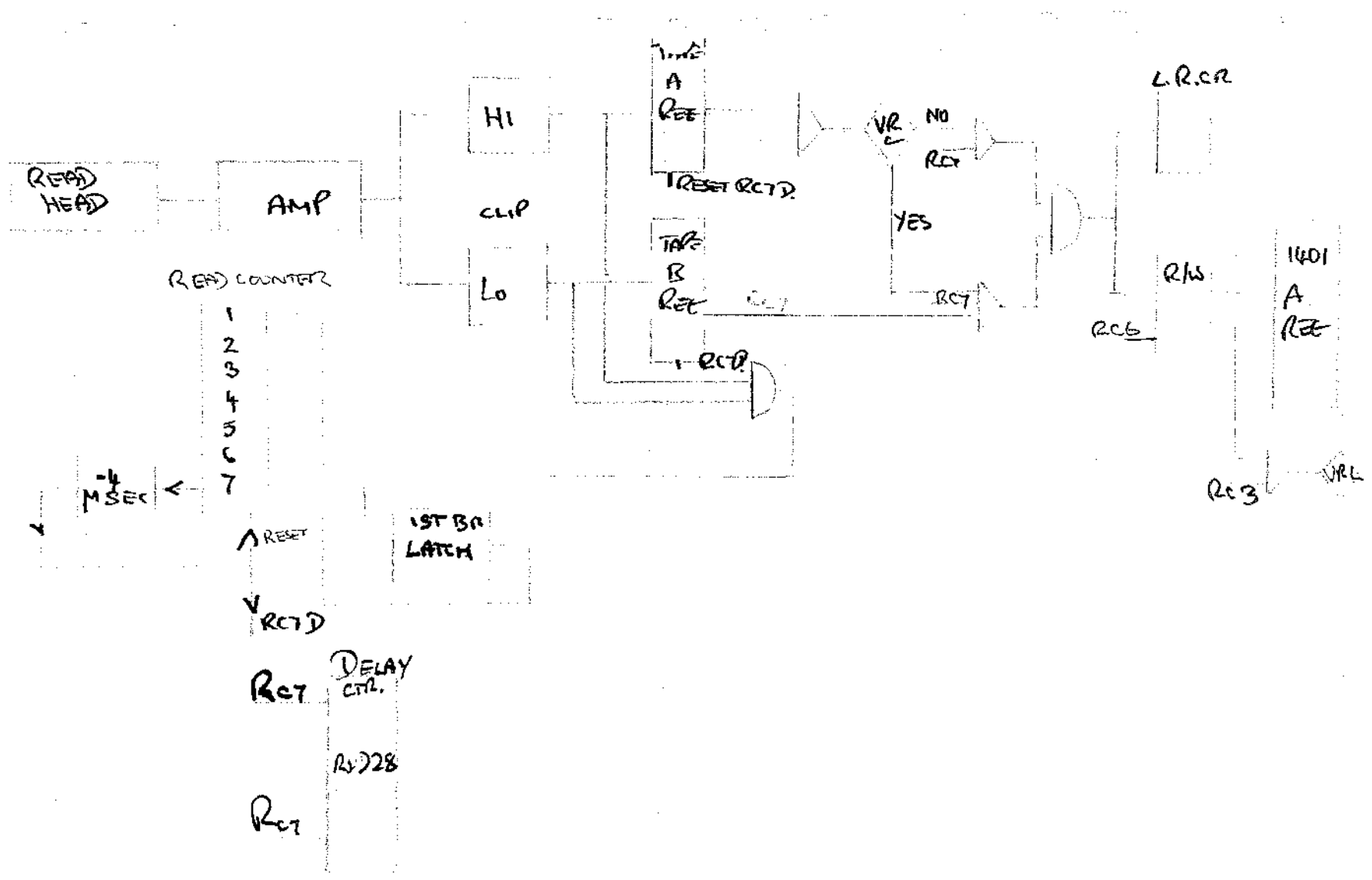


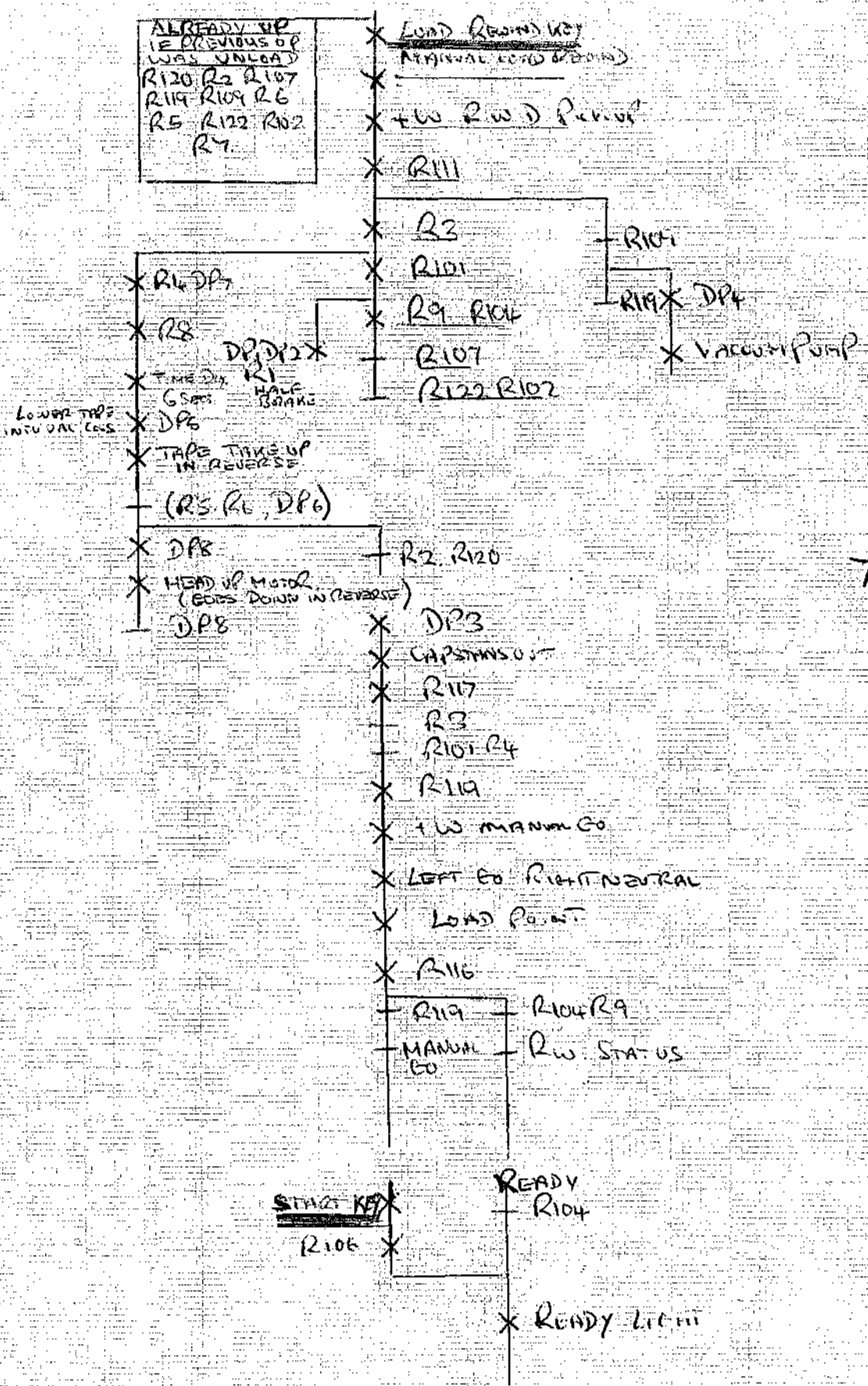
READ TAPE FLOW





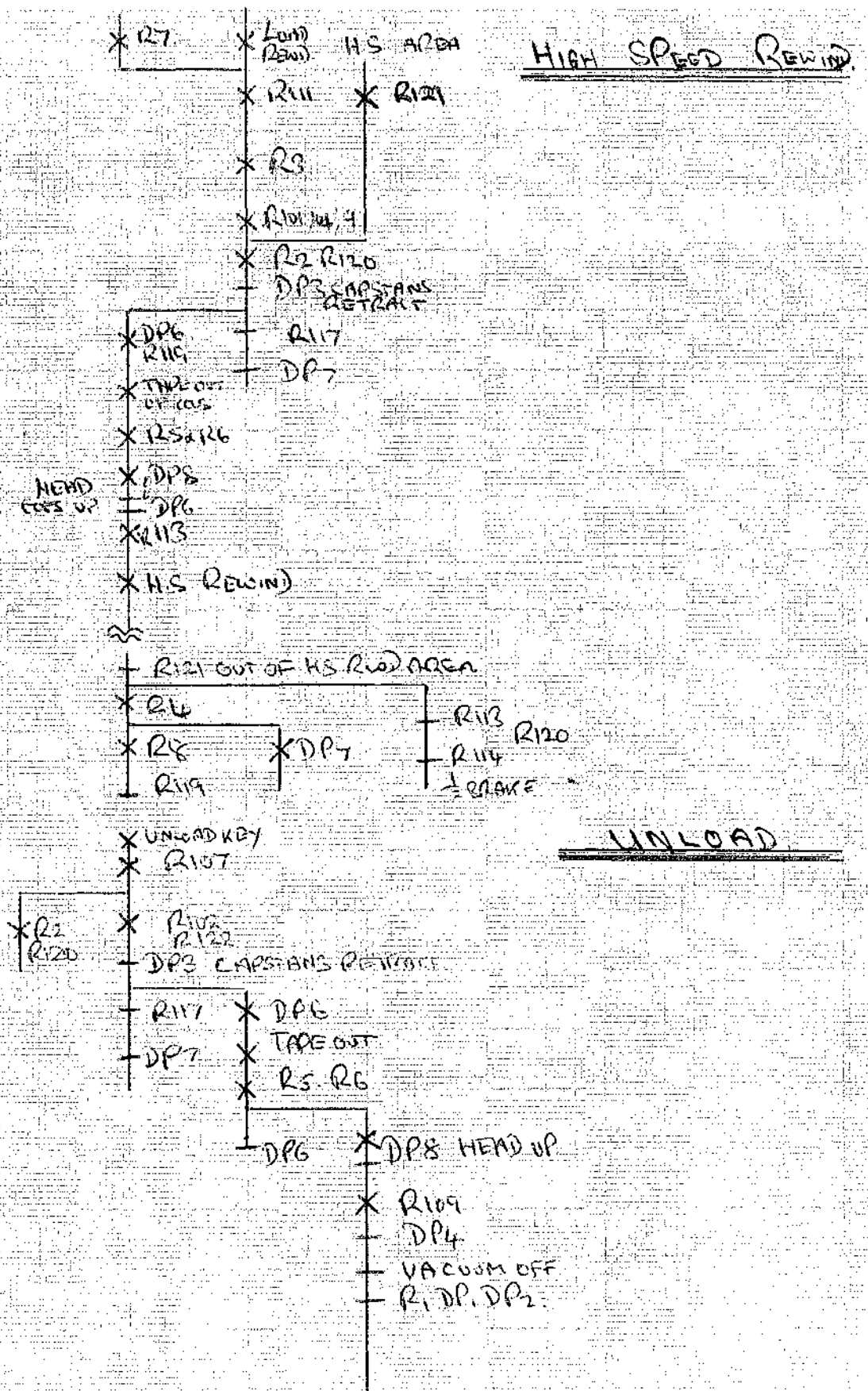


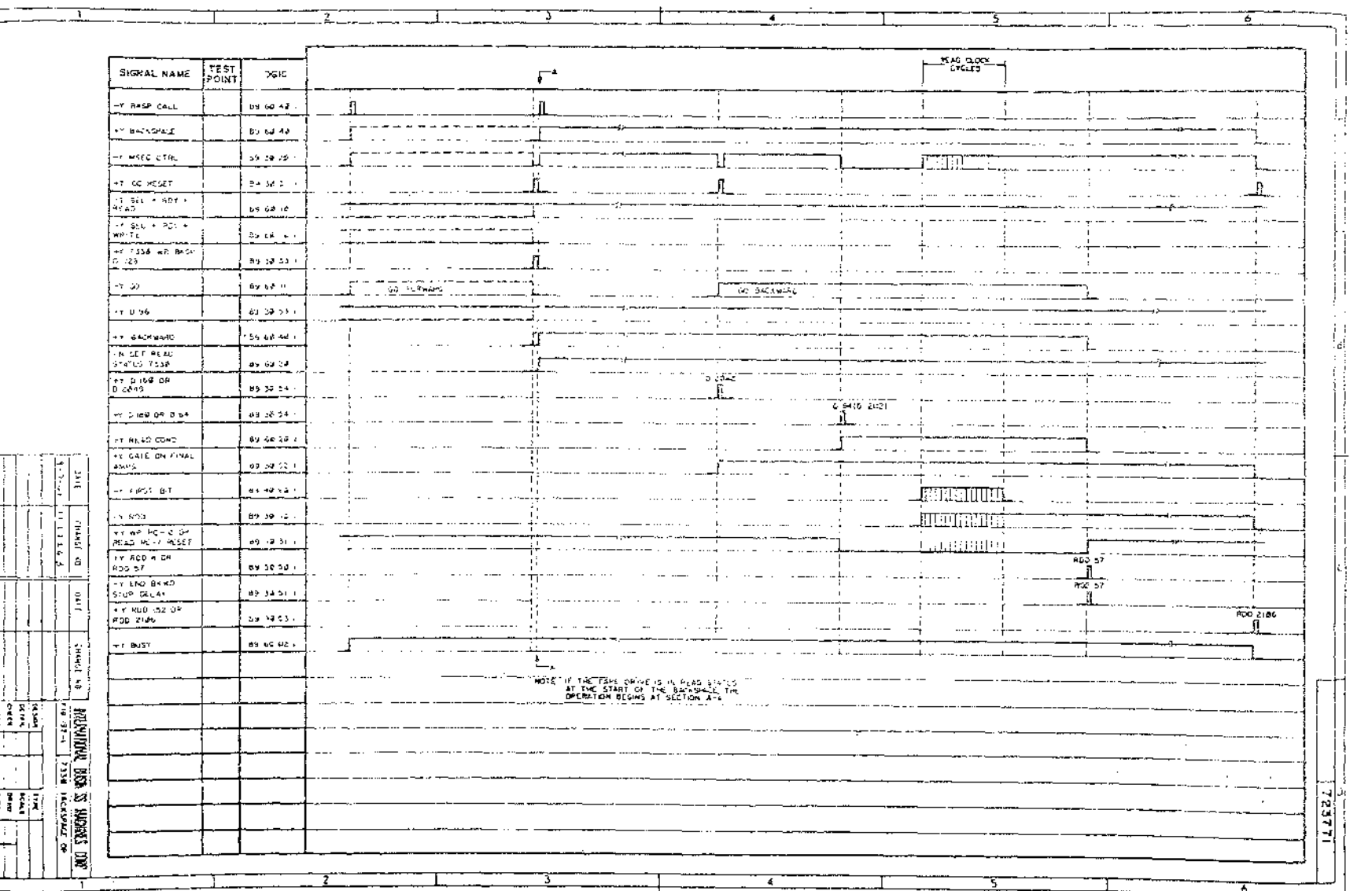
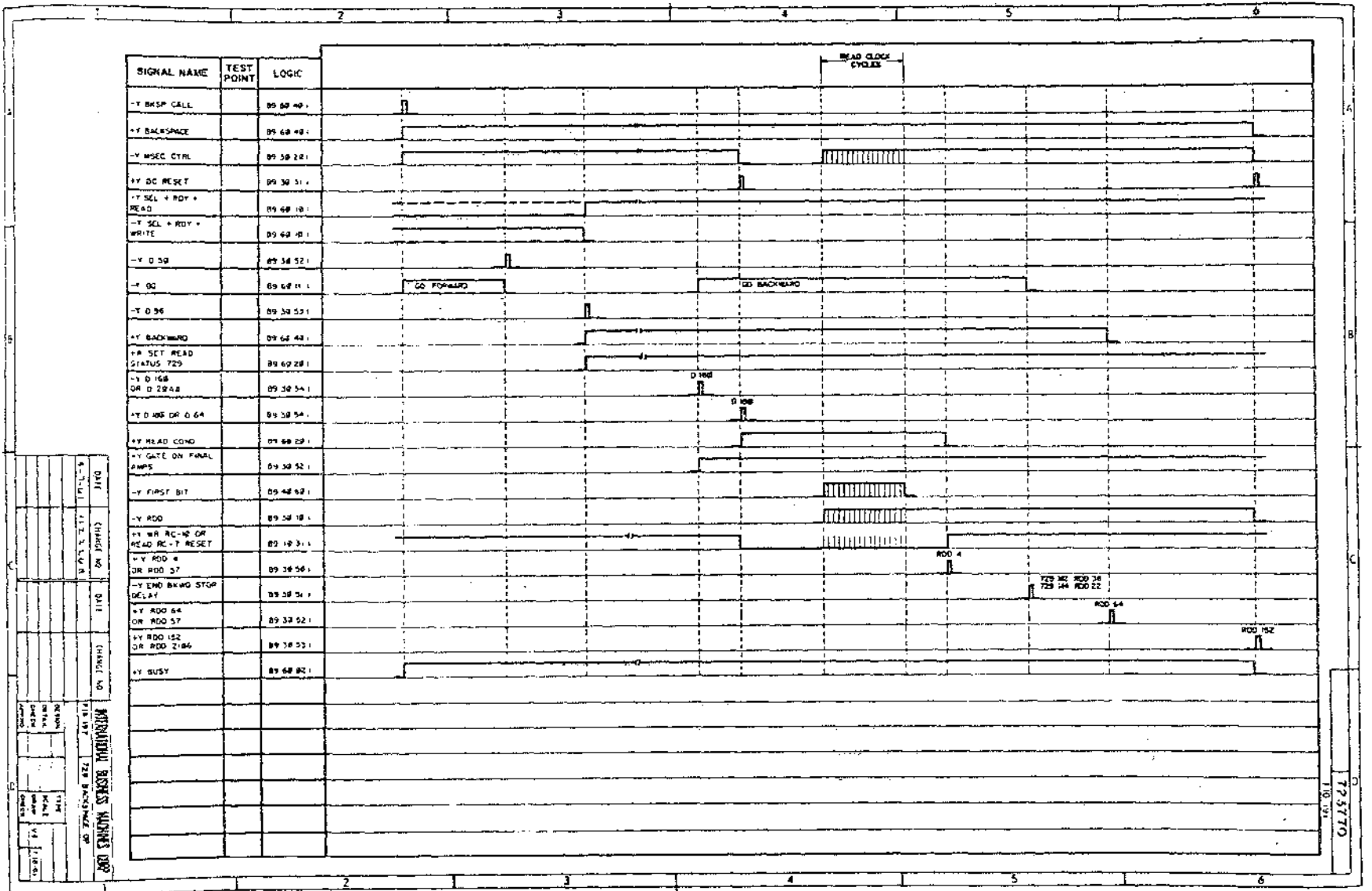




