CHAPTER 5
ENGINEERING DRAWINGS

5.1 GENERAL

This chapter contains a complete set of engineering drawings pertaining to the basic PDP-9 system. A formal set of engineering drawings is also shipped with each PDP-9 system, including those for all ordered options. Where a discrepancy exists between furnished drawings and those contained in this chapter, it must be assumed that the drawings furnished with the machine are correct.

5.2 USE OF DRAWING CODES

DEC engineering drawing numbers are encoded as to drawing type, major assembly, and series. A drawing number such as BS-KD09-A-11 contains the following information: BS, block schematic type; KD09, the I/O control section of the PDP-9; A, the manufacturing series; 11, the eleventh drawing in the I/O control series, which happens to be the teletype control schematic. The complete glossary of drawing type codes is as follows:

AD	Assembly Drawing	LO	Layout Drawing
AR	Arrangement Drawing	MU	Module Utilization Drawing
BD	Functional Block Diagram	PL	Parts List
CD	Cable Diagram	RS	Replacement Schematic
CP	Component List	SP	Specification Drawing
CS	Circuit Schematic	TD	Timing Diagram
FD	Flow Diagram	UA	Unit Assembly
IC	Interface Cabling Diagram	WD	Wiring Diagram
		WL	Wiring List

5.3 DRAWING CONVENTIONS

Block schematics are multipurpose drawings that combine signal flow, logic functions, circuit type, physical location, and other pertinent information. Individual circuits are shown in block form, using special symbols which define the circuit operation. These symbols are explained in the Logic Handbook C-105.

5.4 SIGNAL MNEMONIC INDEX

All signals originating in the PDP-9 are listed in alphanumeric order below. The Origin column locates the source of each signal to the particular logic drawing, using the abbreviated drawing number system, Volume I, Section 1.7.5.

Signal	Origin	Description
0 → CMA	KC19(1)	Clear the control memory address register
0 → MBI	KC19(2)	Clear the memory buffer input gate
0XEN	KD3(1)	Enable devices 0X
00XXEN	KD3(1)	Enable devices 00XX
+1	KC19(1)	Increment the ADR
1 → ACI	KC19(2)	Set the accumulator register input gate
+1 → CA INH	KD2(2)	Inhibit increment of DCH CA register
1 → MBI	KC19(2)	Set the memory buffer input gate
1 → PCI	KC12	Set the program counter input gate
13 → CMA	KC19(1)	Set CM address to 13
ΔMB	KC19(2)	Change the memory buffer contents
A,B,C	KC10(1)	Program start timing flip-flops
A BUS00-05	KC20(1)	A bus contents
A BUS06-11	KC20(2)	A bus contents
A BUS12-17	KC20(3)	A bus contents
A BUS LINK	KC15	Recirculate LINK status
AC00-05	KC20(1)	Accumulator register contents
AC06-11	KC20(2)	Accumulator register contents
AC12-17	KC20(3)	Accumulator register contents
AC D	CS3	Display the accumulator register contents
ACI	KC19(2)	Accumulator register input gate
ACO	KC19(3)	Accumulator register output gate
AC RD	KD3(3)	Read the accumulator register contents into core memory

Signal	Origin	Description
AC RD(B)	KC19(2)	Read the accumulator register contents into core memory.
AC SIGN	KC15	AC00 status
ADDR SW03-17	CS3	Address switch contents
ADOF	KC15	Add data overflow, ADD instruction and DCH add-to-memory
ADR00-05	KC21(1)	Adder register contents
ADR06-11	KC21(2)	Adder register contents
ADR12-17	KC21(3)	Adder register contents
ADR=0 SAVE	KC15	ADRA=0, ADRB=0 status
ADRA=0	KC21(1) KC21(2)	ADR00-08=0
ADRB=0	KC21(2) KC21(3)	ADR09-17=0
ADRL ADRL(B)	KC15	Adder link
ADSO ADSO(G)	KC19(2) KD7(1)	Address switches output gate
AM GRANT	MC1(2)	Grant core memory access to DMA channel
AM STROBE	MC2	Core memory strobed for DMA channel access
AM SYNC AM SYNC(1)B AM SYNC BUS	MC1	Synchronization for DMA cycle
AND	KC19(1)	AND instruction gate
API D	CS3	Display the optional API channel activity
API IO CLR	KD3(2)	
API ON BUS	KD7(1)	Gate optional API activity onto I/O bus (B)
API 0,1,2,3 RQ	KD2(2)	Request API channel break
AR00-05	KC20(1)	Arithmetic register contents
AR06-11	KC20(2)	Arithmetic register contents
AR12-17	KC20(3)	Arithmetic register contents
AR D	CS3	Display the arithmetic register contents
ARI	KC19(2)	Arithmetic register input gate
ARO	KC19(3)	Arithmetic register output gate
ARO RESTORE	KC12 KC10(2)	Restore the arithmetic register output gate
AROS	KC10(2)	Save the arithmetic register output gate
AUT INX	KC14	Increment the contents of indirectly addressed core memory register 00010-17
AXS	KC19(2)	ADD, XOR, SAD instruction gate
B BUS00-05	KC21(1)	B bus contents
B BUS06-11	KC21(2)	B bus contents
B BUS12-17	KC21(3)	B bus contents
BK	KD3(2)	Start program break process
BK CA	KC10(1)	CA cycle of DCH break (memory extension control)
BK0 BK0(0)B BK0(1)B BK1 BK1(0)B BK1(1)B	KD3(3) KC10(1)	Break cycle counter
BK SYNC	KD3(2)	Synchronize program break entry
BS SW3-4	MC2	Core memory bank selection switches
CAF EN CAF EN(B)	KD3(1)	Clear all flags enable
CAL	KC12	CAL instruction gate
CI17	KC14	Initiate a carry into ADR17
CJIT	KC12 KC19(3)	CAL/JMS/Interrupt Transfer gate
CLK	KC10(1)	Main clock pulse
CLK(B)	KD3(2)	
CLK DLY'D	KD3(3)	Main clock pulse delayed 500 ns
CLK EN	KD3(3)	Enable the real-time clock
CLK FLG	KD3(2)	Real-time clock flag
CLK POS	KC10(1)	Main clock pulse
CLK RQ	KD3(2)	Real-time clock request
CLK SYNC	KD3(2)	Synchronize the real-time clock cycle

Signal	Origin	Description
CLL	KC13	Clear the LINK
CLR	KC16	Clear the ⁄1, ACO gates, set the SAO, ARO gates
CLR I	KC19(2)	Clear the MBO, ACI, ARI, PCI, MQI gates
CLR PUN	KD10(1)	Clear the punch buffer and punch flag
CLR RDR	KD9(1)	Clear the RDR FLG, RDR 1, RDR 2 flip-flops
CMA00-05	KC19(1)	Control memory address register contents
CM CLK	KC10(1)	Main clock pulse to control memory
CM CURRENT	KC16	Turn on control memory address selectors
CMG00-07	KC17	Control memory current lines
CML	KC13	Complement the LINK
CMPL	KC13	Complement the ADR contents
CMP00-07	KC17	Control memory current lines
CMSL00-35	KC17 KC18(2)	Control memory sense lines
CM STROBE A,B,C,D	KC16	Strobe the control memory
CM STROBE DLYD	KC16	
CONT	KC19(1)	Continue gate
CO00-05 CO06-11 CO12-17	KC21(1) KC21(2) KC21(3)	Carry out of ADR00-05 Carry out of ADR06-11 Carry out of ADR12-17
DASO	KC13	Data switches output gate
DATA OFLO	KC15	DCH add-to-memory data overflow
DATA SW00-17	CS3	Data switch contents
DB RESTORE	KD3(1)	
DBR DBR(B)	KD3(1) KC15	Debreak and restore the interrupted program
DCH	KC19(1)	
DCH BK DLY	KD3(1)	Illuminate the DCH display indicator
DCH EN	KD3(1)	Enable the DCH Multiplexer W104
DCH GRANT DCH GRANT P	KD3(1)	Grant core memory access to the DCH
DCH INX	KD3(3)	Increment the DCH WC or CA register

Signal	Origin	Description
DCH RQ	KD2(2) KD3(2)	DCH break request
DCH SYNC SAVE	KD3(2)	Save the DCH SYNC status
DEI	KC19(1)	Initiate the defer or execute cycle
DIGIT READ DRIVE	MC1(2)	Turn on core memory address selectors
DIGIT READ ON	MC2	Turn on DIGIT READ DRIVE, DIGIT READ SINK
DIGIT WRITE DRIVE	MC1(2)	Turn on core memory address selectors
DIGIT WRITE SINK	MC1(2)	Turn on core memory address selectors
DLY	KD3(3)	Clock pulse delayed 500 ns
DONE DONE(1)B	KC19(1) KD3(2)	Instruction DONE gate
DPY D	CS3	Display x,y buffers of optional 34H Display
DPY ON BUS	KD7(1)	Gate x,y buffers of optional 34H Display onto the IO Bus(B)
DS00-05 DS00P-05P	KD3(1)	Device select bits
EAE	KC19(1)	Optional extended arithmetic element gate
EAE D	CS3	Not wired
EAE-P EAE-R	KC19(1)	Optional extended arithmetic element gate
EAE STROBE DLYD	KC16	CM STROBE delayed for optional extended arithmetic element
END BIT 0	KC15	LINK to ADRL to AC17. Also for optional extended arithmetic element gating
END BIT 17	KC15	Optional extended arithmetic element gating
EXT EXT(1)B	KC19(3) KD3(3)	External transfer gate (program breaks)
FEED HOLE	KD9(2)	Reader no-tape sensor
FWD FD and NDX	KD10(1)	Punched tape drive power
GO DLY	KD9(1)	Reader enable delay
IND CLK	KC10(1)	Gate CP register contents for display
IN CLR	KC16	Generate CLR I
INC V DCH	KD3(2)	Enter DCH or RTC WC cycle

Signal	Origin	Description
IND EN	KC10(1)	Enable console display selector switch
INC MB	KD2(2) KD3(3)	Increment the memory buffer contents
IN LAST UNIT	KD11(1)	Last keyboard code unit shifted into input buffer
INPUT IO RESTART	KD8 KD3(3)	Restart control memory after manual read-in, EAE, or IOT instruction
INT RD RQ BUS	KD3(3)	Internal read request bus
INT SKP RQ BUS	KD3(1) KD9(1) KD10(1) KD11(1) KD11(2)	Internal skip request bus
IO0 IO1	KD3(3)	Input/output transfer cycle counter
IO ADDR 03-17 IO ADDR 03(B)-17(B)	KD2(2) KD5	DCH and optional API channel address
IO ADDR 12,16,17	KD5	Optional API channel address
IO ADDR D	CS3	Display DCH or optional API address
IO ADDR ON BUS	KD7(1)	Gate DCH or optional API address onto I/O bus (B)
IO BUS00-05 IO BUS06-11 IO BUS12-17 IO BUS00-17	KC21(1) KC21(2) KC21(3) KD2(1)	I/O bus contents
IO BUS00(B)-08(B) IO BUS09(B)-17(B)	KD7(1) KD7(2)	I/O bus buffered
IO BUS ON	KC19(3)	ADR to I/O bus gate
IO CLK(B)	KD3(3)	Main clock pulse
IO CLK POS	KD3(2)	Main clock pulse
IO CLR	KD3(2)	Clear PROG SY, PROG SYNC, BK
IO OFLO	KD3(2)	DCH or RTC operations completed
IOP1	KD3(1) KD3(3)	Input/output pulse 1
IOP2	KD3(1) KD3(3)	Input/output pulse 2
IOP4	KD3(1) KD3(3)	Input/output pulse 4
IOP1P	KD3(3)	Input/output pulse 1
IOP2P	KD3(3)	Input/output pulse 2
IOP4P	KD3(3)	Input/output pulse 4
IO PWR CLR IO PWR CLR POS	KD3(1) KD3(1)	I/O power clear pulse
IO RESTART	KD3(3)	Restart control memory after manual read-in, EAE, or IOT instruction execution.
IO RUN(1)	KD3(1)	Computer RUN condition to I/O devices
IO SKIP	KD3(3)	Skip next instruction on SKIP RQ from I/O device
IO SYNC	KD3(1)	Synchronize program break entry
IO SYNC IN	KD3(2)	Synchronize program break entry
IO SYNC POS	KD3(2)	Synchronize program break entry
IO SYNC SP	KD3(1)	Synchronize optional API break entry
IOT	KC12	Input/output transfer gate
IOT0002 IOT0004 IOT0102 IOT0104 IOT0204 IOT0302 IOT0404 IOT3344	KD3(1) KD3(1) KD9(1) KD9(1) KD10(1) KD11(1) KD11(2) KD3(1)	IOT command
IOT(B)	KD3(1)	Input/output transfer gate
IOT OR ARO	KC12	Set ARO gate for programmed output transfer
IOT PWR CLR	KD3(1)	
IR00-04	KC12	Instruction register contents
IRI	KC19(1)	Instruction register input gate
ISZ	KC12	ISZ instruction gate
KBD FLG	KD11(1)	Keyboard flag
KBD SEL KBD SEL(B)	KD11(1)	Keyboard select

Signal	Origin	Description
KCT KCT(B)	CS3 KC10(1)	CONTINUE key
KDN	CS3	DEPOSIT NEXT key
KDP	CS3	DEPOSIT key
KDPDN	KC10(1)	DEPOSIT/DEPOSIT NEXT key
KDPDN V RI	KC19(3)	DEPOSIT/DEPOSIT NEXT key or READ-IN key
KDPM	CS5	DEPOSIT key (maintenance)
KEY	KC19(2)	Key gate
KEY BUS KEY BUS(B)	KC10(1)	Key bus
KEY DLY	KC10(1)	Delay key-activated RUN condition
KEY INIT POS	KC10(1)	Initiate key operations
KEY ∧ KDPDN	KC13	
KEN	CS3	EXAMINE NEXT key
KEYS	CS5	
KEX	CS3	EXAMINE key
KIO	CS3	I/O RESET key
KIOA3, A4, A5	KC10(1)	Key process address to control memory
KMT	CS5	Key (maintenance)
KRI	CS3	READ-IN mode key
KSP	CS3	STOP key
KST	CS3	START key
KXDM	CS5	EXAMINE/DEPOSIT key (maintenance)
LAR	KC15	Arithmetic register link
LI	KC19(1)	LINK input gate
LINK	KC15	Accumulator register link
LIO	KC13	Load I/O data onto I/O bus
LOCK	CS5	Lock the console controls
LOT	KC12	LAW/OPR/IOT instruction gate
MA05-13 MA14A-17A MA14B-17B	MC1(1)	Memory address register contents

Signal	Origin	Description
MA06(0) ∧ MA07(0) MA06(0) ∧ MA07(1) MA06(1) ∧ MA07(0) MA06(1) ∧ MA07(1) MA10(0) ∧ MA11(0) MA10(0) ∧ MA11(1) MA10(1) ∧ MA11(0) MA10(1) ∧ MA11(1) WR(1) ∧ MA05(1) V WW(1) ∧ MA05(0) WR(1) ∧ MA05(0) V WR(1) ∧ MA05(1)	MC1(1)	Memory address register bits decoded for address selection
MA JAM DIGIT MA JAM PAR MA JAM WORD	MC1(1)	Strobe address into memory address register
MAS03-04	MC2	Memory address bits decoded for expanded memory
MB00-05 MB06-11 MB12-17	KC21(1) KC21(2) KC21(3)	Memory buffer register contents
MBI MBI(1)B	KC19(2) KC28	Memory buffer input gate
MBO	KC19(3)	Memory buffer output gate
MBS00-17	MC3	Core memory input mixer bits
MEM DONE MEM DONE(1)B	MC1(2)	Core memory cycle done
MEM STROBE MEM STROBE(B)	MC2 KC28	Core memory strobed for CP access
MK	CS5	
MODE	MC1(2)	Core memory access mode
MQ00-05 MQ06-11 MQ12-17	KC20(1) KC20(2) KC20(3)	Optional multiplier/quotient register contents
MQ D	CS3	Display the optional multiplier/quotient register contents
MQI	KC19(2)	Optional multiplier/quotient input gate
MQO	KC19(3)	Optional multiplier/quotient output gate
NDX	KD10(1)	Punch the tape feed holes

Signal	Origin	Description
NOSH	KC13	NO SHIFT gate
O BUS00-05 O BUS06-11 O BUS12-17 O BUS00-17	KC20(1) KC20(2) KC20(3) KC22	O bus contents
O BUS L	KC15	LINK status to optional EAE
OFLO	KC14	DCH,RTC word count overflow
OFLO	KC15	ADD instruction overflow
OP	KC12	OPR instruction gate
OR ACI	KC12	Set the ACI gate for programmed input transfer
OR MBO	KC12	Set the MBO gate for LAW instruction
PB10-17	KD10(1)	Punch buffer contents
PC05 PC06-17 PC012-17	KC20(1) KC20(2) KC20(3)	Program counter contents
PC D	CS3	Display the program counter contents
PCI	KC19(2)	Program counter input gate
PCO	KC19(3)	Program counter output gate
PCO RESTORE	KC10(2)	Restore the PCO gate
PCOS	KC10(2)	Save the PCO gate
PIE	KD3(2)	Program interrupt enable
PIE(0)	KD3(2)	Program interrupt disable
PK CLR PK CLR(B)	KC10(1) MC2	Power and key clear pulse
POST CLK	MC2	Main clock delayed/strobe the MODE flip-flop
PRE-STROBE	MC2	Generate MEM STROBE,STROBE SAL,STROBE SAR
PRE-WRITE OFF	MC2	Set MEM DONE, issue AM GRANT
PROG INT RQ	KD2(1) KD3(2) KD9(2) KD10(1) KD11(1) KD11(2)	Program interrupt request
PROG SY PROG SY(1)B PROG SYNC PROG SYNC(1)B	KD3(2)	Synchronize program interrupt entry
PUN	KD10(1)	Punch mechanism operating
PUN ACT	KD10(1)	Actuate punch mechanism
PUN FEED	KD10(2)	Punch feed holes manually
PUN FLG	KD10(1)	Punch flag
PUN HOLE 1-8	KD10(1)	Punch buffer bits to punch solenoids
PUN LINE	KD10(1)	Enable punch solenoid drivers
PUN NO TAPE	KD10(1)	Punch out of tape
PUN PWR	KD10(1)	Punch power
PUN PWR ON	KD10(1)	Punch power on
PUN SEL	KD10(1)	Punch select
PUN SPD	KD10(1)	Punch motor up to speed
PUN SYNC	KD10(2)	Punch motor in punching position
PV	KC12	Memory protection violation
PWR(B)	KD9(1)	Reader power on
PWR CLR POS	KC10(1)	Power clear pulse
RB00-17	KD9(2)	Reader buffer contents
RD HOLE 1(B)-7(B)	KD9(2)	Punched tape contents
RD HOLE 7(C)	KD9(2)	Punched hole 7
RD HOLE 8(B)	KD9(2)	Punched hole 8
RD HOLE 8P V ALPHA	KD9(2)	Reader binary or alpha mode
RD IO BUS	KD7(1)	
RDR 1	KD9(1)	Read first line of tape into reader buffer
RDR 2	KD9(1)	Read second line of tape into reader buffer
RDR A RDR A(0)B RDR A(1)B	KD9(1) KD9(2) KD9(2)	Reader line index count
RDR ALPHA	KD9(1)	Reader alpha mode

Signal	Origin	Description
RDR B RDR B(0)B RDR B(1)B	KD9(1) KD9(2) KD9(2)	Reader line index count
RDR CLK	KD9(1)	Reader clock pulse
RDR CLK EN	KD9(1)	Reader clock enable
RDR COUNT	KD9(1)	Reader line index count
RDR D	CS3	Display the reader buffer contents
RDR FEED	KD9(2)	Feed tape manually without reading
RDR FLG RDR FLG(B)	KD9(1) KD8	Reader flag
RDR GO	KD9(1)	Enable reader clock
RDR INDEX	KD9(1)	Reader clock pulses
RDR NO TAPE	KD9(1)	Reader out of tape
RDR ON BUS	KD7(1)	Gate reader buffer contents onto I/O bus (B)
RDR PWR	KD9(1)	Reader power
RDR RUN	KD9(1)	Generate RUN
RDR SEL RDR SEL(B)	KD9(1)	Reader select
RD RQ RD RQ(B)	KD2(1) KD3(3)	Read request from I/O device
RD START RQ	KC10(1)	Read manually entered tape word into core memory
RD STATUS	KD11(1)	Read teletype status
R12(1)B	KD8	Manually entered tape word count
RQ MBI	KC19(2)	Turn on memory buffer input gate
RSB	KD8	Select reader binary mode
RUN	KD9(1)	Set RDR GO
RUN RUN(1)B	KC10(1)	Computer program started
RUN(0)	KC10(1)	Computer program stop
SA00-17	MC6	Sense amplifier contents
SAO SAO(0)B	KC19(3) KC15	Sense amplifier output gate

Signal	Origin	Description
SD00-01 SD00P-01P	KD3(1)	Special device select bits
SEN SEN(1)B	KC10(2) KC10(1)	Computer RUN sensor
SHIFT	KC15	Shift ADR contents enable
SHL1	KC13	Shift ADR contents left one position
SHL2	KC13	Shift ADR contents left two positions
SHR1	KC13	Shift ADR contents right one position
SHR2	KC13	Shift ADR contents right two positions
SKIP	KC14	Skip next instruction gate
SKIP RQ	KD2(1)	Skip request from I/O device
SKPI	KC19(1)	Skip input gate
SM	KC19(2)	Start memory gate
SPEED 2,3,4	CS3	Repeat speed selections
SPEED WIPER	CS3	Repeat speed switch wiper
STATUS D	CS3	Display the I/O device status bits
STATUS ON BUS	KD7(1)	Gate the I/O device status bits onto I/O bus (B)
STOP DLY	KD9(1)	Decelerate the reader motor
$\overline{\text{STOP DLY}}$	KD9(1)	Permit reader motor to restart
STOP DLY POS	KD9(1)	Disable reader clock
STROBE DLYD	KC16	Control memory strobe delayed
STROBE SAL	MC2	Strobe the left hand sense amplifiers
STROBE SAR	MC2	Strobe the right hand sense amplifiers
SW EXD	CS3	Optional memory extend mode switch
SW SGL INST	CS3	Single instruction switch
SW PARITY	CS3	Optional memory parity switch
SW PRTCT	CS3	Optional memory protect switch
SW REPT	CS3	Repeat switch
SUB	KC19(1)	Subtract gate
SYNC CLK	MC2	Set AM SYNC if AM RQ is present

Signal	Origin	Description
TAPE	KD10(2)	Punch out of tape
TI	KC19(1)	Test for indirect address gate
T-PRNTR FLG	KD11(2)	Teleprinter flag
T-PRNTR SEL T-PRNTR SEL(B)	KD11(2)	Select teleprinter
TTI00-07	KD11(1)	Teletype input buffer contents
TTI CLK	KD11(1)	Teletype input clock
TTI D	CS3	Display the teletype input buffer contents
TTI FULL	KD11(1)	Teletype input buffer is full
TTI INITIALIZE	KD11(1)	Initialize teletype input buffer and controls
TTI LOAD	KD11(1)	Load the teletype input buffer
TT IN ACT	KD11(1)	Teletype input circuits active
TTI ON BUS	KD7(1)	Gate teletype input buffer contents onto I/O bus (B)
TT KBD IN TT KBD IN(B)	KD11(1)	Teletype keyboard input
TT LINE	KD11(2)	Actuate teleprinter to generate space or mark
TTO00-07	KD11(2)	Teletype output buffer contents
TTO CLK	KD11(2)	Teletype output clock
TTO EN	KD11(2)	Teletype output enable
TTO EQ	KD11(2)	All teletype output buffer bits serially shifted into teleprinter
TTO LOAD	KD11(2)	Load the teletype output buffer
TTO OUT ACT	KD11(2)	Teletype output circuits active
TT RDR RUN	KD11(1)	Release teleprinter magnet to generate marks and spaces
TTO START	KD11(2)	Start teletype output operations
TTO STOP	KD11(2)	Stop teletype output operations
UM(0)B UM(1)B	KD3(3)	User Mode disabled (Memory Protect Option) User Mode enabled (Memory Protect Option)
WORD READ	MC1(2)	Turn on core memory address selectors
WORD READ ON	MC2	Turn on WORD READ
WORD WRITE	MC1(2)	Turn on core memory address selectors
WRITES OFF	MC2	Turn off core memory address selectors
WRITES ON	MC2	Turn on DIGIT WRITE DRIVE, DIGIT WRITE SINK
WR RQ	KD2(2) DK3(3)	Write request from I/O device
WR RQ(B)	KD3(2)	

5.5 ENGINEERING DRAWING LIST

A list of the full complement of engineering drawings contained in this chapter follows.

Drawing Number	Title	Revision	Page
	System Drawings		
D-UA-9-0-0	PDP-9 Assembly (sheet 1)	E	12
D-UA-9-0-0	PDP-9 Assembly (sheet 2)	E	13
D-UA-9-0-0	PDP-9 Assembly (sheet 3)	E	14
A-PL-9-0-0	PDP-9 Assembly Parts List (sheet 1)	E	15
A-PL-9-0-0	PDP-9 Assembly Parts List (sheet 2)	E	15
A-PL-9-0-0	PDP-9 Assembly Parts List (sheet 3)	E	16
A-PL-9-0-0	PDP-9 Assembly Parts List (sheet 4)	E	16
A-PL-9-0-0	PDP-9 Assembly Parts List (sheet 5)	E	17
D-IC-9-0-1	Power Wiring	--	18
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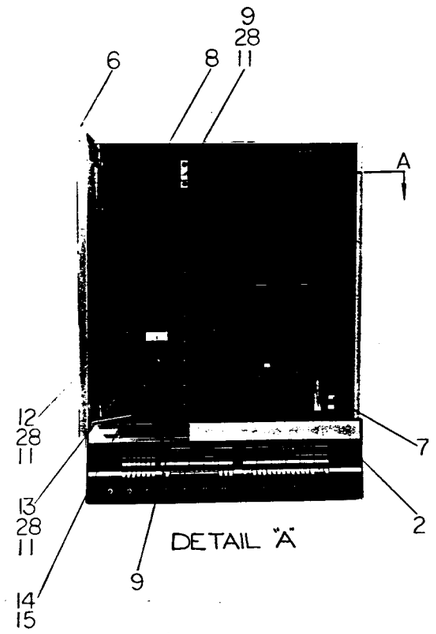
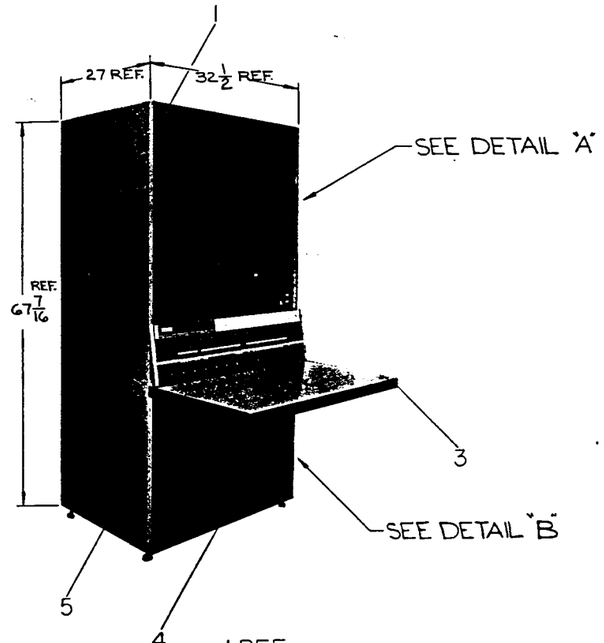
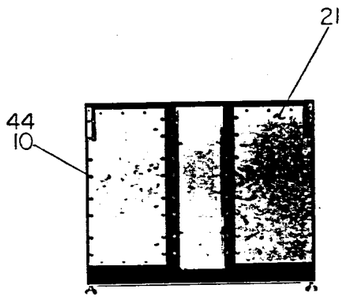
D-CS-9-0-3	Console Keys and Wiring Diagram	A	20
D-CS-9-0-4	Console Indicators	A	21
D-CS-9-0-5	Maintenance Area Wiring	--	22
C-CS-709-0-1	709 Power Supply	B	23
B-CS-841-A-1	841A Power Control	A	24
	Control Memory Drawings		
D-UA-MC09-A-0	Control Memory Type MC09-A	--	25
A-PL-MC09-A-0	Control Memory Type MC09-A	A	26

NOTES:
1. FOR MTG. OF SHIPPING BRKT REFER TO (D-AD-7005 DWG) SH 3 OF 5, SECTION A-A
2. INSTALL ITEM 5 (WHEN REQ'D) PER DEL M-M DWG D-DA-7005 DWG
3. FOR DWG. INDEX LIST REFER TO DWG. D-DI-9-0-0
4. FOR OPTIONAL EQUIPMENT LAY-OUT (PDP-9) REFER TO DWG D-AR-9-0-0

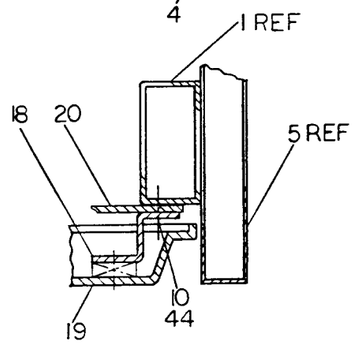


DETAIL "A"



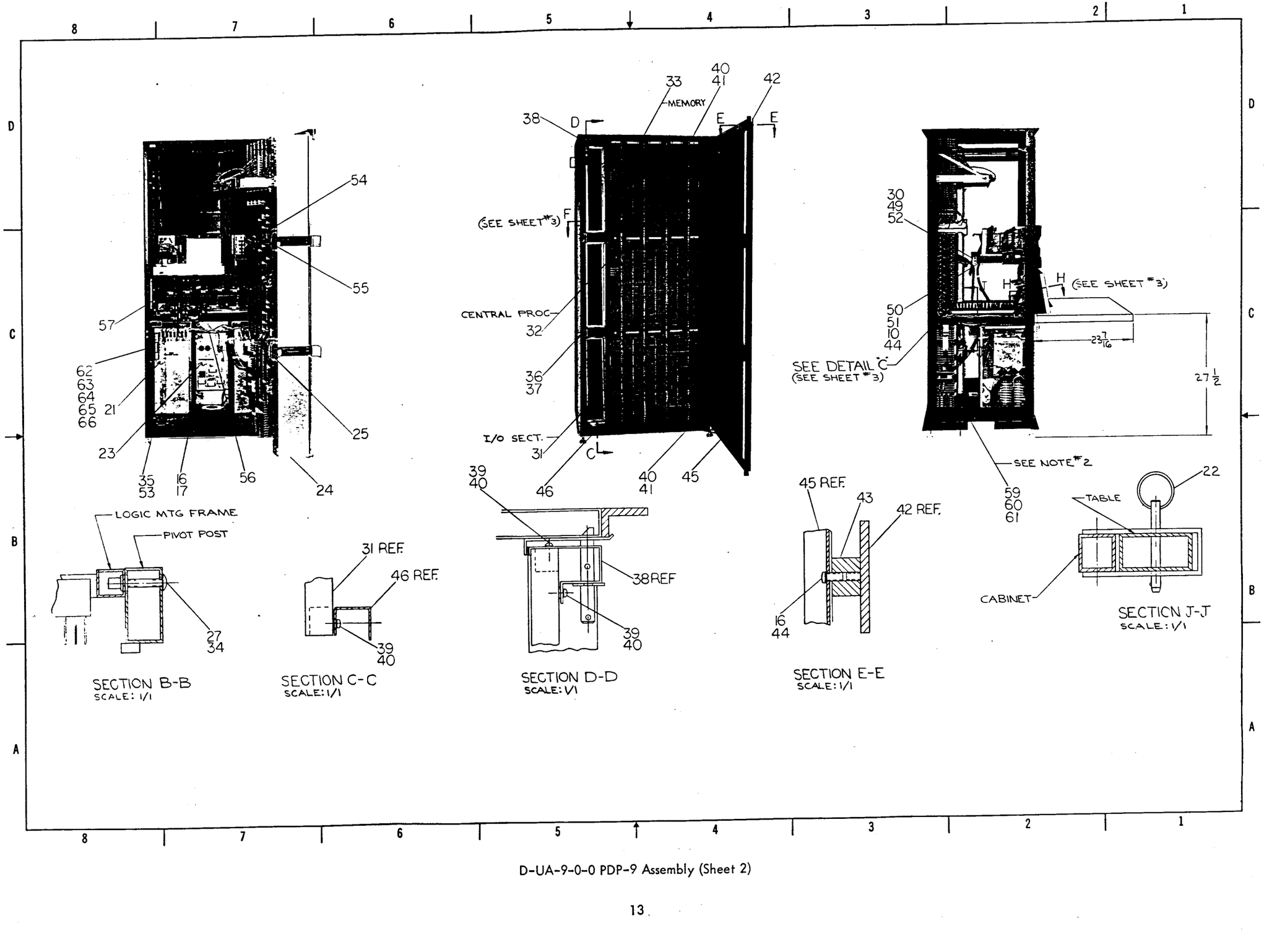


DETAIL "B"
WITH COVER REMOVED

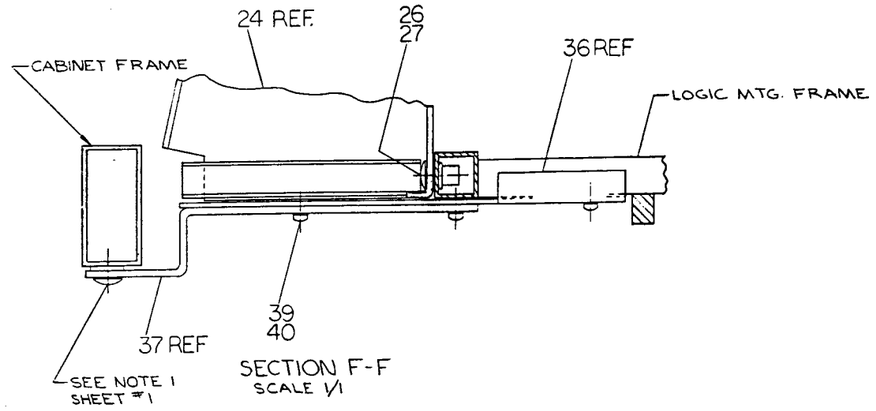


SECTION A-A
SCALE 1/1

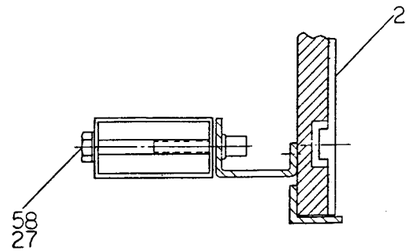
D-UA-9-0-0 PDP-9 Assembly (Sheet 1)



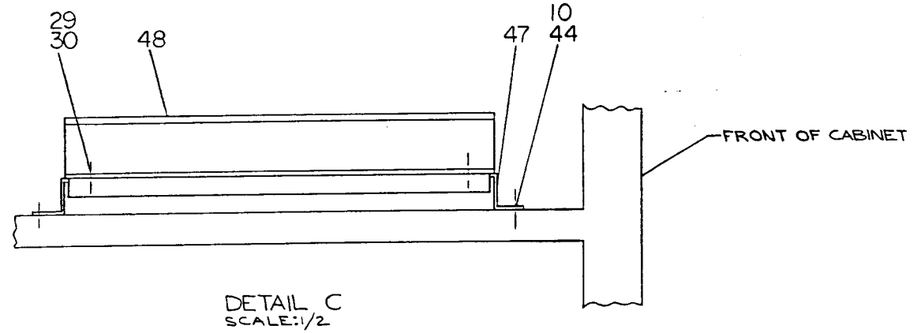
D-UA-9-0-0 PDP-9 Assembly (Sheet 2)



SECTION F-F
SCALE 1/1



SECTION H-H
SCALE: 1/1



DETAIL C
SCALE: 1/2

D-UA-9-0-0 PDP-9 Assembly (Sheet 3)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1	A-PL-7005243-0-0	1	CABINET FRAME ASSY (PDP-9)	7005243
2	A-PL-7005235-0-0	1	CONSOLE ASSY	7005235
3	A-PL-7005090-0-0	1	TABLE	7005090
4	A-PL-7405181-0-0	1	DETACHABLE COVER	7405181
5	E-IA-7405092-0-0	2	END PANEL	7405092
6	A-PL-7005250-0-0	1	DOOR ASSY	7005250
7	A-PL-PC09-0-0	1	READER, PUNCH (PC09)	
8	C-MD-7405722-0-0	4	PANEL, BLANK	7405722
9	B-MD-7405437-0-0	2	STRIKER PLATE	7405437
10		40	SCR PHL HD TRUSS #10-32 x 3/4 SST	
11		24	WASH. 3/8 O.D.x 1/4 I.D. x .020 THK NYLON	
12	A-PL-7005280-0-0	1	MARGINAL CHECK ASSY	7005280
13	A-PL-7005256-0-0	1	MAINT. PANEL ASSY	7005256
14	B-MD-7405500-0-0	1	DOOR STOP ROD	7405500
15		1	RATCHET PLATE HS-47285 CARR FASTN.	
16		8	SCR. PHL HD TRUSS #10-32 x 1/2 SST	

A-PL-9-0-0 PDP-9 Assembly Parts List (Sheet 1)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
17		4	NUT "KEPS" #10-32 SST	
18	C-IA-7405570-1-0	8	COVER RETAINER	7405570-1-0
19	D-SC-3405331-0-0	4	COVER	3405331
20	B-MD-5100	4	STD PANEL "C" SIZE	7402016
21	A-PL-709-0-0	2	709 POWER SUPPLY	
22		2	FASPIN #34-D-4-14R LEHIGH METALS	
23	A-PL-841-A-0	1	841-A POWER CONTROL	
24	A-PL-7005229-0-0	3	FAN & MARGINAL CHK ASSY	7005229
25	A-PL-7005499-0-0	1	JUMPER SET	7005499
26		9	SCR PHL HD TRUSS 1/4-20 x 5/8 SST	
27		22	WASH. EXT TOOTH 1/4-20 SST	
28		24	SCR PHL HD TRUSS #10-32 x 3/4 (BLK PASSIVATE)	
29		2	SCR PHL HD PAN #8-32 x 1/2 SST	
30		6	NUT KEPS #8-32 SST	
31	A-PL-KD09-A-0	1	I/O ASSEMBLY (KD09-A)	
32	A-PL-KC09-A-0	1	C/P ASSEMBLY(KC09-A)	

A-PL-9-0-0 PDP-9 Assembly Parts List (Sheet 2)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
33	A-PL-MC70-B-0	1	MEMORY UNIT MC70-B	
34		9	SCR PHL HD TRUSS 1/4-20 x 1-1/2 SST	
35	B-MD-7405521-0-0	1	DOOR SUPPORT (SHIPPING)	7405521
36	B-MD-7405093-0-0	2	INTERMEDIATE SUPPORT	7405093
37	C-MD-7405291-0-0	2	SHIPPING BRKT	7405291
38	A-PL-7005439-0-0	1	LATCH BRACKET	7005439
39		14	SCR PHL PAN HD #6-32 x 5/8 SST	
40		18	WASH INT TOOTH #6	
41		4	SCR PHL PAN HD #6-32 x 1/4 SST	
42	D-MD-7405278-2-0	1	VENT STRIP (RED)	7405278-2-0
43	A-MD-7405321-0-0	4	SPACER, VENT STRIP	7405321
44		44	WASH EXT TOOTH #10	
45	A-PL-7005171-0-0	1	REAR DOOR ASSY	7005171
46	C-MD-7405315-0-0	1	MAGNET CATCH	7405315
47	D-MD-7405327-0-0	1	CABLE HOLD DOWN BRACKET	7405327
48	C-MD-7405633-0-0	1	CABLE DUCT #1	7405633

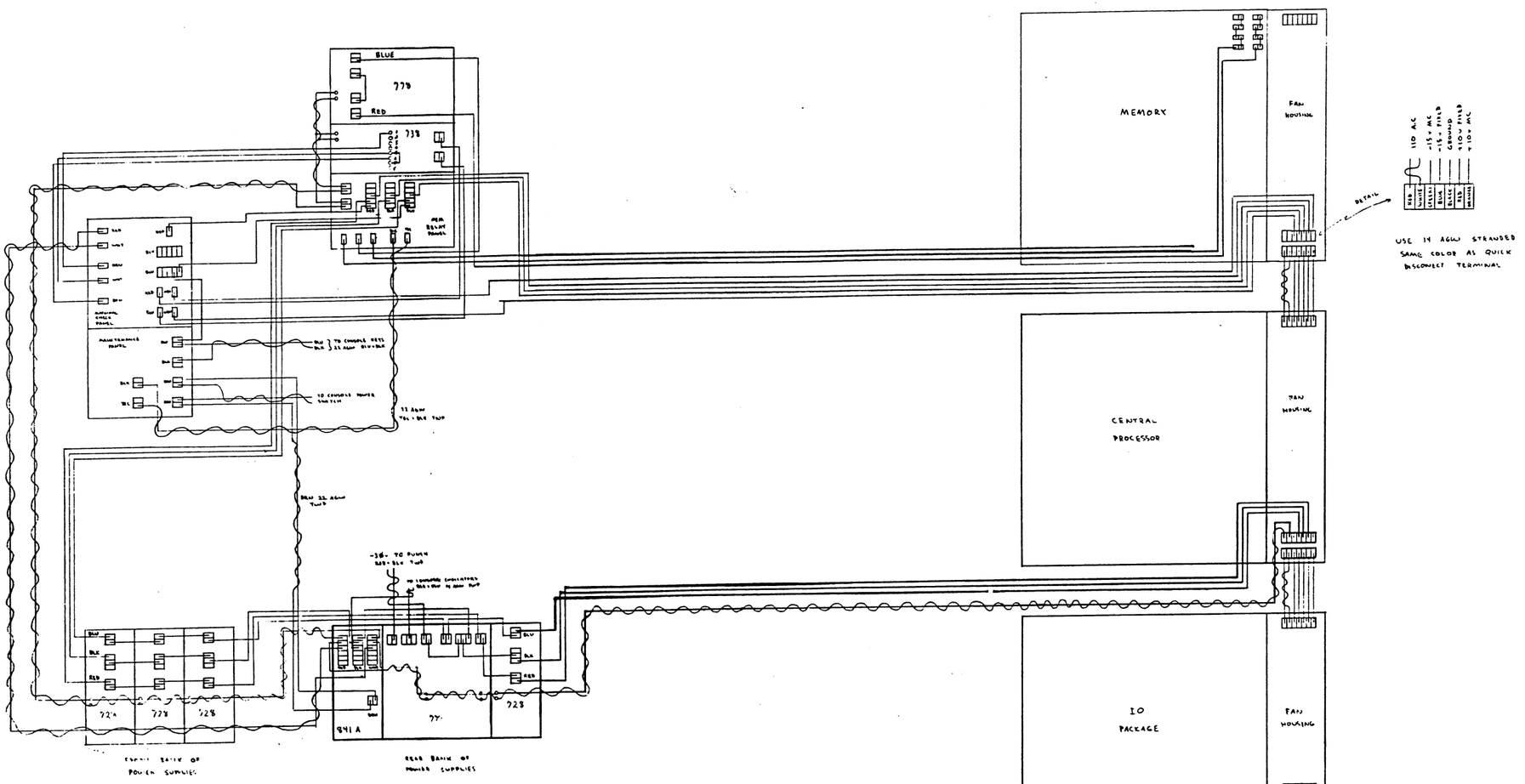
A-PL-9-0-0 PDP-9 Assembly Parts List (Sheet 3)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
49	D-SC-3404701-3-0	1	SLIDE BRACE	3404701-3-0
50	D-SC-3404701-1-0	1	CHASSIS TRACK (LEFT)	3404701-1-0
51	D-SC-3404701-2-0	1	CHASSIS TRACK (RIGHT)	3404701-2-0
52		4	SCR PHL HD PAN #8-32 x 3/8 SST	
53		2	SCR FLAT HD M.S. #6-32 x 1" SST	
54	D-IA-7005417-0-0	2	CABLE W021-W028 SHUNT RES	7005417
55	D-IA-7005418-0-0	2	CABLE W021-W028 SERIES RES	7005418
56	J-IA-7005376-0-0	1	POWER CABLE PDP-9	7005376
57	C-AD-7005372-0-0	1	CABLE SET	7005372
58		4	SCR PHL HD TRUSS 1/4-20 x 2-1/2 SST	
59		2	BOLT SQ HD 3/8-16 x 8" LG	
60		2	WASH FLAT 7/8 O.D. x 13/32 I.D. x 5/64 THK	
61		2	NUT, HEX 3/8-16	
62	C-MD-7406466-0-0	1	MARG CHECK ADAPTER	
63	B-IA-7005486-0-0	1	SHORTING PLUG	
64		1	SOCKET S-306-FP CINCH JONES	1203519