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11





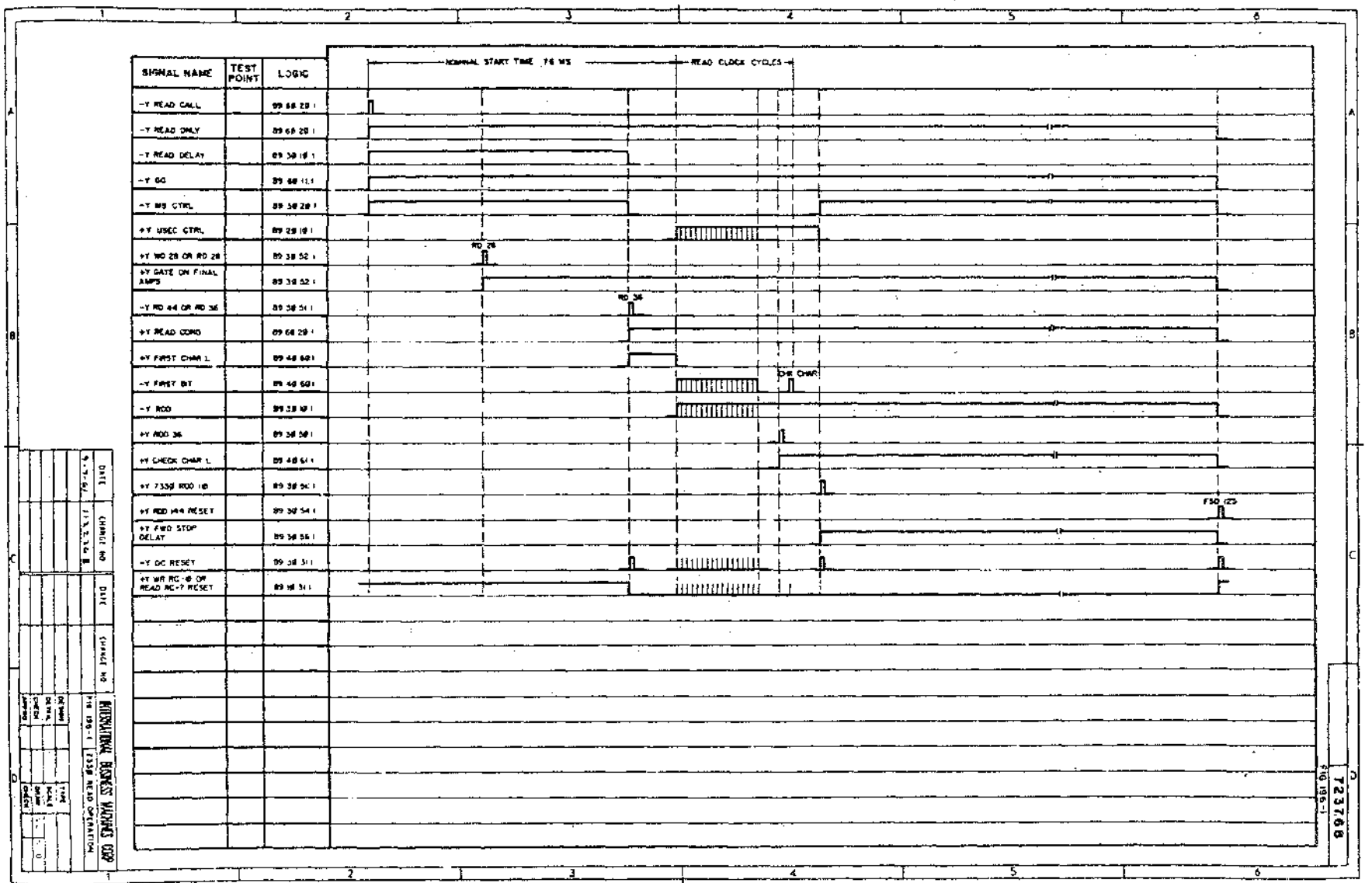
723

724

17-10-01 TA 378287B

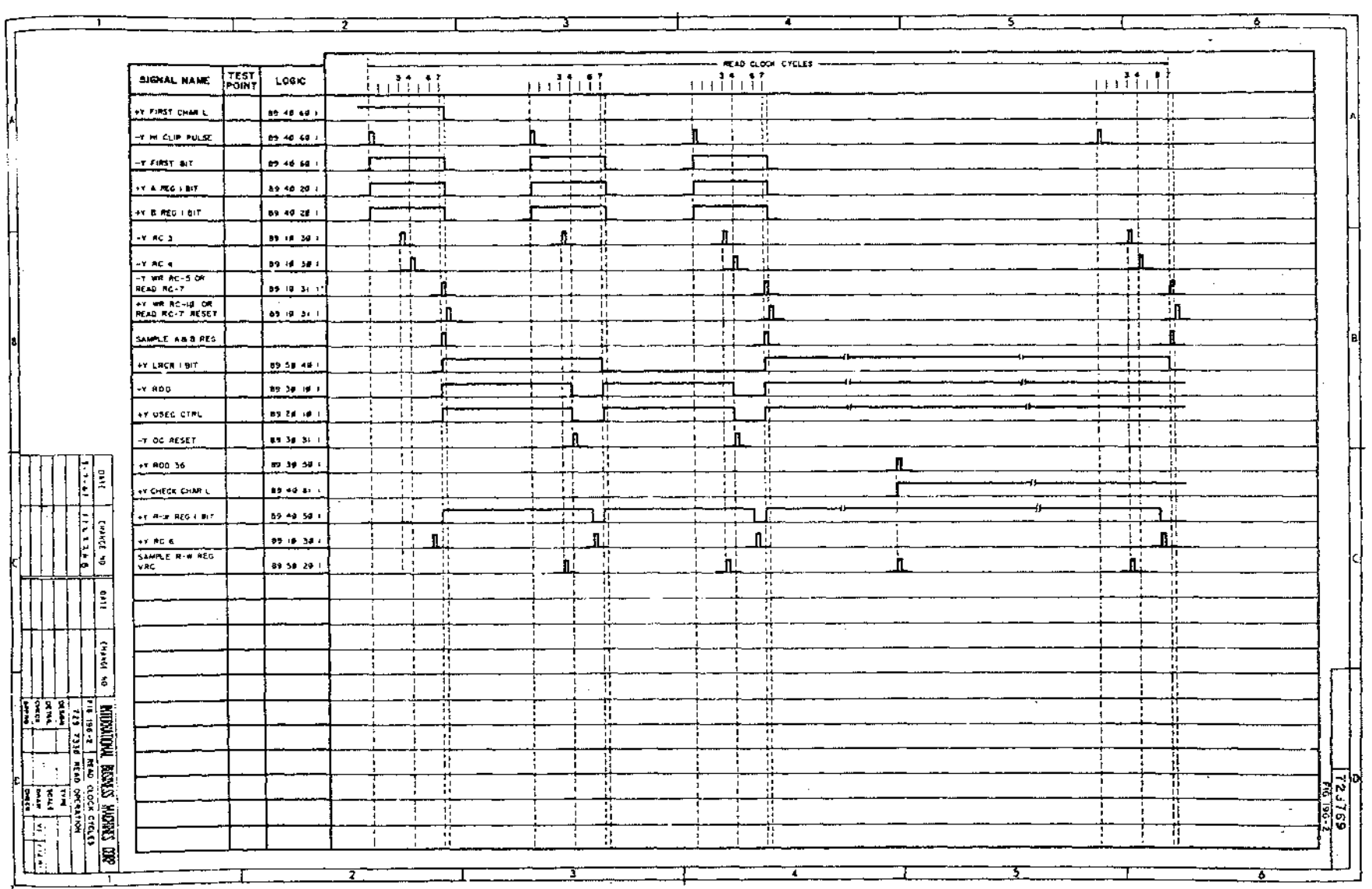
723770

17-10-01 TA 378287B



1710, BT, TA, JS  
72168  
2-061, 09  
69/1/21

721



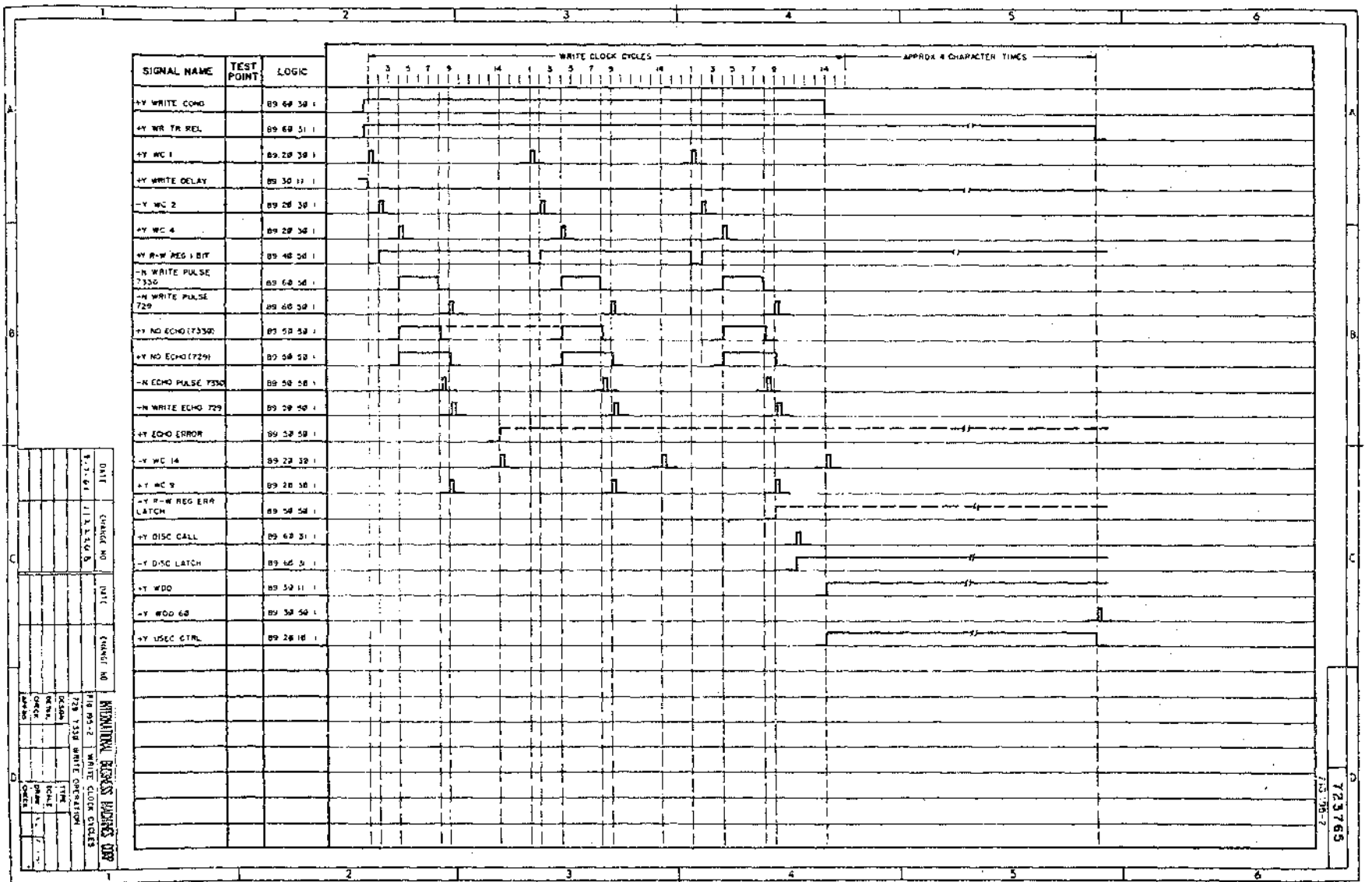
1710, BT, TA, JS  
72168  
2-061, 09  
69/1/21

122



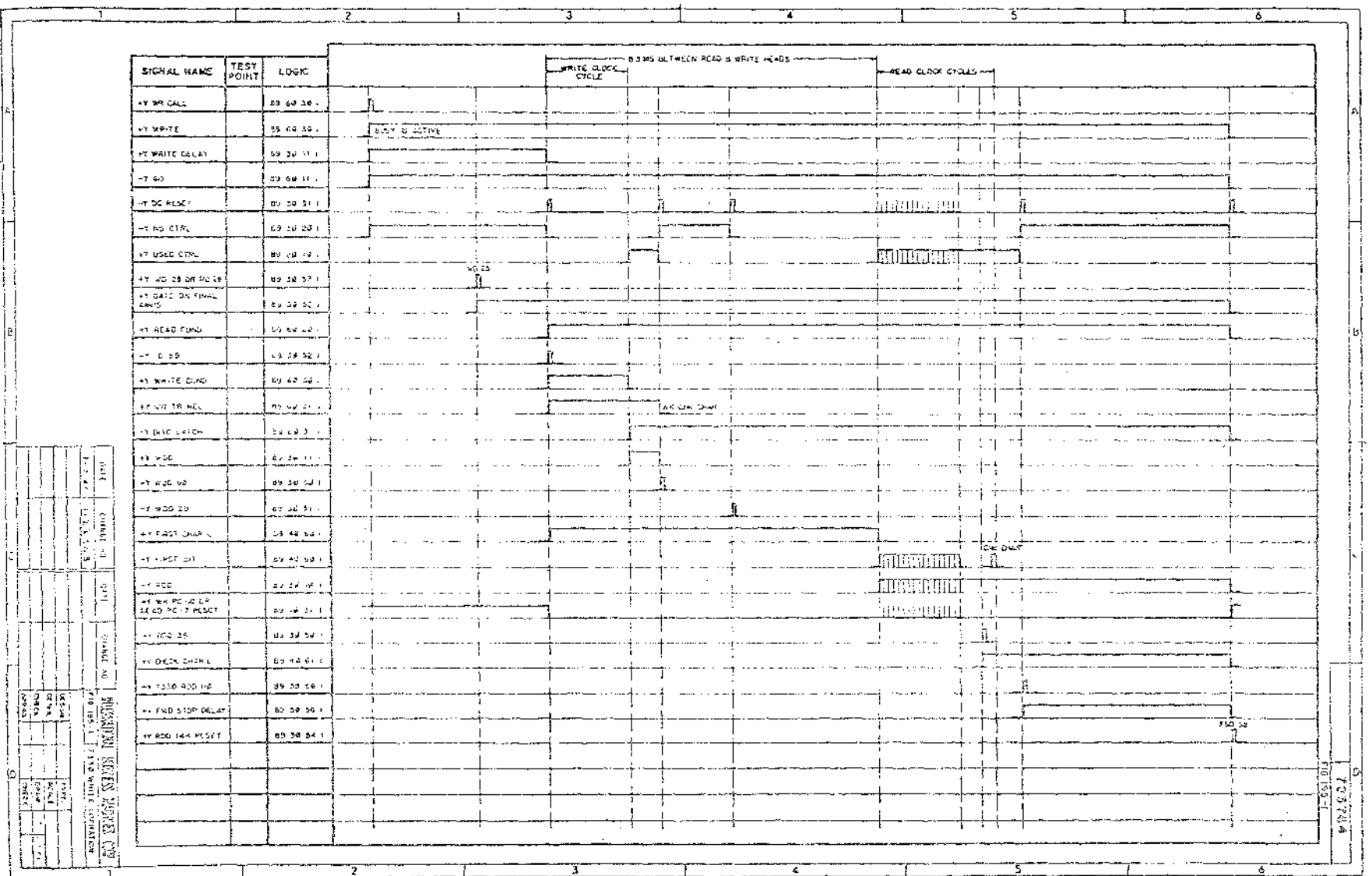






17,10,81 TA 1

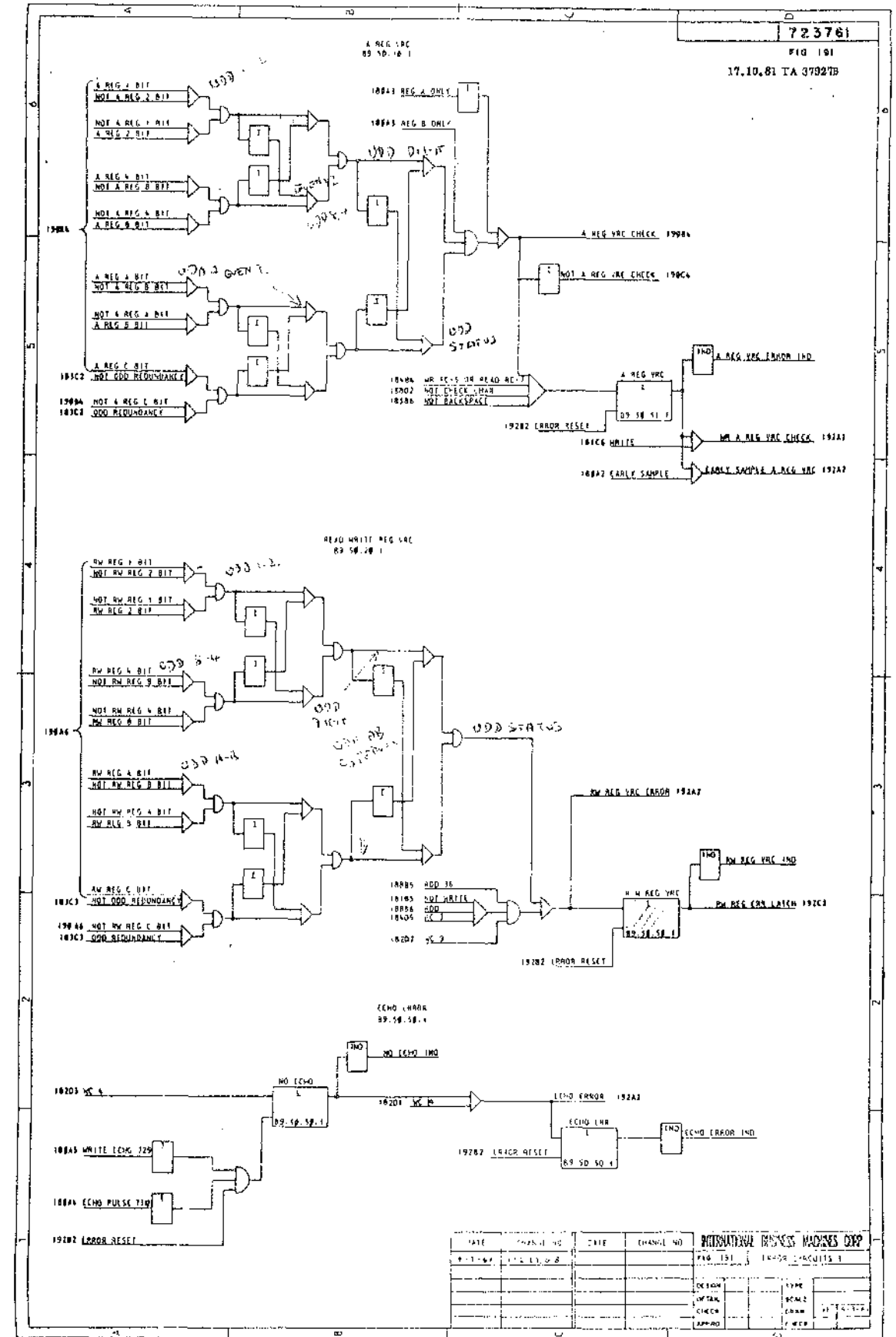
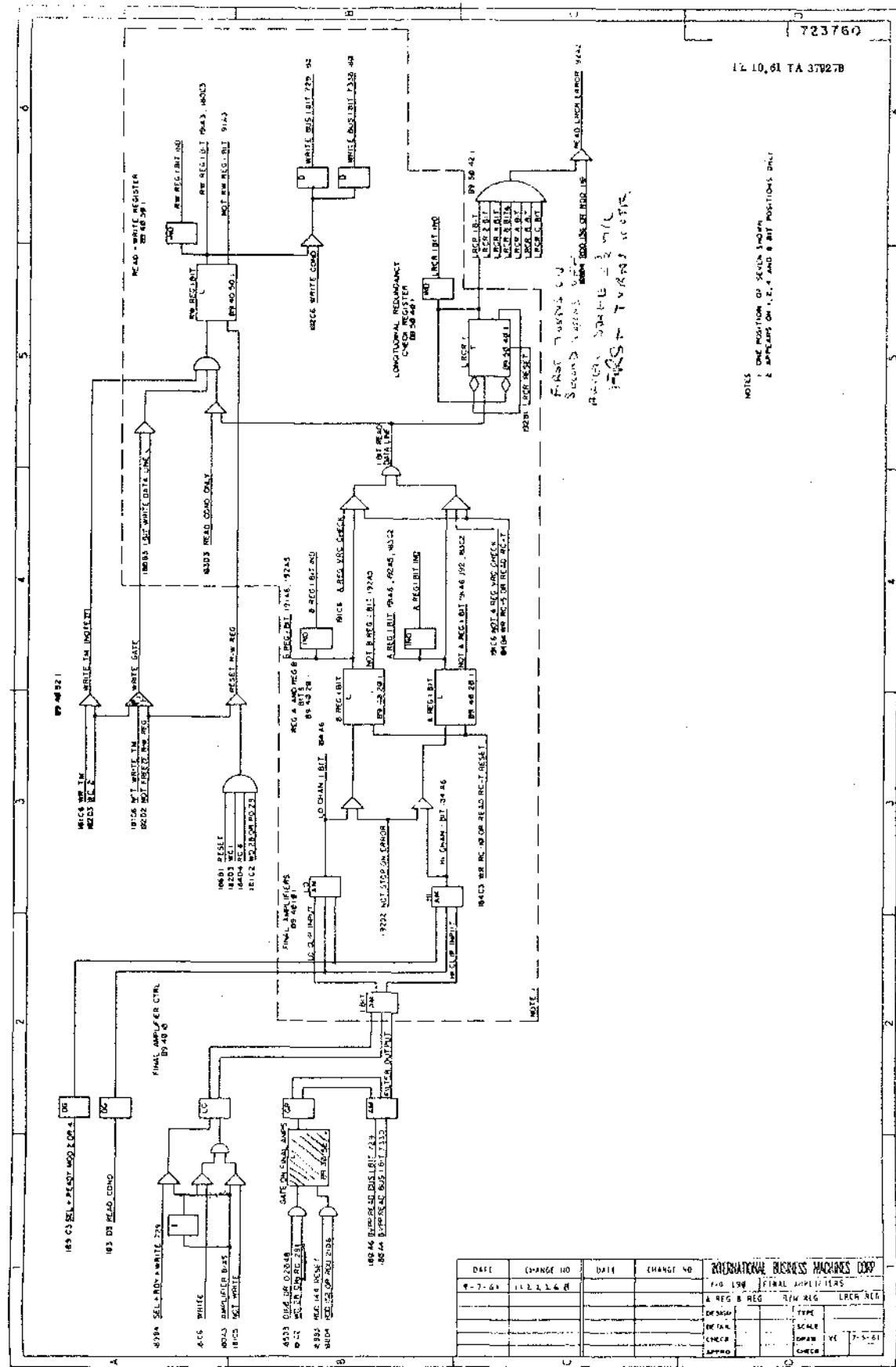
717