A-PL-9-0-0 PDP-9 Assembly Parts List (Sheet 4)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
65		4	SCR, PHL HD PAN #6-32 x 3/8 SST	7006022-1
66		4	NUT, KEPS #6-32 SST	

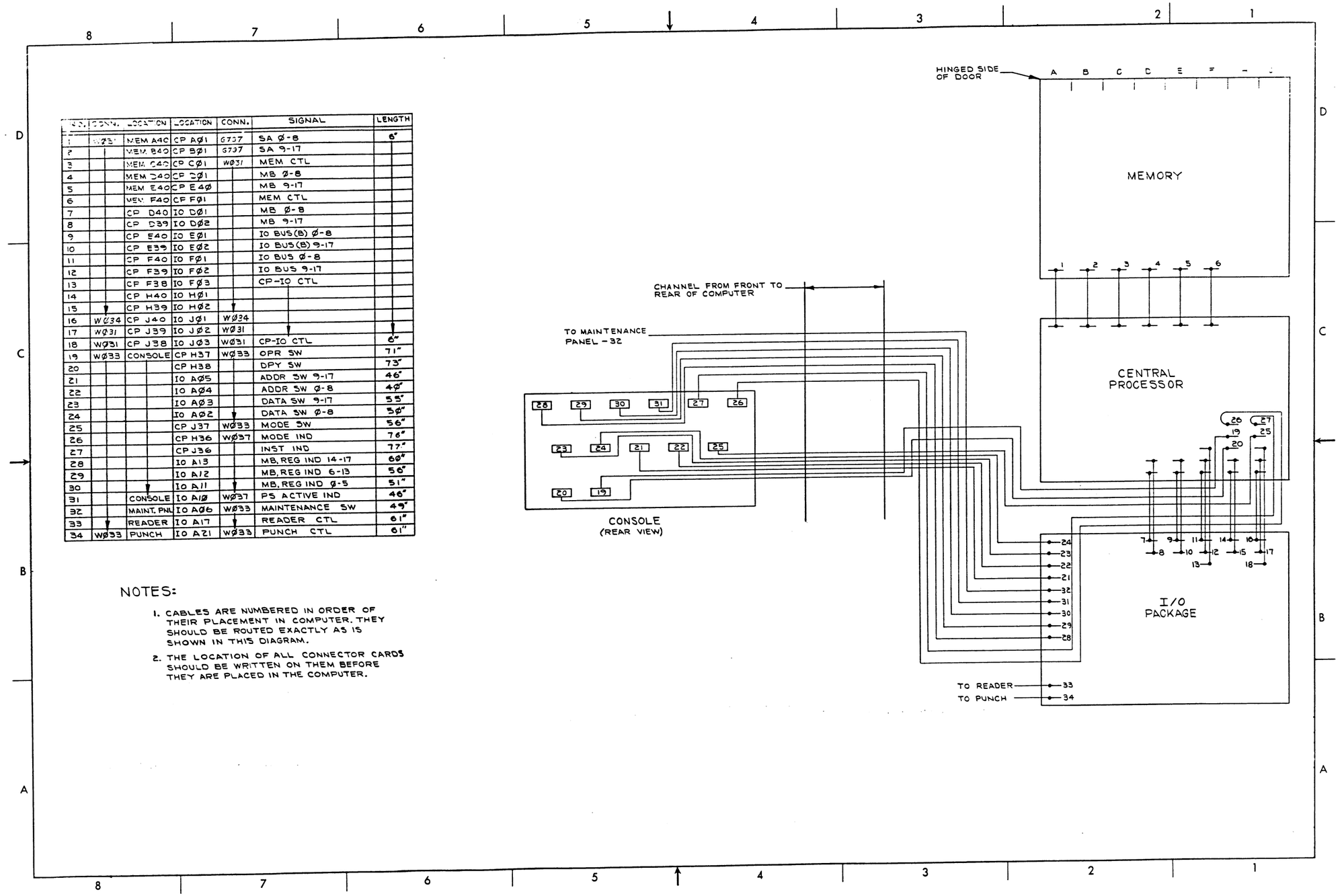
A-PL-9-0-0 PDP-9 Assembly Parts List (Sheet 5)



POWER SUPPLIES REQUIRED	
TYPE	NO.
728	4
738	1
778	1
779	1
841 A	1

D-IC-9-0-1 Power Wiring

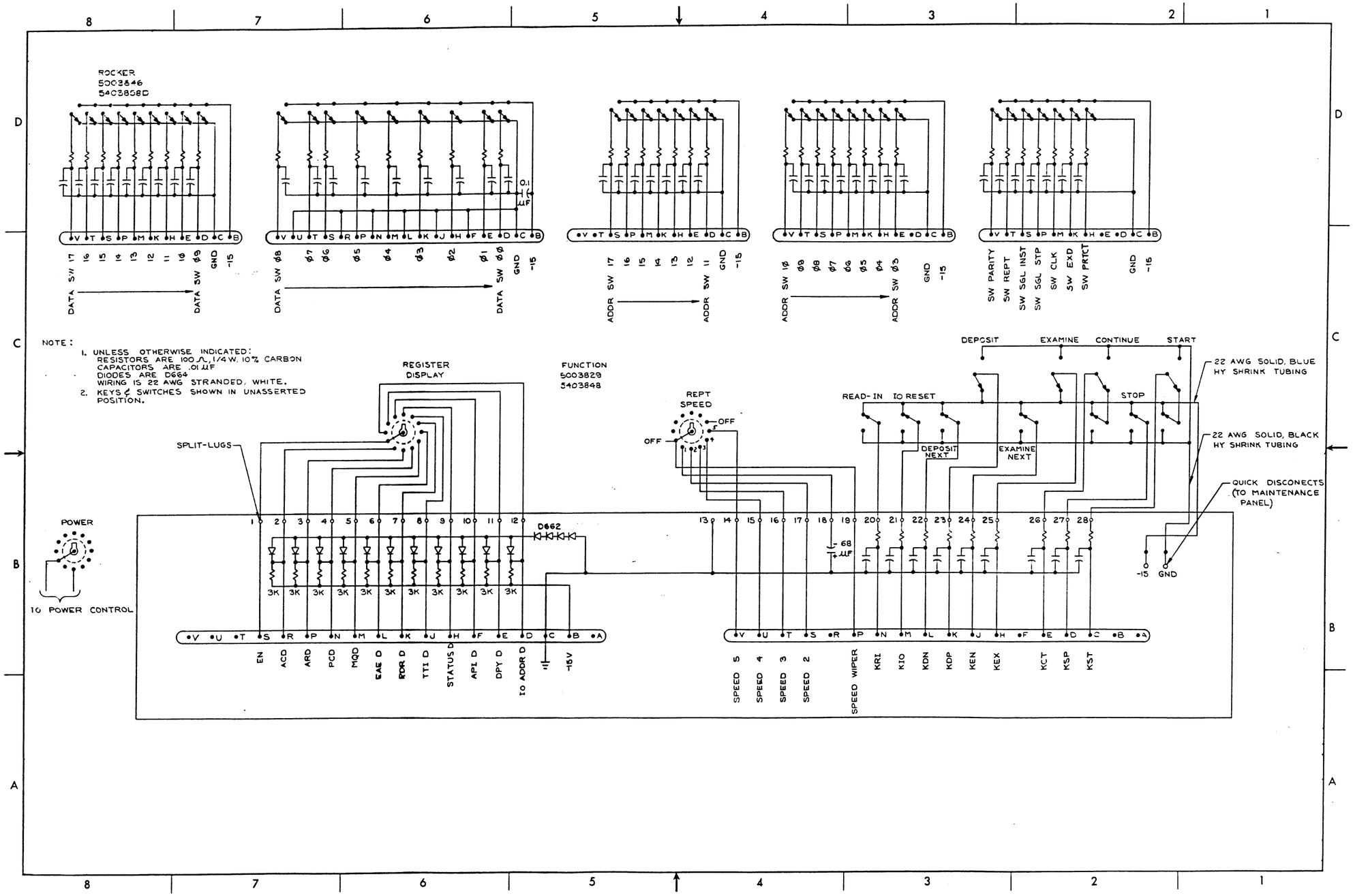
NO.	CONN. LOCATION	LOCATION	CONN.	SIGNAL	LENGTH
1	W033 MEM A40	CP AØ1	G737	SA Ø-8	6"
2	MEM B40	CP BØ1	G737	SA 9-17	
3	MEM C40	CP CØ1	WØ31	MEM CTL	
4	MEM D40	CP DØ1		MB Ø-8	
5	MEM E40	CP EØ1		MB 9-17	
6	MEM F40	CP FØ1		MEM CTL	
7	CP D40	IO DØ1		MB Ø-8	
8	CP D39	IO DØ2		MB 9-17	
9	CP E40	IO EØ1		IO BUS(B) Ø-8	
10	CP E39	IO EØ2		IO BUS(B) 9-17	
11	CP F40	IO FØ1		IO BUS Ø-8	
12	CP F39	IO FØ2		IO BUS 9-17	
13	CP F38	IO FØ3		CP-IO CTL	
14	CP H40	IO HØ1			
15	CP H39	IO HØ2			
16	WØ34 CP J40	IO JØ1	WØ34		
17	WØ31 CP J39	IO JØ2	WØ31		6"
18	WØ31 CP J38	IO JØ3	WØ31	CP-IO CTL	71"
19	WØ33 CONSOLE	CP H37	WØ33	OPR SW	73"
20		CP H38		DPY SW	46"
21		IO AØ5		ADDR SW 9-17	49"
22		IO AØ4		ADDR SW Ø-8	55"
23		IO AØ3		DATA SW 9-17	50"
24		IO AØ2		DATA SW Ø-8	56"
25		CP J37	WØ33	MODE SW	76"
26		CP H36	WØ37	MODE IND	77"
27		CP J36		INST IND	60"
28		IO A13		MB, REG IND 14-17	56"
29		IO A12		MB, REG IND 6-13	51"
30		IO A11		MB, REG IND Ø-5	46"
31	CONSOLE	IO AIØ	WØ37	PS ACTIVE IND	49"
32	MAINT. PNL	IO AØ6	WØ33	MAINTENANCE SW	61"
33	READER	IO A17		READER CTL	61"
34	WØ33 PUNCH	IO A21	WØ33	PUNCH CTL	



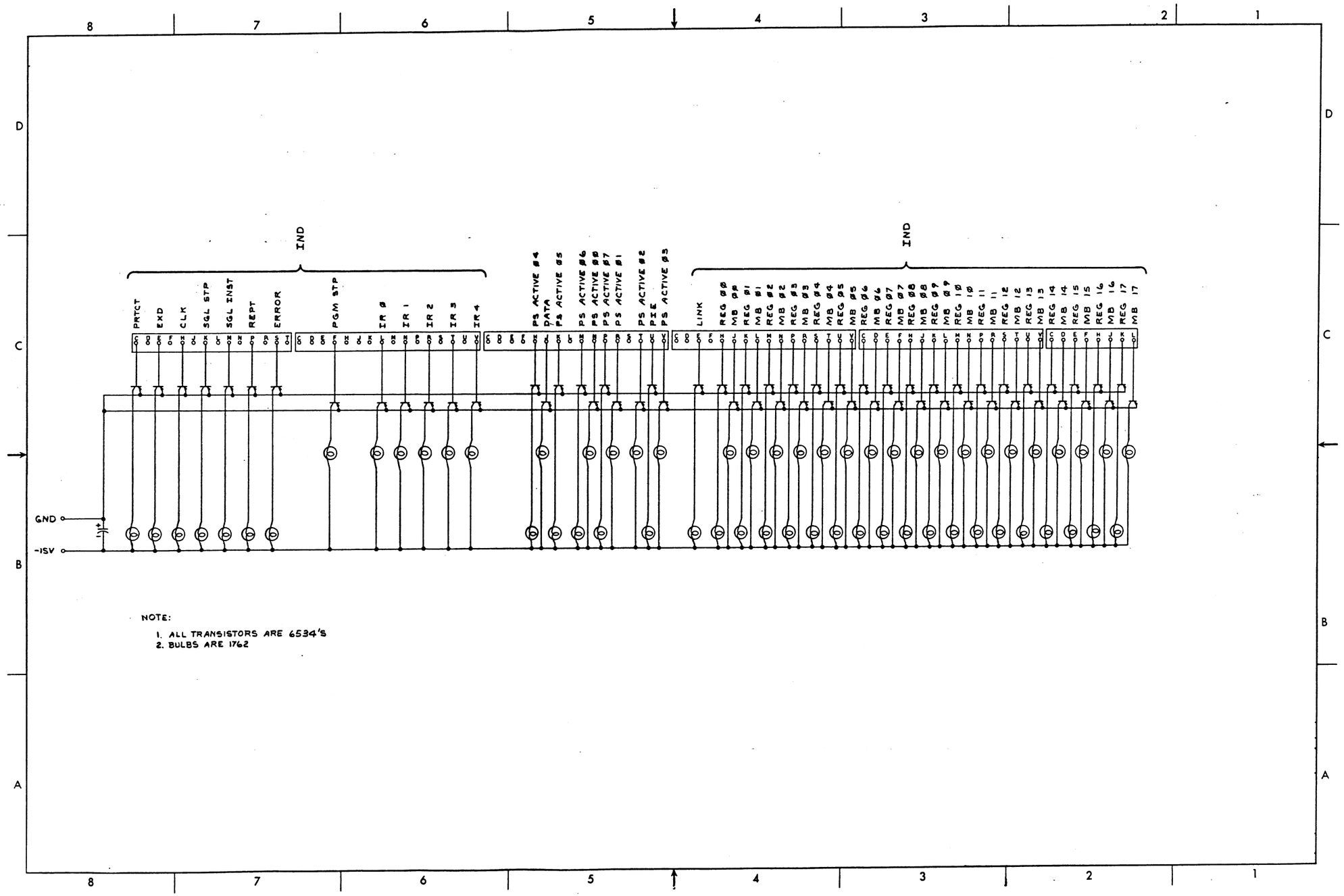
NOTES:

1. CABLES ARE NUMBERED IN ORDER OF THEIR PLACEMENT IN COMPUTER. THEY SHOULD BE ROUTED EXACTLY AS IS SHOWN IN THIS DIAGRAM.
2. THE LOCATION OF ALL CONNECTOR CARDS SHOULD BE WRITTEN ON THEM BEFORE THEY ARE PLACED IN THE COMPUTER.

D-CD-9-0-2 Cable Diagram

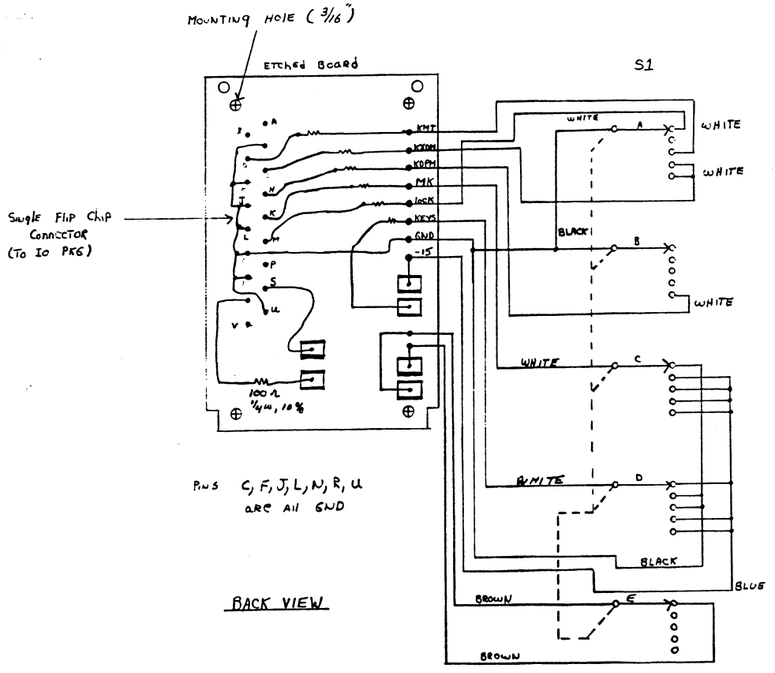


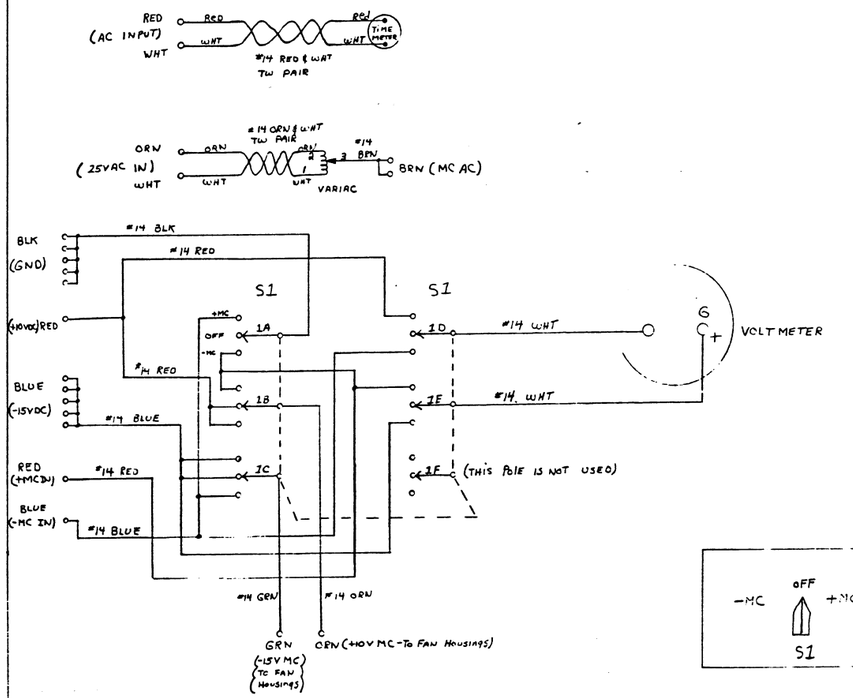
D-CS-9-0-3 Console Keys and Wiring Diagram

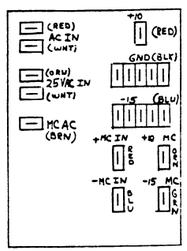


D-CS-9-0-4 Console Indicators

Maintenance PANEL WIRING







MARGINAL CHECK PANEL WIRING

ETCHED BOARD

PDP-9 MAINTENANCE PANEL

"5003944-0-0 C

UNLESS OTHERWISE SPECIFIED:

All RESISTORS ARE 10Ω 1/4W 10%

All CAPACITORS ARE .01 MFD DISK SPRAGUE

All WIRING IS #22 GAUGE (STRANDED)

S1 (6PN-5 POS)

LOCK

NORMAL

MAINTENANCE

EXAMINE

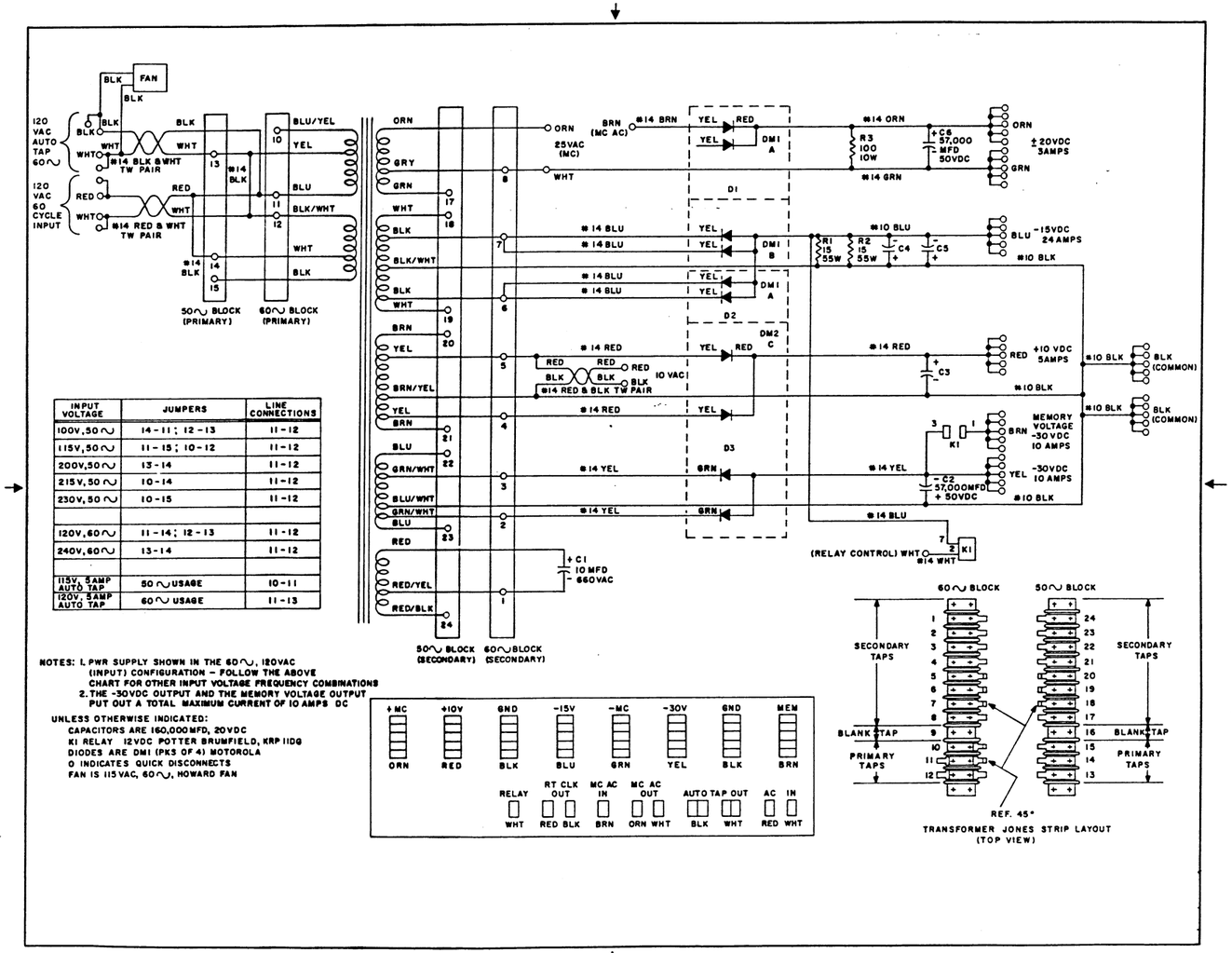
DEPOSIT

MARGINAL CHECK TAB PANEL

UNLESS OTHERWISE SPECIFIED:

1. TIME METER Hobbs
2. VARIAC (0-140VAC) 10 8-40 POWERSTAT
3. S1 HEAVY DUTY 3 POS; 6 PER 34-12451
4. VOLTMETER 10-0-10 VDC GE 2½" VERTICAL

D-CS-9-0-5 Maintenance Area Wiring

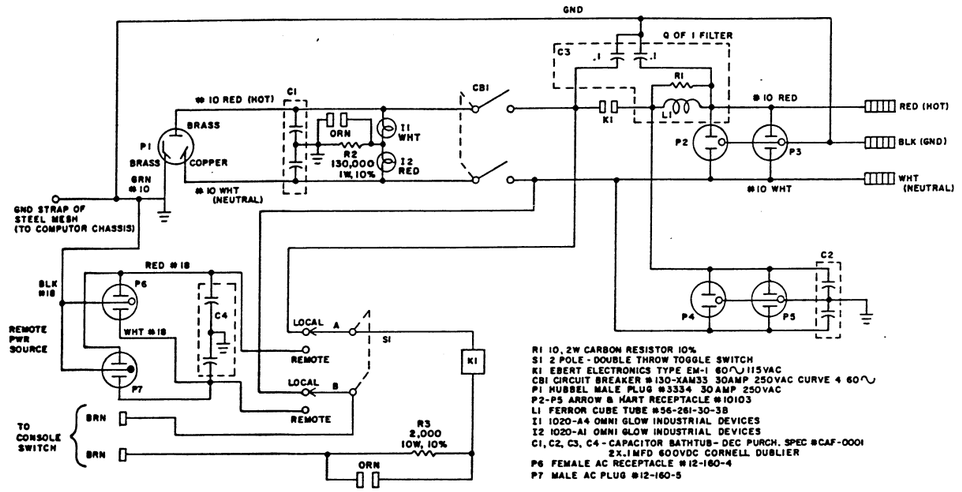


INPUT VOLTAGE	JUMPERS	LINE CONNECTIONS
100V,50~	14-11; 12-13	11-12
115V,50~	11-15; 10-12	11-12
200V,50~	13-14	11-12
215V,50~	10-14	11-12
230V,50~	10-15	11-12
120V,60~	11-14; 12-13	11-12
240V,60~	13-14	11-12
115V, 5 AMP AUTO TAP	50~ USAGE	10-11
120V, 5 AMP AUTO TAP	60~ USAGE	11-13

NOTES: 1. PWR SUPPLY SHOWN IN THE 60~, 120VAC (INPUT) CONFIGURATION - FOLLOW THE ABOVE CHART FOR OTHER INPUT VOLTAGE FREQUENCY COMBINATIONS
2. THE -30VDC OUTPUT AND THE MEMORY VOLTAGE OUTPUT PUT OUT A TOTAL MAXIMUM CURRENT OF 10 AMPS DC

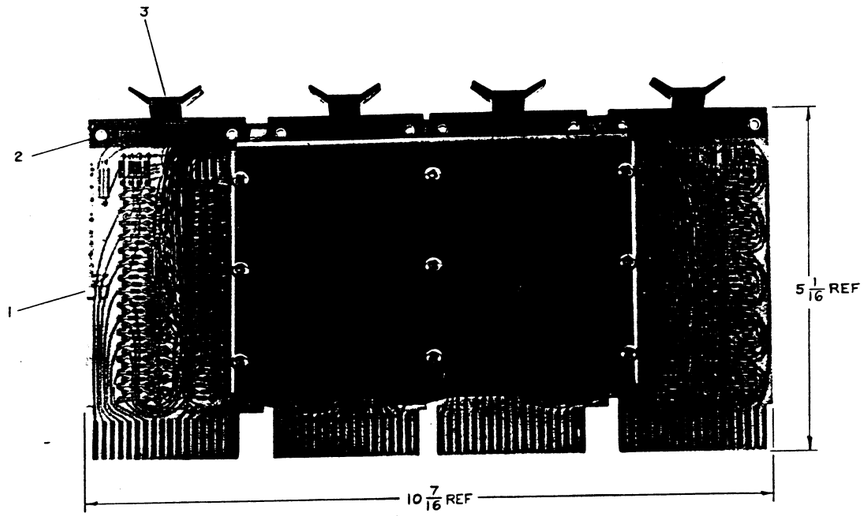
UNLESS OTHERWISE INDICATED:
CAPACITORS ARE 160,000MFD, 20VDC
K1 RELAY 12VDC POTTER BRUMFIELD, KRP 11DG
DIODES ARE DMI (PKS OF 4) MOTOROLA
O INDICATES QUICK DISCONNECTS
FAN IS 115 VAC, 60~, HOWARD FAN

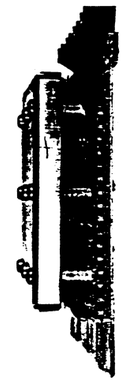
C-CS-709-0-1 709 Power Supply

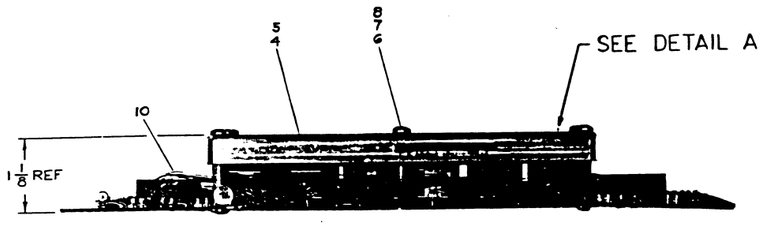


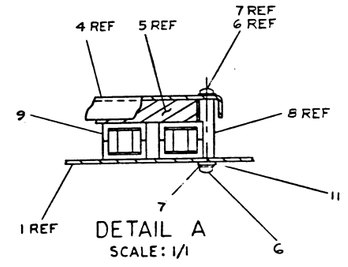
R1 10, 2W CARBON RESISTOR 10%
S1 2 POLE - DOUBLE THROW TOGGLE SWITCH
K1 EBERT ELECTRONICS TYPE EM-1 60~/115VAC
CB1 CIRCUIT BREAKER #130-XAM33 30AMP 250VAC CURVE 4 60~
P1 HUBBEL MALE PLUG #3334 30AMP 250VAC
P2-P5 ARROW & HART RECEPTACLE #10103
L1 FERROR CUBE TUBE #56-261-30-38
I1 1020-A4 OMNI GLOW INDUSTRIAL DEVICES
I2 1020-A1 OMNI GLOW INDUSTRIAL DEVICES
C1, C2, C3, C4 - CAPACITOR BATHTUB- DEC PURCH. SPEC #CAF-0001
2X.1MFD 600VDC CORNELL DUBLIER
P6 FEMALE AC RECEPTACLE #12-160-4
P7 MALE AC PLUG #12-160-5

B-CS-841-A-1 841A Power Control







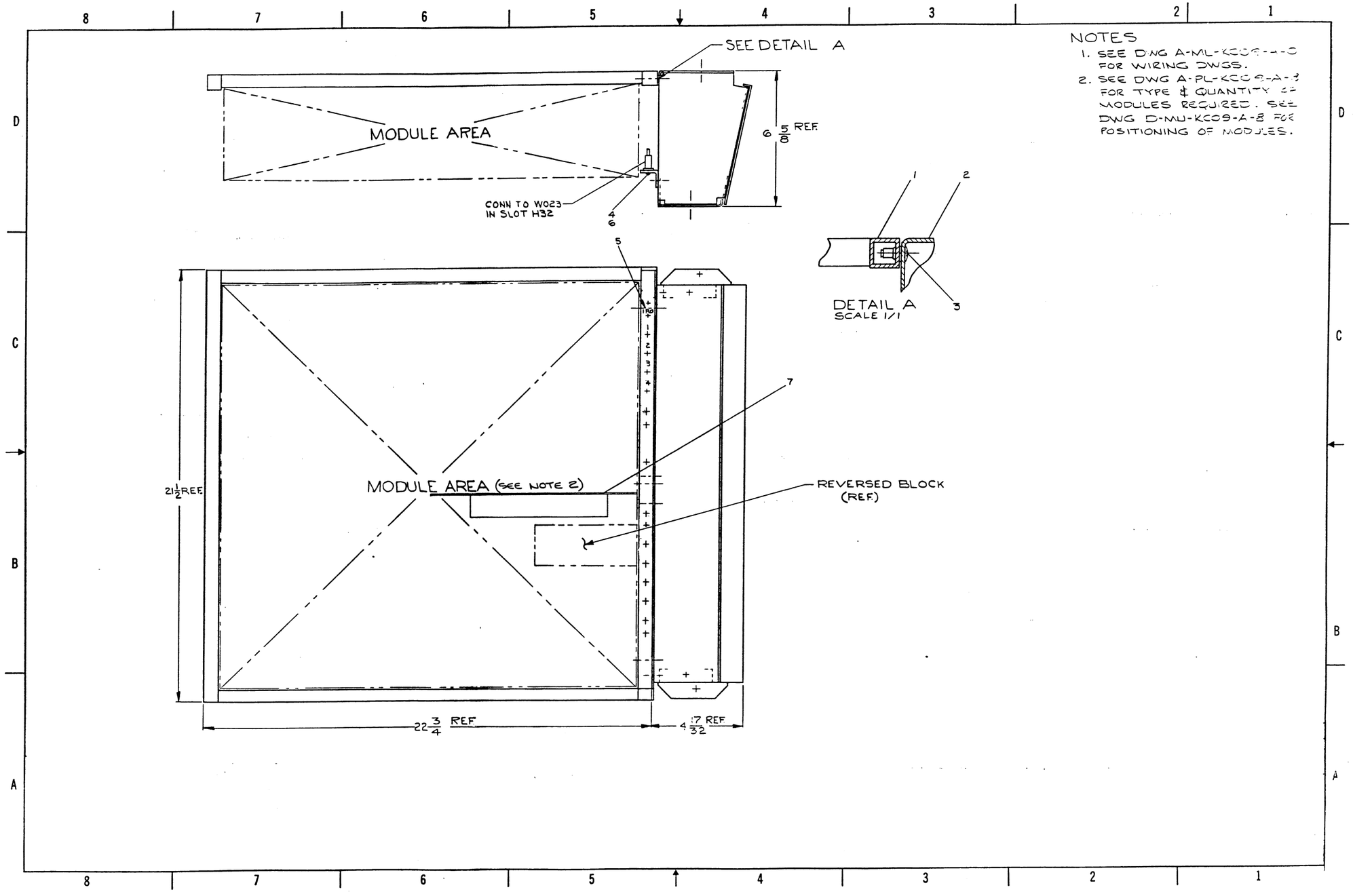


DETAIL A
SCALE: 1/1

D-UA-MC09-A-0 Control Memory Type MC09-A

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1	D-UA-G920-0-0	1	G920 ASSEMBLY	
2		8	EYELET GS-4-9 STIMPSON	
3	MD-C-100151-1-0-2	4	HANDLE (GREEN) LABEL "MC09"	1202258
4	C-MD-5503916-0-0	1	COVER PLATE	
5		2	FOAM POLYURETHANE (RECLAIMED) #18 DENSITY 2 9/16 x 3 9/16 x 3/8	
6		18	SCR PHL H PAN #6-32 x 1/2 SST	
7		18	WASH LOCK INT #6 SST	
8		9	STAND-OFF #6T-1000 CURRENT INC	
9		36	"E" CORE #CF-903 INDIANA GEN.	
10		AR	WIRE #27 COPPER PLY HEAT STRIP	
11		9	WASHER NYLON #6 x 1/32 THK	

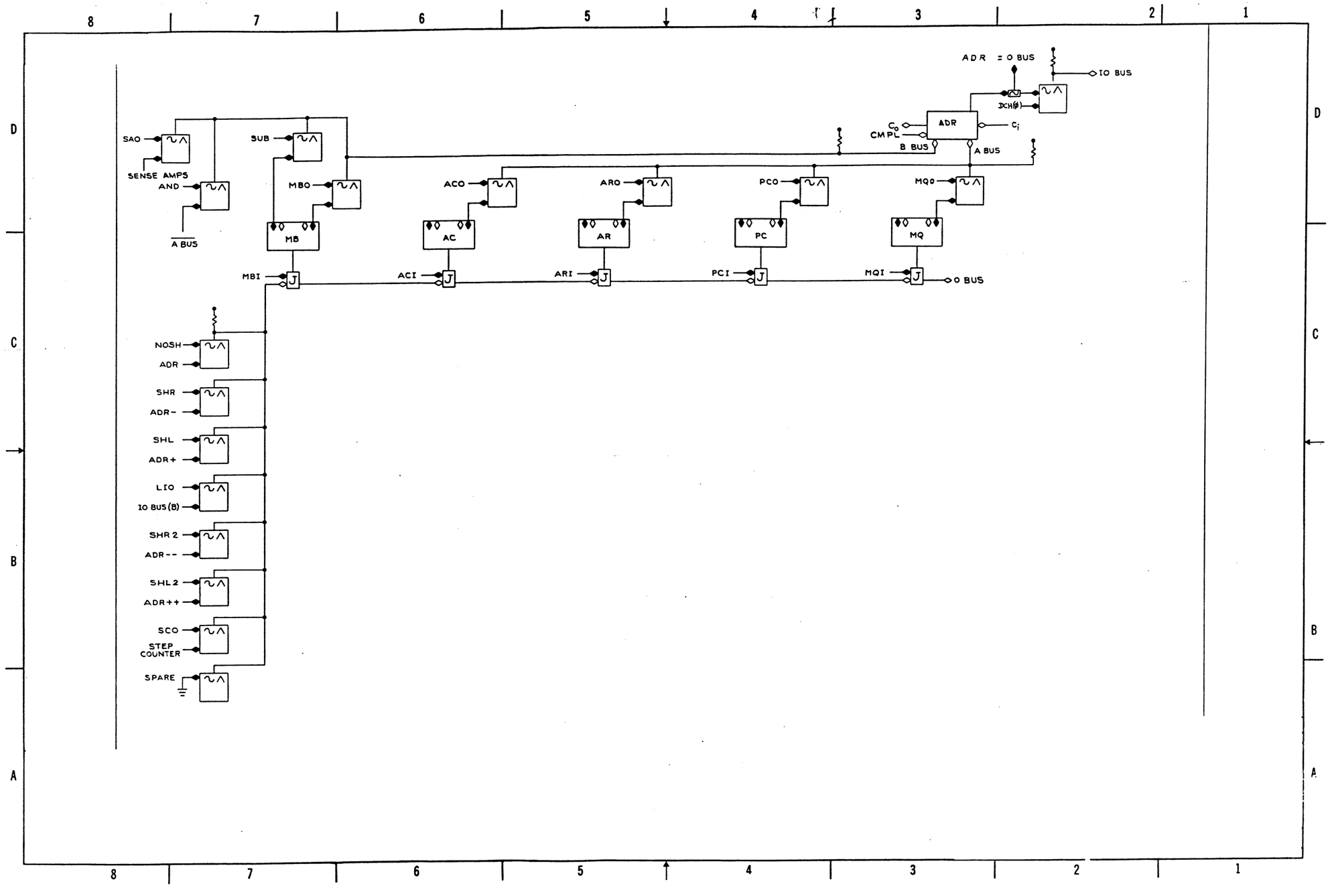
A-PL-MC09-A-0 Control Memory Type MC09-A



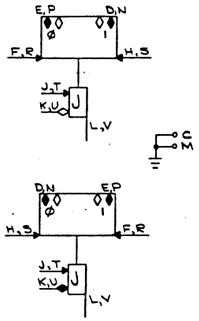
D-UA-KC09-A-0 Unit Assembly

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1	D-AD-7005303-0-0	1	CENTRAL PROCESSOR BUS ASSEMBLY	7005303-0-0
2	A-PL-7005229-0-0	1	FAN & MARGINAL CHECK ASSY	7005229-0-0
3		3	SCR PHL TRUS HD 1/4-20 x 5/8 SST	
	A-ML-KC09-A	REF	MDL (CENTRAL PROCESSOR ASSY)	
	D-MU-KC09-A-8	REF	MODULE UTILIZATION LIST	
	A-PL-KC09-A-8	REF	MODULE LIST	
4	D-IA-7005385-0-0	1	AIR BAFFLE SW ASSY (KC09-A)	7005385-0-0
5	A-SS-7405842-0-0	AS REQD	SCOTCHCAL STICKERS	7405842-0-0
6		2	SCR PHL HD PAN 6-32 x 9/16 SST	
7	A-PL-MC09-A-0	1	CONTROL MEMORY MC09-A	