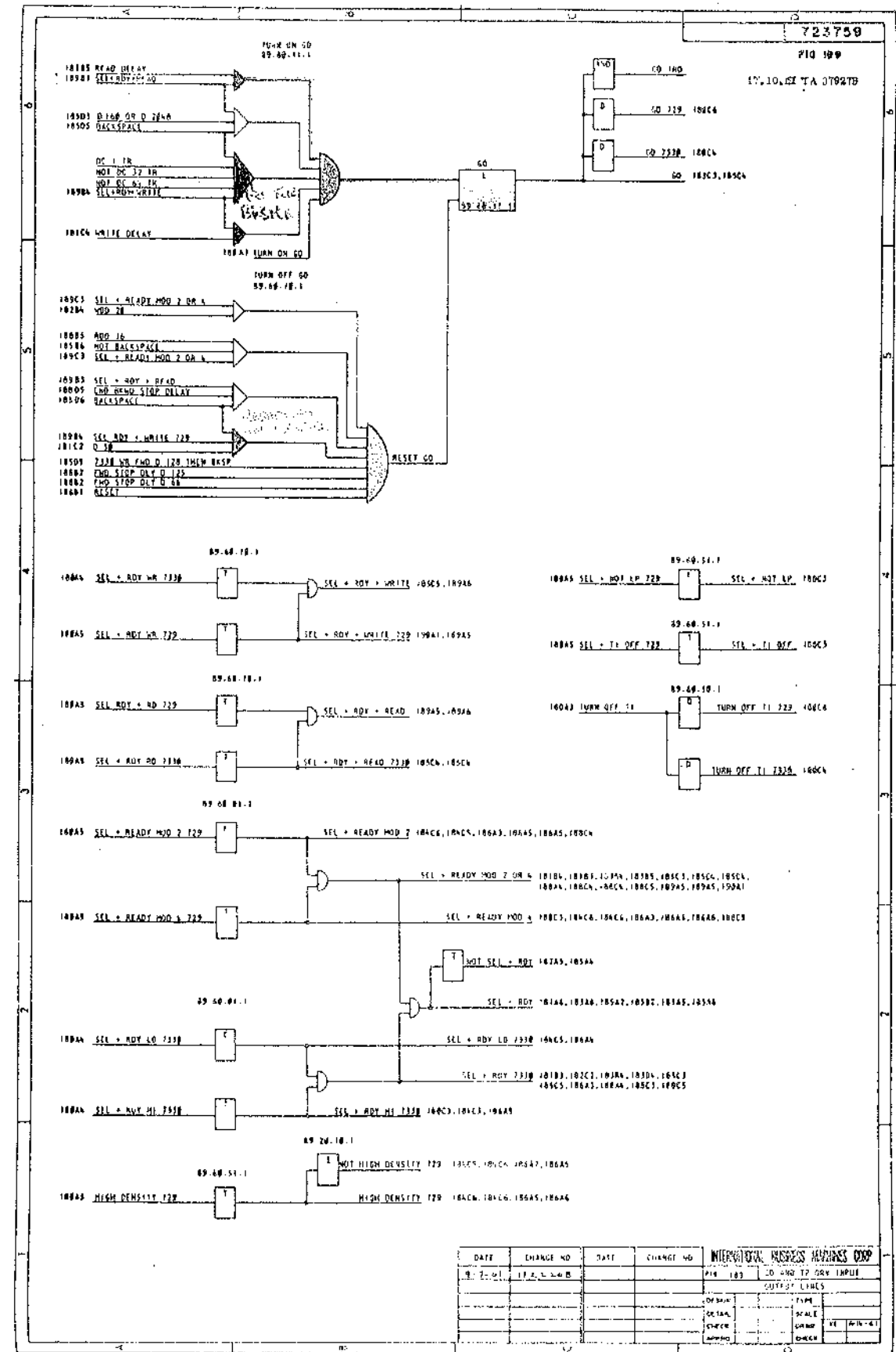
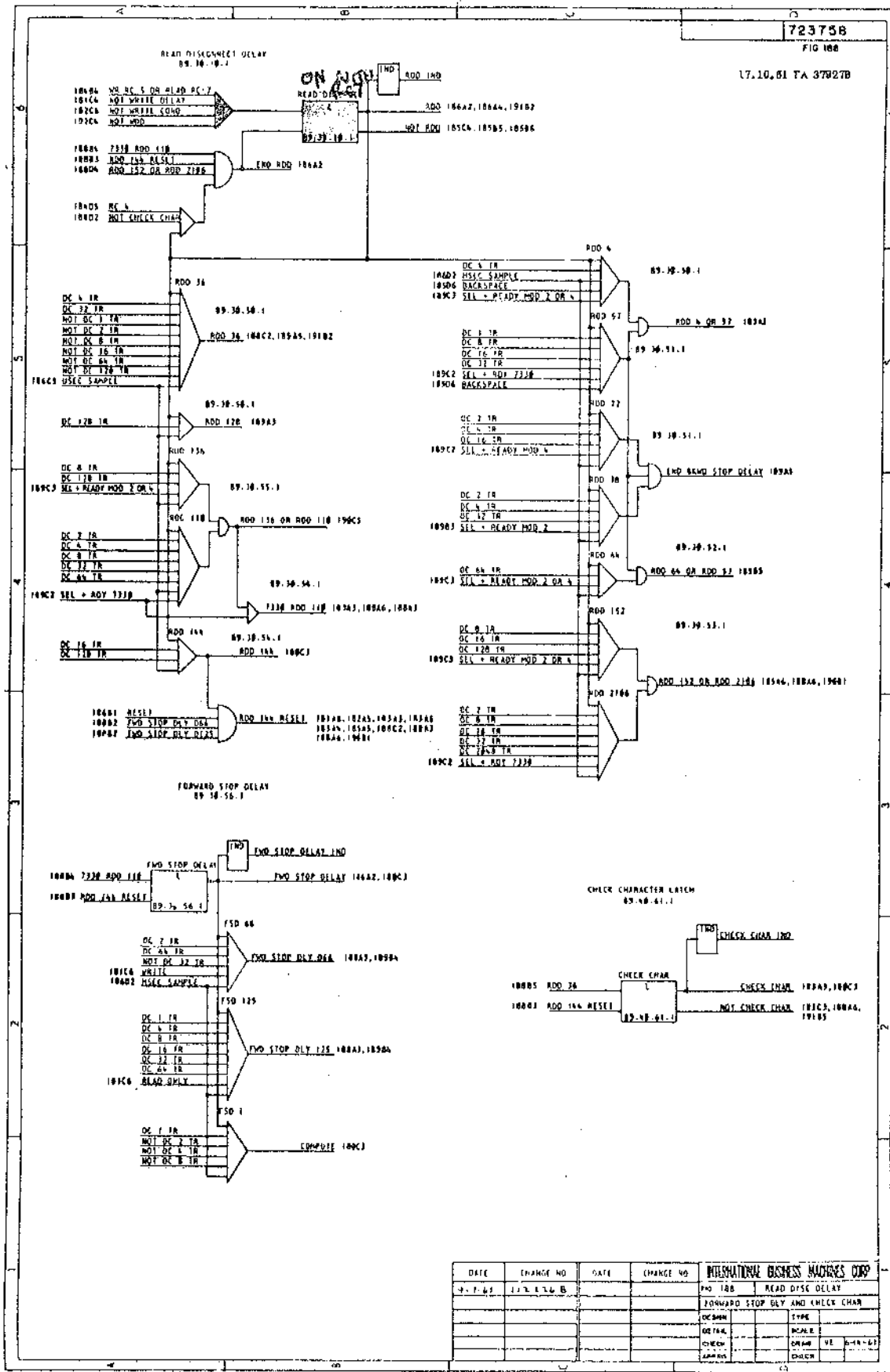


17,10,81 TA 308878

718









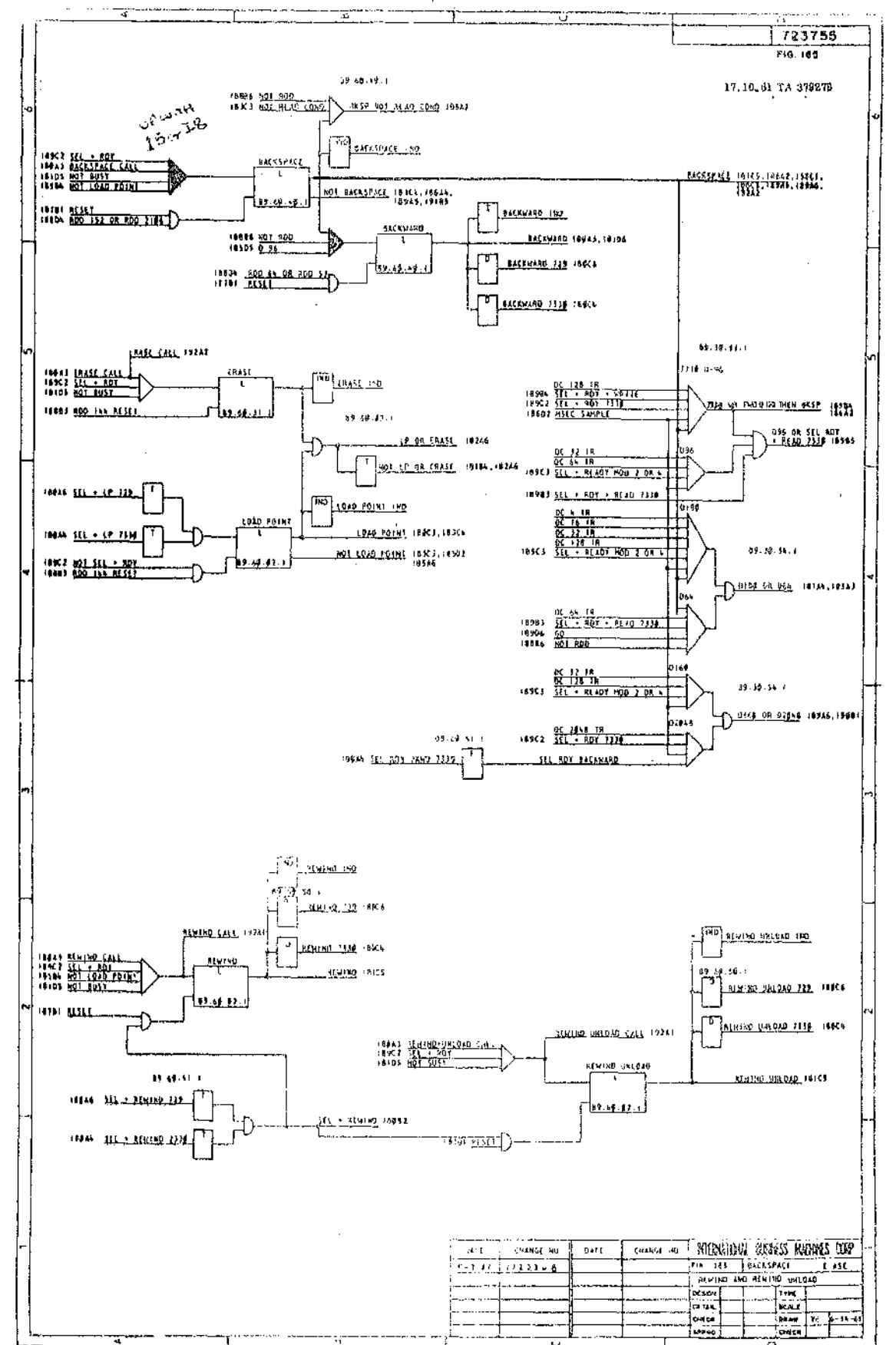
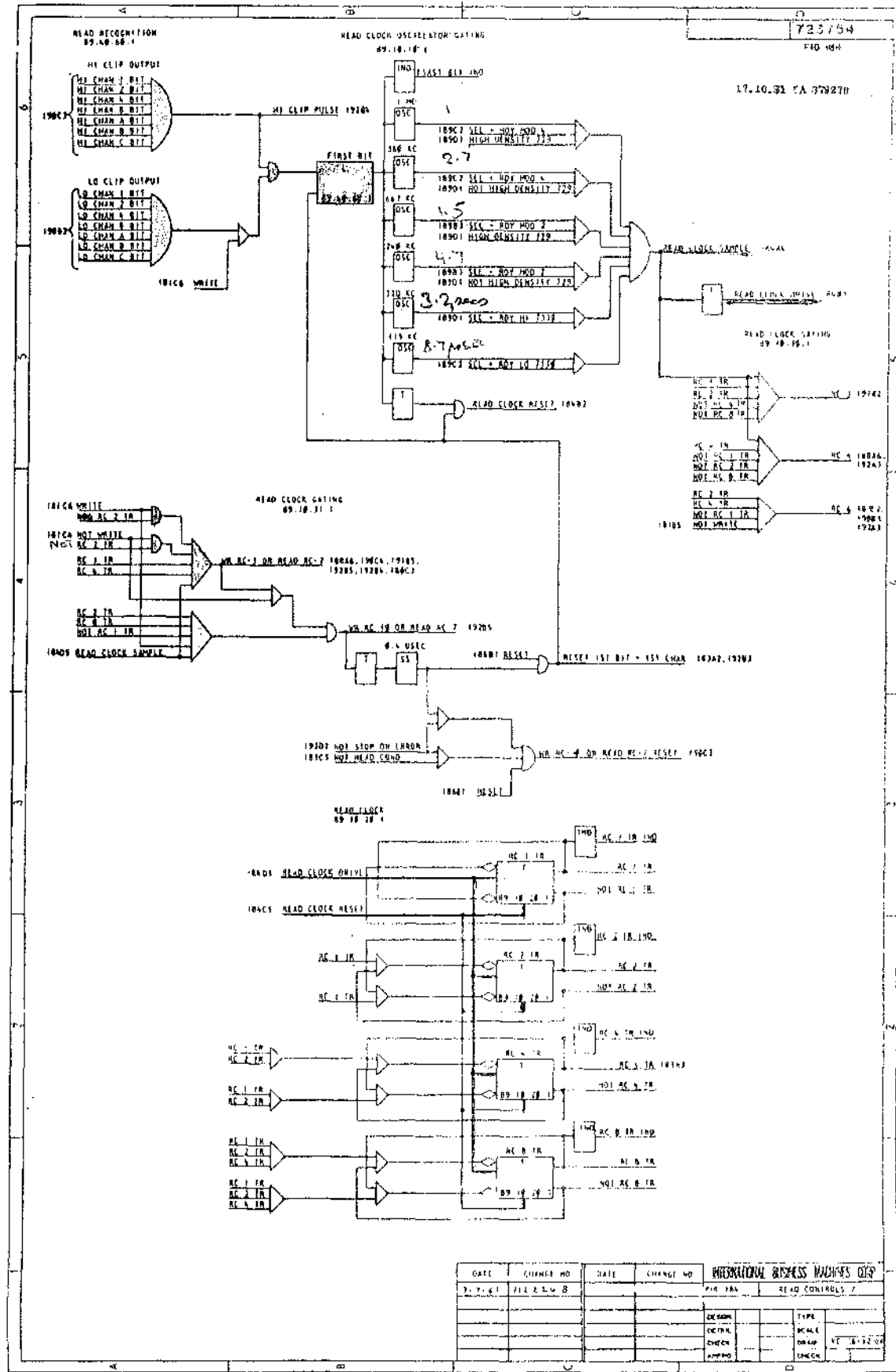