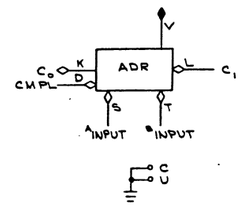
A-PL-KC09-A-0 Assembly Parts List



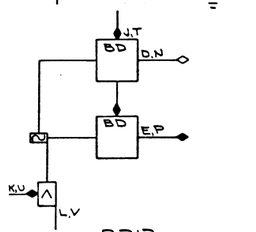
D-BS-KC09-A-1 Register Configuration



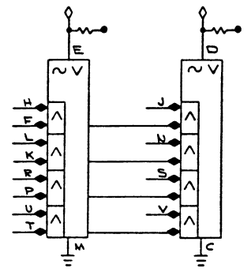
B213



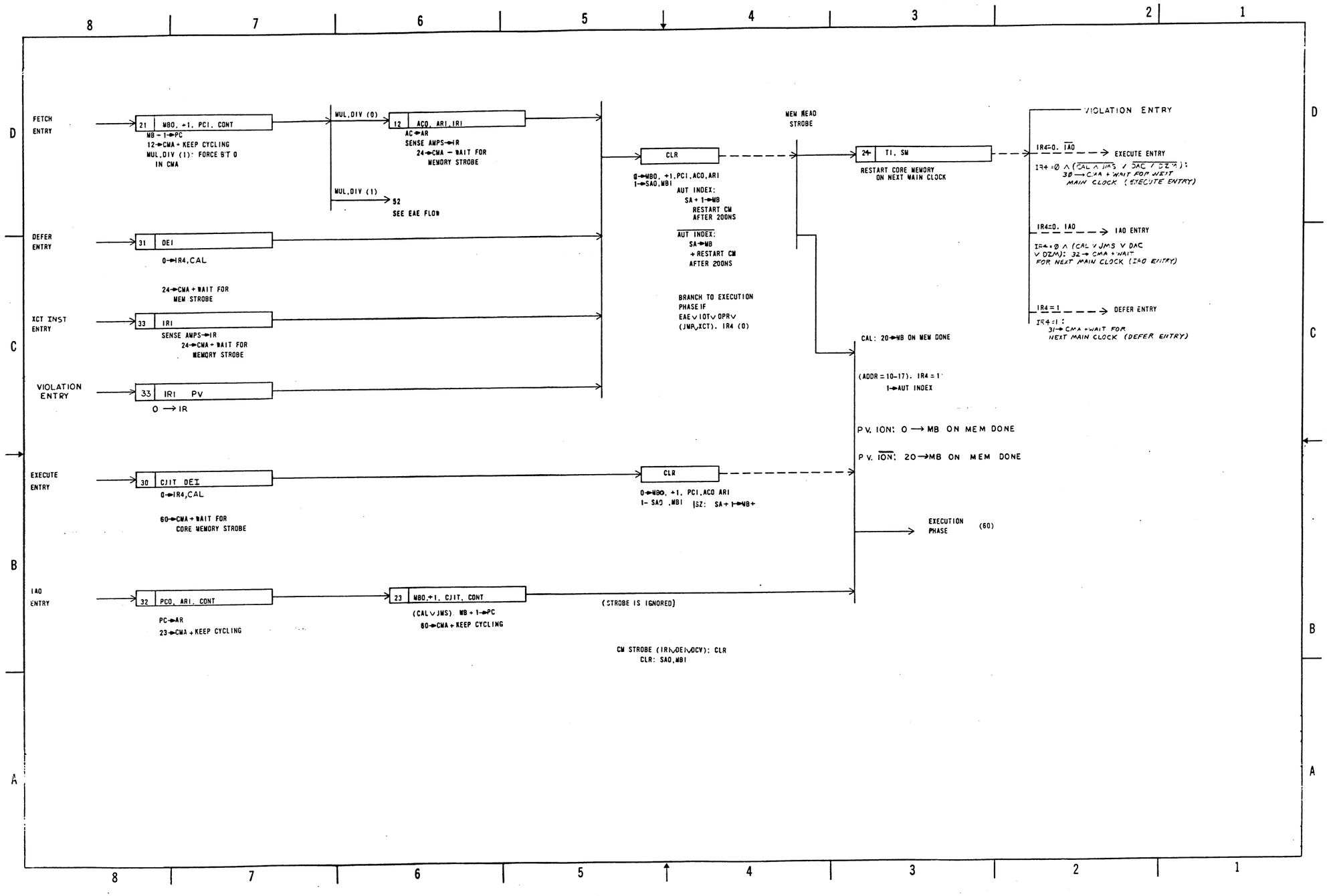
ADDER
B131



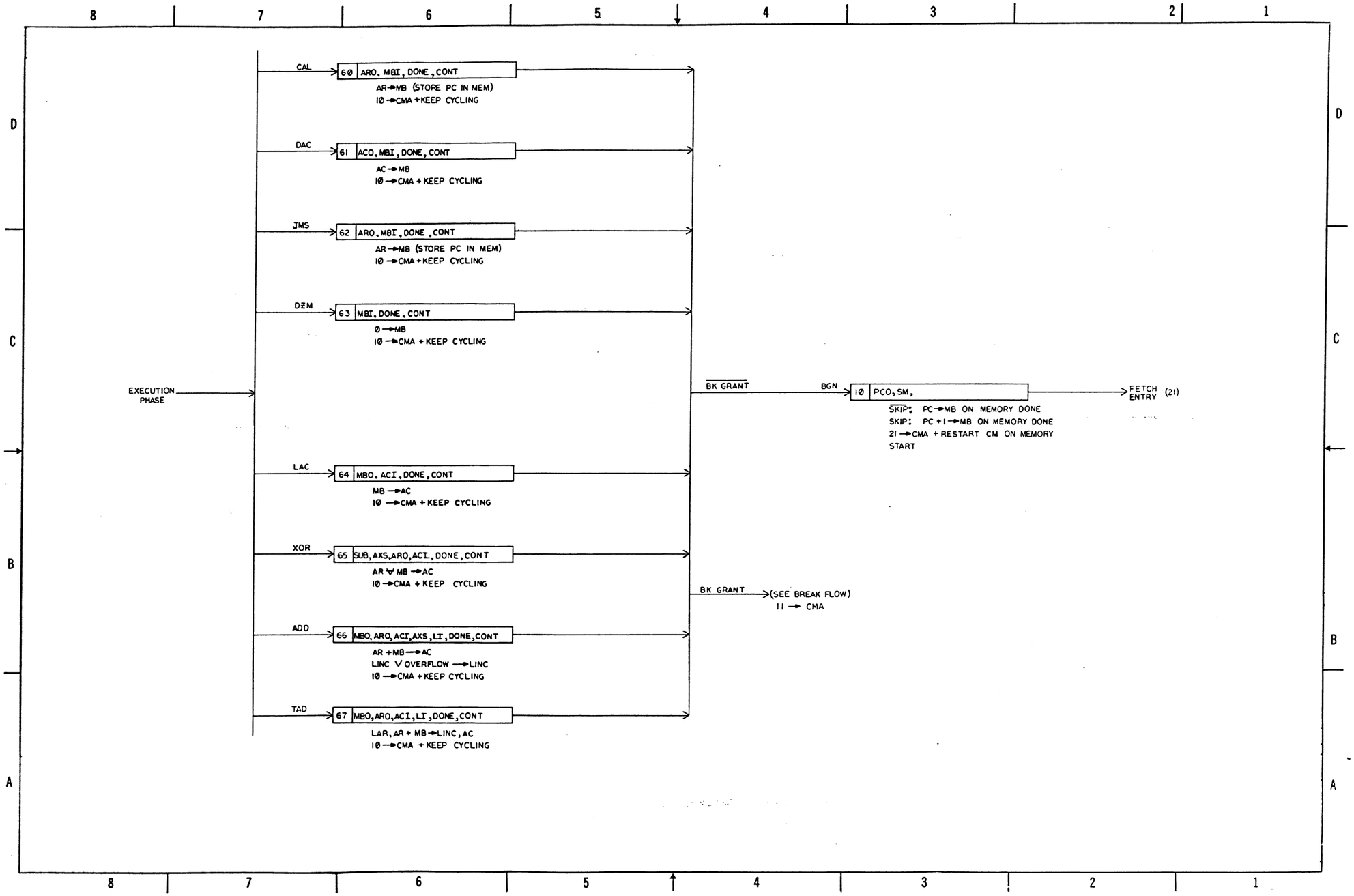
B213



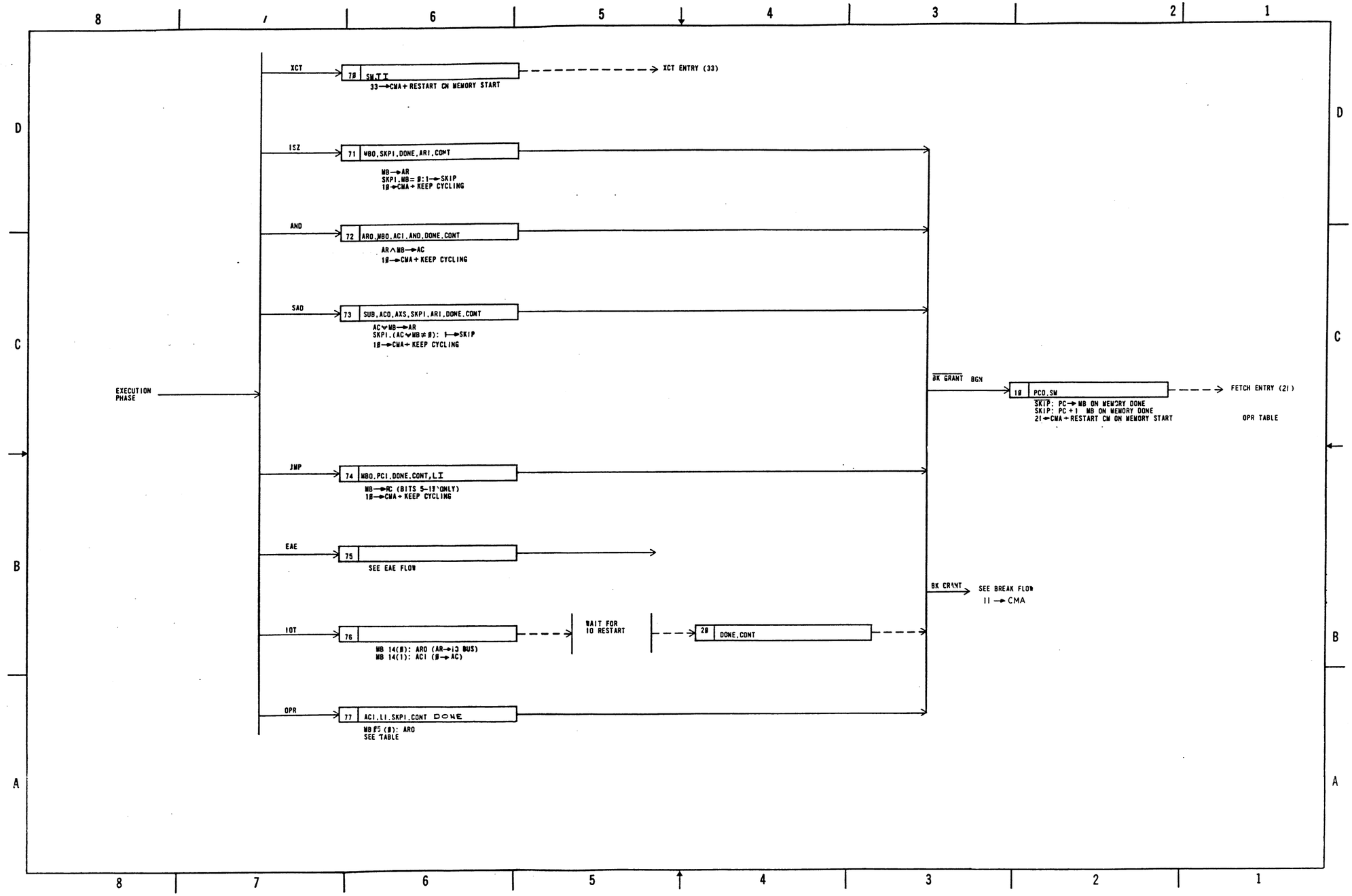
B169



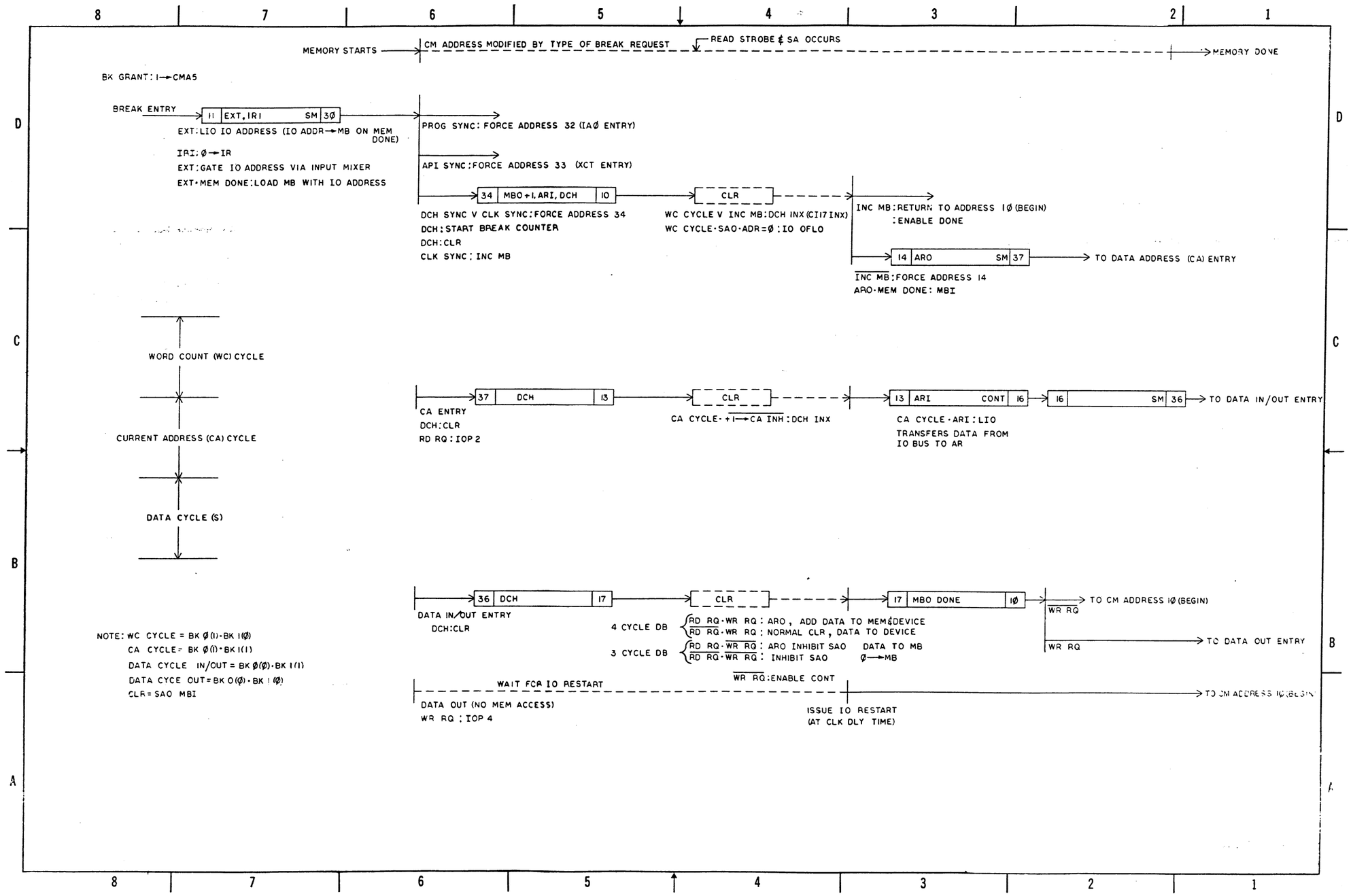
D-FD-KC09-A-3 Operand Fetch Flow



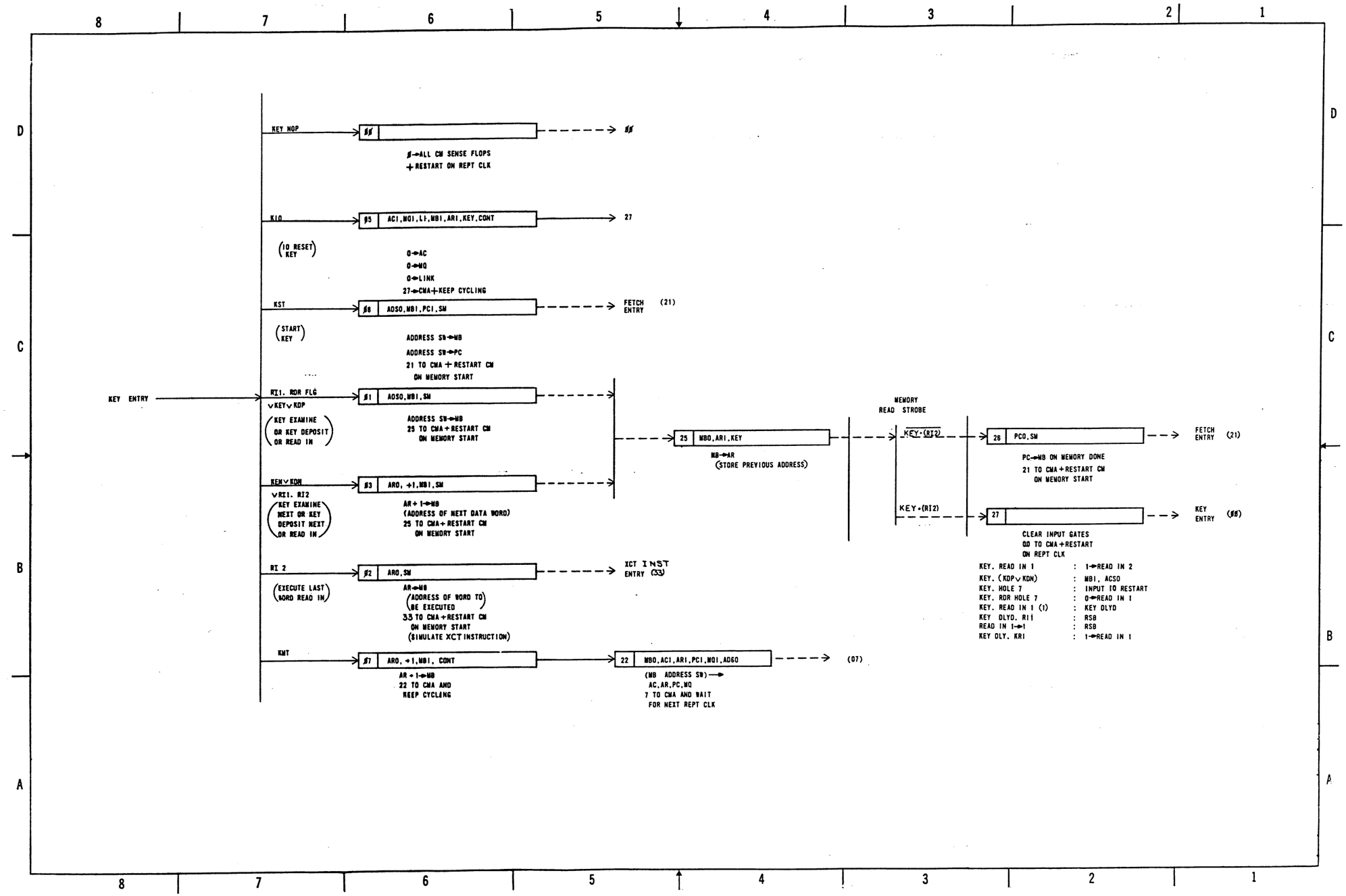
D-FD-KC09-A-4 Execution Flow (Sheet 1)



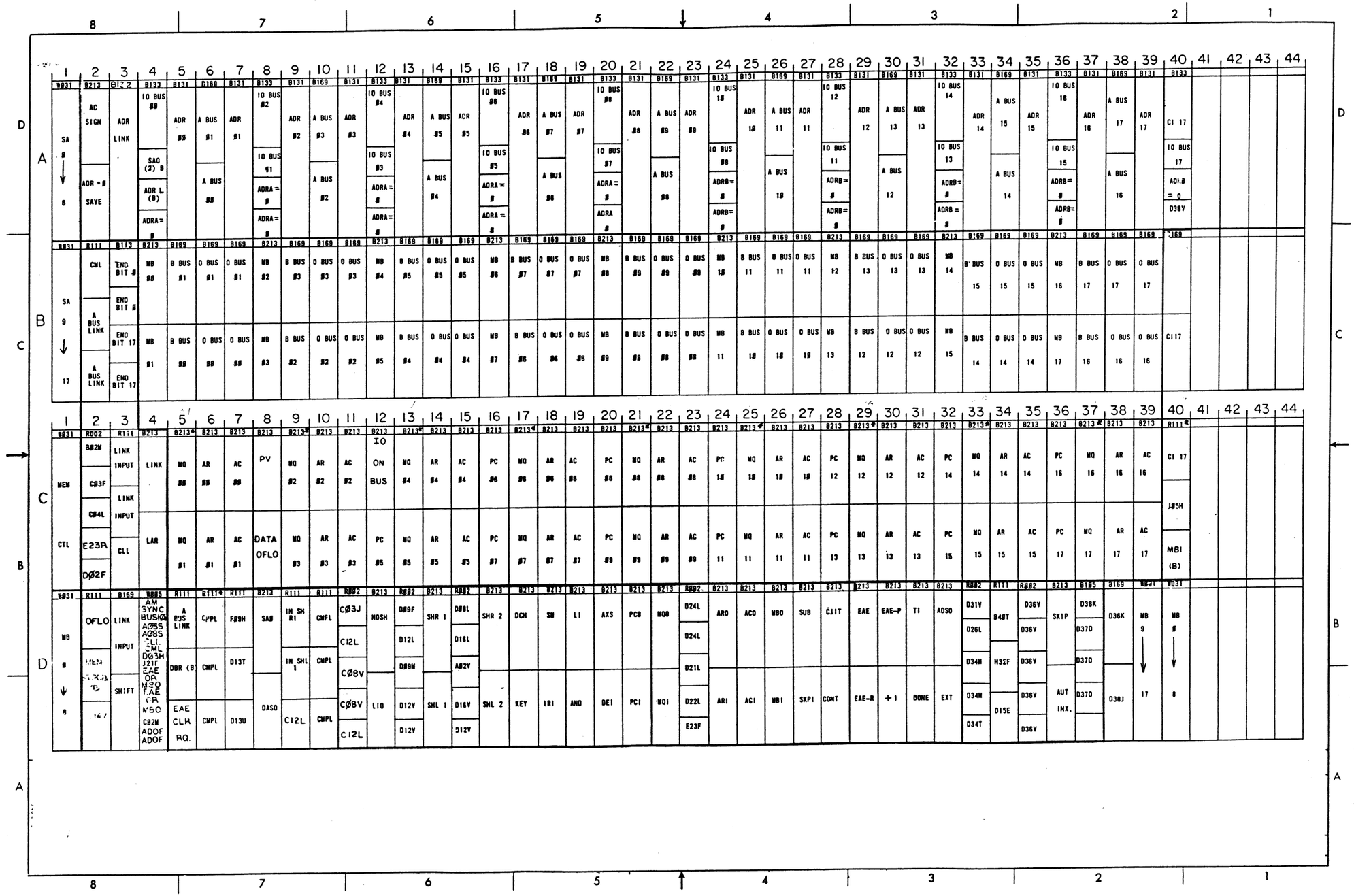
D-FD-KC09-A-4 Execution Flow (Sheet 2)



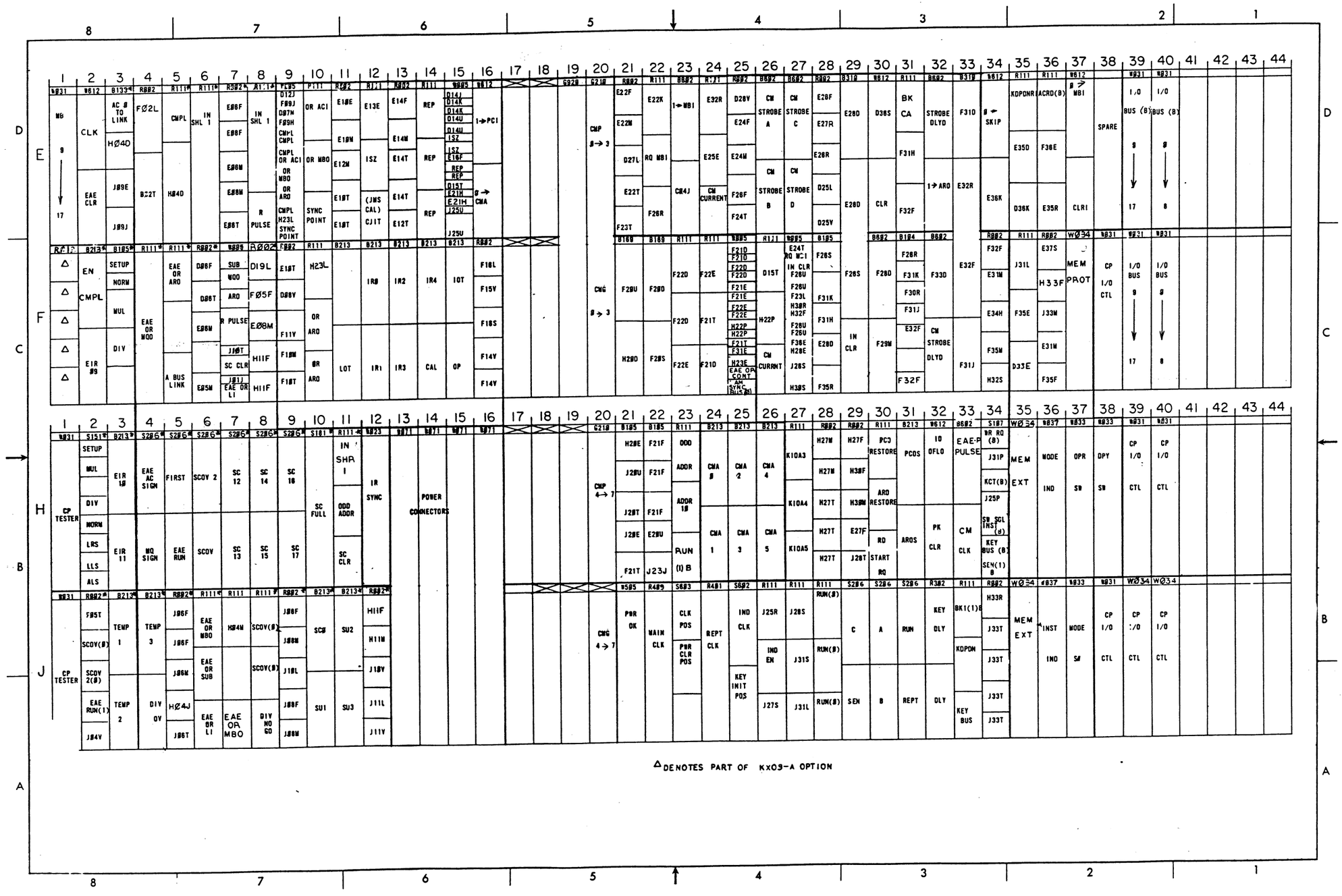
D-FD-KC09-A-5 Break Flow



D-FD-KC09-A-6 Key Flow



D-MU-KC09-A-8 CP Module List (Sheet 1)



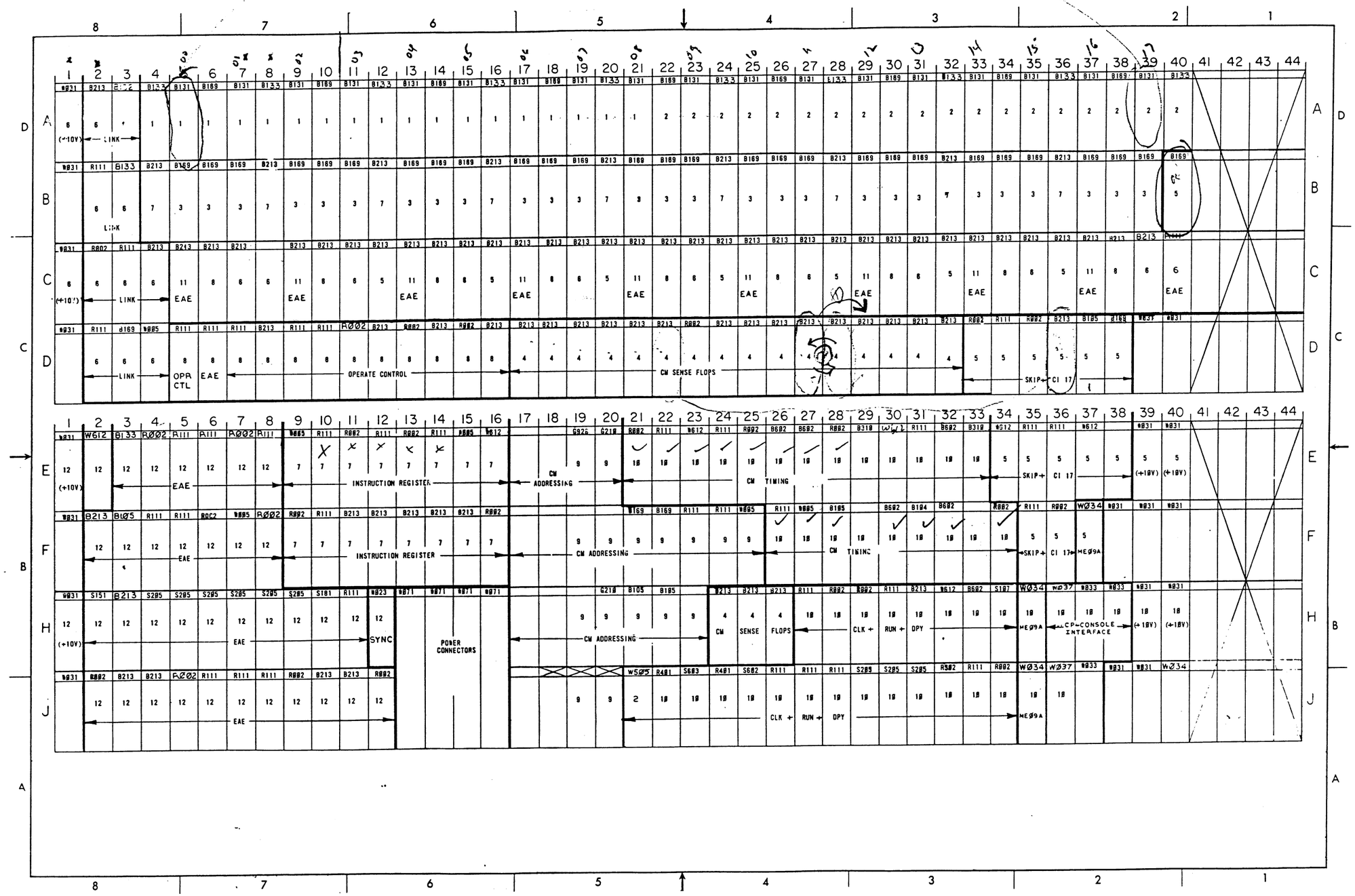
D-MU-KC09-A-8 CP Modules List (Sheet 2)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
		1	B104 INVERTER	
		4	B105 INVERTER	
		19	B131 ADDER	
		41	B169 INVERTER	
		75	B213 FLIP-FLOP	
		2	B310 DELAY LINE	
		7	B602 PULSE AMPLIFIER	
		2	G210	
		1	G920	
		18	R002 DIODE NETWORK	
		30	R111 DIODE GATE	
		1	R302 DELAY ONE SHOT	
		2	R401 CLOCK	
		1	S107 INVERTER	
		3	S205 DUAL FLIP FLOP	
		1	S602 PULSE AMPLIFIER	

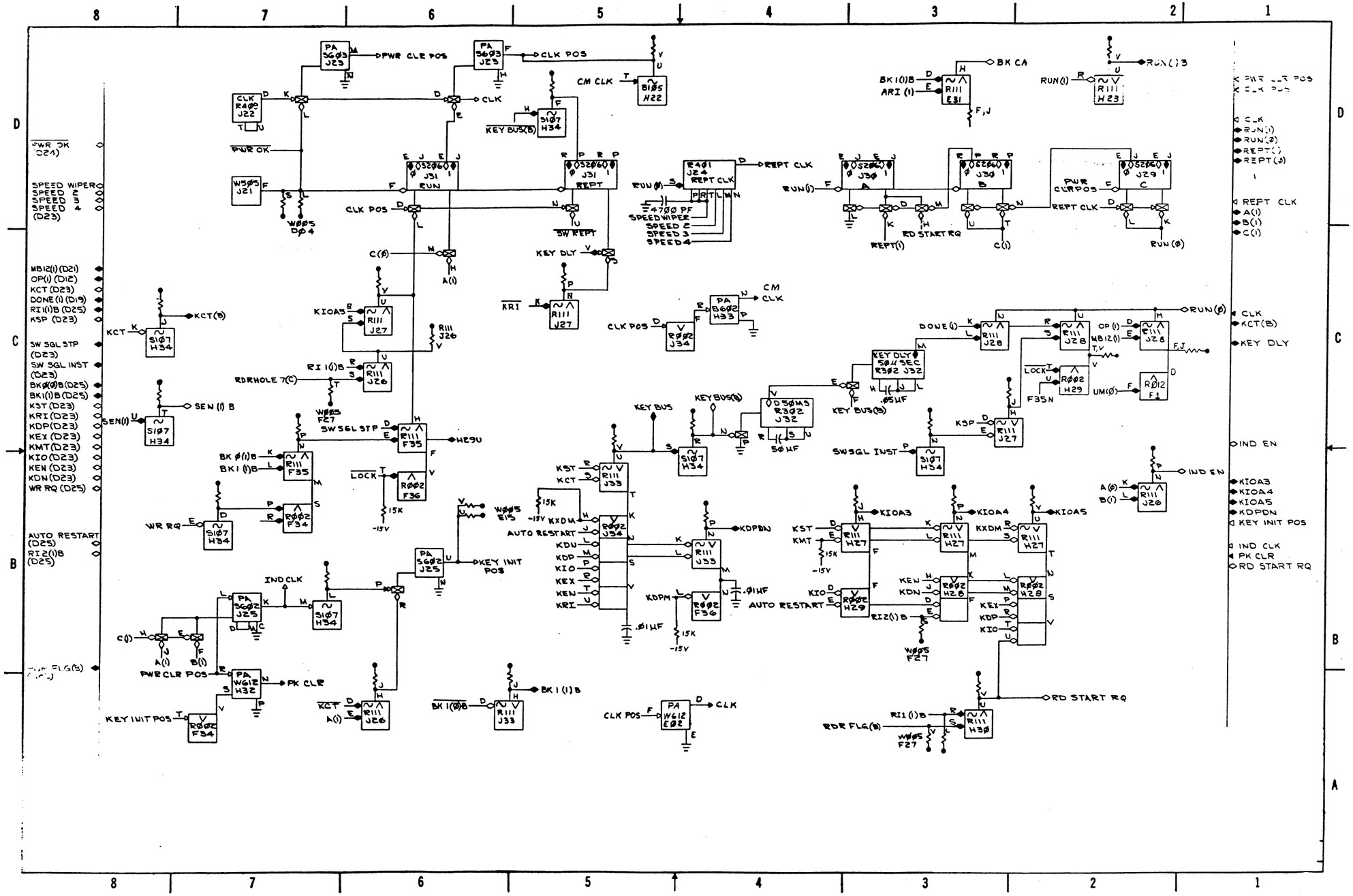
A-PL-KC09-A-8 Module Parts List (Sheet 1)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
		1	S603 PULSE AMPLIFIER	
		5	W005 CLAMPED LOADS	
		20	W031 SIGNAL CABLE CONN	
		3	W033	
		2	W036	
		4	W071 POWER CONN	
		1	W505	
		5	W612 PULSE AMPLIFIER	
		10	B133	

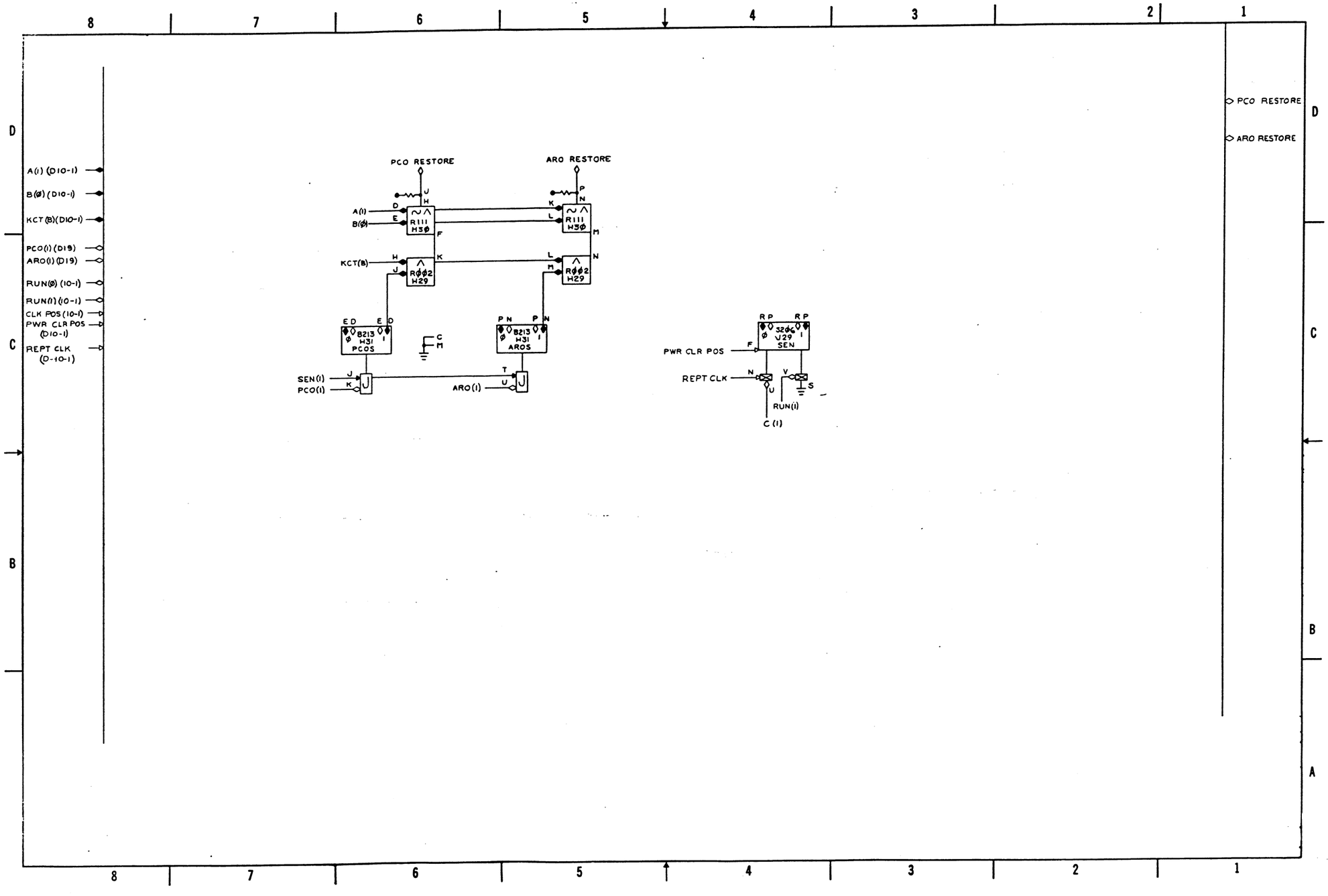
A-PL-KC09-A-8 Module Parts List (Sheet 2)



D-IC-KC09-A-9 MC Switch Configuration



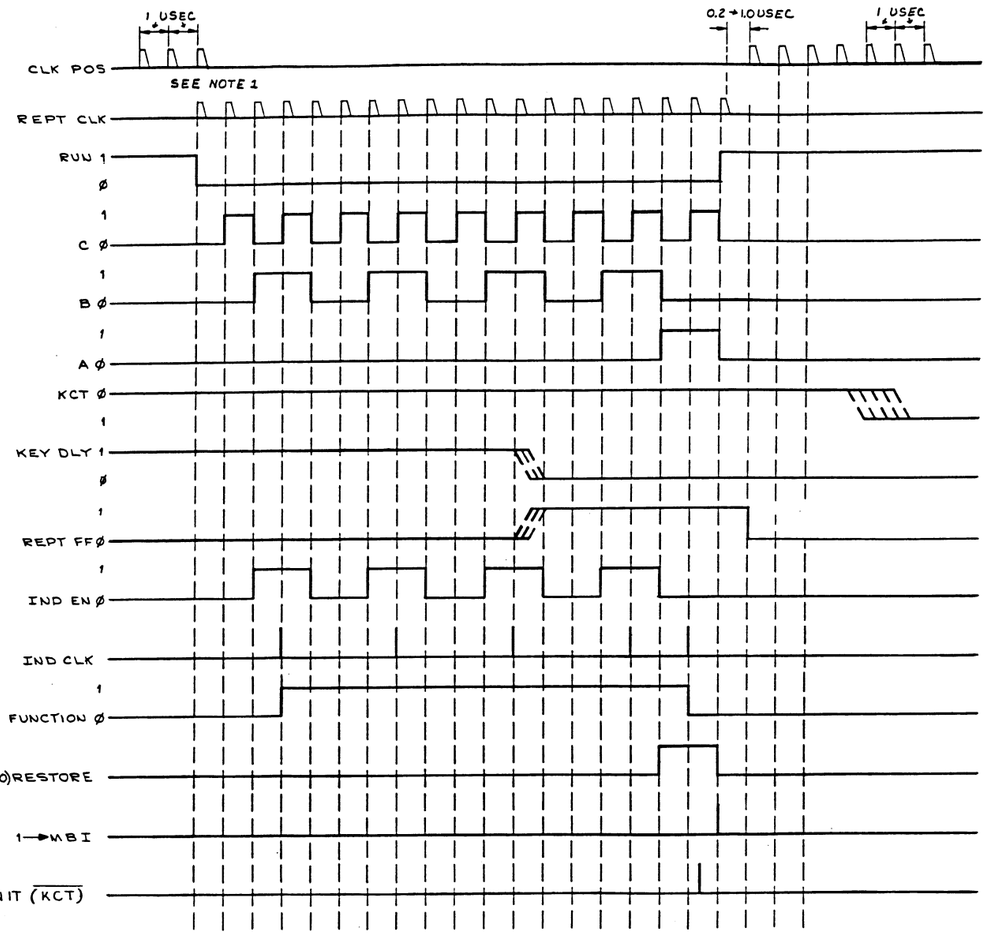
D-BS-KC09-A-10 Clock, Run, and Display (Sheet 1)