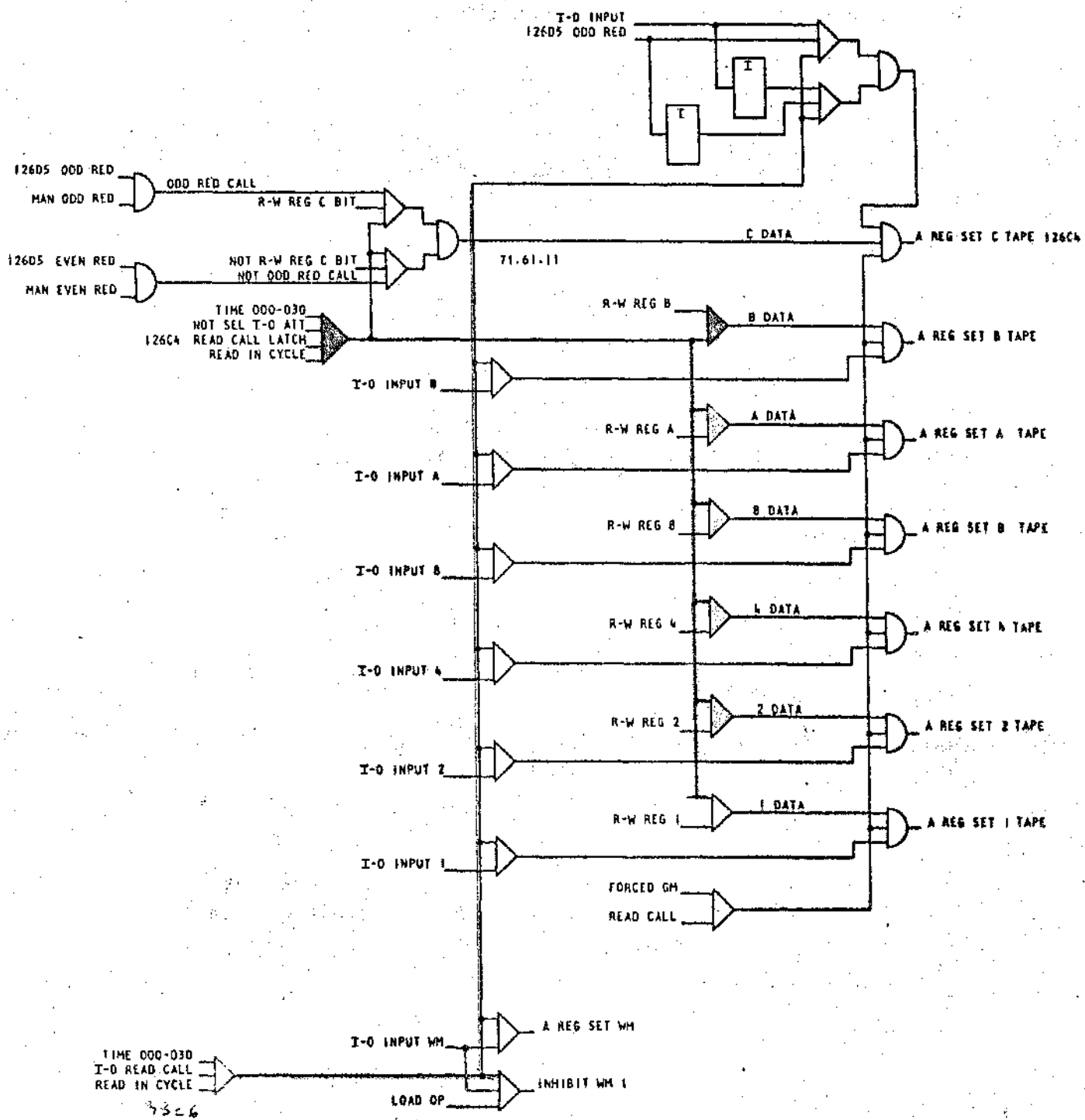




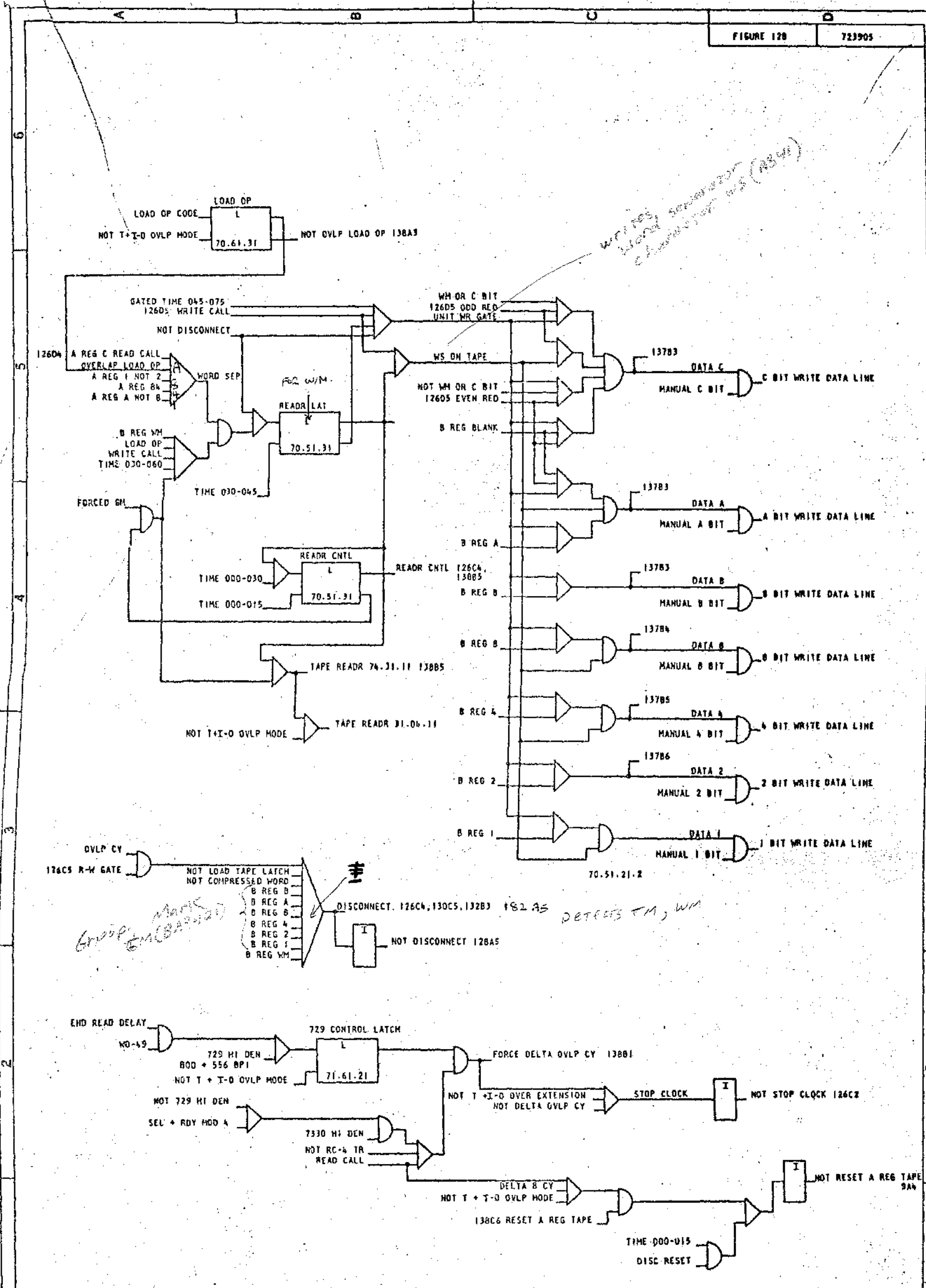


FIGURE 127

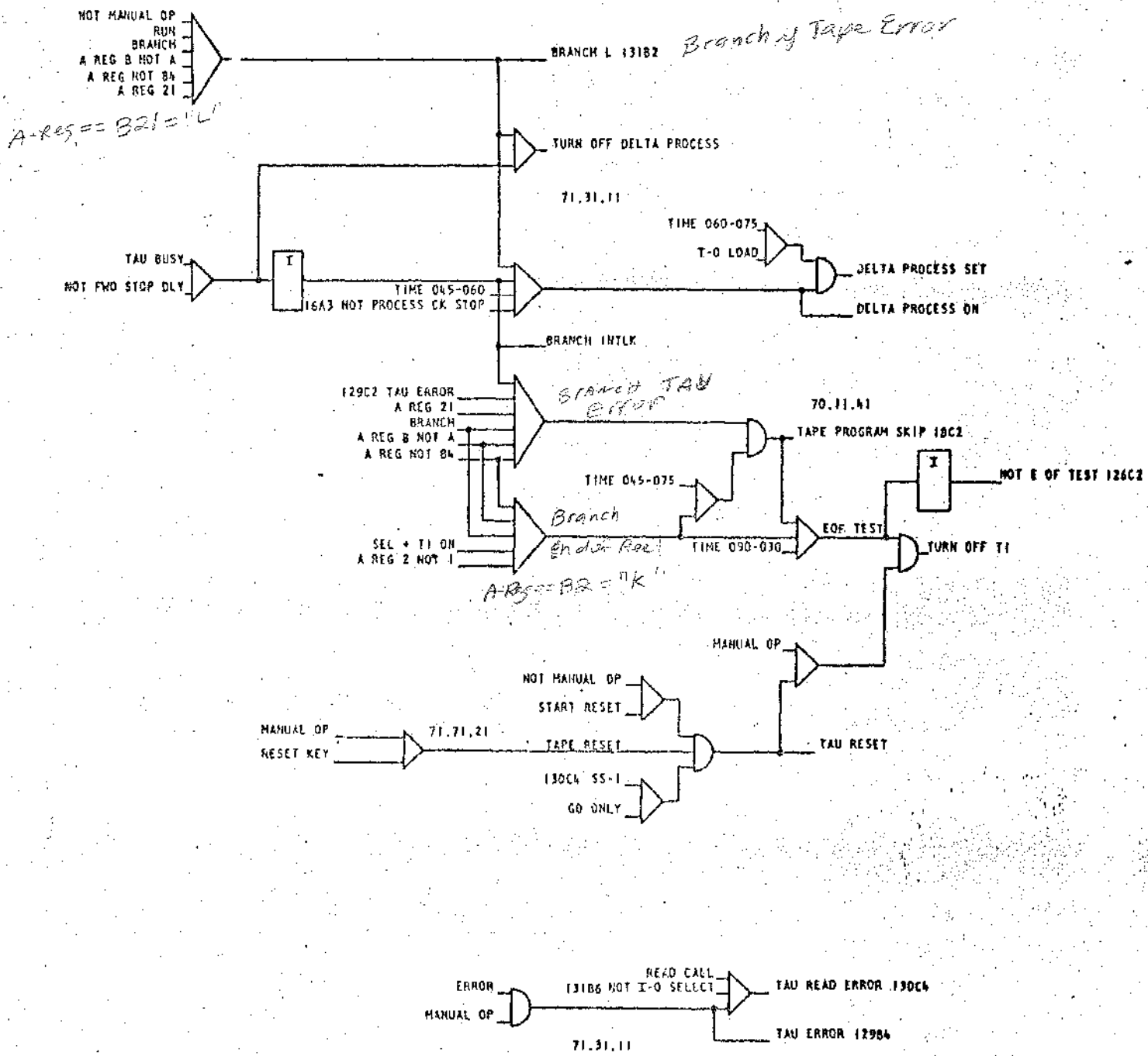
723998



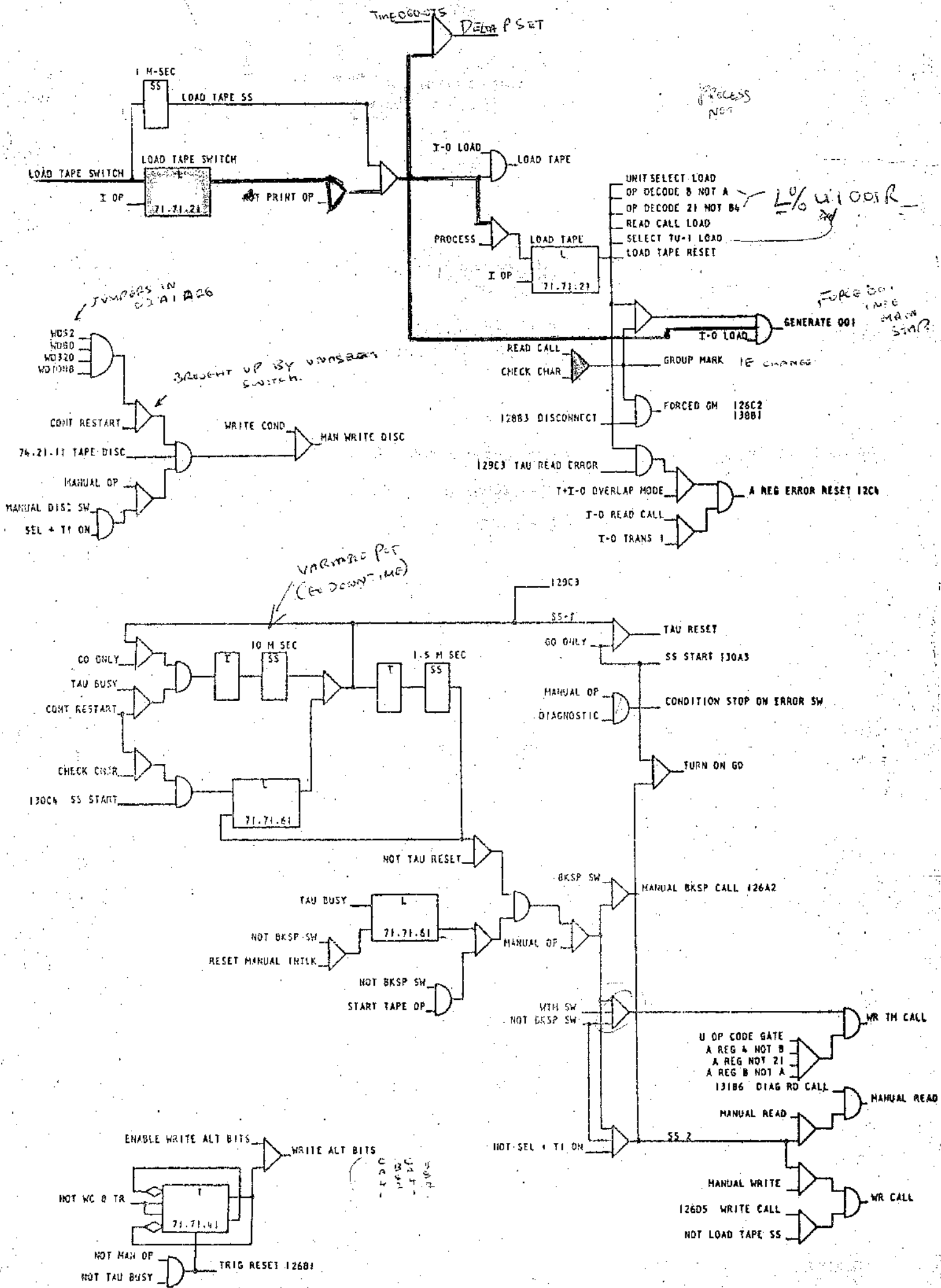
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113930 b	81.7.62	TA 1370 K	NAME READ AND WRITE TAPE 2			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE J-3-61
				APPRO		CHECK	MW 1-5-62



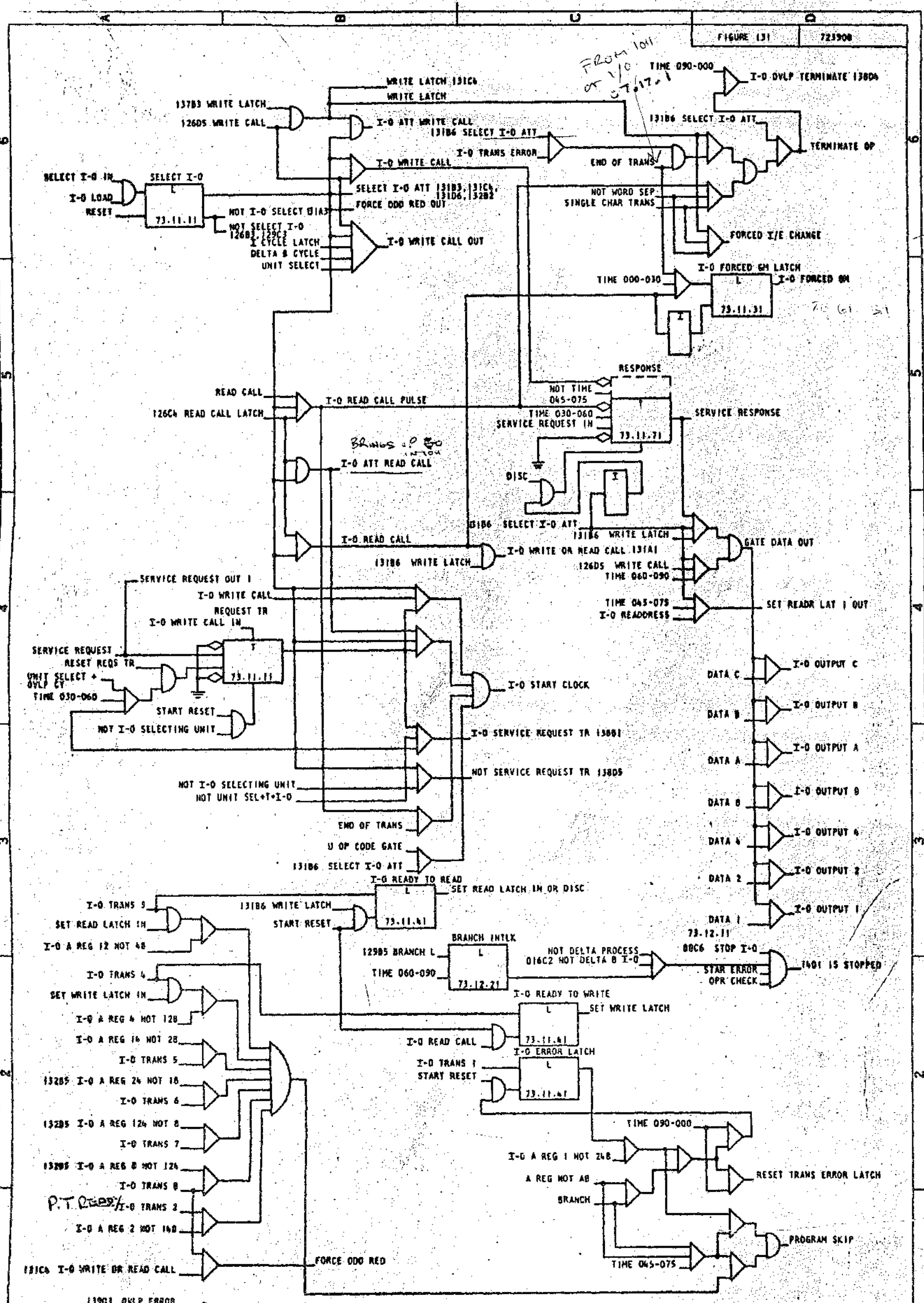
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	112220 D			NAME READ AND WRITE TAPES			
6-21-62	114144 B	31 7 62	TA 1370 K	WITH WORD MARKS			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 1-3-62
				APPRO		CHECK	MW 1-5-62



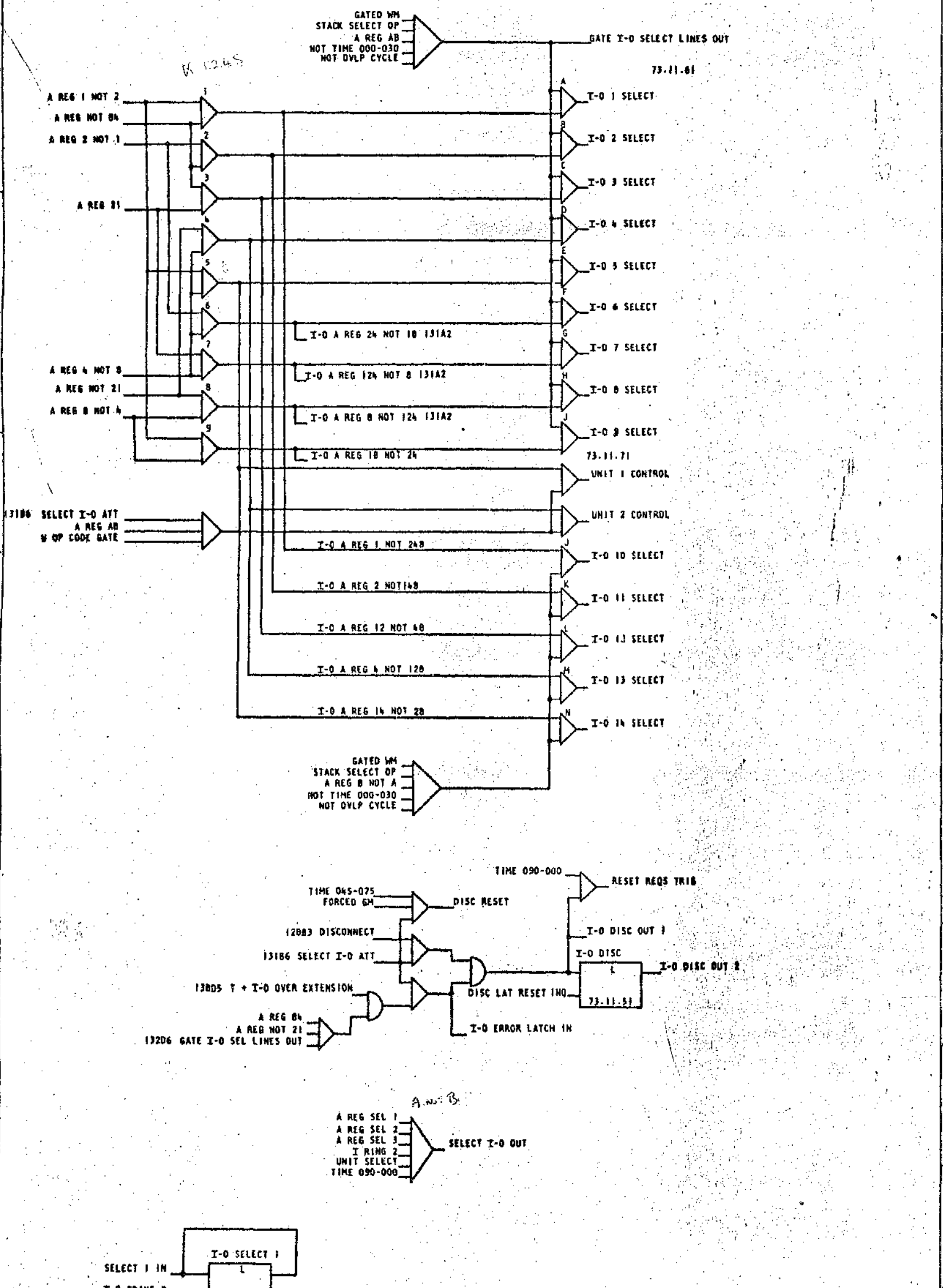
DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP	
4-10-61	113330 D			NAME	TAPE BRANCH CODES
6-21-62	114144B	31.7.62	TA 1370 K	DESIGN	TYPE
				DETAIL	SCALE NONE
				CHECK	DRAW VE 1-1-62
				APPRO	CHECK M.W.H-4-61



DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	11320 V			NAME	MANUAL TAPE OPERATION		
6-21-62	1141640	31.7.62	TA 1370 K	RESET AND LOAD			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 1-3-62
				APPRO		CHECK	MW 11-4-62

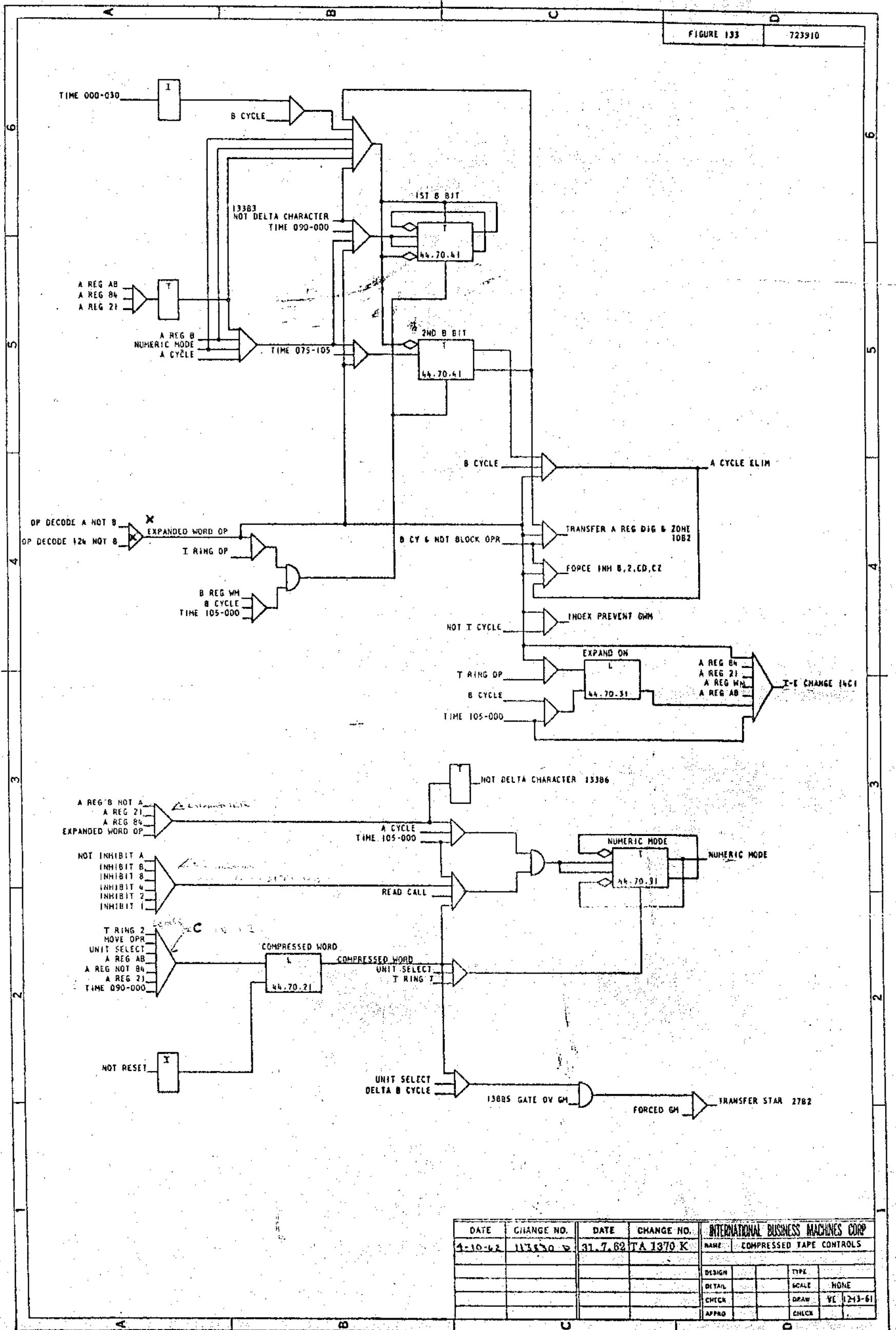


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP		
4-10-62	113330 D			NAME	I-O CONTROLS	
6-21-62	114148	31-7-62	TA 1370 K	DESIGN	TYPE	
				DETAIL	SCALE	NONE
				CHECK	DRAW	VE 1-3-62
				APPRO	CHECK	MW 1-4-62

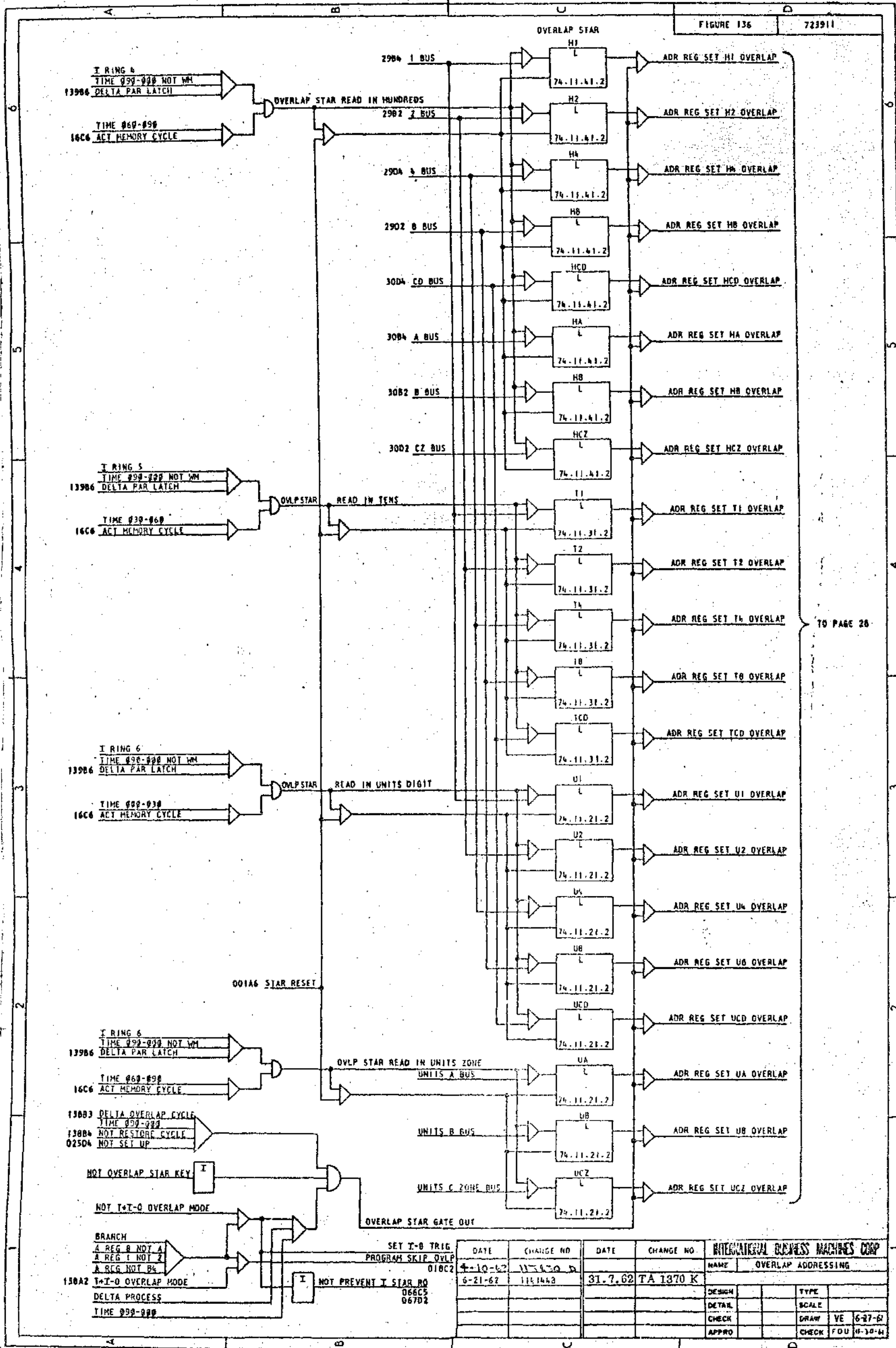


DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP
4-10-62	112430 D			NAME I-O SELECT LINES
6-21-62	114148	31.7.62	TA 1970 K	
				DESIGN
				TYPE
				DETAIL
				SCALE
				WORK
				CHECK
				DRAW VE 1-3-62
				APPRO
				CHECK MW 1-4-61





DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP			
4-10-62	113350	31-7-62	TA 1370 K	NAME COMPRESSED TAPE CONTROLS			
				DESIGN		TYPE	
				DETAIL		SCALE	NONE
				CHECK		DRAW	VE 12-13-61
				APPRO		CHCK	