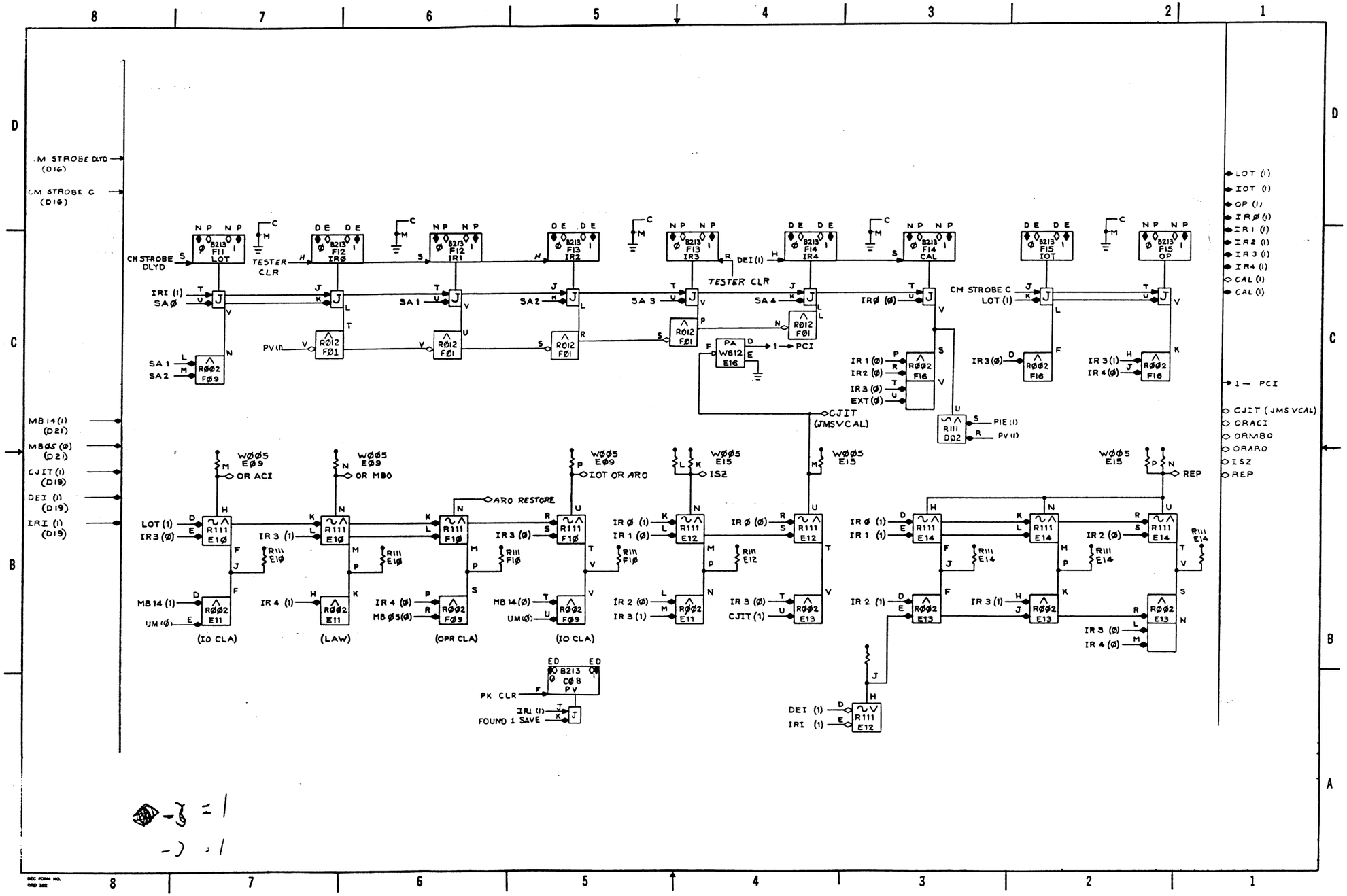
D-BS-KC09-A-10 Clock, Run, and Display (Sheet 2)

NOTE:
1. REPEAT SWITCH DETERMINES PERIOD OF REPT CLK. APPROXIMATE TIMES AS FOLLOWS:

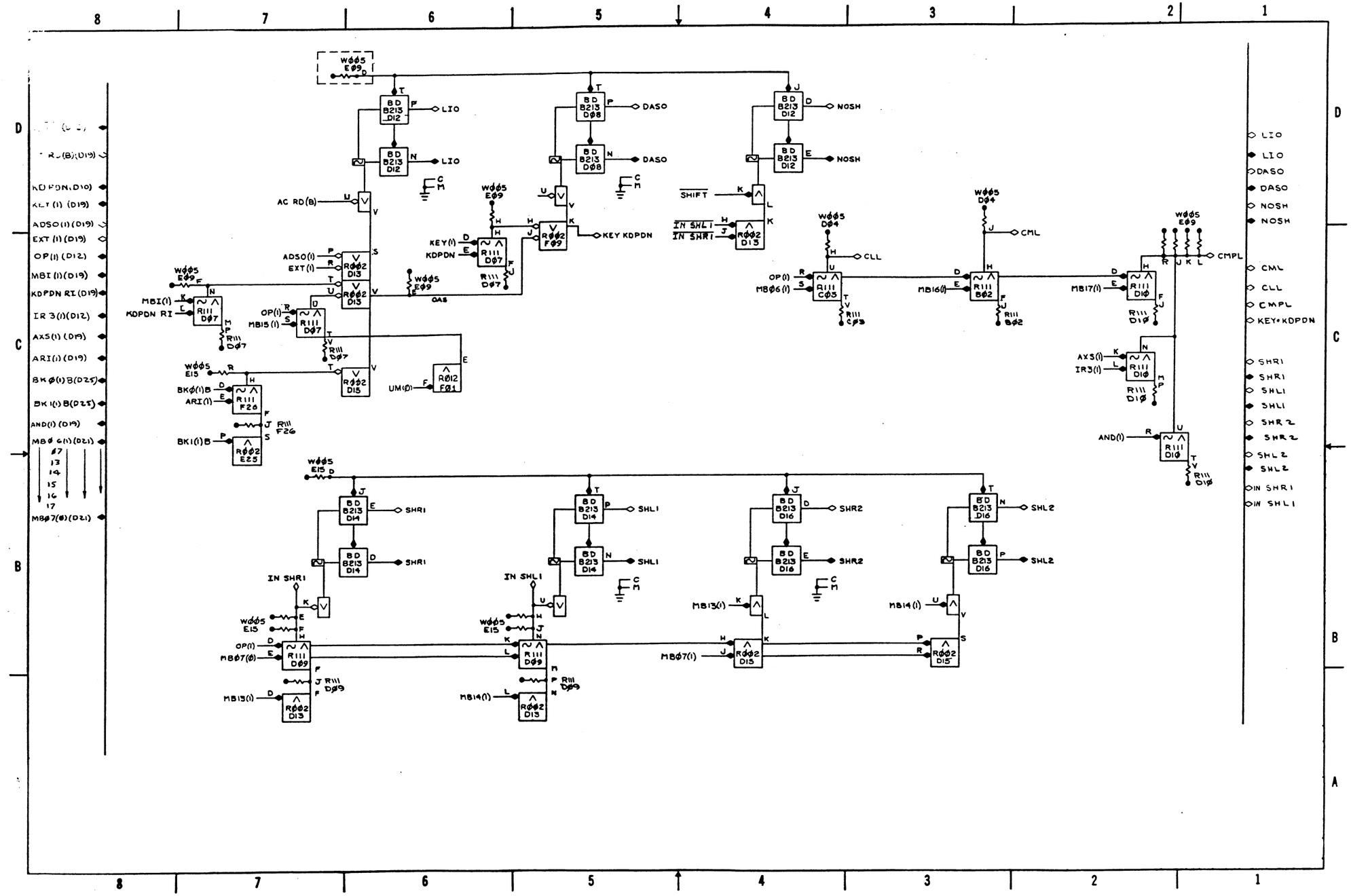
REPT. SW. POS.	PERIOD
1	8 USEC
2	22 USEC
3	200 USEC
4	2.5 MSEC
5	60 MSEC



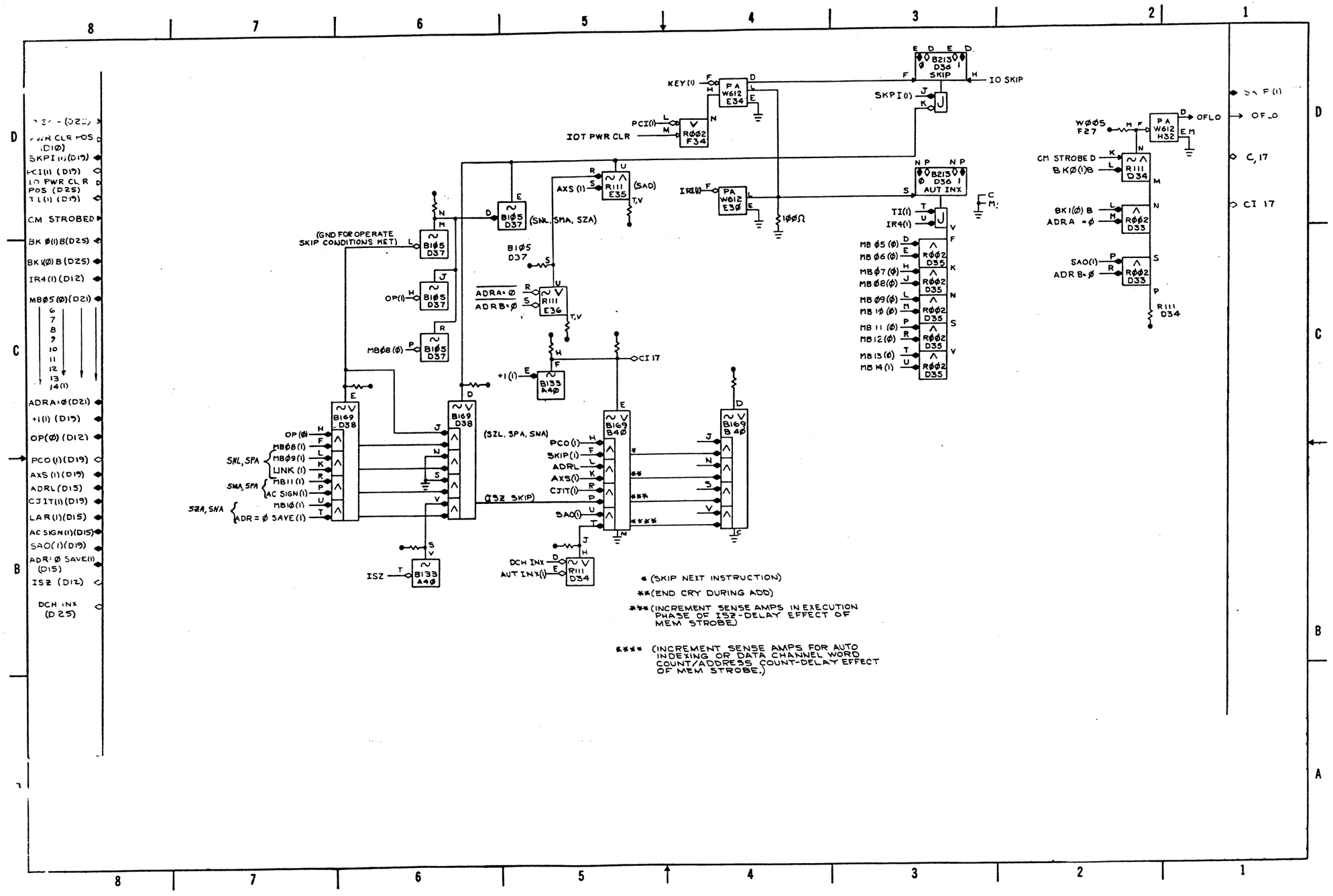
D-TD-KC09-A-11 Clock, Run, and Display Timing



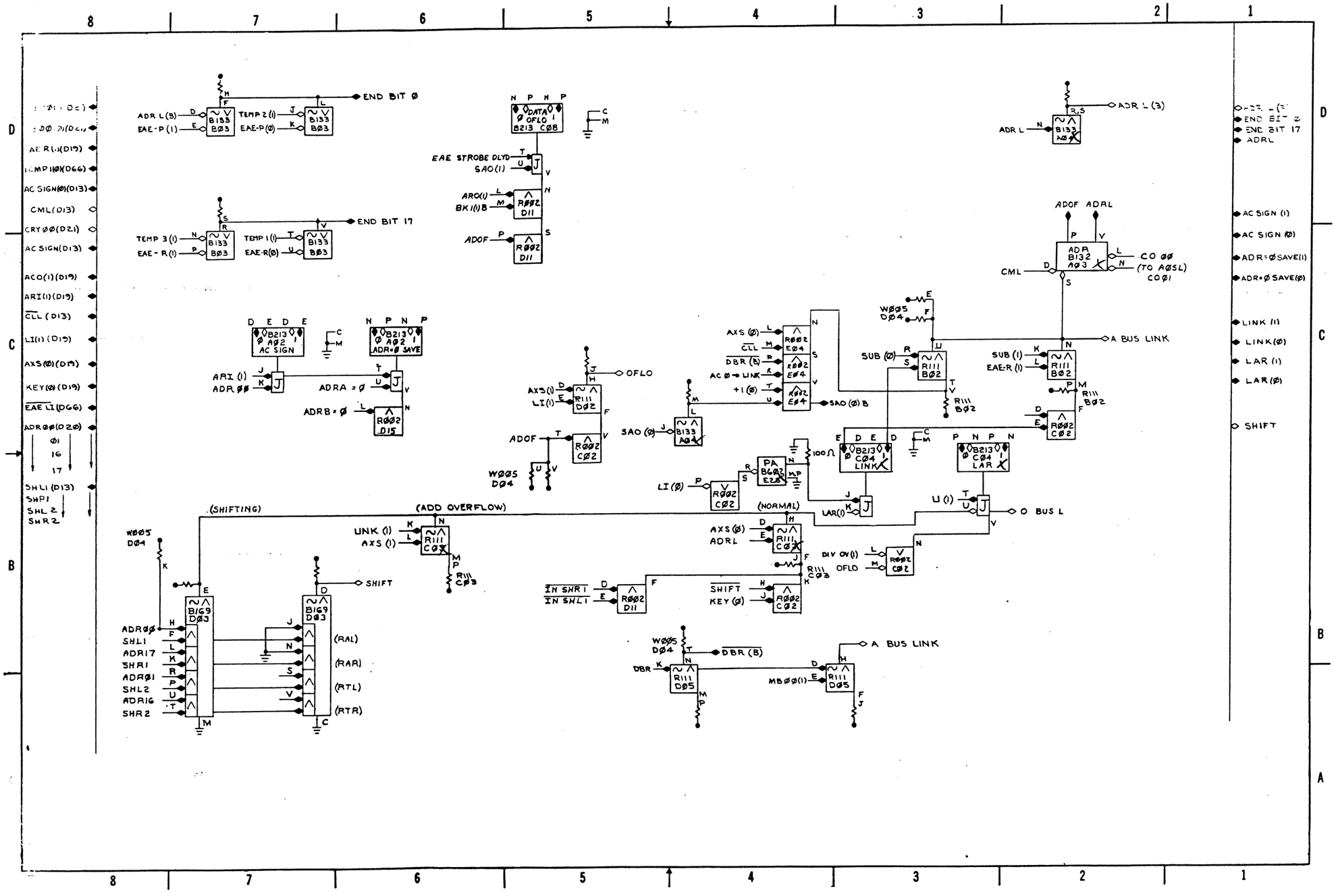
D-BS-KC09-A-12 Instruction Register



D-BS-KC09-A-13 Operate Control

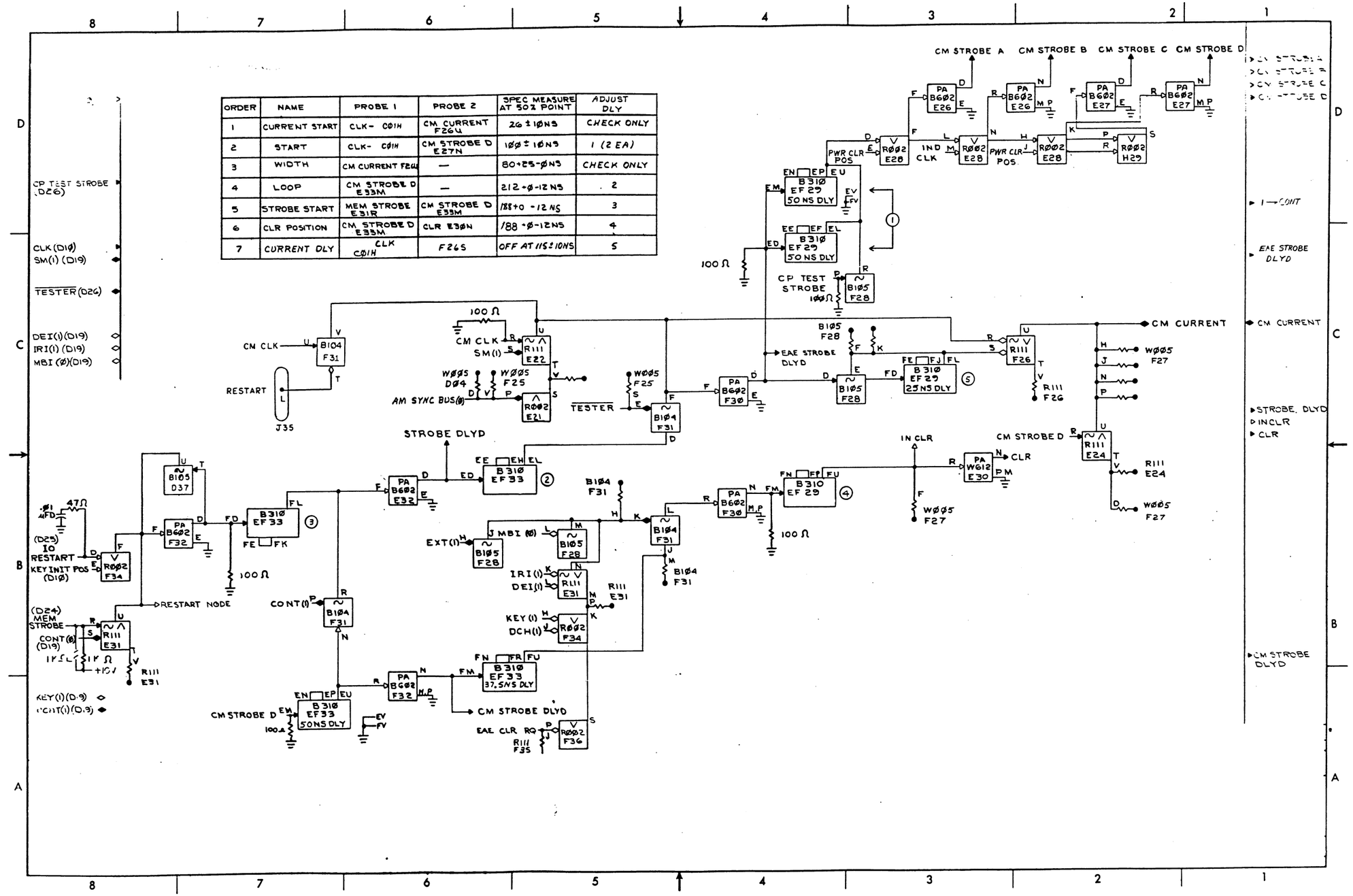


D-BS-KC09-A-14 Skip and CI17

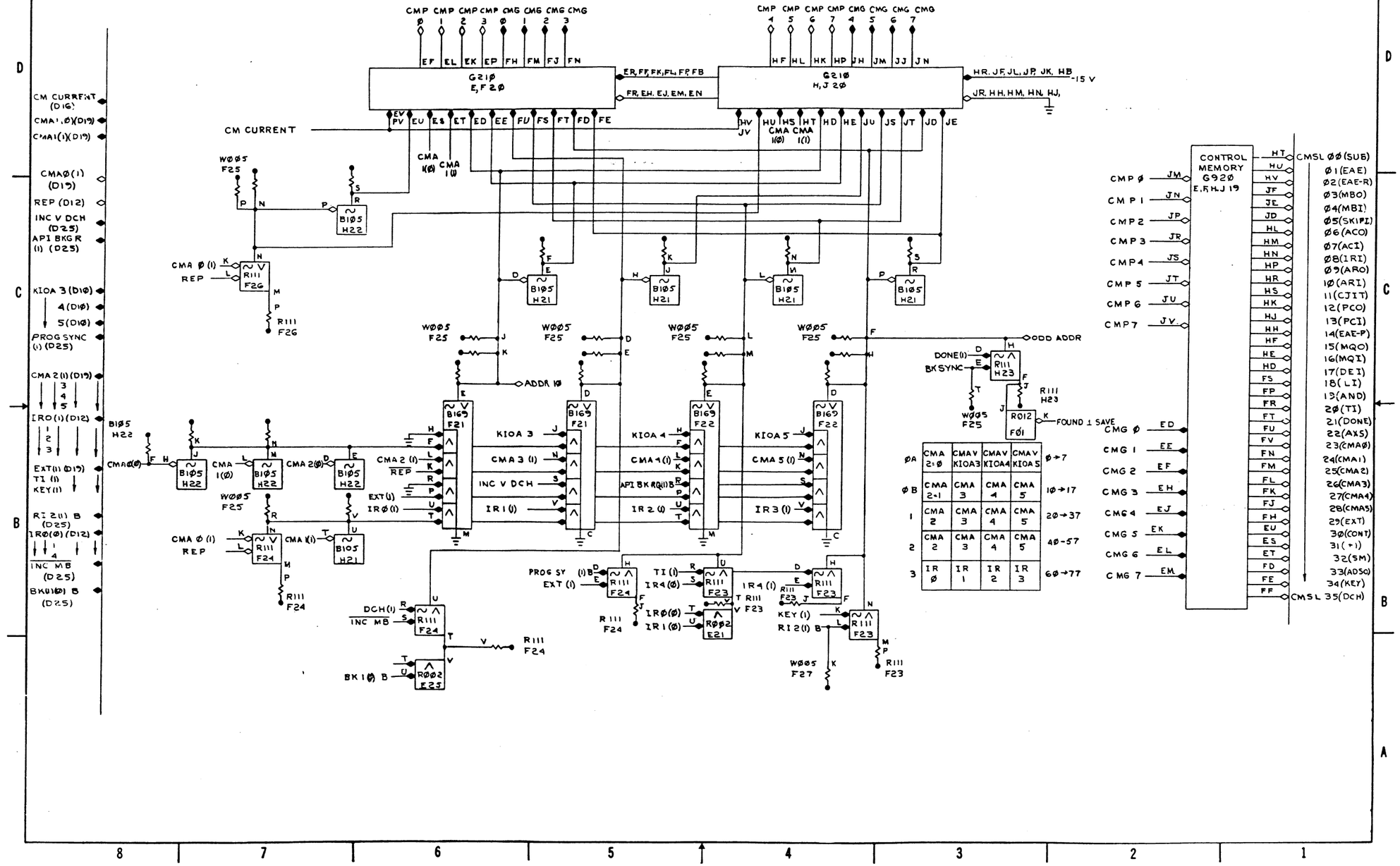


D-BS-KC09-A-15 LINK Control

ORDER	NAME	PROBE 1	PROBE 2	SPEC MEASURE AT 50% POINT	ADJUST DLY
1	CURRENT START	CLK- C0IH	CM CURRENT F26U	26 ± 10NS	CHECK ONLY
2	START	CLK- C0IH	CM STROBE D E27N	100 ± 10NS	1 (2 EA)
3	WIDTH	CM CURRENT F26U	—	80+25-0NS	CHECK ONLY
4	LOOP	CM STROBE D E33M	—	212+0-12 NS	2
5	STROBE START	MEM STROBE E31R	CM STROBE D E33M	188+0 -12 NS	3
6	CLR POSITION	CM STROBE D E33M	CLR E30N	188 +0-12NS	4
7	CURRENT DLY	CLK C0IH	F26S	OFF AT 115±10NS	5



D-BS-KC09-A-16 CM Timing

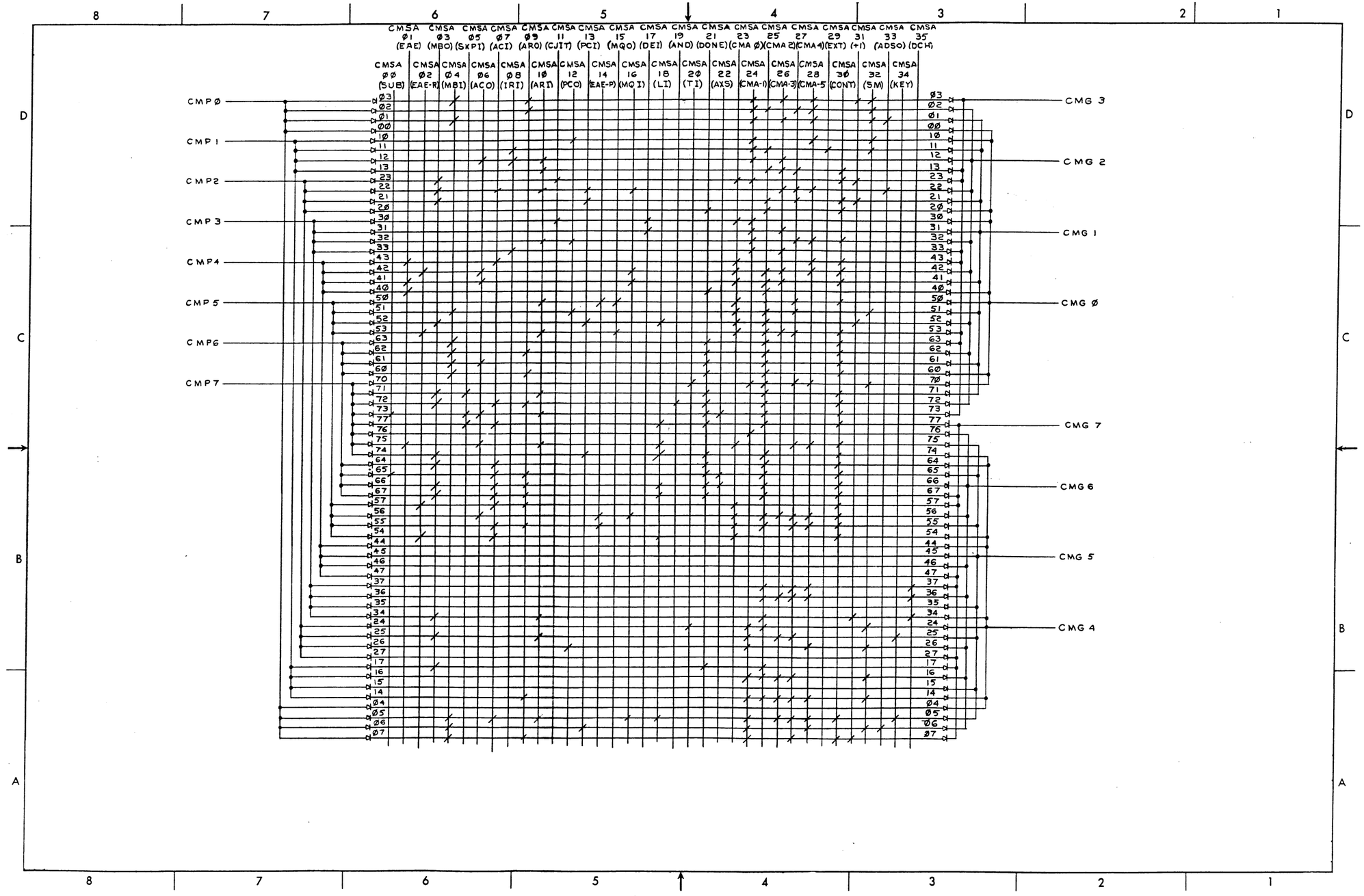


D-BS-KC09-A-17 CM Addressing

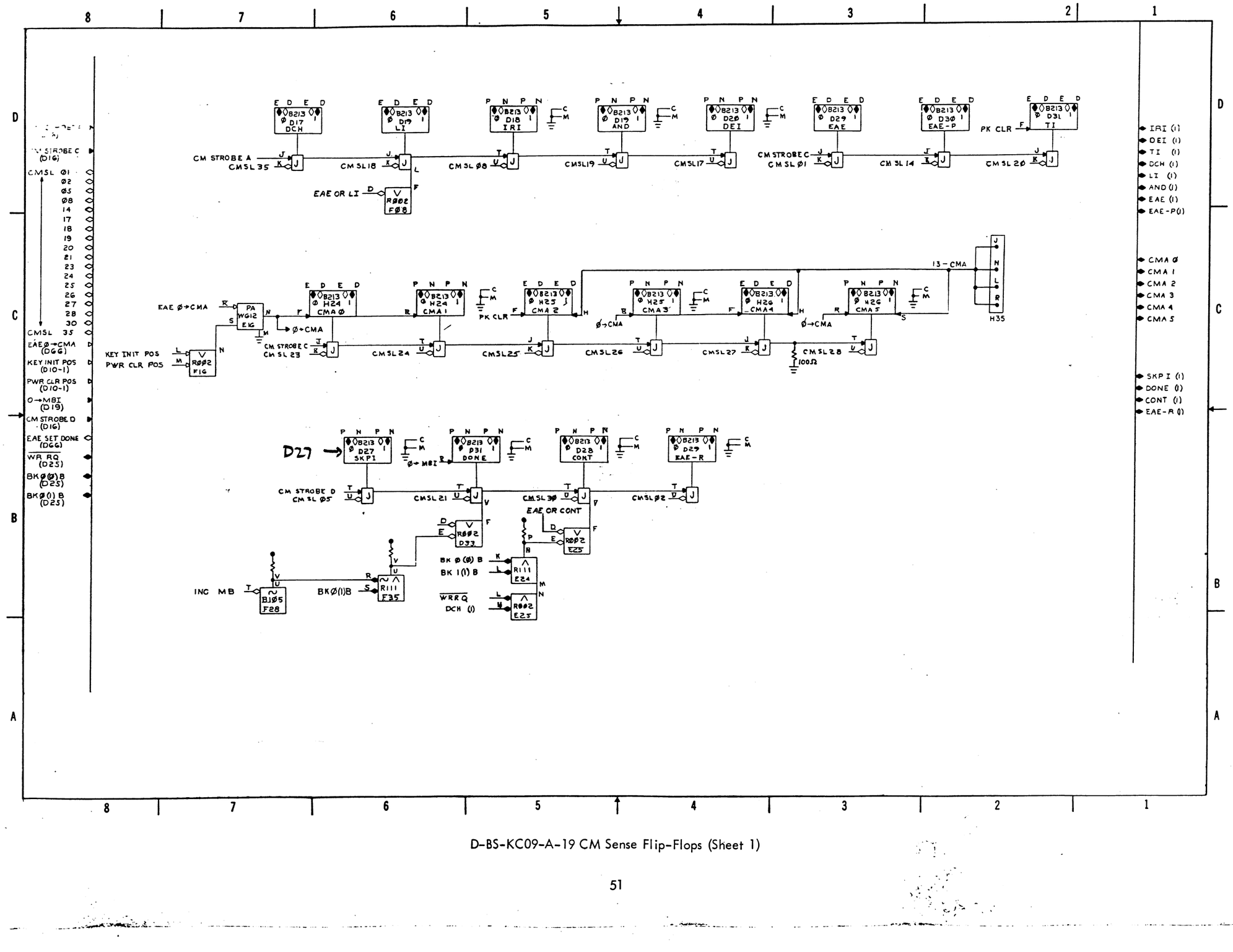
LOC	TAG	BITS	SYNC	JMP
00	KEY NOP			00
01	RI1+RDR FLGV KEYVKDP	ADSO, MBI	SM	25
02	RI 2	ARO	SM	33
03	KENV KDNV RI1+RI2	ARO,+1, MBI	SM	25
04				
05	KIO	ACI,MCI,LI,KEY,MBI,ARI	CONT	27
06	KST	ADSO, MBI, PCI	SM	21
07	KMT	ARO,+1, MBI	CONT	22
10	BGN	PCO	SM	21
11	BREAK ENTRY	EXT, IRI	SM	30
12		ACO, ARI, IRI		24
13		ARI	CONT	16
14		ARO	SM	37
15				
16			SM	36
17		MBO, DONE		10
20		DONE	CONT	10
21	FETCH ENTRY	MBO,+1, PCI	CONT	12
22		MBO,ACI,ARI,PCI,MCI,ADSD		07
23		MBO,+1, CJIT	CONT	60
24		TI, SM		30
25		MBO, ARI, KEY		26
26	$\overline{\text{KEY.(RI1VRI2)}}$	PCO	SM	21
27	KEY. (RI1VRI2)			00
30	EXECUTE ENTRY	CJIT, DEI		60
31	DEFER ENTRY	DEI		24
32	IAO ENTRY	PCO, ARI	CONT	23
33	XCT ENTRY	IRI		24
34	DCH SYNCV CLK SYNC	MBO,+1, ARI, DCH		10
35				
36	DATA IN/OUT ENTRY	DCH		17
37	CA ENTRY	DCH		13

LOC	TAG	BITS	SYNC	JMP
40		EAE,DONE		10
41		ACO, MQI, EAE	CONT	54
42		ACO, MQI, EAE-R	CONT	55
43		ACI, EAE	CONT	41
44				
45				
46				
47				
50		MQO, ARI, EAE-P	CONT	42
51		PCO, MBI	CONT	52
52		MBO,+1,PCI,LI		50
53		MQO, ARI, EAE-R	CONT	56
54		ACI, EAE-R,	CONT	40
55		ARO, ACI, EAE-P	CONT	53
56		ACO, MQI, EAE-P	CONT	57
57		ARO, ACI, EAE-R	CONT	40
60	CAL	ARO, MBI, DONE	CONT	10
61	DAC	ACO, MBI, DONE	CONT	10
62	JMS	ARO, MBI, DONE	CONT	10
63	DZM	MBI, DONE	CONT	10
64	LAC	MBO, ACT, DONE	CONT	10
65	XOR	SUB,AXS,ARO,ACI,DONE	CONT	10
66	ADD	MBO,ARO,ACI,AXS,LI,DONE	CONT	10
67	TAD	MBO,ARO,ACI,LI,DONE	CONT	10
70	XCT	TI	SM	33
71	ISZ	MBO, SKPI, ARI, DONE	CONT	10
72	AND	ARO,MBO,ACI,AND,DONE	CONT	10
73	SAD	SUB,ACO,AXS,SKPI, ARI,DONE	CONT	10
74	JMP	MBO, PCI, DONE, LI	CONT	10
75	EAE	ACO, ARI, EAE, LI	CONT	43
76	IOT			20
77	OPR	ACI, LI, SKPI, DONE	CONT	10

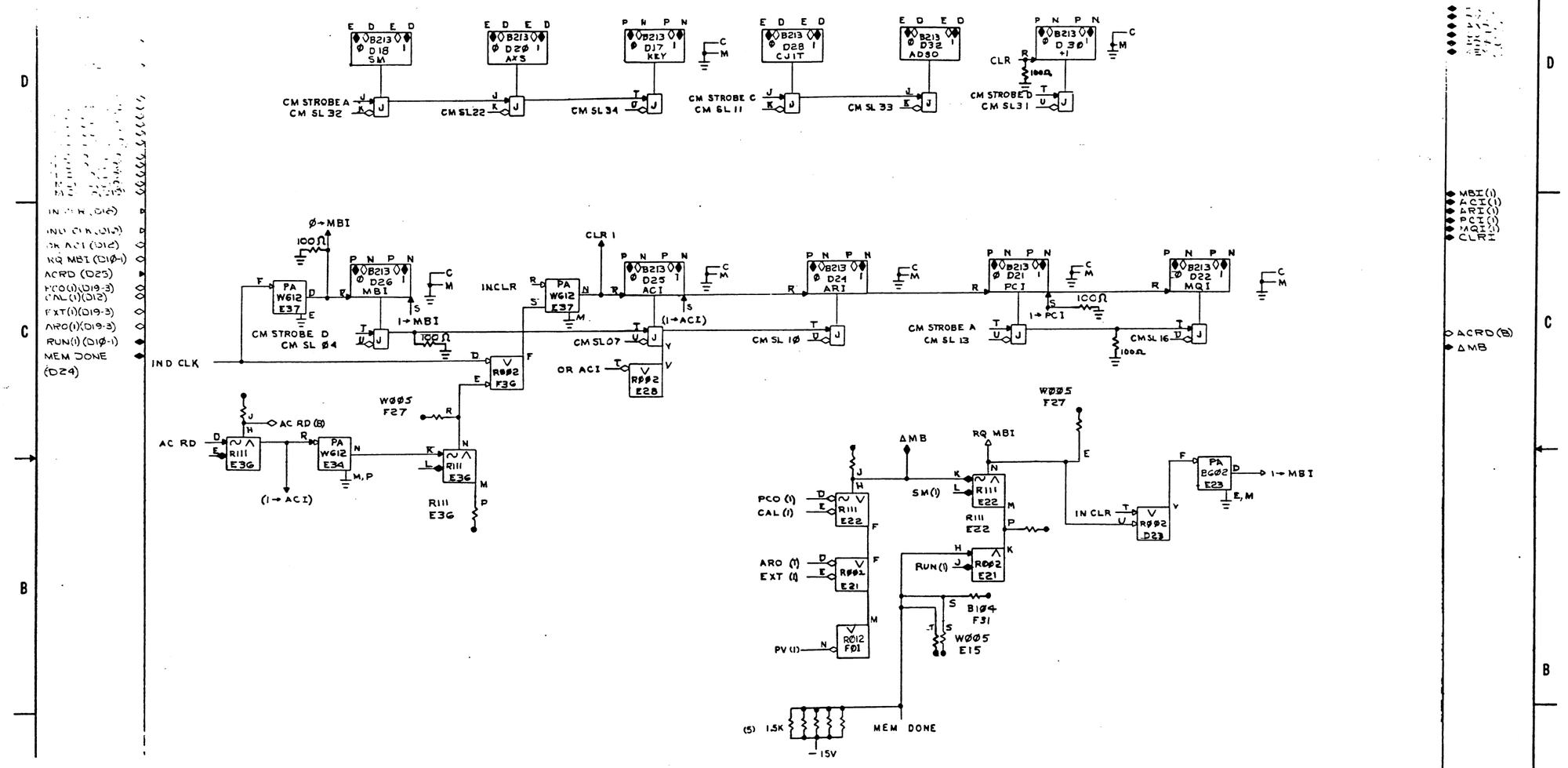
D-FD-KC09-A-18 CM Wiring Matrix and Program (Sheet 1)



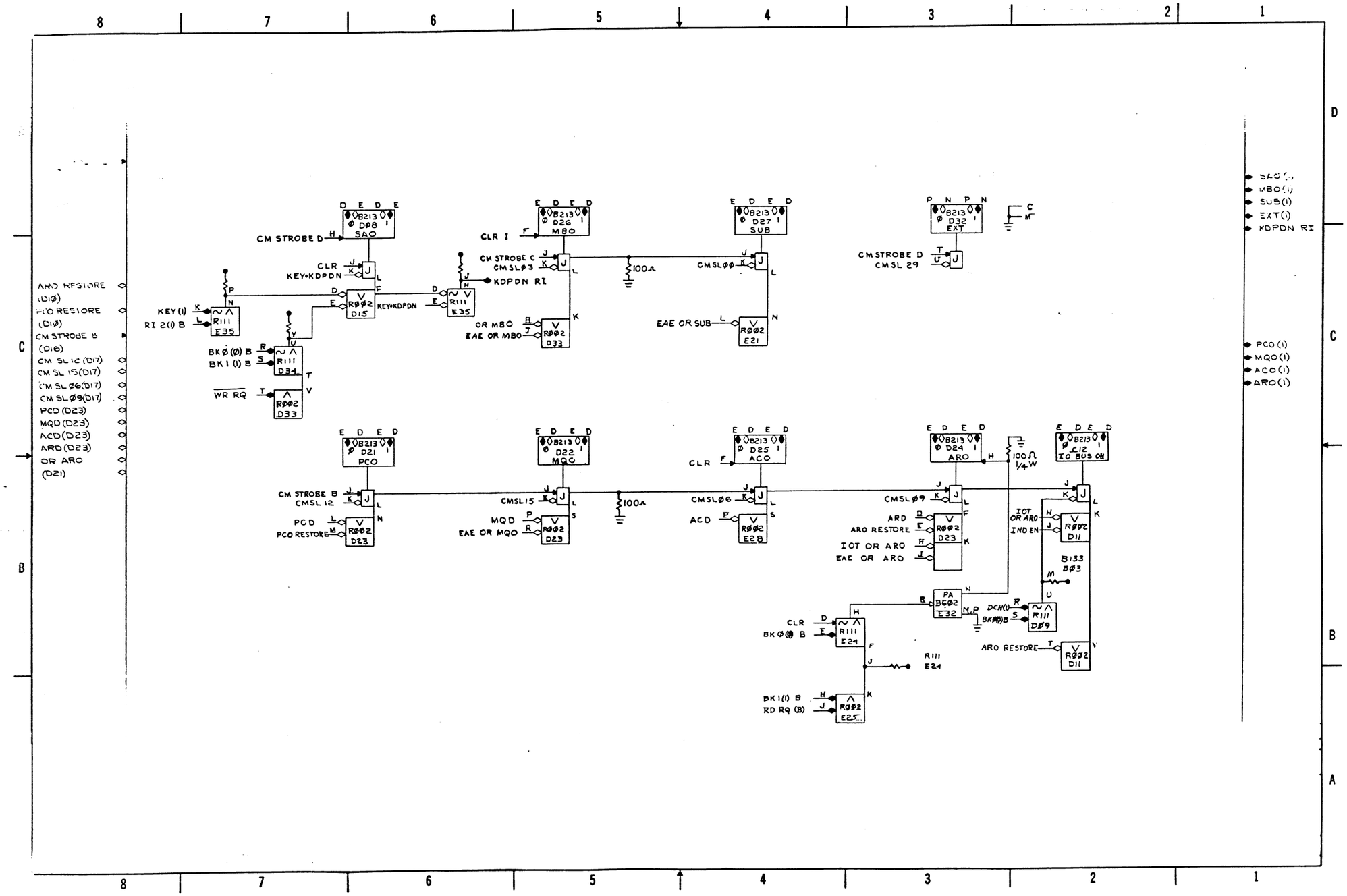
D-FD-KC09-A-18 CM Wiring Matrix and Program (Sheet 2)