TO PAGE 28

INTERMEDIAL BUSINESS MACHINES CORP			
DATE	CHANGE NO	DATE	CHANGE NO
4-10-62	115430 D		
6-21-62	118144B	31-7-62	TA 1370 K

SET T-B TRIG  
 PROGRAM SKIP OVL  
 010C2  
 NOT PREVENT I STAR RD  
 066C5  
 067D2  
 13003 DELTA OVERLAP CYCLE  
 TIME 099-099  
 13004 NOT RESTORE CYCLE  
 02504 NOT SET UP  
 NOT OVERLAP STAR KEY  
 NOT T-I-O OVERLAP MODE  
 BRANCH  
 A REG B NOT A  
 A REG I NOT J  
 A REG NOT B4  
 130A2 T-I-O OVERLAP MODE  
 DELTA PROCESS  
 TIME 099-099





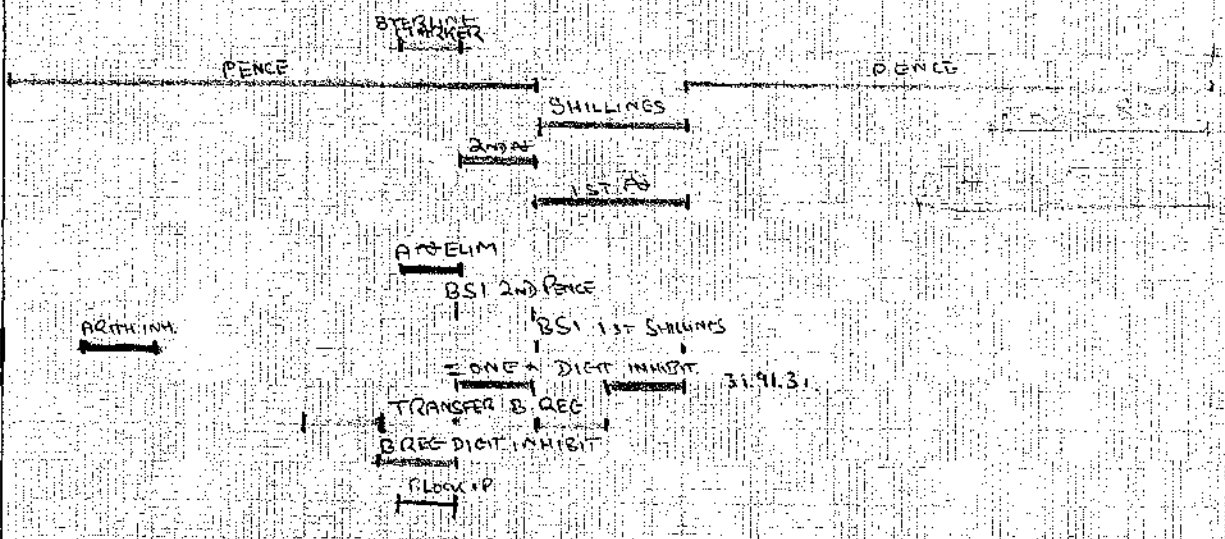






FUNCTION	A	B	A	B	A	B	B	A	B	A	B	A	B	B	B	B
MAIN * REG	210	270	209	269	208	268	267	207	266	206	265	205	264	263	202	261
A REG	8	8	4	4	8	8	8	D	D	2	2	1	1	1	1	
B REG	8	8	4	4	8	8	8	D	D	2	2	1	1	1	1	
A REG-1		8		4										1	8	
CARRY															8	
ARITHM		8													8	
I*															8	
A*	209		208		207		266		265		264		263	262	261	260
S*		269		268		267		266		265		264		263	262	261

(A REG ZONE MIGHT NEED)



2	2	2	2	2	2
1	2	D	8	4	8

(BSI)



MPLY

IBM @ AAA BBB

A:00240120100 B:1215:0XXXX

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
LINE 1	1	2	1	5	A	:	0	x	x	x	x			
LINE 2					B	:	M	x	1	0	0			
LINE 3							M							
LINE 4					M									
LINE 5					M	4 <sup>th</sup>	x	1	0	0				
LINE 6					M	x	0	1	2	0				
LINE 7					M	x	0	1	2	0				
LINE 8					M	x	0	0	2	4				
LINE 9					M	x	0	0	2	4				

NORMAL B FIELD SHIFT. SET SIGN  
 B 2, B 1, NOT A OR 2A, B ZR OR BLK, No  
 SHIFT STERL MK, STILL MELIM. B 2, 82C  
 SET TR1, INSERT 4<sup>th</sup> Row A & B FIELD SHIFTS  
 SET TR2, No. 4<sup>th</sup> Row B FIELD SHIFT  
 SET TR3, LAST ADD LAT. A & B FIELD SHIFT  
 RESET TR3, B FIELD SHIFT  
 NO SHIFT, IE CHANGE.

A. IBM CODING

The programming is a normal multiply command. The A field has 00240120100 pre-stored, the B field has the sterling value with at least one decimal position of pence. The usual rules apply to B field length i.e. it contains positions junior to the decimal pence position equal to the number of positions in the A field (lowest order factor) plus one. As normal, these positions may contain any information (except a sterling marker) before the operation begins. The units position of the lowest order factor of the A field may carry a sign if desired. If negative this will cause a change of sign as well as a conversion to pence.

INDEX FOR IFC  
 1-3 CLOCKING AND STORAGE  
 4-32 DATA FLOW AND CONTROLS  
 36-50 ARITHMETIC OPERATIONS  
 56-63 BASIC OPERATIONS  
 66-69 ADVANCED PROGRAMMING  
 71-75 I/O EXPANDED STORAGE  
 81-120 INPUT/OUTPUT  
 125-133 MAGNETIC TAPE AND I/O ATTACHMENT CONTROLS  
 136-139 OVERLAP CONTROLS

PART NO.	FIG. NO.	NAME	PART NO.	FIG. NO.	NAME
723875	0	1601 BASIC SYSTEM DATA FLOW	723859	74	STORAGE DECODE SWITCHES 12 TO 16K
723916	1	CLOCK CONTROL AND CLOCK PULSES	723860	75	CORE STORAGE DRIVE CIRCUITS AND SENSE CIRCUITS 12 TO 16K
723917	2	STORAGE DECODE SWITCHES	723861	76	FULL STORAGE PRINT OUT
723918	3	CURRENT SWITCHES, INHIBIT DRIVERS, PRESENSE AND SENSE AMPS			
723919	4	DATA FLOW 1	723862	81	READ CONTROLS AND DATA FLOW WITH PFR
723920	5	DATA FLOW 2	723863	82	PUNCH A REG DECODE AND PUNCH CHECK DECODE
723921	6	DATA FLOW 3	723864	83	PUNCH ADDRESS DECODES
723922	7	DATA FLOW CONTROLS 1	723865	84	PUNCH CONTROLS WITH PFR
723923	8	DATA FLOW CONTROLS 2	723866	85	ROW BIT CONTROL AND CHECK PLANE LATCHES
723809	9	INHIBIT CHECK AND A AND B CHECK 1	723867	86	RD-PCH ERROR SET AND CHECK PLANE INHIBIT
723810	10	INHIBIT CHECK AND A AND B CHECK 2	723868	87	READ AND PUNCH CHECK CIRCUITS 1 WITH PFR
723811	11	INHIBIT CHECK AND A AND B CHECK 3	723869	88	READ AND PUNCH CHECK CIRCUITS 2
723812	12	I-E CHANGE, A CYCLE ELIM, EXEC ELIM	723870	89	P.F.R. CONTROLS
723813	13	I-A-B CYCLE GENERATION			
723815	14	START, STOP, PROCESS AND DELTA PROCESS			
723815	15	0 CYCLE, MANUAL ENTRY, LOAD AND REVERSE SCAN CONTROL			
723816	16	TRUNC AND PROGRAM SKIP			
723817	17	ADDRESS STOP			
723818	18	OP REG AND OP CODE DEVELOPMENT	723876	94	COLUMN BINARY CONTROLS
723819	19	OP CHECK	723877	95	COLUMN BINARY READ ENCODE AND PUNCH DECODE
723820	20	A STAR	723878	96	MOVE COLUMN BINARY CONTROLS
723821	21	B STAR	723879	97	S1 COLUMN FEED
723822	22	I STAR	723880	98	PRINT HAMMER DRIVE LINES
723823	23	I STAR, AUTO SCAN, STAR MANUAL SET	723881	99	HAMMER DRIVERS
723824	24	I STAR, AUTO SCAN, STAR MANUAL SET	723882	100	HAMMER DRIVE RESET
723825	25	MODIFIER CONTROLS	723883	101	PRINT SUB SCAN COUNTERS (NPF)
723826	26	ADDRESS REGISTER AND SERIAL GATES	723884	102	COMPARE COUNTERS (NPF)
723827	27	MODIFIER 1-2-A-B BUS	723885	103	PRINT COMPARE (NPF)
723828	28	MODIFIER CD-A-B-CZ BUS	723886	104	PSS RING AND PRINT CONTROL (NPF)
723829	29	MODIFIER UNITS A-B-C BUS	723887	105	PRINT SCAN COUNTER (NPF)
723830	30	STORAGE ADDRESS VALIDITY CHECK	723888	106	PRINT BUFFER STORAGE AND DATA FLOW 1 (PF)
723831	31	ADD SUBTRACT AND ADDER CONTROLS	723889	107	PRINT BUFFER STORAGE AND DATA FLOW 2 (PF)
723832	32	ADD SUBTRACT AND ADDER CONTROLS	723890	108	PRINT BUFFER CLOCK (PF)
723833	33	ADD SUBTRACT AND ADDER CONTROLS	723891	109	PRINT BUFFER RINGS (PF)
723834	34	A AUX STAR AND B AUX STAR REG GATE IN AND OUT CTRLS	723892	110	PRINT BUFFER COUNTER (PF)
723835	35	A AUX STAR AND B AUX STAR REG GATE IN AND OUT CTRLS	723893	111	PRINT BUFFER CONTROLS 1 (PF)
723836	36	B AUX STAR AND GATE CONTROLS	723894	112	PRINT BUFFER CONTROLS 2 (PF)
723837	37	MULTIPLY AND DIVIDE CONTROLS 1	723895	113	PRINT BUFFER CONTROLS 3 (PF)
723838	38	MULTIPLY AND DIVIDE CONTROLS 2	723896	114	PRINT BUFFER CONTROLS 4 (PF)
723839	39	MULTIPLY AND DIVIDE CONTROLS 3	723897	115	PRINT BUFFER CONTROLS 5 (PF)
723840	40	MULTIPLY AND DIVIDE CONTROLS 4	723898	116	CARRIAGE CONTROLS 1
723841	41	MULTIPLY AND DIVIDE CONTROLS 5	723899	117	CARRIAGE CONTROLS 2
723842	42	MULTIPLY AND DIVIDE CONTROLS 6	723900	118	DUAL SPEED CARRIAGE CONTROLS
723843	43	MULTIPLY AND DIVIDE CONTROLS 7	723901	119	RAMAC AND INQUIRY 1
			723902	120	RAMAC AND INQUIRY 2
723844	44	MOVE, LOAD, COMPARE, CLEAR, AND BIT TEST	723903	126	READ AND WRITE TAPE 1
723845	45	STOP, BRANCH, NO OPR, WRT SET, ZONE TEST	723904	127	READ AND WRITE TAPE 2
723846	46	COMPARE OPR	723905	128	READ AND WRITE TAPES WITH LOAD MARKS
723847	47	HI-LO EQUAL COMPARE 1	723906	129	TAPE BRANCH CODES
723848	48	HI-LO EQUAL COMPARE 2	723907	130	MANUAL TAPE OPERATION RESET AND LOAD
723849	49	HI-LO EQUAL COMPARE 3	723908	131	I-O CONTROLS
723850	50	EDIT AND EXPANDED EDIT 1	723909	132	I-O SELECT LINES
723851	51	EDIT AND EXPANDED EDIT 2	723910	133	COMPRESSED TAPE CONTROLS
723852	52	ADVANCED PROGRAMMING CONTROLS 1	723911	136	OVERLAP ADDRESSING
723853	53	ADVANCED PROGRAMMING CONTROLS 2	723912	137	"0" REGISTER
723854	54	ADVANCED PROGRAMMING CONTROLS 3	723913	138	OVERLAP CONTROLS 1
723855	55	ADVANCED PROGRAMMING CONTROLS 4	723914	139	OVERLAP CONTROLS 2
723856	56	MODIFY OP AND STORAGE CONTROL PULSES			
723857	57	STORAGE DECODE SWITCHES 4 TO 12K			
723858	58	CORE STORAGE DRIVE CIRCUIT, AND SENSE CIRCUITS 4 TO 12K			

DATE	CHANGE NO.	DATE	CHANGE NO.	INTERNATIONAL BUSINESS MACHINES CORP		
9-10-62	11,583 C D	1-7-62	TA 1370 K	NAME	INDEX FOR 1503 MACHINES	
				ABOVE SERIAL 25000		
				DESIGN	TYPE	
				DETAIL	SCALE	NOTE
				CHECK	DRAW	VE 1-24-62
				APPRO	CHECK	Sup 2276