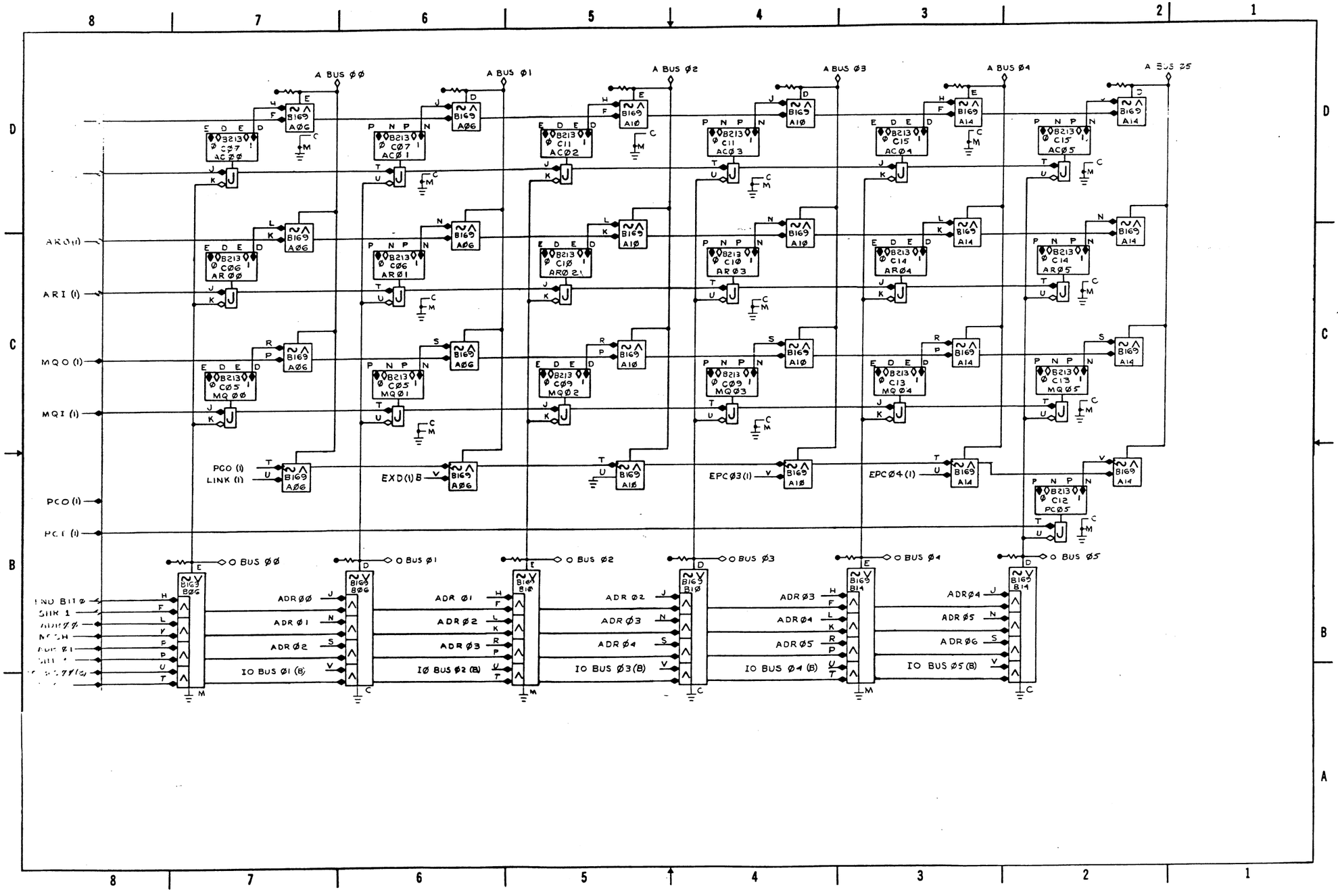
D-BS-KC09-A-19 CM Sense Flip-Flops (Sheet 1)



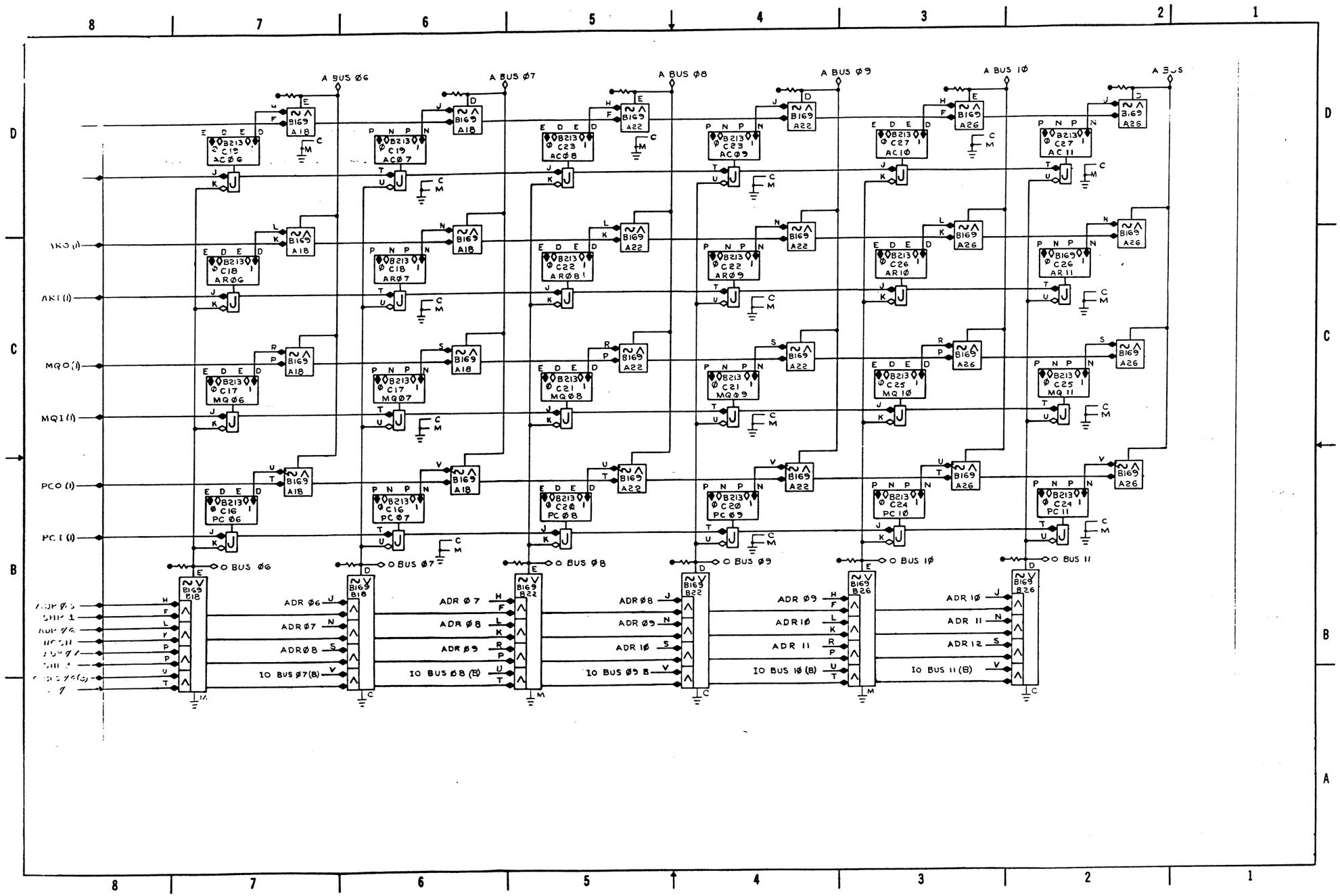
D-BS-KC09-A-19 CM Sense Flip-Flops (Sheet 2)



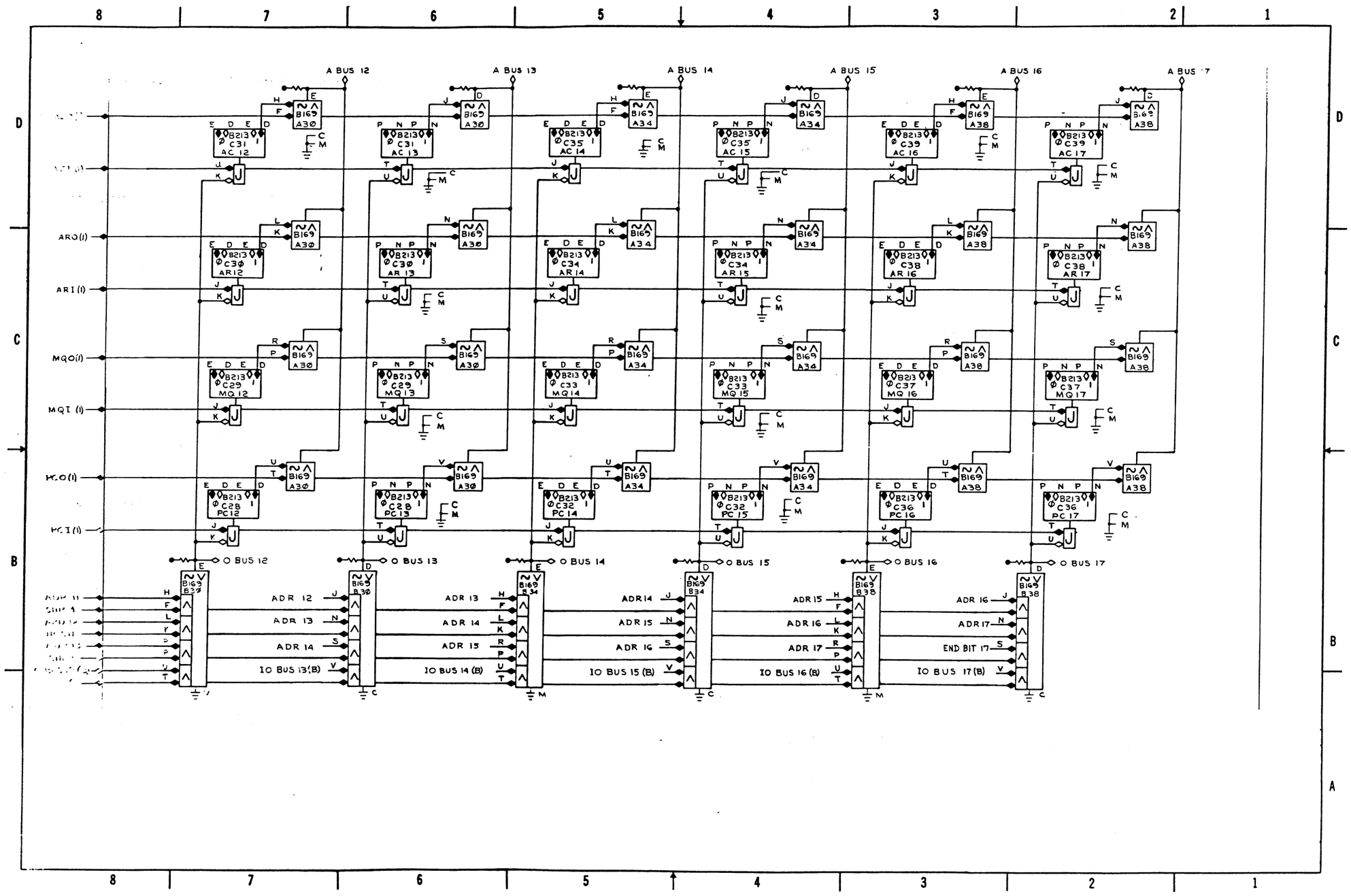
D-BS-KC09-A-19 CM Sense Flip-Flops (Sheet 3)



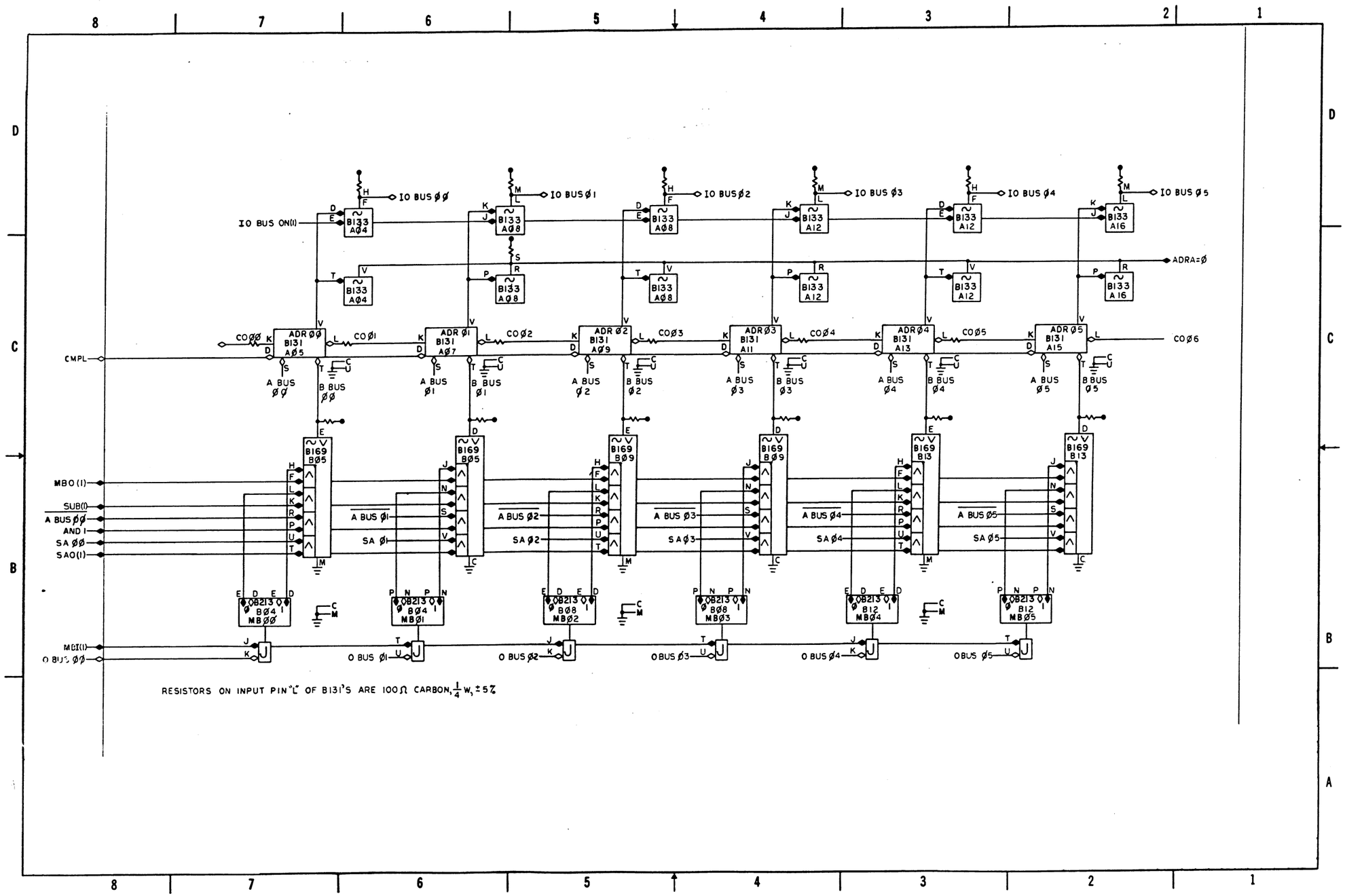
D-BS-KC09-A-20 AC, AR, MQ, PC (Sheet 1)



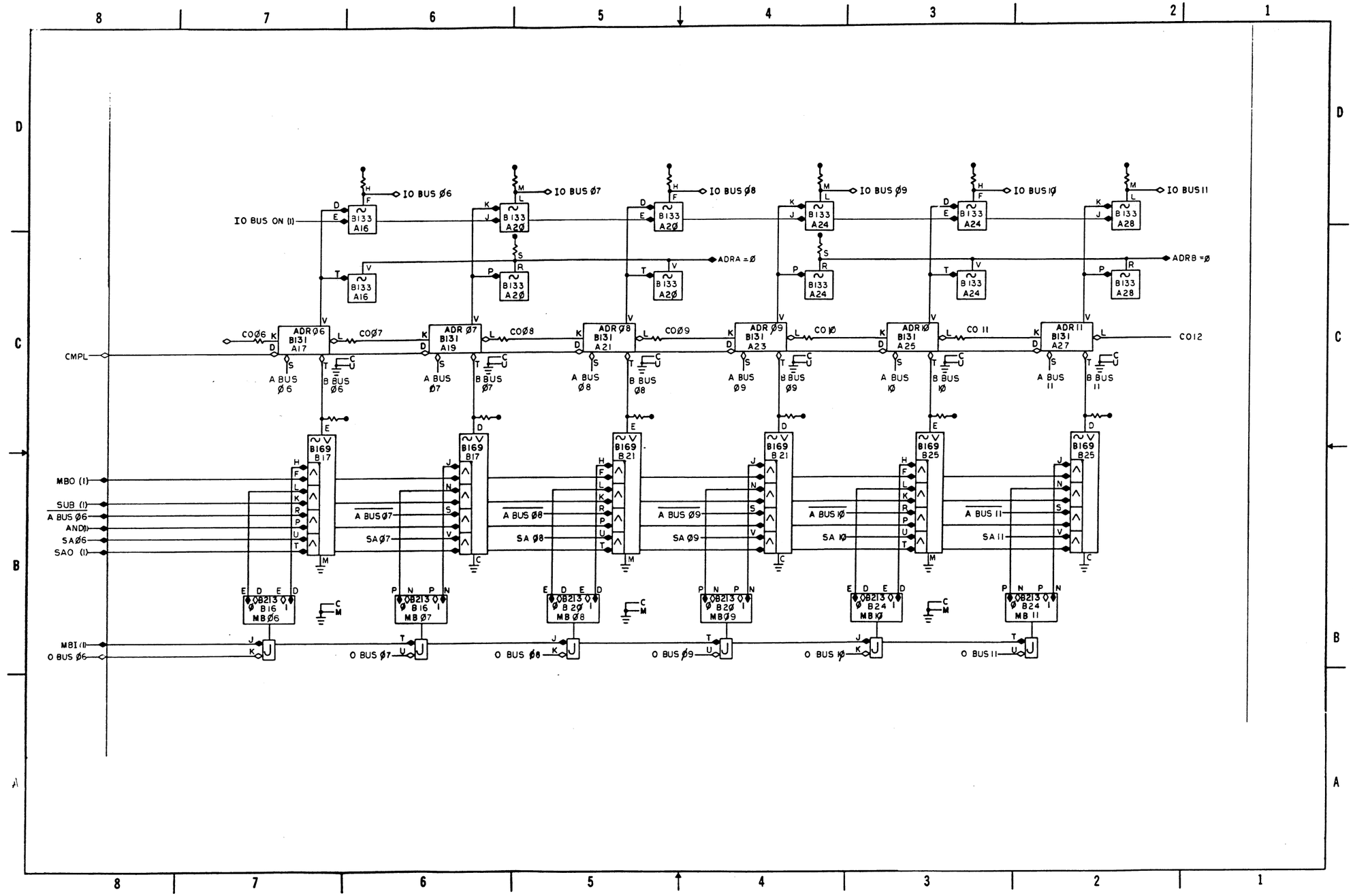
D-BS-KC09-A-20 AC, AR, MQ, PC (Sheet 2)



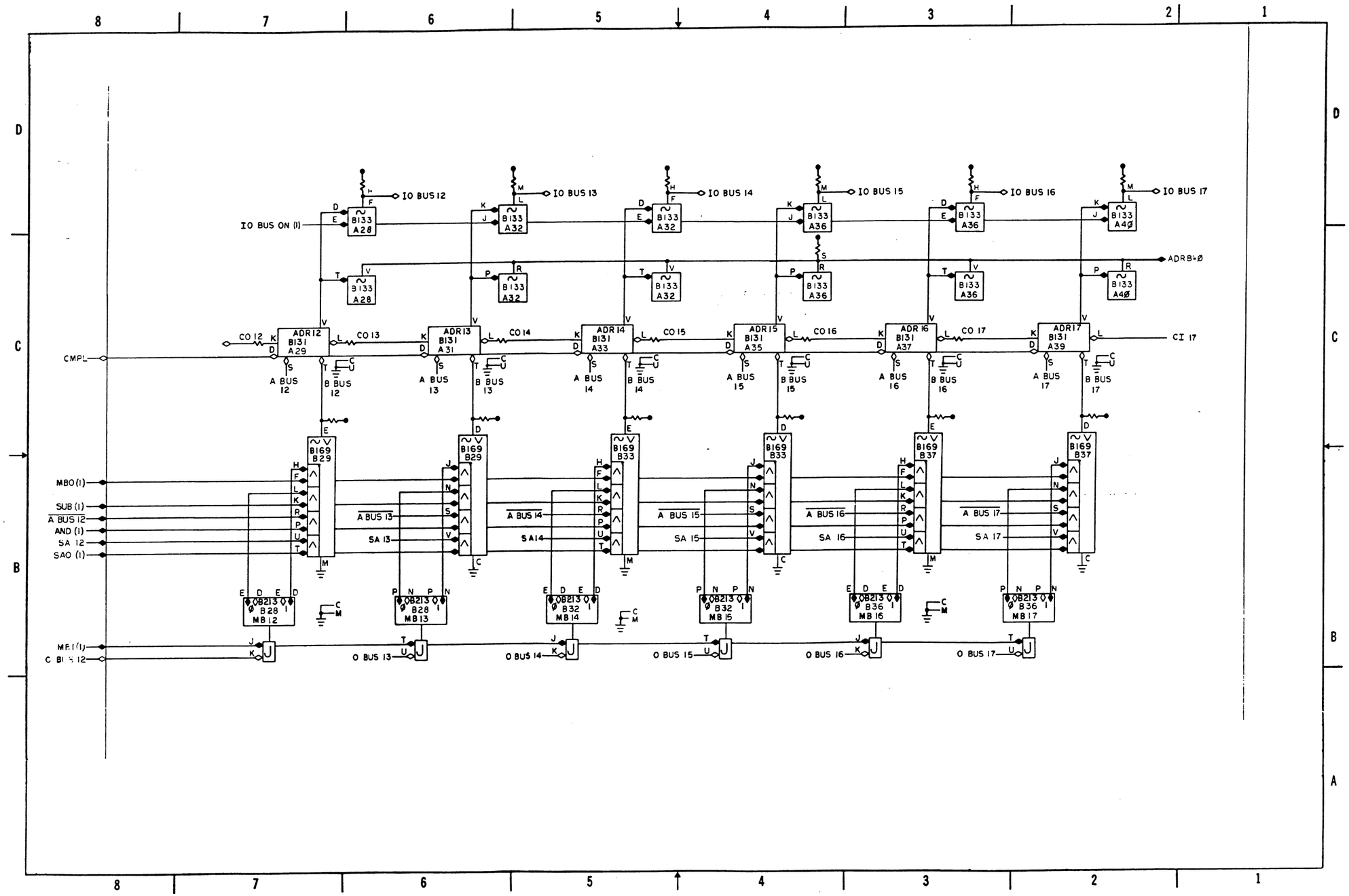
D-BS-KC09-A-20 AC, AR, MQ, PC (Sheet 3)



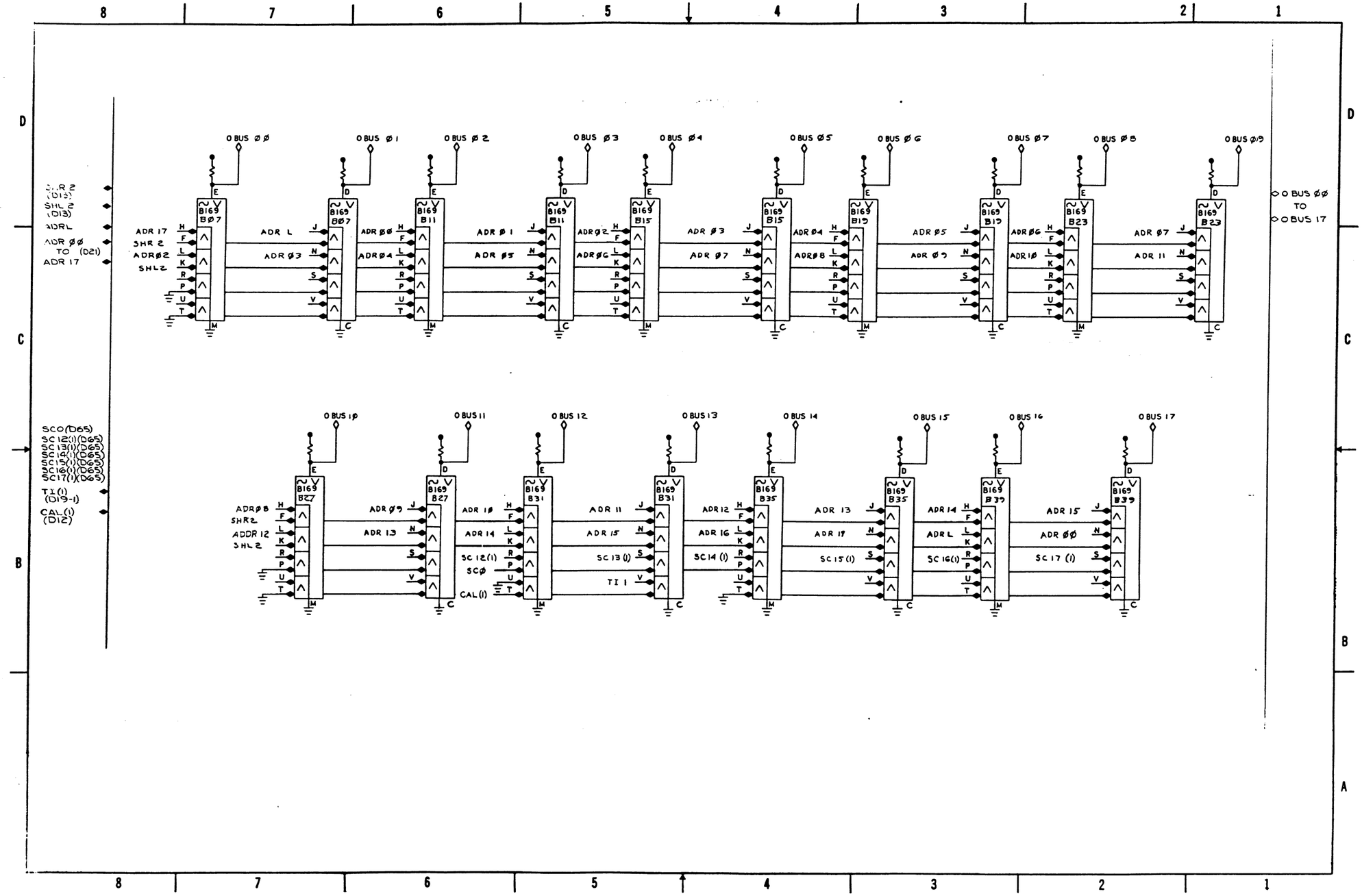
D-BS-KC09-A-21 MB and Adder (Sheet 1)



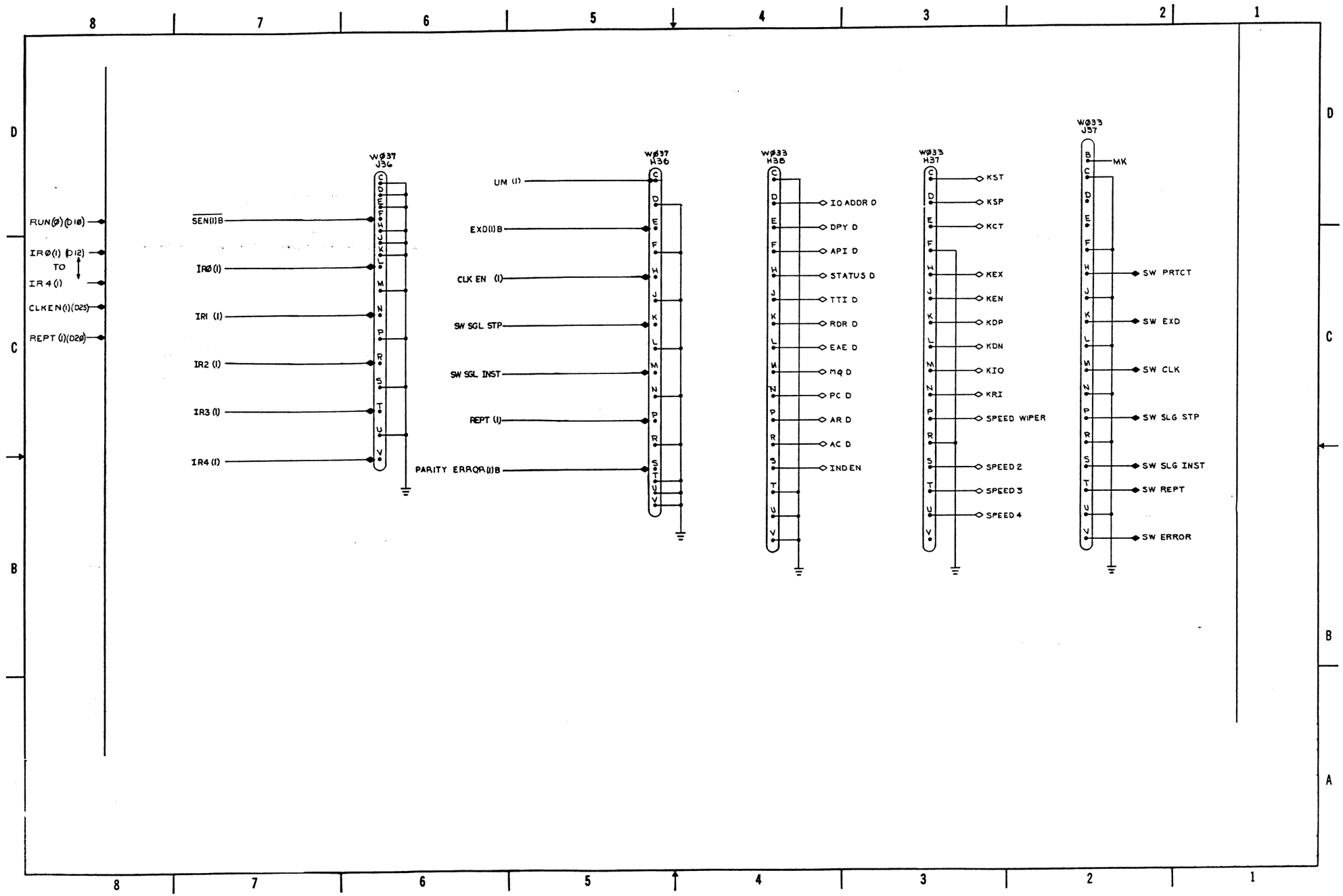
D-BS-KC09-A-21 MB and Adder (Sheet 2)



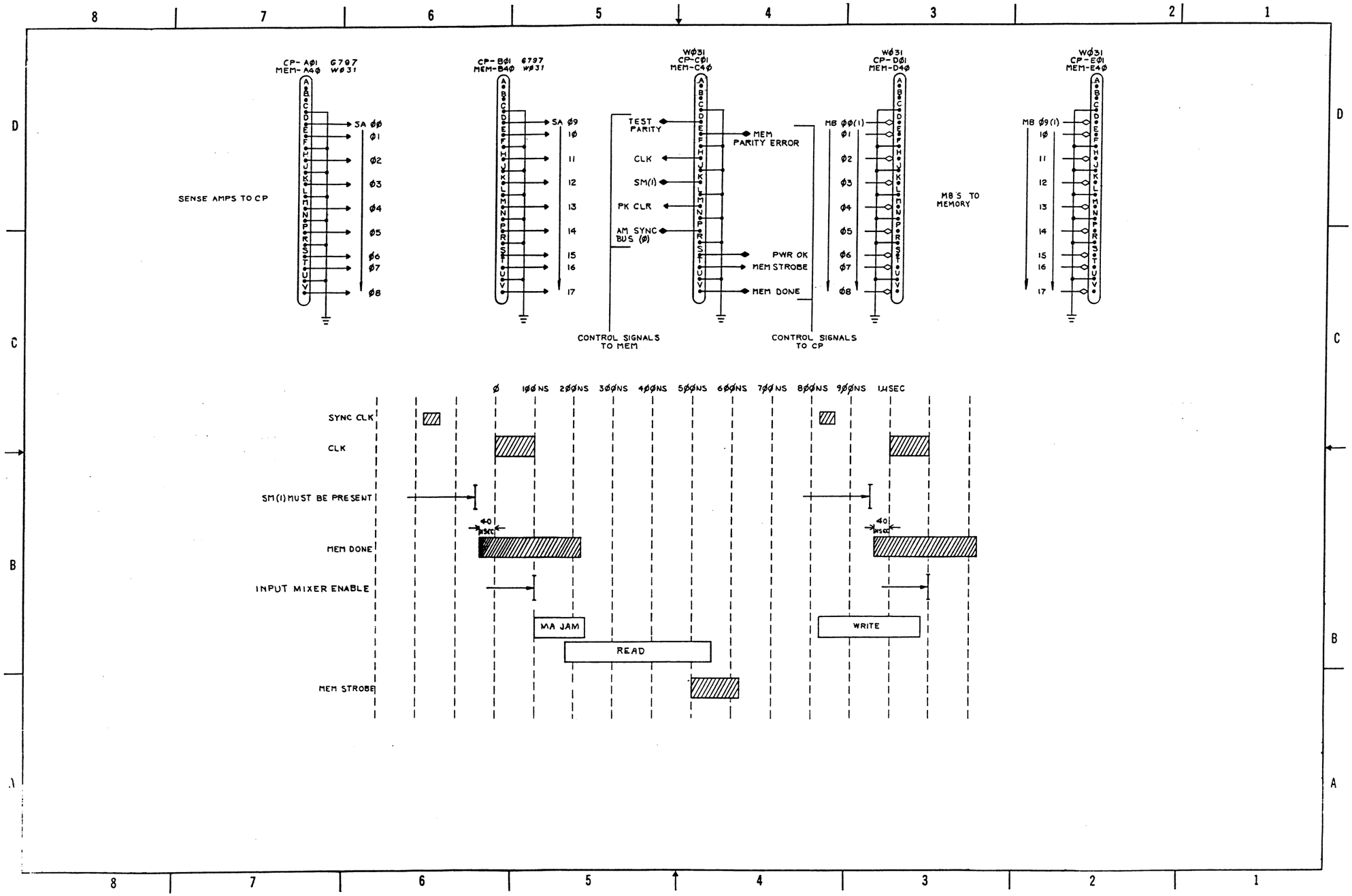
D-BS-KC09-A-21 MB and Adder (Sheet 3)



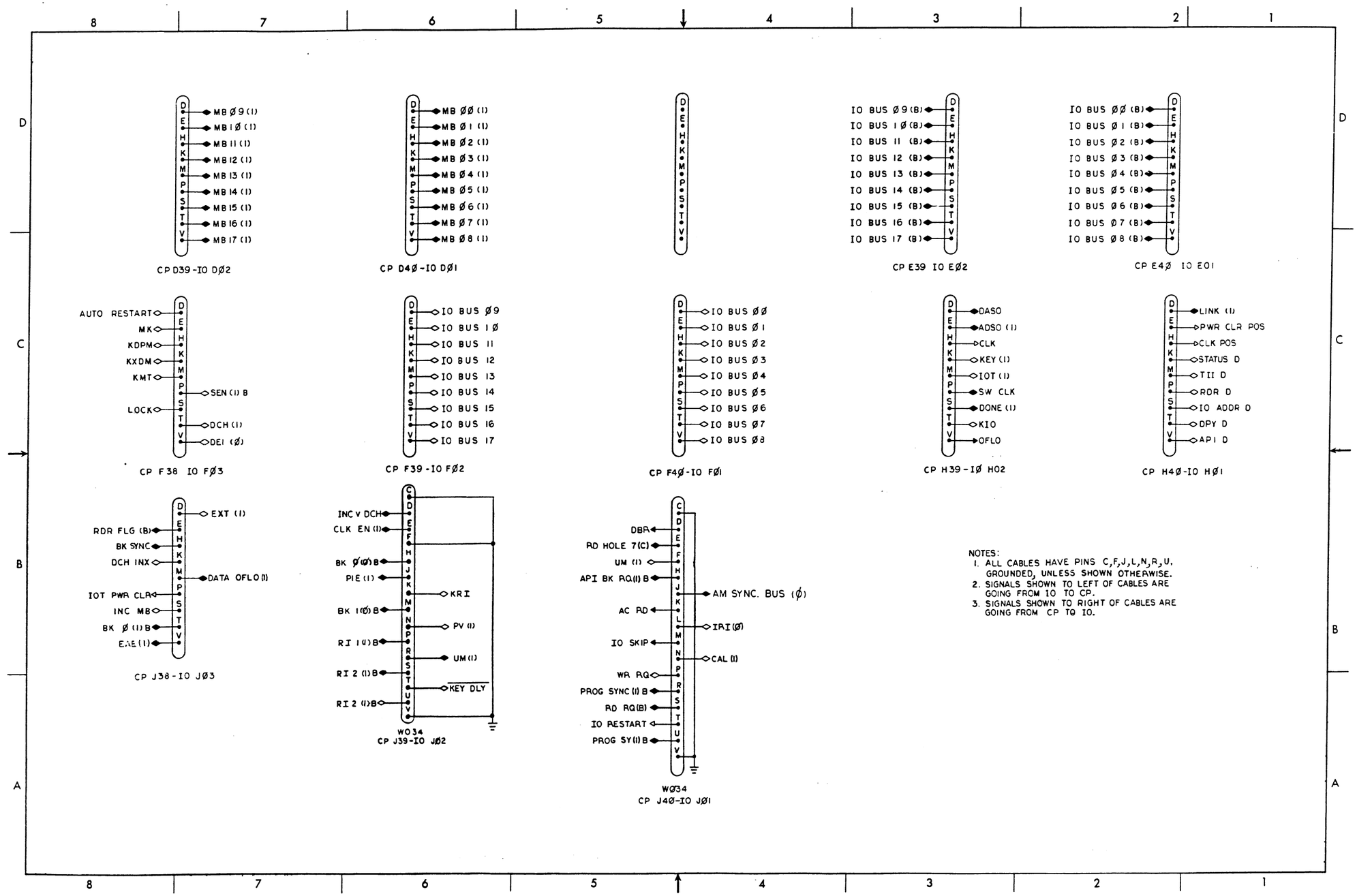
D-BS-KC09-A-22 Shift X2 Gates



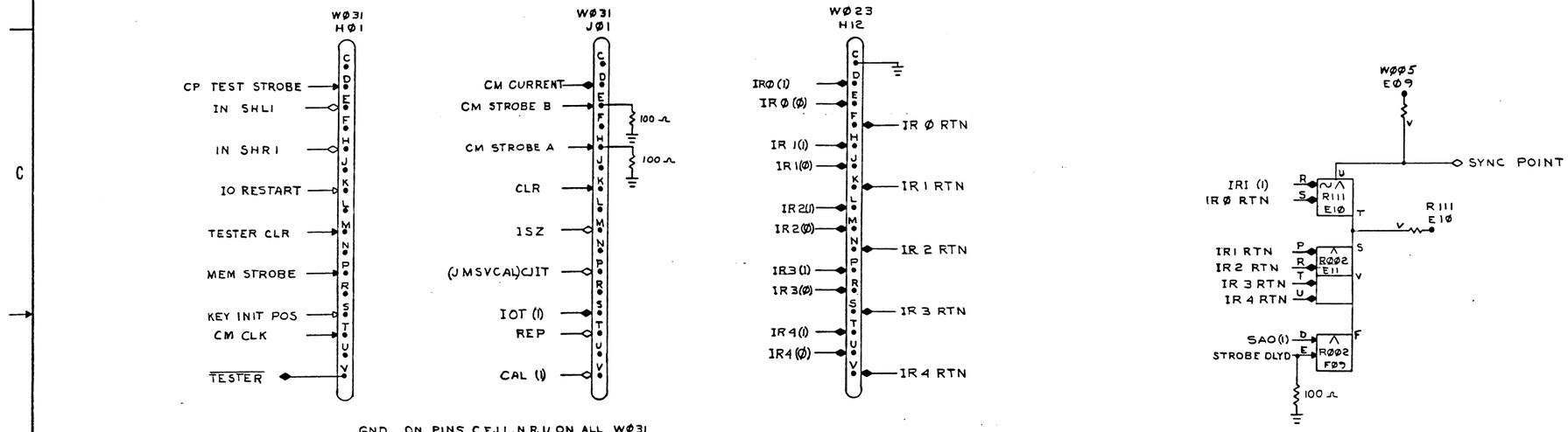
D-IC-KC09-A-23 CP/Console Interface



D-IC-KC09-A-24 CP/Memory Interface



D-IC-KC09-A-25 CP/IO Interface



GND ON PINS C,F,J,L,N,R,U ON ALL WØ31

D-BS-KC09-A-26 CP/Tester Interface

COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
* Jumper TEMP I (1)	Jumper		B03T	B03C	
* Jumper SCO(1)	Jumper		B31P	B31C	
CM Strobe DLYD	100 Ω 1/4 W		F11S	F11C	
CM Strobe D	150Ω 1/4 W		D08H	D08C	
CM Strobe A	100Ω 1/4 W		D22T	D22C	
CM Strobe B	↕ ↕		D25J	D25C	
CM Strobe C			D26J	D26C	
Ø MBI	100 1/4W		D26R	D27C	
ACI	.001MFD +150Ω		J12P	J12C	
F30D	100Ω 1/4 W		E29D	E29C	
CM CLK	100Ω 1/4W		E22R	E22C	
CM Strobe D	150Ω 1/4W		E33M	E33C	
Strobe DLYD	100Ω 1/4W		F09E	F09C	
CP Test Strobe	↕ ↕		F28P	F28C	
F30N	100Ω 1/4W		F29M	F29C	
F32D	100 Ω 1/4 W		F33D	F33C	
I/Ø Restart	47 Ω+.01 MFD		F34D	F34C	
F36N	.01UFD 50V		F36N	F36C	
KDPM	15KΩ 1/4 W		F36L	F36B	
LOCK	15KΩ 1/4 W		F36T	F35B	
MEM Strobe	1K Ω 1/4 W		H01P	H01A	
CM Strobe C	100 Ω 1/4 W		H26T	H26C	
KMT	15 K 1/4 W		H27S	H27B	
CM Strobe B	100 Ω 1/4 W		J01E	J02C	
CM Strobe A	↓		J01H	J01C	
CLR	↓		J01K	H01U	

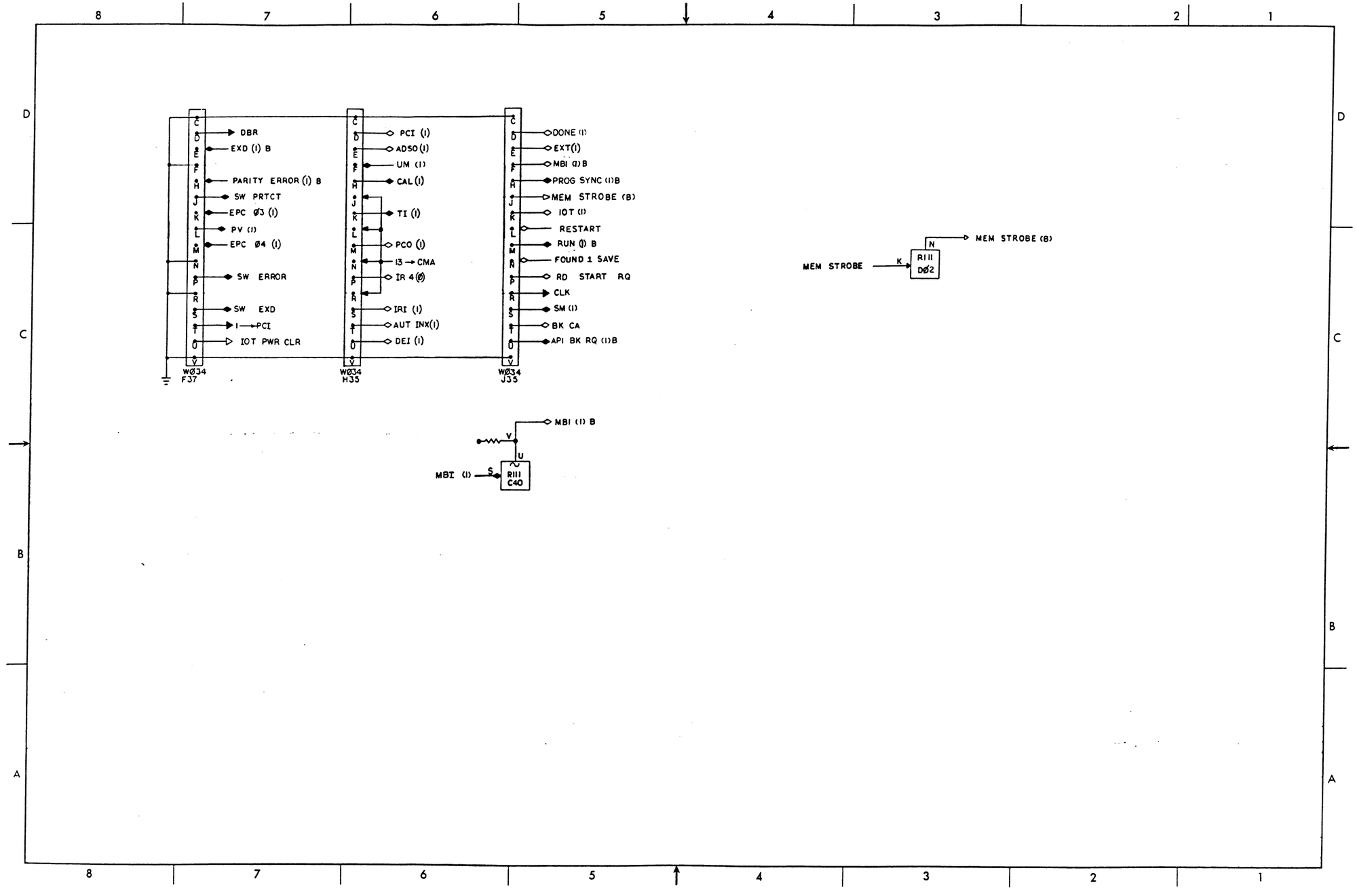
A-CP-KC09-A-27 External Components List (Sheet 1)

COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
Key Delay's	50 MFD 50V	—	J32R	J32S	+
Key Delay's	.047 MFD 100V	—	J32H	J32J	+
J34V	.01 MFD 50V		J34V	J34C	
KXDM	15 KΩ 1/4 W		J34H	J34B	
1 → PCI	100Ω 1/4 W		D21S	D21C	
*JUMPER ADRL (B)	JUMPER		BØ3D	BØ3N	
*ACØ → LINK	15KΩ ¼W		EØ4R	EØ4B	
SPEED WIPER	4700pf		J24T	J24C	
MEM STROBE	150Ω 1/4W		E31R	E31C	
SCOV (1)	750Ω ¼W		HØ6P	HØ6B	
**EXD (1) B ◆	JUMPER		F37E	F36C	
**EPCØ3 (1) ◆	JUMPER		F37K	F37C	
**EPCØ4 (1) ◆	JUMPER		F37M	F38C	
E32N	1ØØΩ 1/4W		D24H	D24C	
* FØ5T	JUMPER		EØ5T	FØ5C	
***API BK RQ	JUMPER		F22R	F22C	
EAE-P- PULSE	1ØØ Ω ¼W		FØ2J	FØ2C	
E23N	100Ω 1/4 W		CØ4J	CØ4C	
*** Jumpers removed when API is installed					
* Jumpers Removed when EAE Modules are installed					
** Jumpers Removed when KGØ9A Mem Ext Control Is Installed					
MEM DONE	1.5K 1/4W		CØ1V	CØ2B	
↓	↓		E15S	E15B	
↓	↓		E15T	E16B	
↓	↓		E21H	E21B	
MEM DONE	1.5K 1/4W		F31S	F31B	

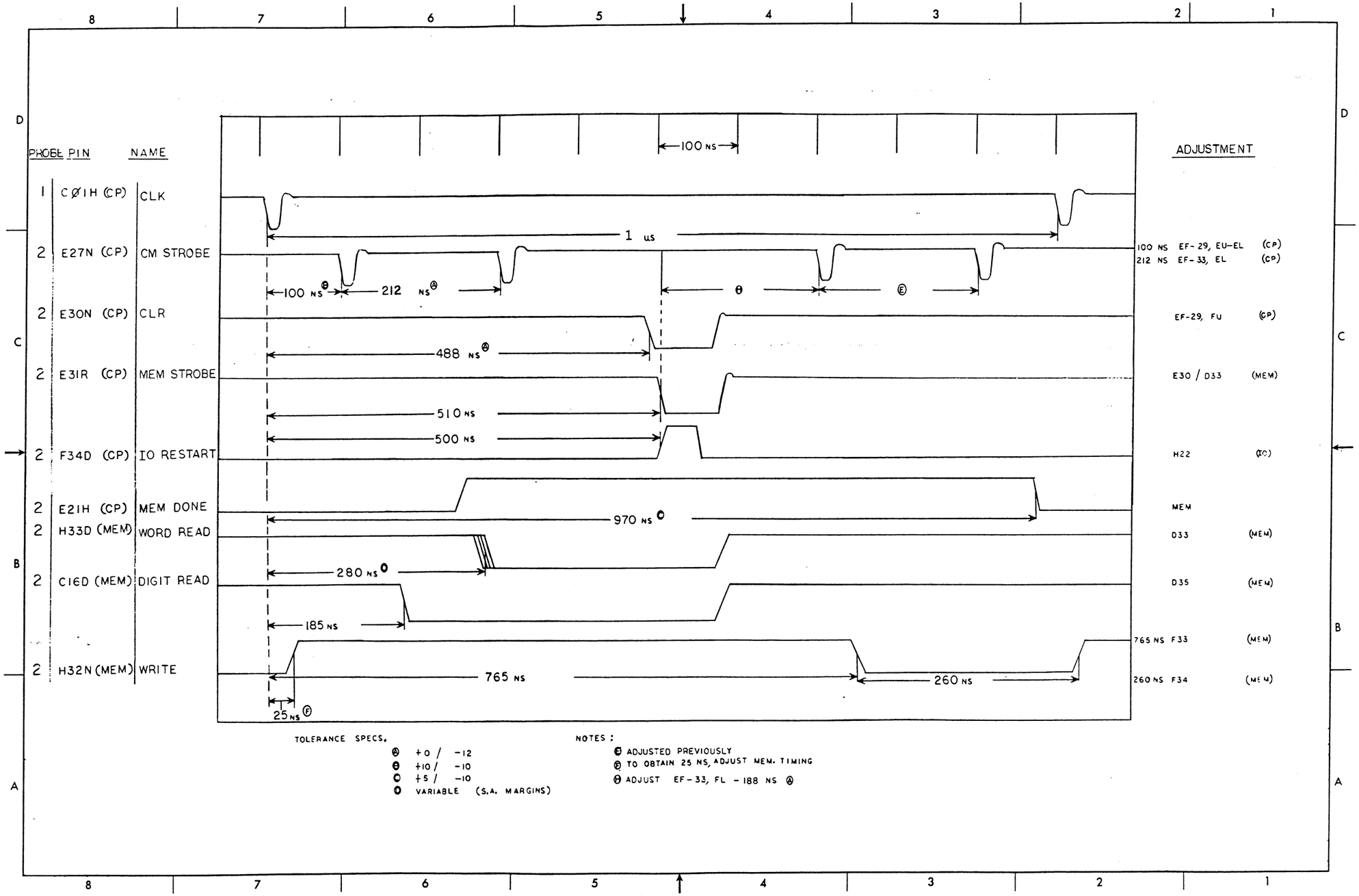
A-CP-KC09-A-27 External Components List (Sheet 2)

COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
MEM STROBE	1KΩ 1/4W		CØ1T	CØ1A	
MQI	.001MFD +150Ω		C37T	C37C	

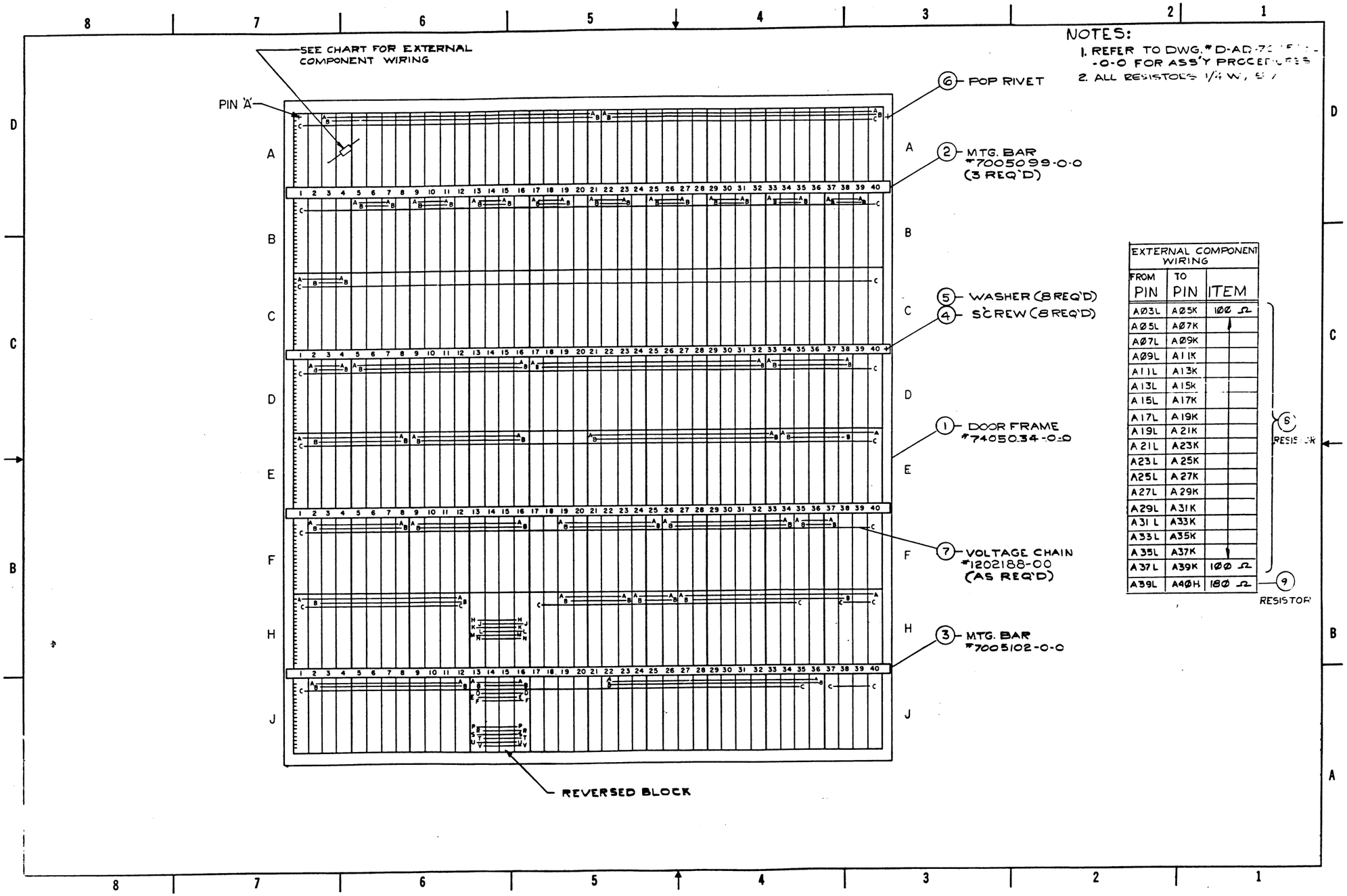
A-CP-KC09-A-27 External Components List (Sheet 3)



D-CD-KC09-A-28 CP Memory Extension/Parity Interface



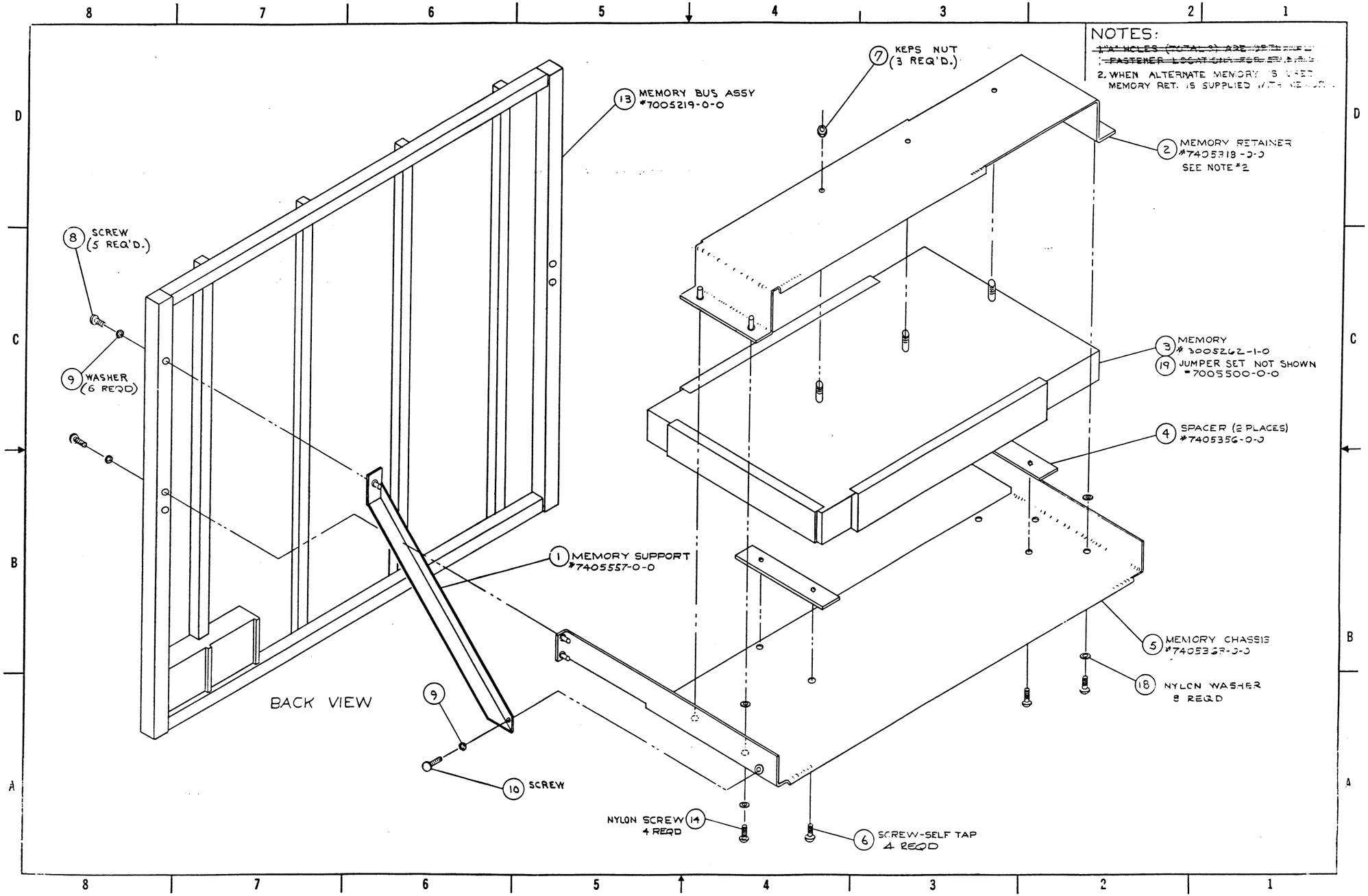
D-TD-KC09-A-29 System Timing



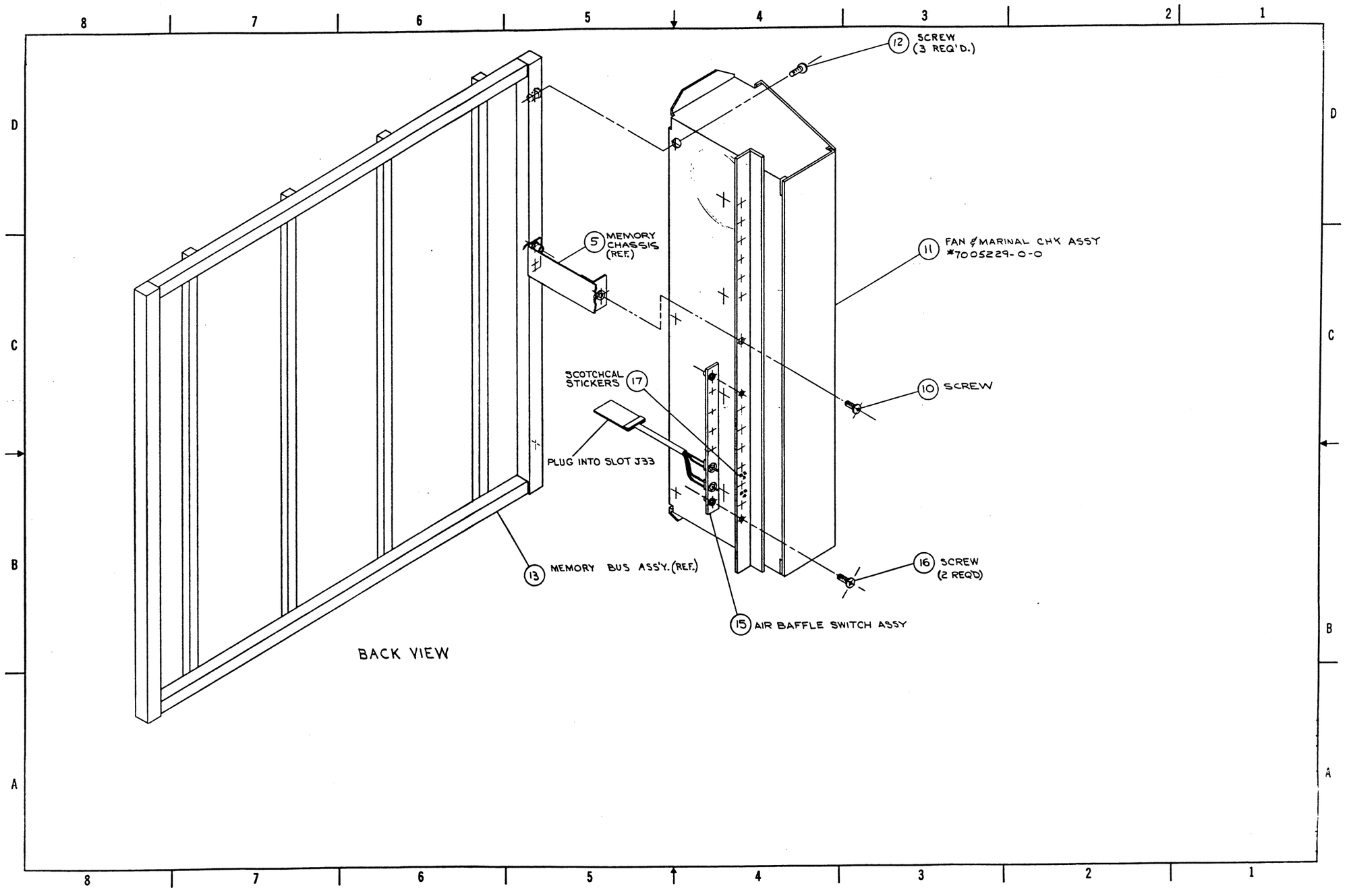
D-AD-7005303-0-0 CP Bus Assembly

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1	E-IA-7405034-0-0	1	DOOR FRAME (MTG BAR)	
2	D-AD-7005099-0-0	3	MTG BAR ASSY (CONN BLOCKS)	
3	D-AD-7005102-0-0	1	MTG BAR ASSY (ONE REVERSE BLK)	
4		8	SCREW PHL PAN HD #8-32 x I. 1/4 SST	
5		8	WASHER LOCK INT TOOTH #8 SST	
6		1	POP RIVET 1/8 DIA x 3/16 LG.	
7		AR	VOLT-CHAIN-PURCH SPEC-CHV 0001	12-3584-032
8		18	RESISTOR-CARB 100 OHM 1/4W 5%	
9		1	RESISTOR-CARB 180 OHM 1/4W 5%	

A-PL-7005303-0-0 CP Bus Assembly



D-UA-MC70-B-0 Unit Assembly (Sheet 1)



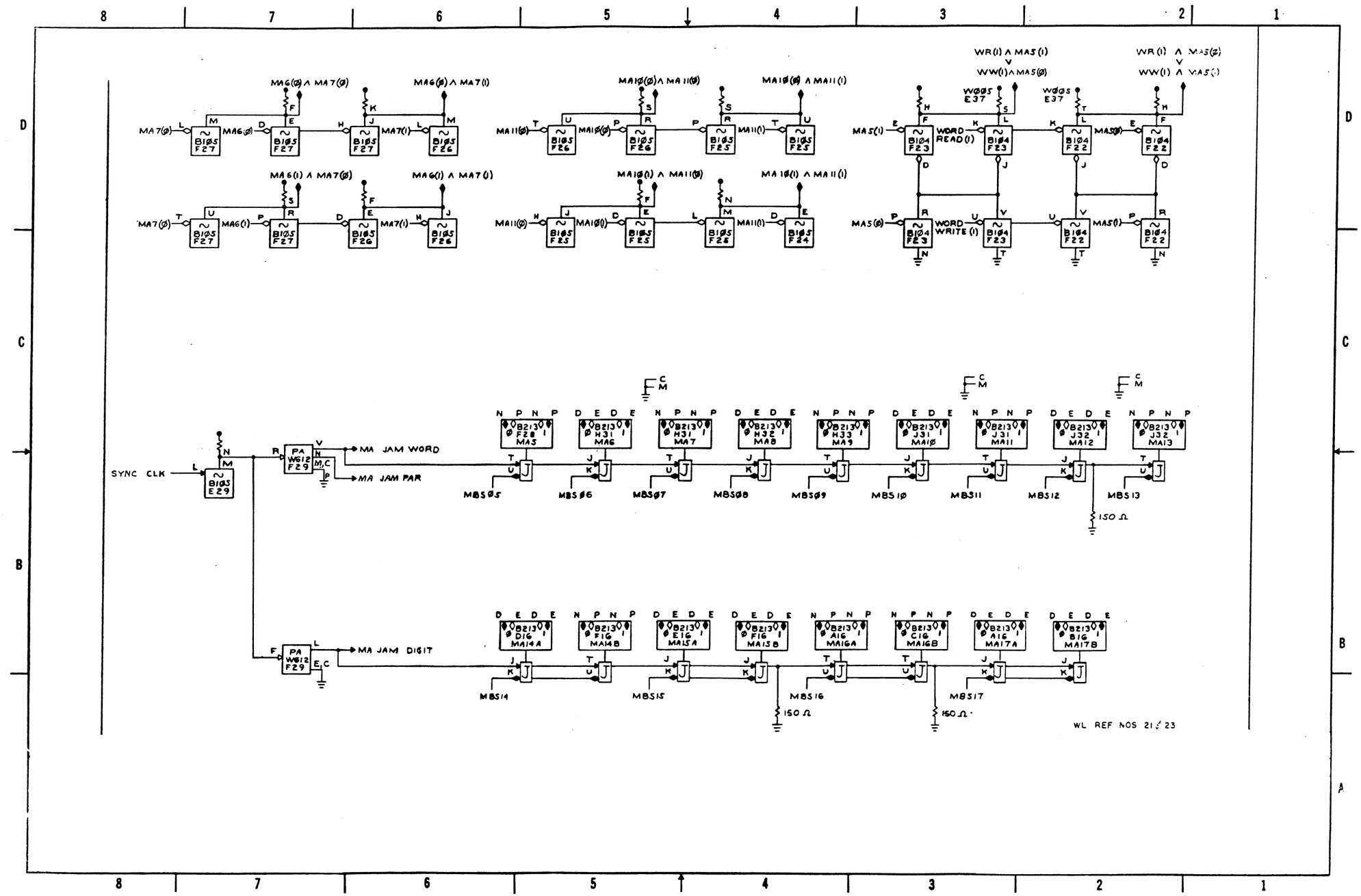
D-UA-MC70-B-0 Unit Assembly (Sheet 2)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
1	C-IA-7405557-0-0	1	SUPPORT-MEMORY UNIT	
2	D-IA-7405318-0-0	1	MEMORY RETAINER	
3		1	MEMORY CORE STACK (18 BIT)	3305262-1-0
4	B-MD-7405356-0-0	2	SPACER BAR (MEMORY)	
5	D-IA-7405363-0-0	1	CHASSIS (MEMORY)	
6		4	SCR POSIDRIVE PHL HD 8-32 x 3/8	
7		3	HEX NUT KEPS #10-32 SST.	
8		5	SCR PHL TRU HD 10-32 x 1 1/4 SST.	
9		6	WASHER LOCK INT #10 SST	
10		2	SCR PHL TRU HD 10-32 x 5/8 SST.	
11	A-PL- 7005229-0-0	1	FAN & MARGINAL CHECK ASSY	7005229-0-0
12		3	SCR PHL TRU HD 1/4-20 x 3/4 SST.	
13	D-AD-7005219-0-0	1	MEMORY BUS ASSEMBLY	
14		4	SCREW PHL PAN HD 10-32 x 3/4 NYLON	
15	D-IA-7005384-0-0	1	AIR BAFFLE SW ASSY (MC70-B)	7005384-0-0
16		2	SCR PHL HD PAN 6-32 x 9/16 SST	

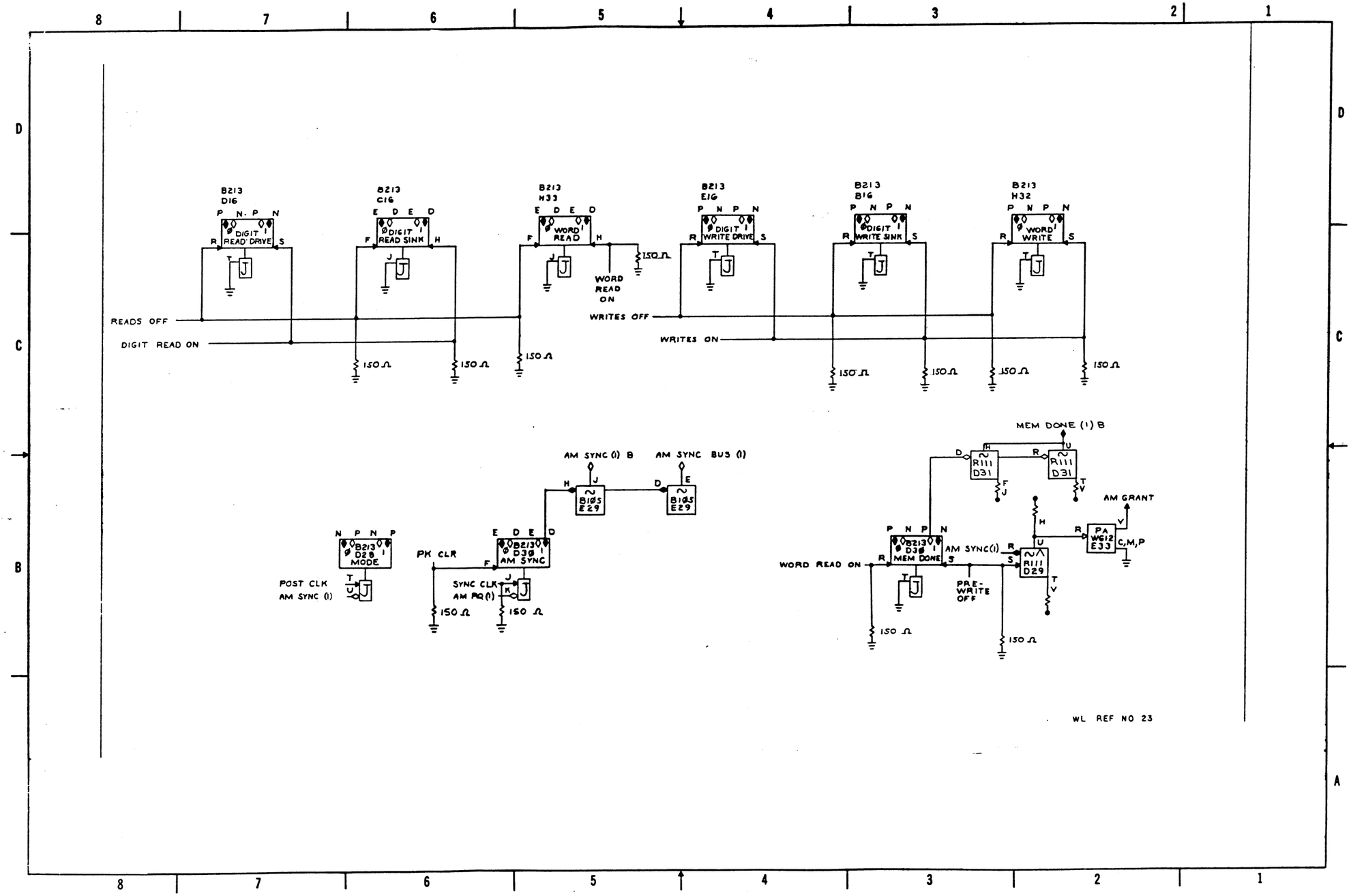
A-PL-MC70-B-0 Memory Unit Assembly Parts List (Sheet 1)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
17	A-SS-7405843-0-0	AS REQD	SCOTCHCAL STICKERS	7405843-0-0
18		8	WASH 3/8 x 1/4 x 1/32 NYLON	
19	A-PL-7005500-0-0	3	JUMPER SET MC70-B	7005500

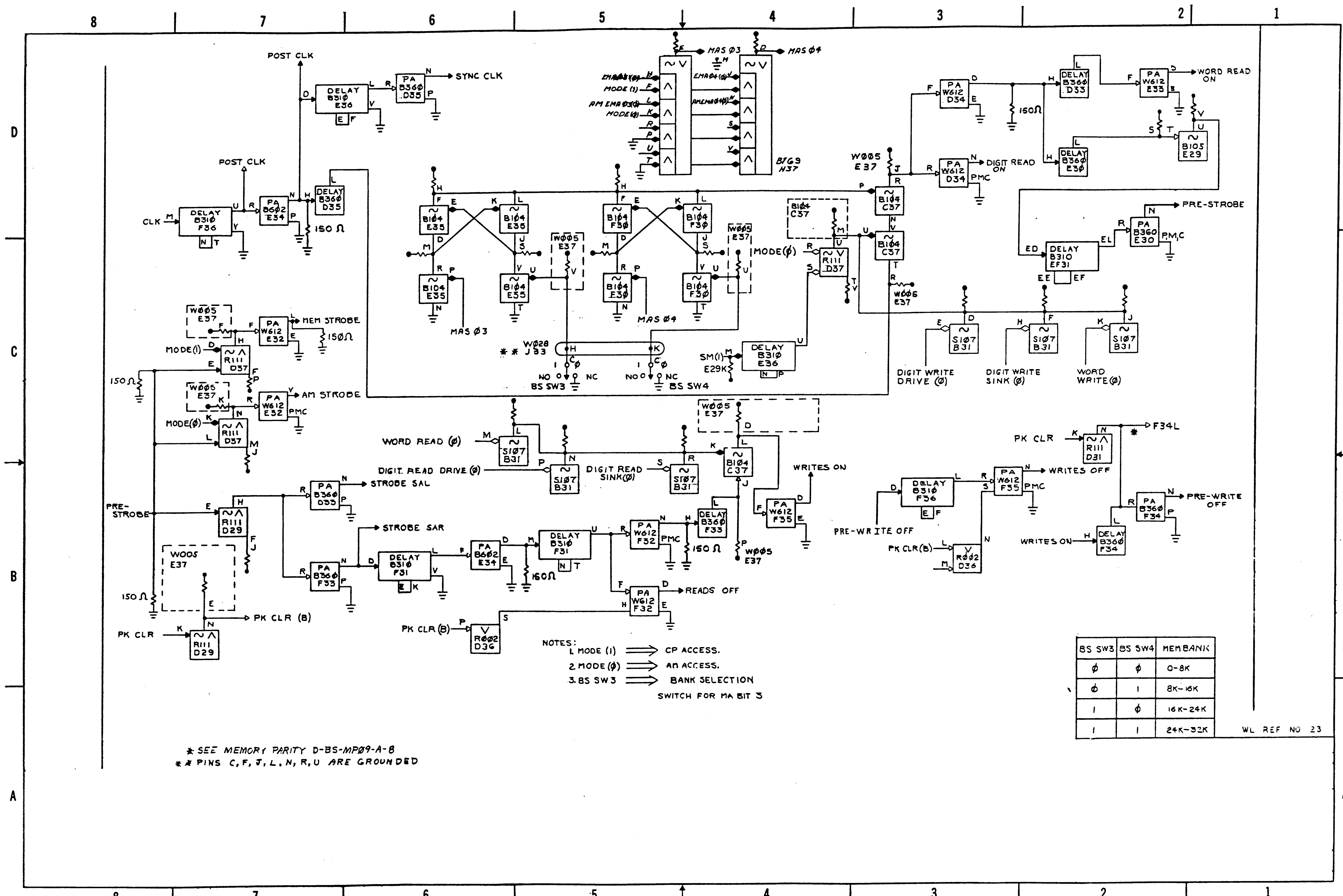
A-PL-MC70-B-0 Memory Unit Assembly Parts List (Sheet 2)



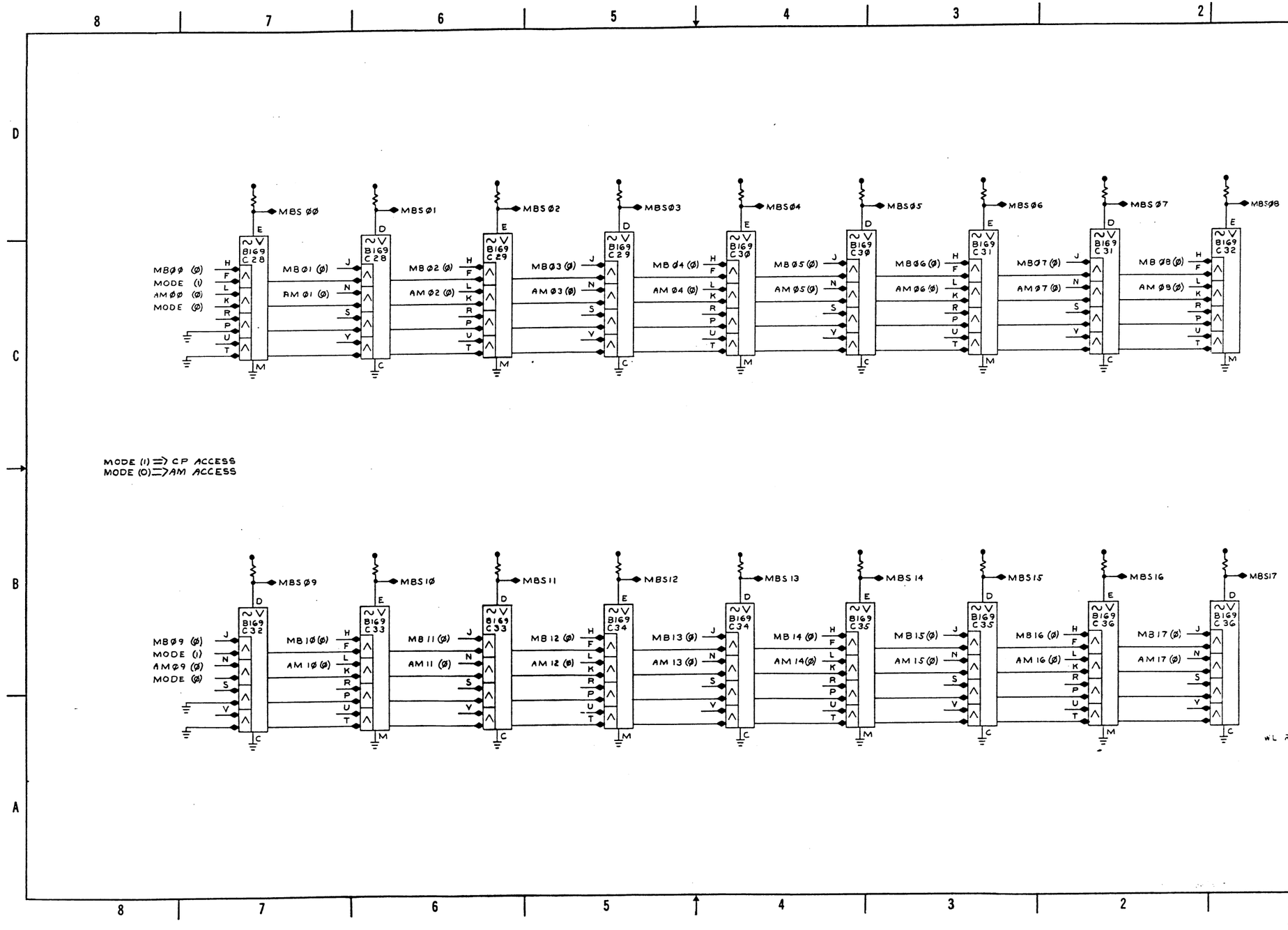
D-BS-MC70-B-1 Memory Control (Sheet 1)



D-BS-MC70-B-1 Memory Control (Sheet 2)



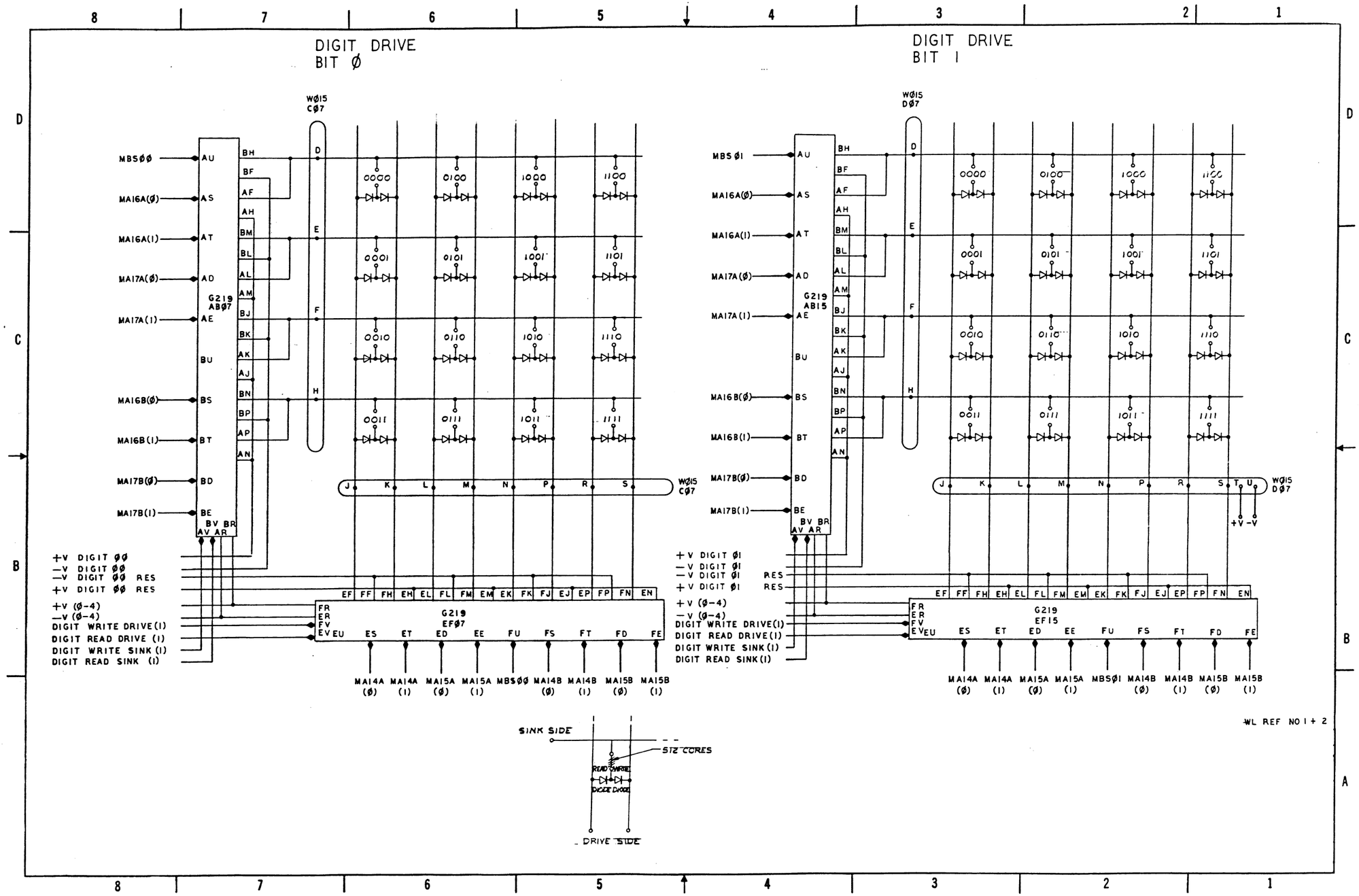
D-BS-MC70-B-2 Memory Timing Chain



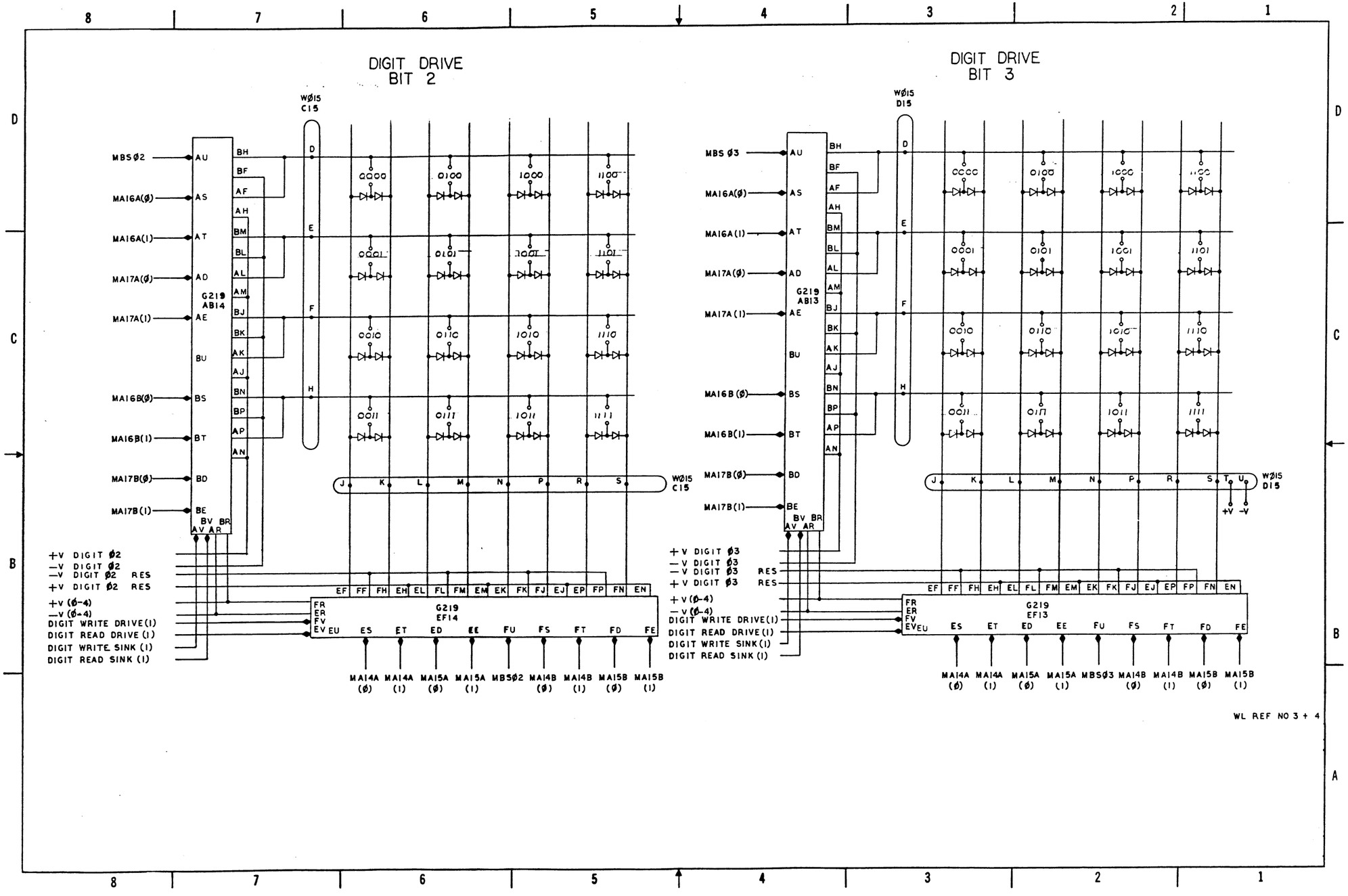
MODE (1) ⇒ CP ACCESS
MODE (0) ⇒ AM ACCESS

WL REF NO 20

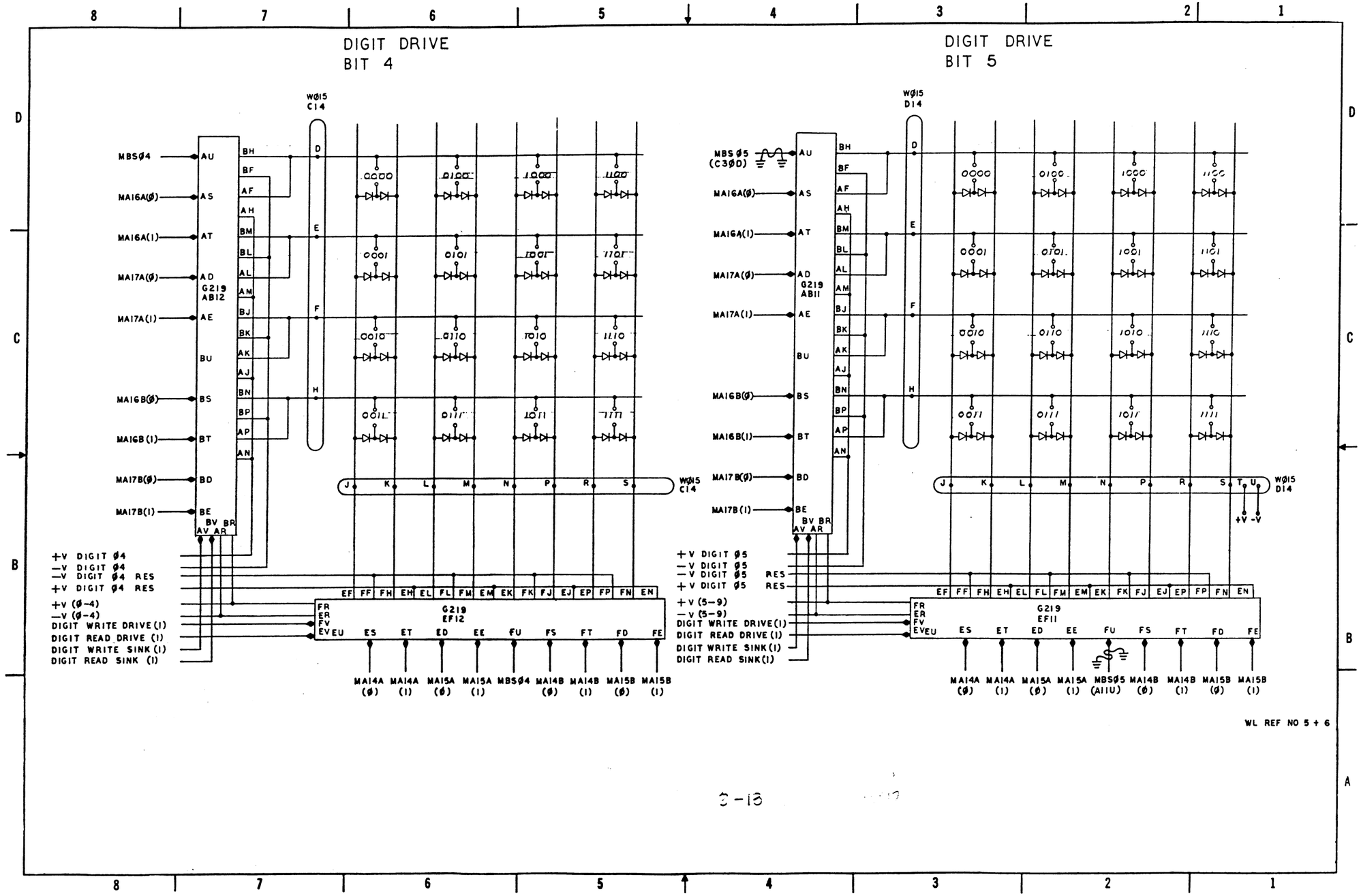
D-BS-MC70-B-3 Memory Input Mixer



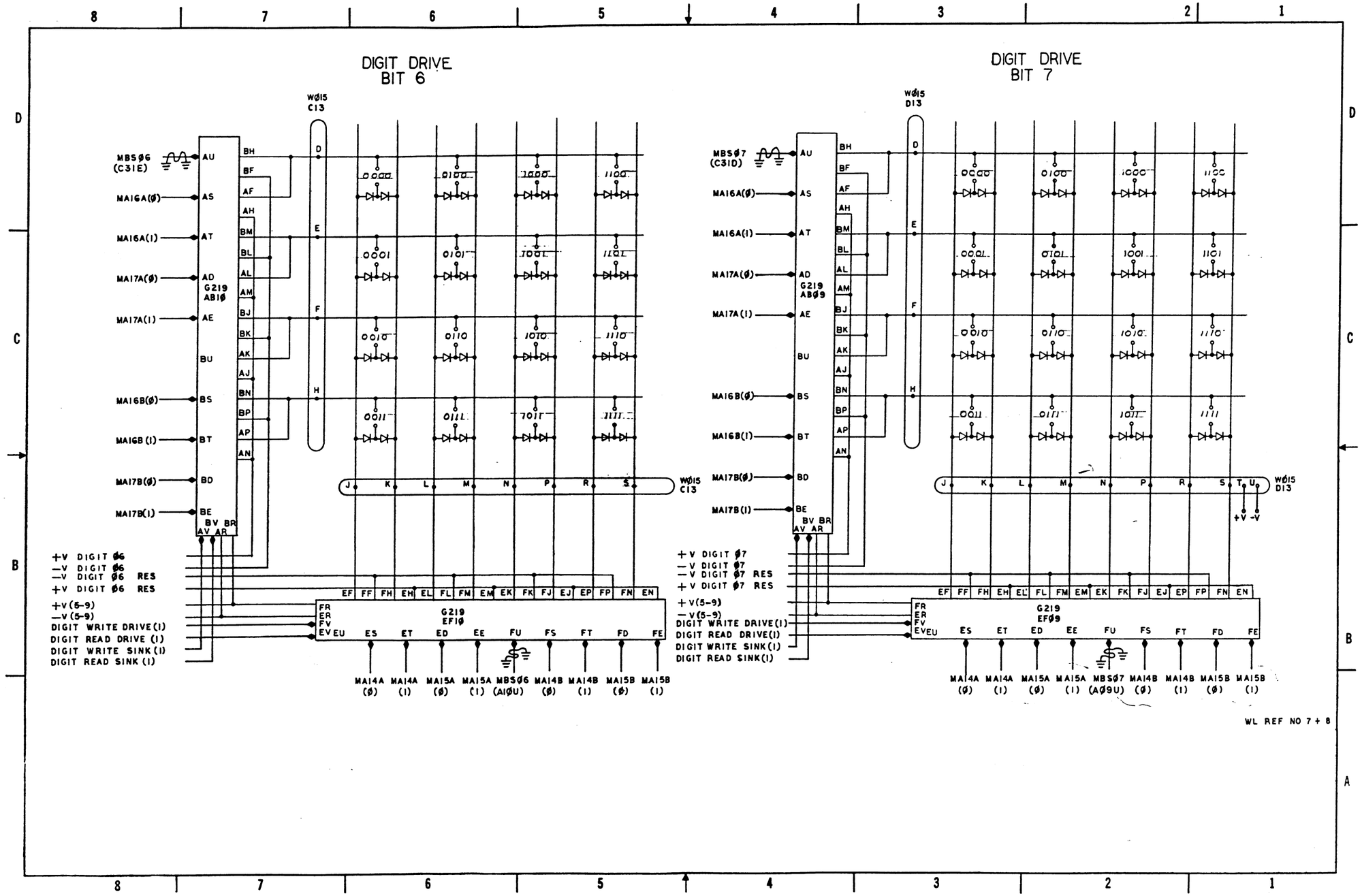
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 1)



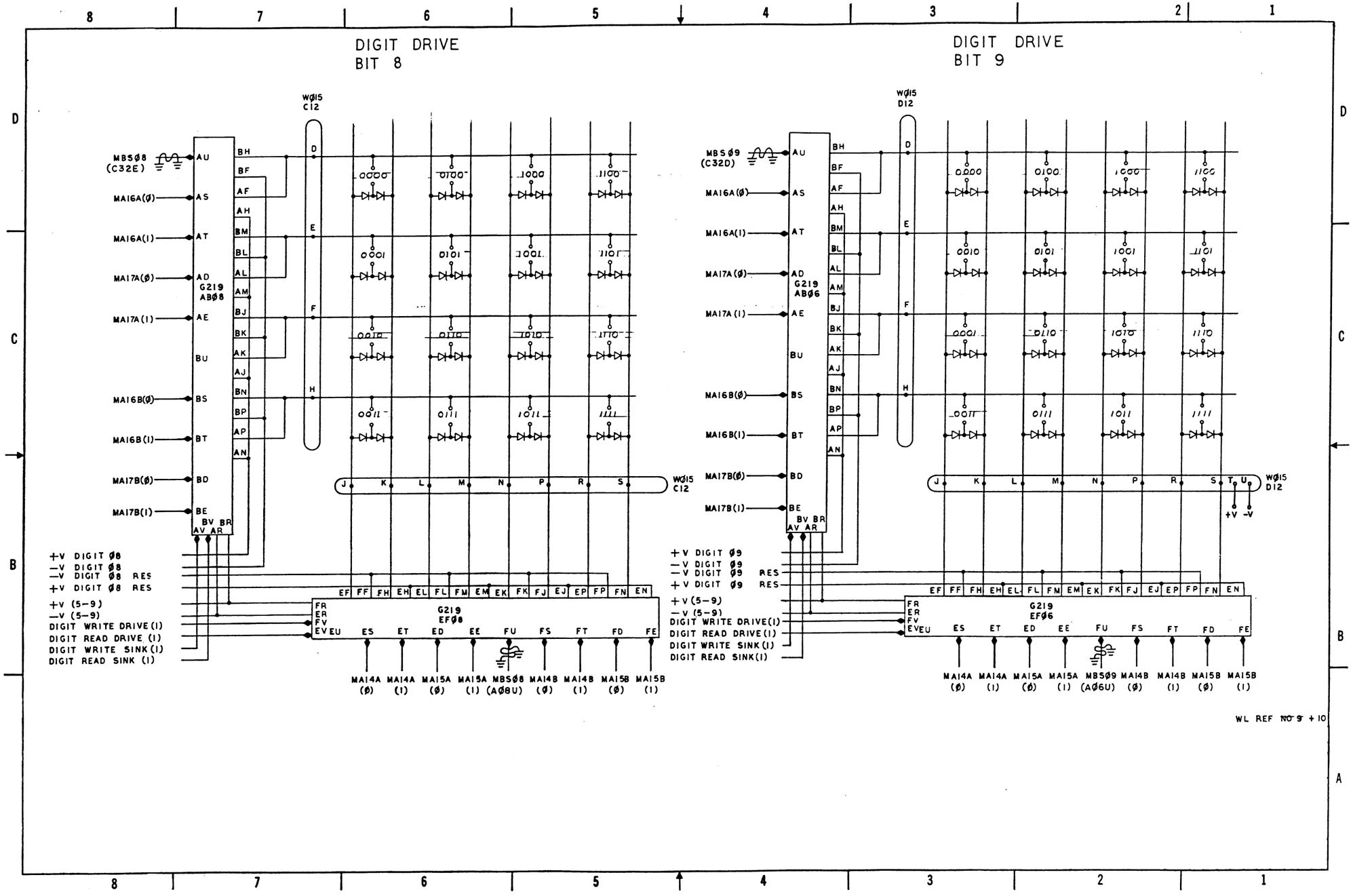
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 2)



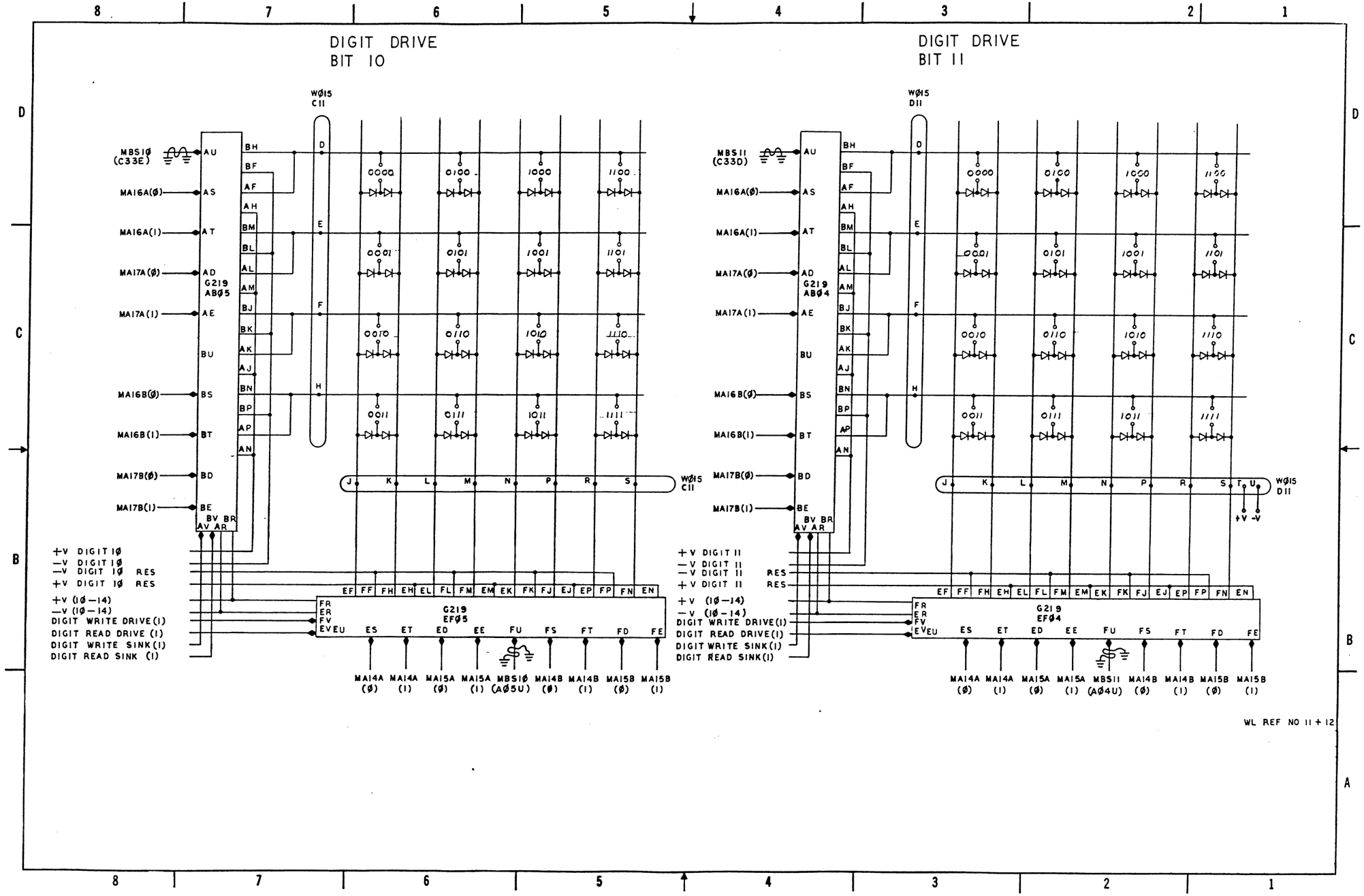
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 3)



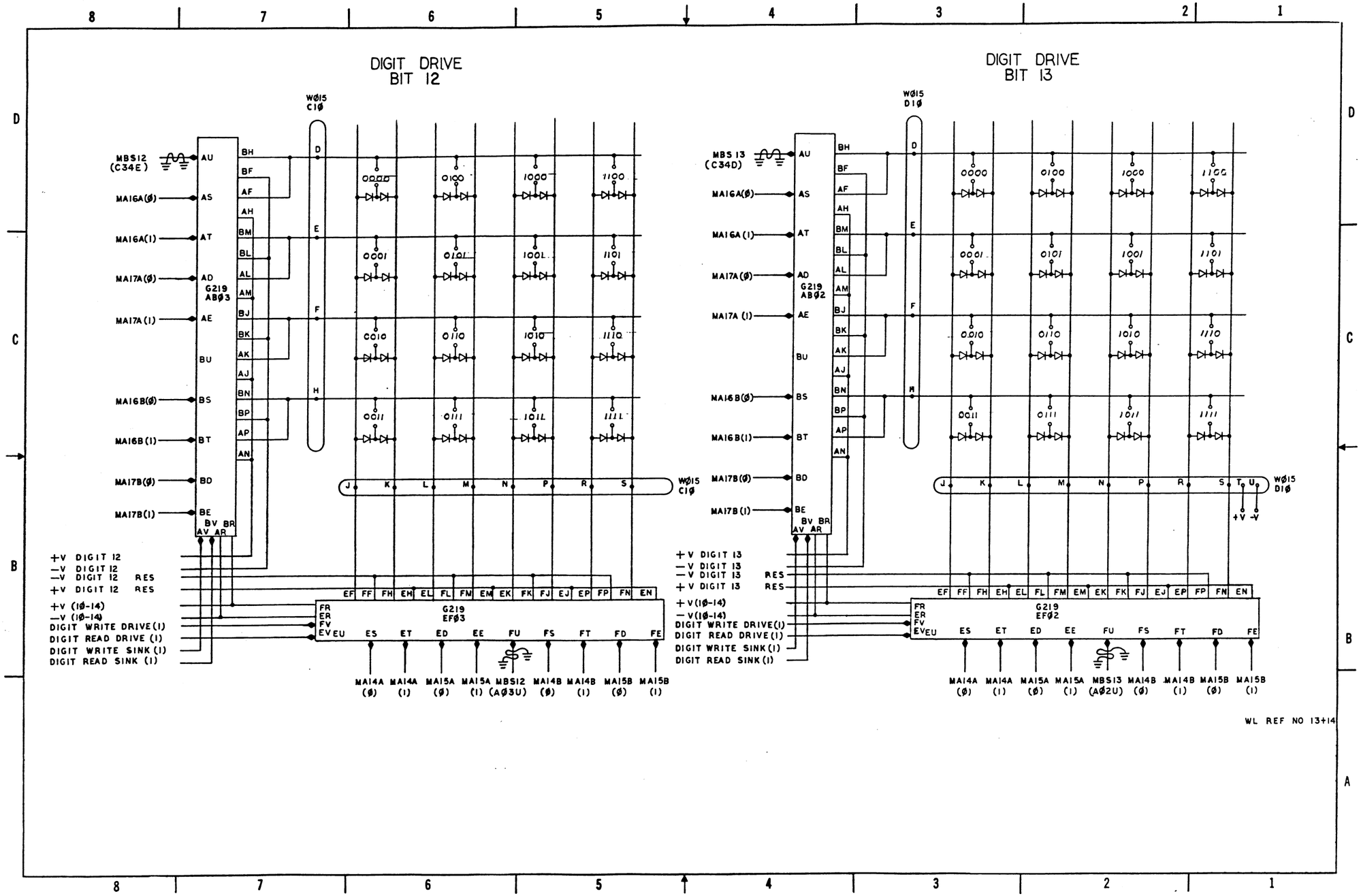
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 4)



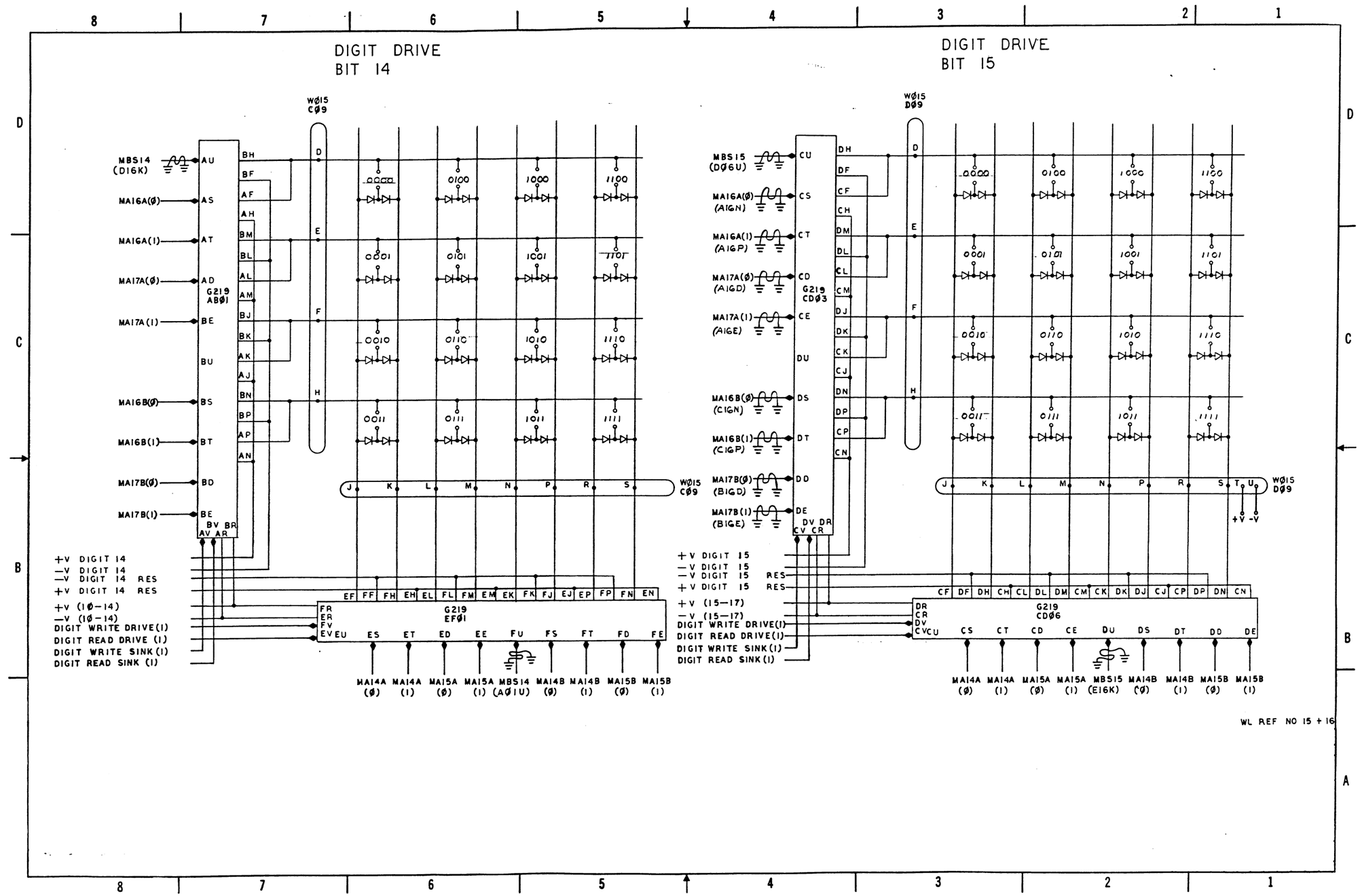
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 5)



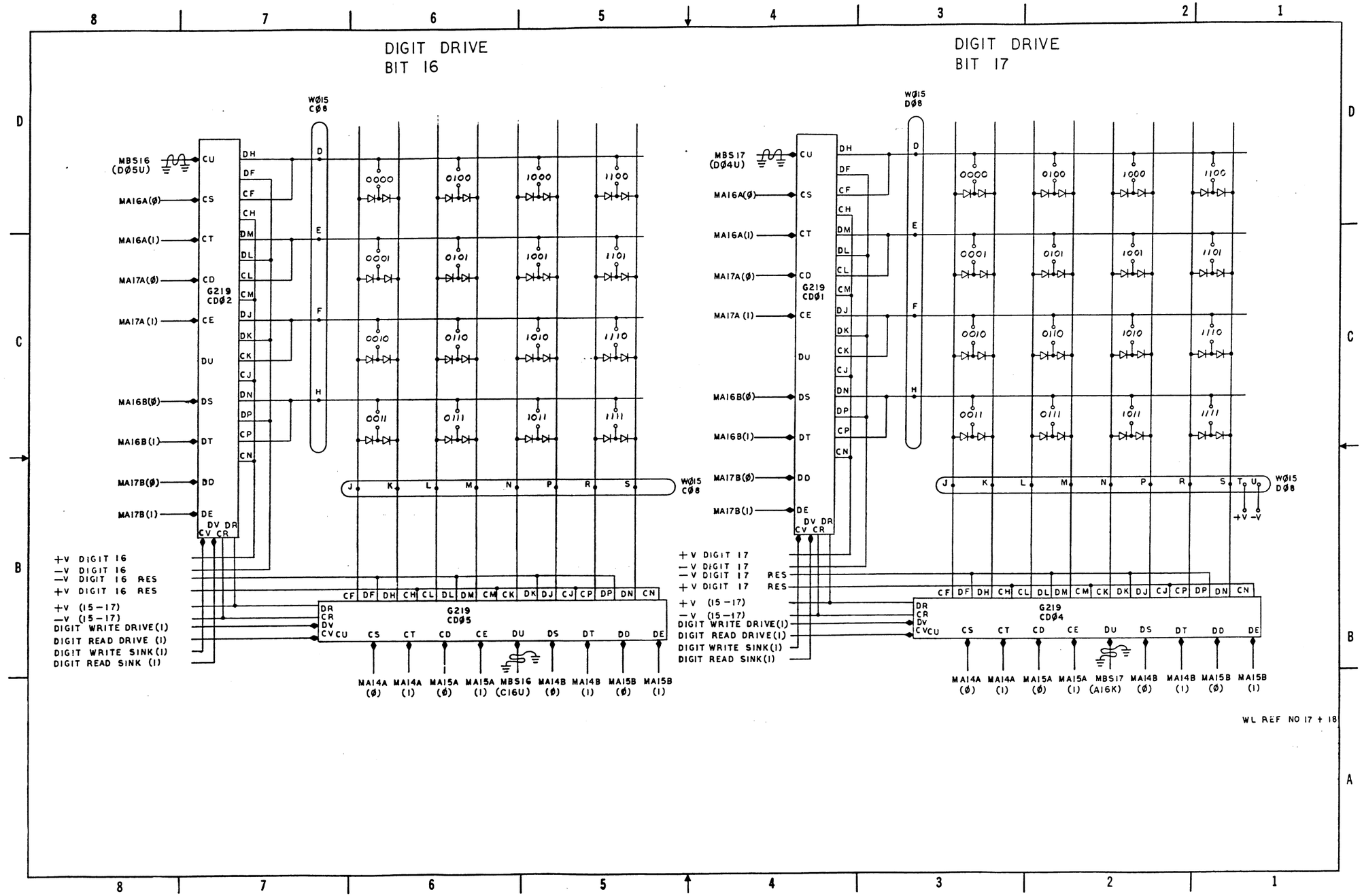
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 6)



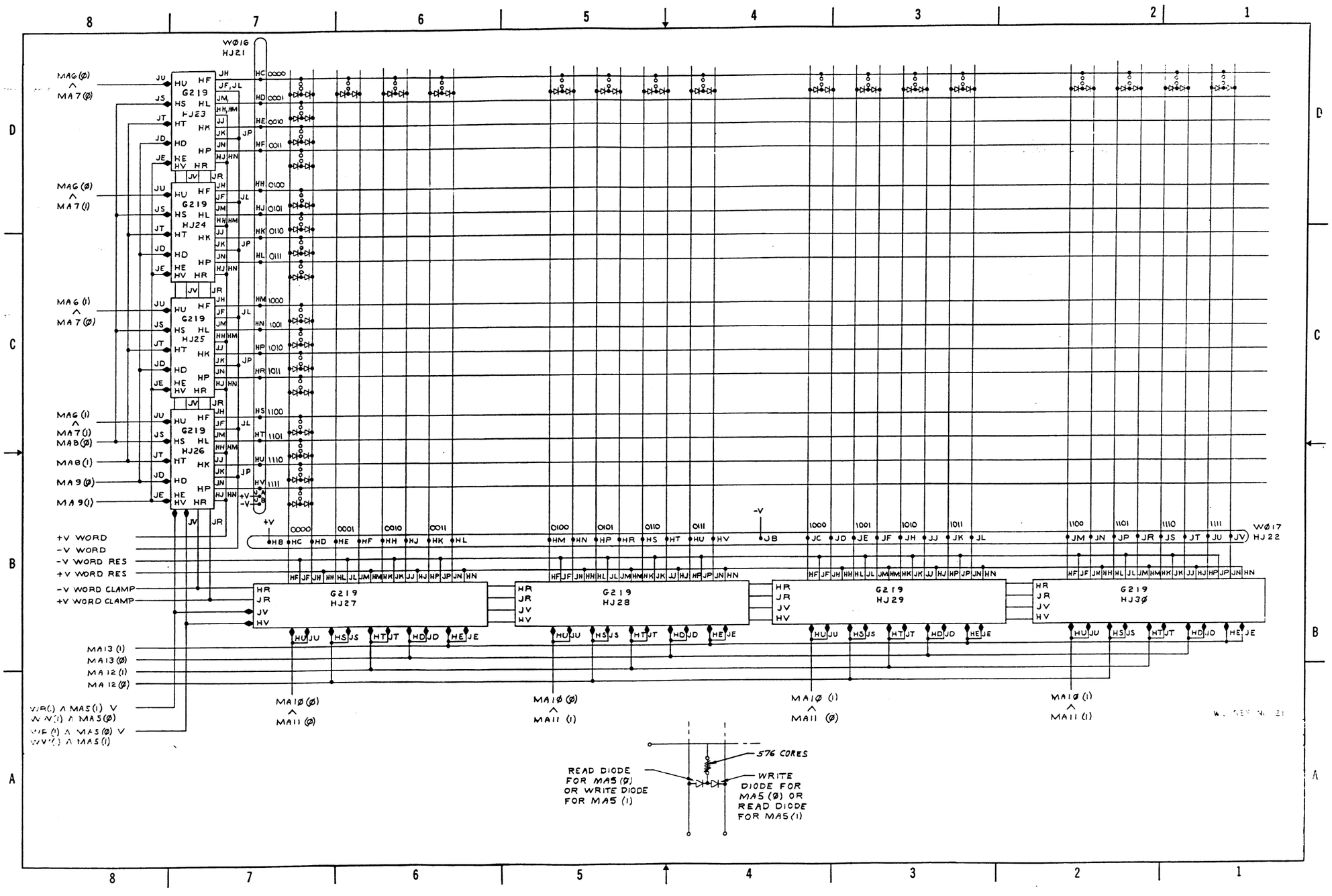
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 7)



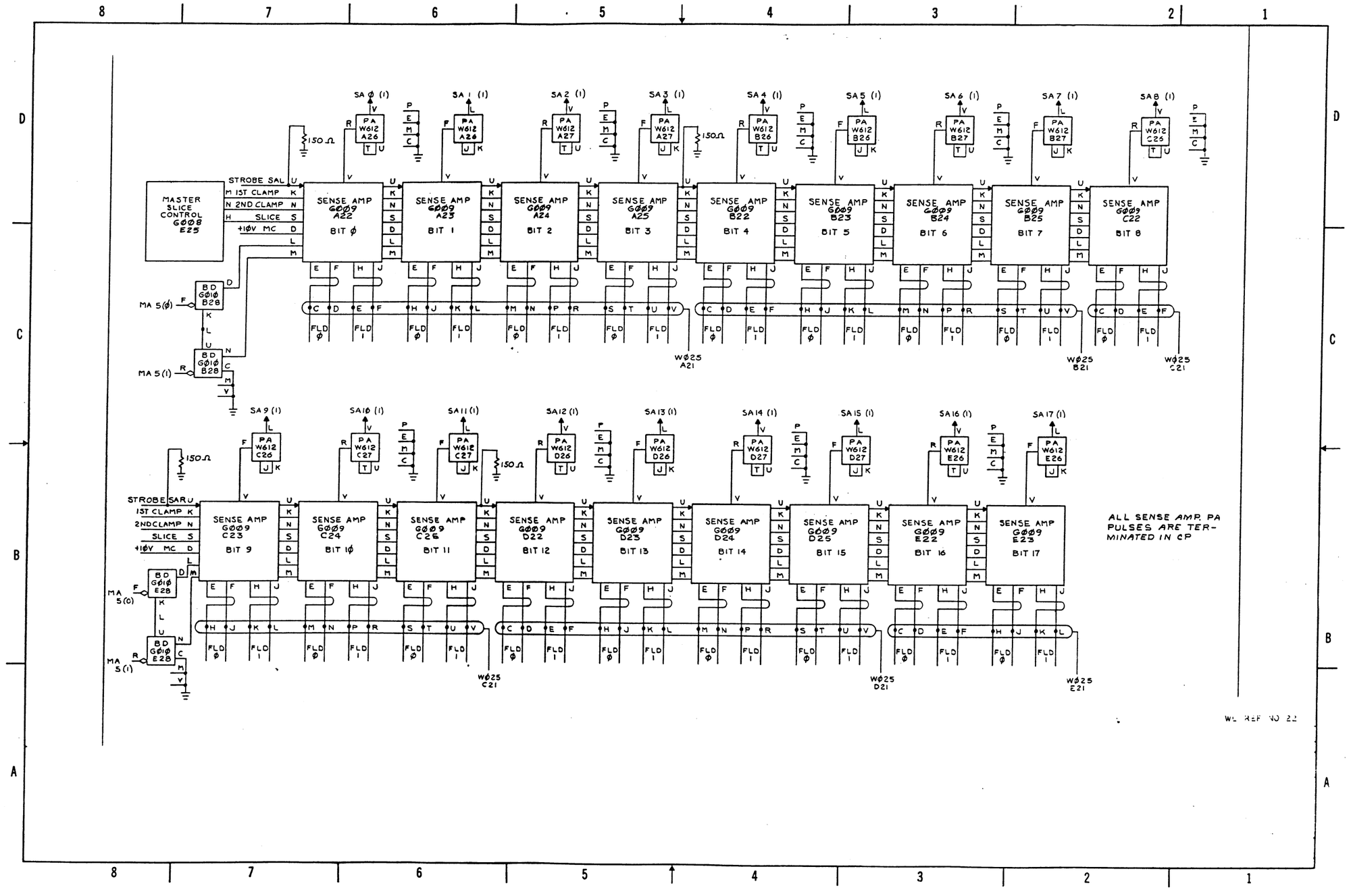
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 8)



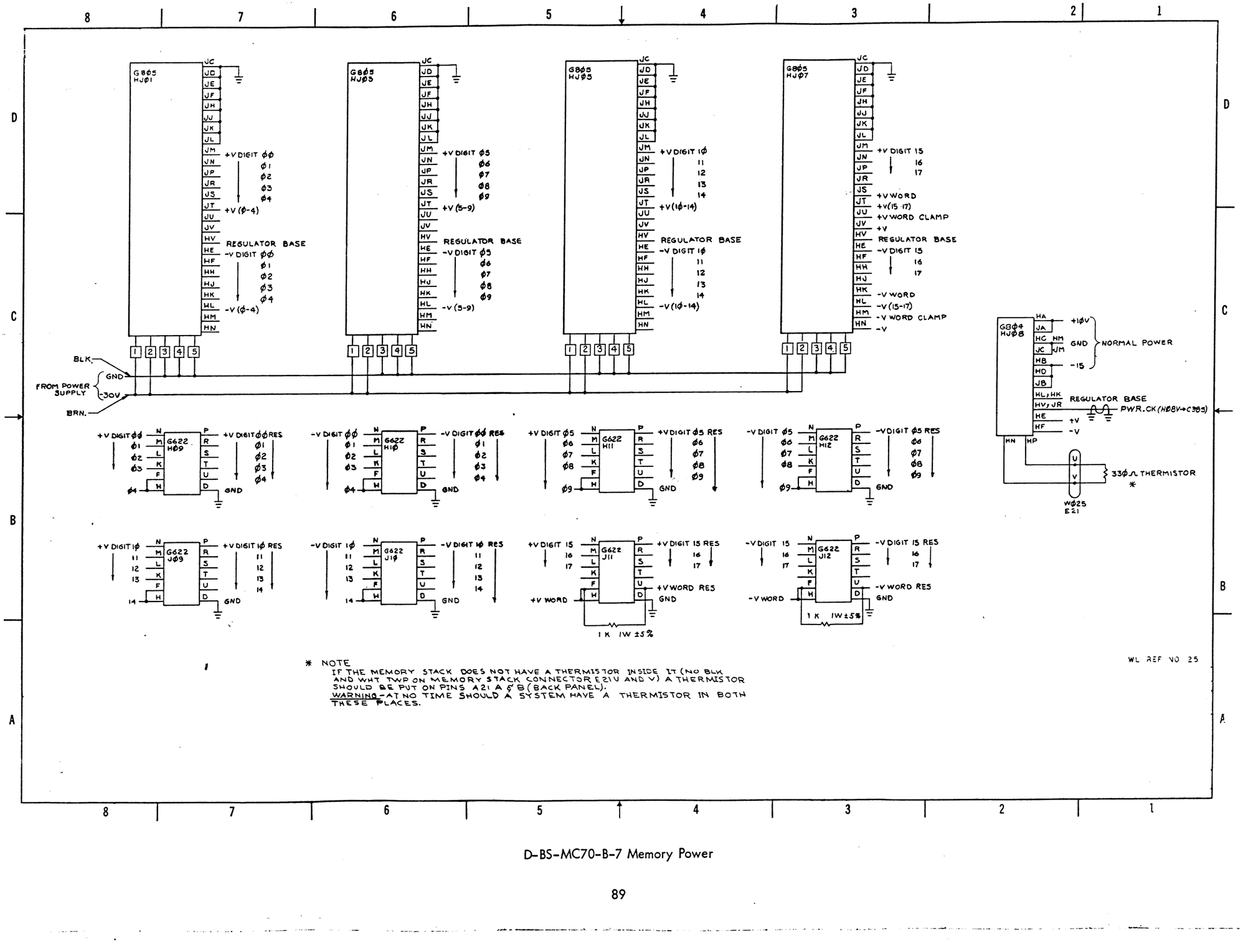
D-BS-MC70-B-4 Digit Drive Bits 0-17 (Sheet 9)



D-BS-MC70-B-5 Word Selection

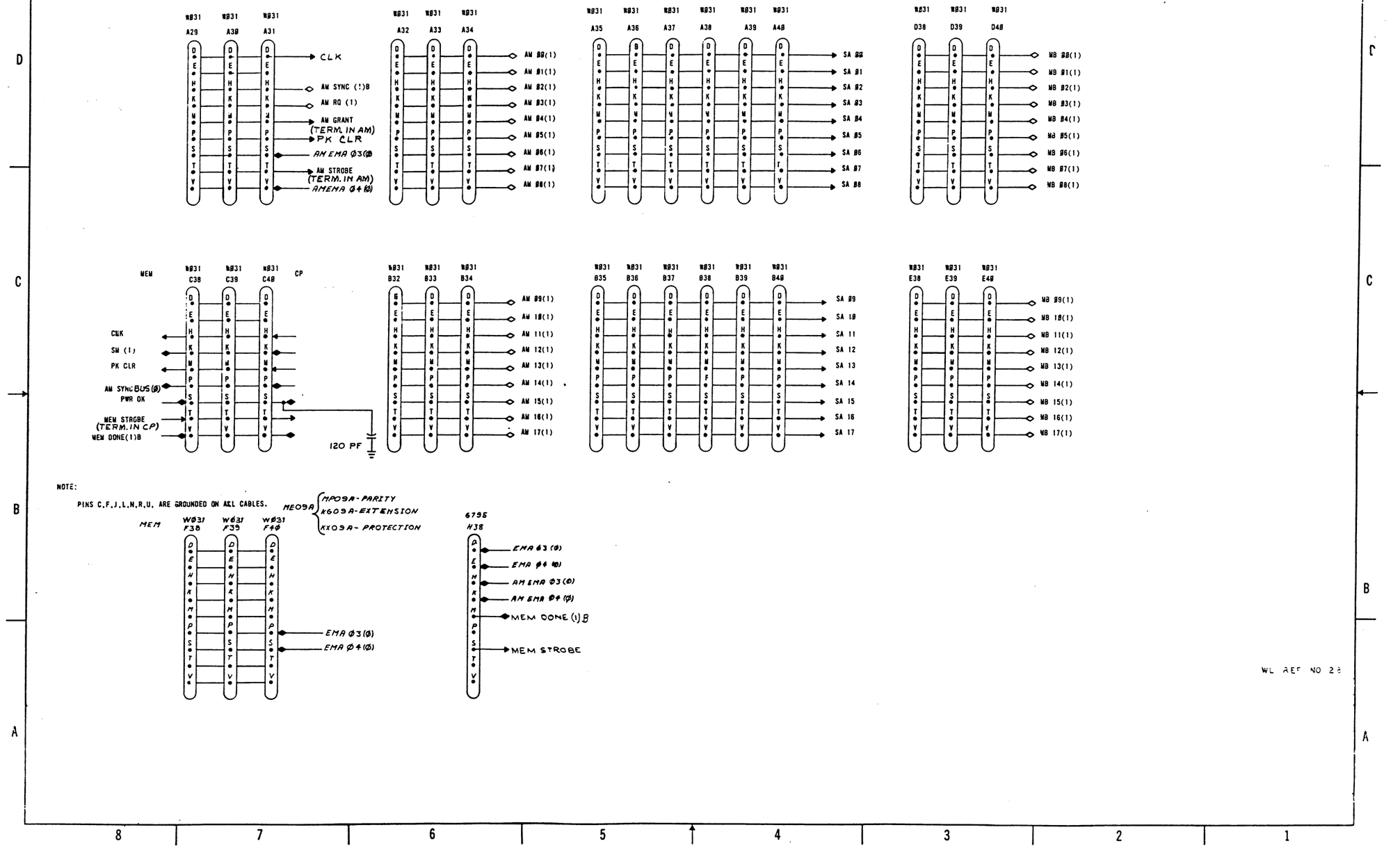


D-BS-MC70-B-6 Sense Amplifiers



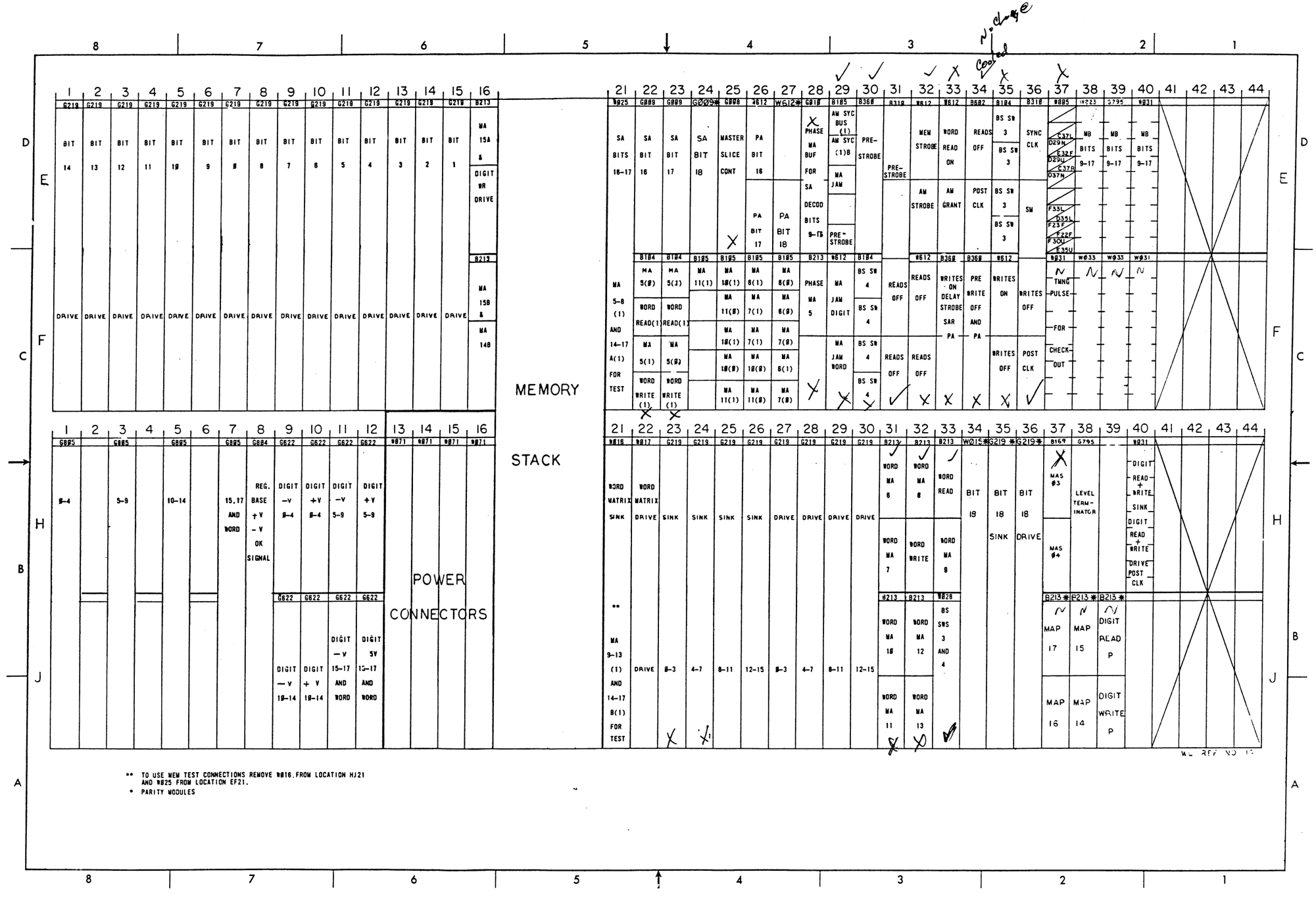
* NOTE
IF THE MEMORY STACK DOES NOT HAVE A THERMISTOR INSIDE IT (NO BLK AND WHT TWP ON MEMORY STACK CONNECTOR E21U AND V) A THERMISTOR SHOULD BE PUT ON PINS A21 A & B (BACK PANEL).
WARNING - AT NO TIME SHOULD A SYSTEM HAVE A THERMISTOR IN BOTH THESE PLACES.

WL REF NO 25



D-BS-MC70-B-8 Mem/AM Cable Connections

D-BS-MC70-B-9 Module Utilization (Sheet 1)



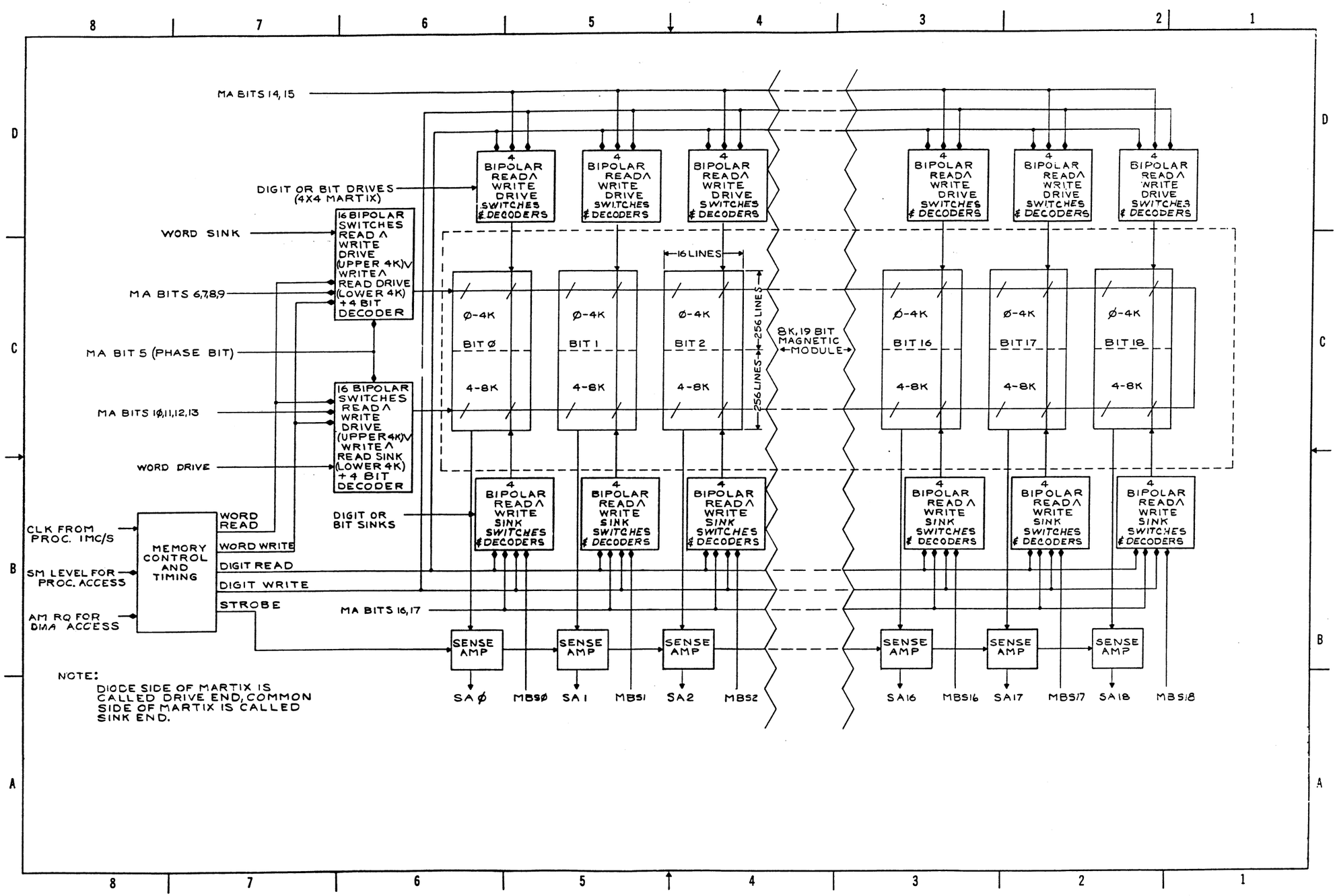
D-BS-MC70-B-9 Module Utilization (Sheet 2)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
		5	B104 INVERTER	
		5	B105 INVERTER	
		9	B169 INVERTER	
		14	B213 FLIP FLOP	
		2	B310 DELAY	
		5	B360 DELAY WITH PULSE AMPLIFIER	
		1	B602 PULSE AMPLIFIER	
		1	G008 MASTER SLICE CONTROL	
		18	G009 2 INPUT SENSE AMPLIFIER	
		2	G010 SENSE AMPLIFIER SELECTOR	
		44	G219 MEMORY SELECTOR	
		8	G622 RESISTOR BOARD	
		1	G804 CONTROL FOR G805	
		4	G805 REGULATOR	
		1	R002 DIODE NETWORK	
		2	R111 DIODE GATE	

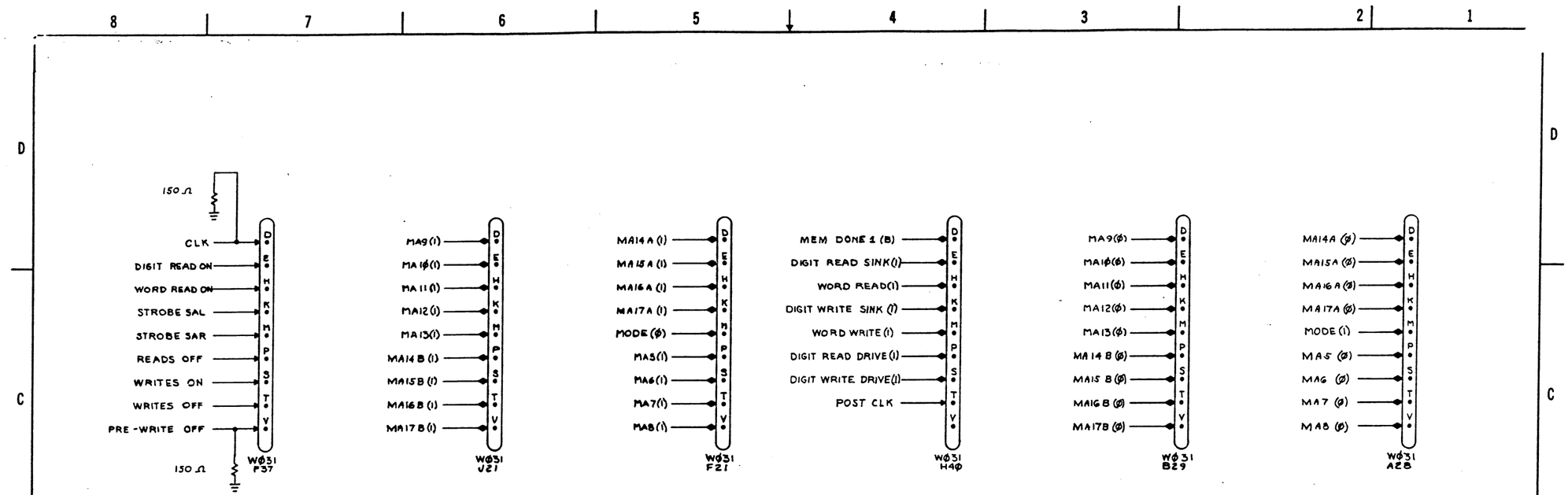
A-PL-MC70-B-9 Module Parts List (Sheet 1)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM — STOCK SIZE — CAT. NO. — MFG.	DEC. STOCK NO.
		1	W016 WORD SINK STACK CONN.	
		1	W017 WORD DRIVE STACK CONN.	
		12	W025 CONNECTOR BOARD	
		1	W028 CABLE CONNECTOR	
		35	W031 CABLE CONNECTOR	
		4	W071 POWER CONNECTOR	
		15	W612 PULSE AMPLIFIER	
		1	S107 INVERTER	
		3	G795 CABLE TERMINATOR	

A-PL-MC70-B-9 Module Parts List (Sheet 2)



D-BD-MC70-B-10 Functional Block Diagram



D-BS-MC70-B-11 Memory Test Connections

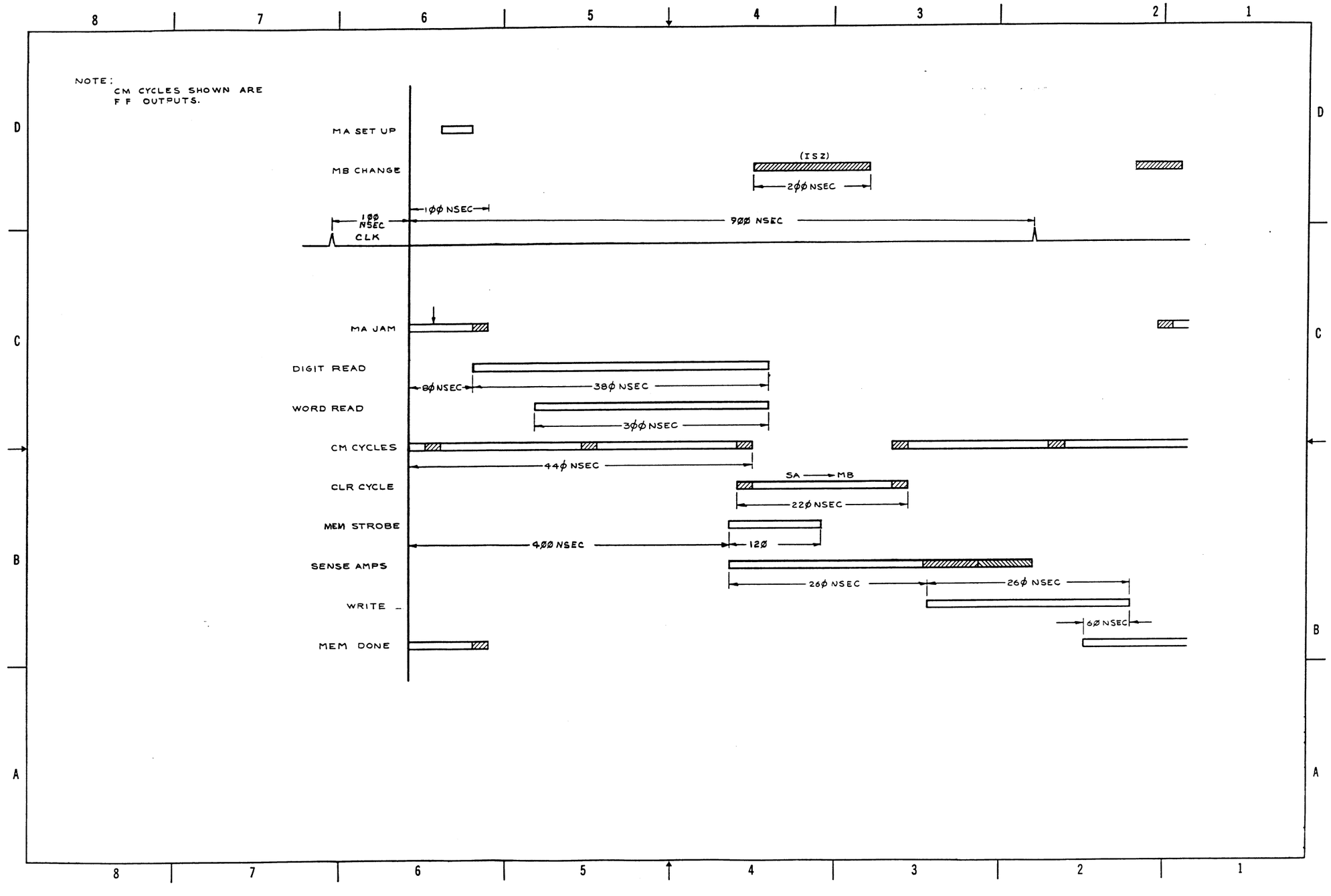
COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
RES (DIGIT READ ON)	150 ,1/4W, 10%		C16H	C16C	
RES (MA JAM DIGIT)	150 ,1/4W, 10%		A16J	A16C	
RES (MA JAM WORD)	150 ,1/4W, 10%		J32T	J32M	
RES (PRE-STROBE)	150 ,1/4W, 10%		D37E	D37C	
RES (PRE-STROBE)	150 ,1/4W, 10%		D29E	D29C	
RES (PRE-WRITES OFF)	150 ,1/4W, 10%		D29S	D29C	
RES (PRE-WRITES OFF)	150 ,1/4W, 10%		F37V	F37C	
RES (READS OFF)	150 ,1/4W, 10%		C16F	C16M	
RES (READS OFF)	150 ,1/4W, 10%		H33F	H33C	
RES (STROBE SAL)	150 ,1/4W, 10%		A22U	A22C	
RES (STROBE SAL)	150 ,1/4W, 10%		B22U	B22C	
RES (STROBE SAR)	150 ,1/4W, 10%		C23U	C23C	
RES (STROBE SAR)	150 ,1/4W, 10%		D22U	D22C	
RES (WORD READ ON)	150 ,1/4W, 10%		D30R	D30C	
RES (WORD READ ON)	150 ,1/4W, 10%		H33H	H33C	
RES (WRITES OFF)	150 ,1/4W, 10%		B16R	B16M	
RES (WRITES OFF)	150 ,1/4W, 10%		J39R	J40C	
RES (WRITES ON)	150 ,1/4W, 10%		B16S	B16C	
RES (WRITES ON)	150 ,1/4W, 10%		J39S	J39C	
RES (WORD LIMITING)	1K 1W, 5%		J11U	J11F	
RES (WORD LIMITING)	1K 1W, 5%		J12U	J12F	
(O.K. SIGNAL CAPACITOR)	120 PF		C40S	C40C	
THERMISTOR, CARBORUNDUM #0905P-8	330		A21A	A21B	
RES (CLK)	150 1/4W 10%		F37D	F37C	
RES (MA JAM DIGIT)	150 1/4W 10%		A16T	B14C	

A-CP-MC70-B-12 External Components List (Sheet 1)

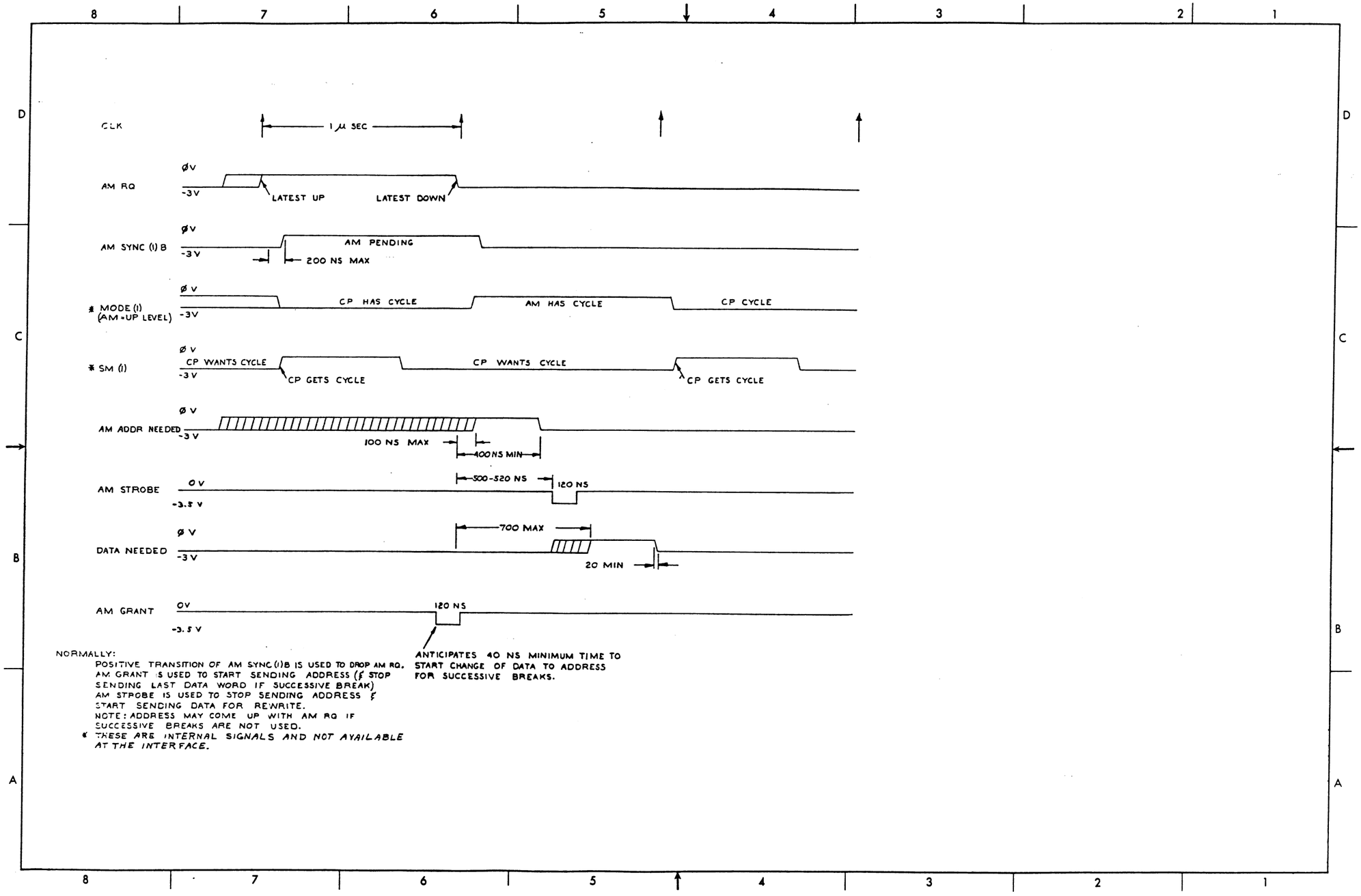
COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
RES(PK CLR)	150,¼W,10%		D30F	D30C	
RES(POST CLK)			D35H	D35C	
RES(SYNC CLK)			D30J	D30M	
RES(E30H)			E30H	E30C	
RES(F31M)			F31M	F31C	
RES(F33H)	150,¼W,10%		F33H	F33C	
RES (MA JAM PAR)	47Ω,½W,10%		J38T	J38C	
*JUMPER EMA 04	JUMPER		F30E	F30C	
*JUMPER EMA 04	JUMPER		F30K	F31C	
*JUMPER EMA 03	JUMPER		E35E	E35C	
*JUMPER EMA 03	JUMPER		E35K	E36C	
RES (MEM STROBE)	150Ω,½,10%		E32L	E32C	
*TEMPORARY JUMPERS REMOVED WHEN EXTENDED MEMORY CONTROL (KG09A) IS INSTALLED.					

A-CP-MC70-B-12 External Components List (Sheet 2)

NOTE:
CM CYCLES SHOWN ARE
F F OUTPUTS.



D-TD-MC70-B-14 Mem/CP Timing



D-TD-MC70-B-15 DMA Interface Timing

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
BIT Ø FLD Ø	A21C	A22E	BLK TWP	
↓	A21D	A22F	WHT	
BIT Ø FLD 1	A21E	A22H		
↓	A21F	A22J		
BIT 1 FLD Ø	A21H	A23E		
↓	A21J	A23F		
BIT 1 FLD 1	A21K	A23H		
↓	A21L	A23J		
BIT 2 FLD Ø	A21M	A24E		
↓	A21N	A24F		
BIT 2 FLD 1	A21P	A24H		
↓	A21R	A24J		
BIT 3 FLD Ø	A21S	A25E		
↓	A21T	A25F		
BIT 3 FLD 1	A21U	A25H		
↓	A21V	A25J		
BIT 4 FLD Ø	B21C	B22E		
↓	B21D	B22F		
BIT 4 FLD 1	B21E	B22H		
↓	B21F	B22J		
BIT 5 FLD Ø	B21H	B23E		
↓	B21J	B23F		
BIT 5 FLD 1	B21K	B23H		
↓	B21L	B23J		
BIT 6 FLD Ø	B21M	B24E	BLK TWP	
↓	B21N	B24F	WHT	

A-WL-MC70-B-16 TWP Wiring Sheets (Sheet 1)

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
BIT 6 FLD 1	B21P	B24H	BLK TWP	
↓	B21R	B24J	WHT	
BIT 7 FLD Ø	B21S	B25E		
↓	B21T	B25F		
BIT 7 FLD 1	B21U	B25H		
↓	B21V	B25J		
BIT 8 FLD Ø	C21C	C22E		
↓	C21D	C22F		
BIT 8 FLD 1	C21E	C22H		
↓	C21F	C22J		
BIT 9 FLD Ø	C21H	C23E		
↓	C21J	C23F		
BIT 9 FLD 1	C21K	C23H		
↓	C21L	C23J		
BIT 10 FLD Ø	C21M	C24E		
↓	C21N	C24F		
BIT 10 FLD 1	C21P	C24H		
↓	C21R	C24J		
BIT 11 FLD Ø	C21S	C25E		
↓	C21T	C25F		
BIT 11 FLD 1	C21U	C25H		
↓	C21V	C25J		
BIT 12 FLD Ø	D21C	D22E		
↓	D21D	D22F		
BIT 12 FLD 1	D21E	D22H	BLK TWP	
↓	D21F	D22J	WHT	

A-WL-MC70-B-16 TWP Wiring Sheets (Sheet 2)

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
BIT 13 FLD Ø	D21H	D23E	BLK TWP	
↓	D21J	D23F	WHT	
BIT 13 FLD 1	D21K	D23H		
↓	D21L	D23J		
BIT 14 FLD Ø	D21M	D24E		
↓	D21N	D24F		
BIT 14 FLD 1	D21P	D24H		
↓	D21R	D24J		
BIT 15 FLD Ø	D21S	D25E		
↓	D21T	D25F		
BIT 15 FLD 1	D21U	D25H		
↓	D21V	D25J		
BIT 16 FLD Ø	E21C	E22E		
↓	E21D	E22F		
BIT 16 FLD 1	E21E	E22H		
↓	E21F	E22J		
BIT 17 FLD Ø	E21H	E23E		
↓	E21J	E23F		
BIT 17 FLD 1	E21K	E23H		
↓	E21L	E23J		
PARITY BIT FLD Ø	E21M	E24E		
↓	E21N	E24F		
PARITY BIT FLD 1	E21P	E24H	BLK TWP	
↓	E21R	E24J	WHT	

A-WL-MC70-B-16 TWP Wiring Sheets (Sheet 3)

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
MBS Ø5	C30C	B11C	BLK TWP	
↑ Ø5	C30D	A11U	WHT	
Ø5	A11C	H11C		
Ø5	A11U	F11U		
Ø6	C31C	A10C		
Ø6	C31E	A10U		
Ø6	A10C	H10C		
Ø6	A10U	F10U		
Ø7	C31M	A09C		
Ø7	C31D	A09U		
Ø7	B09C	H09C		
Ø7	A09U	F09U		
Ø8	H08C	B08C		
Ø8	F08U	A08U		
Ø8	A08C	C32C		
Ø8	A08U	C32E		
Ø9	H06C	B06C		
Ø9	F06U	A06U		
Ø9	A06C	C32M		
Ø9	A06U	C32D		
1Ø	B05C	H05C		
1Ø	A05U	F05U		
1Ø	C33M	A05C		
1Ø	C33E	A05U		
↓ 11	H04C	A04C	BLK TWP	
MBS 11	F04U	A04U	WHT	

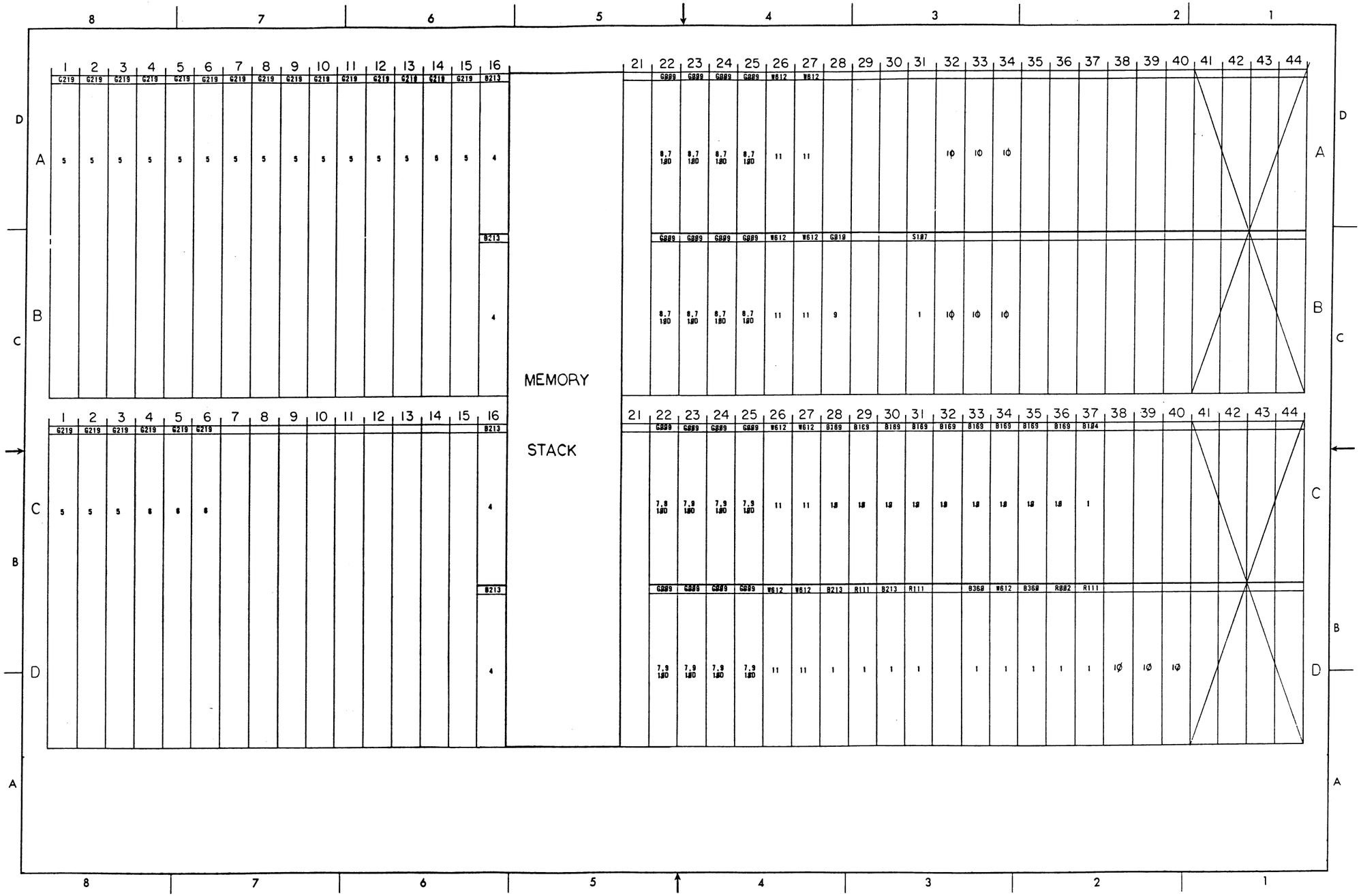
A-WL-MC70-B-16 TWP Wiring Sheets (Sheet 4)

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
MBS 11	B04C	C33C	BLK } TWP	
11	A04U	C33D	WHT }	
12	H03C	A03C		
12	F03U	A03U		
12	B03C	C34M		
12	A03U	C34E		
13	H02C	A02C		
13	F02U	A02U		
13	B02C	C34C		
13	A02U	C34D		
14	H01C	A01C		
14	F01U	A01U		
14	B01C	D16C		
14	A01U	D16K		
15	D03C	E06C		
15	C03U	D06U		
15	D06C	E16C		
15	D06U	E16K		
16	D02C	E05C		
16	C02U	D05U		
16	D05C	D16M		
16	D05U	C16U		
17	D01C	D04C		
17	C01U	D04U		
17	D03C	A16C	BLK } TWP	
MBS 17	D04U	A16K	WHT }	

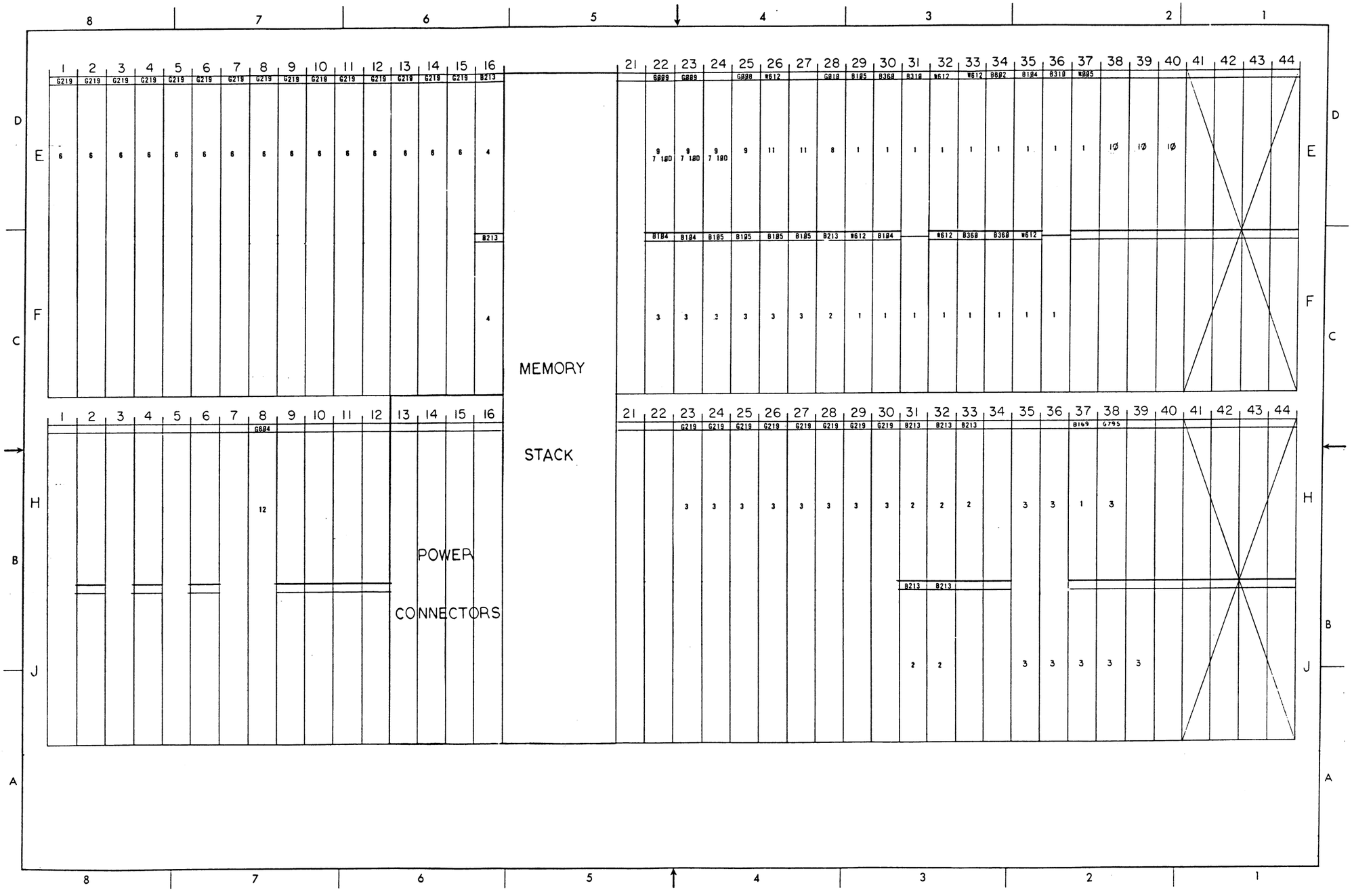
A-WL-MC70-B-16 TWP Wiring Sheets (Sheet 5)

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
MA16A Ø-	A16N	C03S	WHT } TWP	
16A Ø-	A15C	C03C	BLK }	
16A 1-	A16P	C03T		
16A 1-	A16M	C02C		
16B Ø-	C16N	D03S		
16B Ø-	C16C	E02C		
16B 1-	C16P	D03T		
16B 1-	C16M	E01C		
MA17A Ø-	A16D	C03D		
17A Ø-	A14C	C04C		
17A 1-	A16E	C03E		
17A 1-	B15C	C05C		
17B 0-	B16D	D03D		
17B 0-	B16C	E04C		
17B 1-	B16E	D03E	WHT } TWP	
MA17B 1-	B16M	E07C	BLK }	
PWR OK	H08V	C38S	WHT } TWP	
PWR OK	J08C	C38R	BLK }	

A-WL-MC70-B-16 TWP Wiring Sheets (Sheet 6)



D-SP-MC70-B-17 MC Switch Configuration (Sheet 1)



D-SP-MC70-B-17 MC Switch Configuration (Sheet 2)

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 6/9/67

TITLE EMI MEMORY STACK INSTALLATION PROCEDURE

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
	ORIG.	69			[illegible]	[illegible]
	ADDED "E & I"	87	D.R	7/14/67	[illegible]	[illegible]

1. Remove the memory from the wooden box.

2. Inspect all cables for broken wires, cold solder or broken components.

3. Remove the KEP nuts from the top of the stacks mounting screws.

4. Remove the stack holddown bar from the stack frame. Be sure you save the four white nylon washers that are used as spacers between the stack holddown bar and stack frame.

5. Inspect the stack frame to be sure the stack mount blocks are covered with electrical tape. These blocks will be nylon on future machines.

6. Place the stack, with the manufacturers label up on to the edge of the stack frame.

7. Place the sense winding cables (W025 double boards) into the locations shown in figure 1.

8. Place the W016 card into locations HJ21.
   Place the W017 card into locations HJ22.

9. Place the white nylon washers over the four holes in the stack frame.

10. Place the metal holddown bar over the stack bolts, positioning the stack so that the holddown may be fasten to the stack frame.

11. Fasten the stack holddown bar to the stack frame using the nylon bolts provided.

12. Fasten the stacks to the holddown bar with the kep nuts provided.

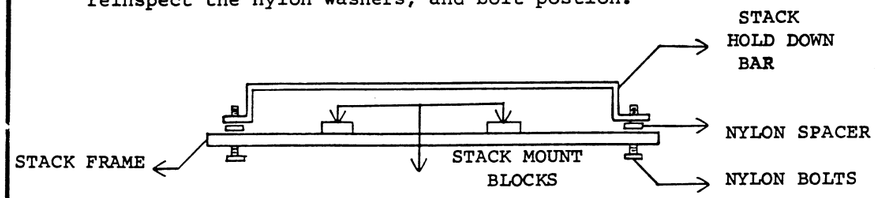
A-SP-MC70-B-18 EMI Memory Stack Installation Procedure (Sheet 1)

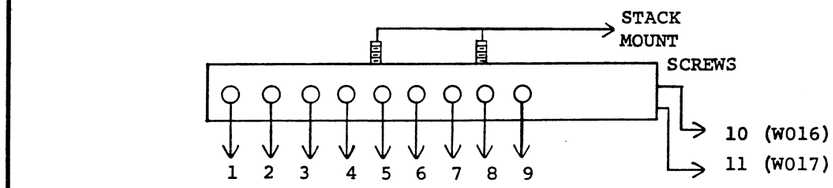
ENGINEERING SPECIFICATION digital CONTINUATION SHEET

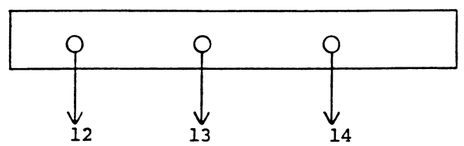
TITLE EMI MEMORY STACK INSTALLATION PROCEDURE

13. Insert the digit drive cables (W015) using the table in figure 1.

14. The stack holddown bar should be isolated from the stack frame via the nylon washers and nylon bolts. With an ohm meter try to measure continuity between the stack holddown bar and stack frame - there should be none. If you read continuity, reinspect the nylon washers, and bolt postion.







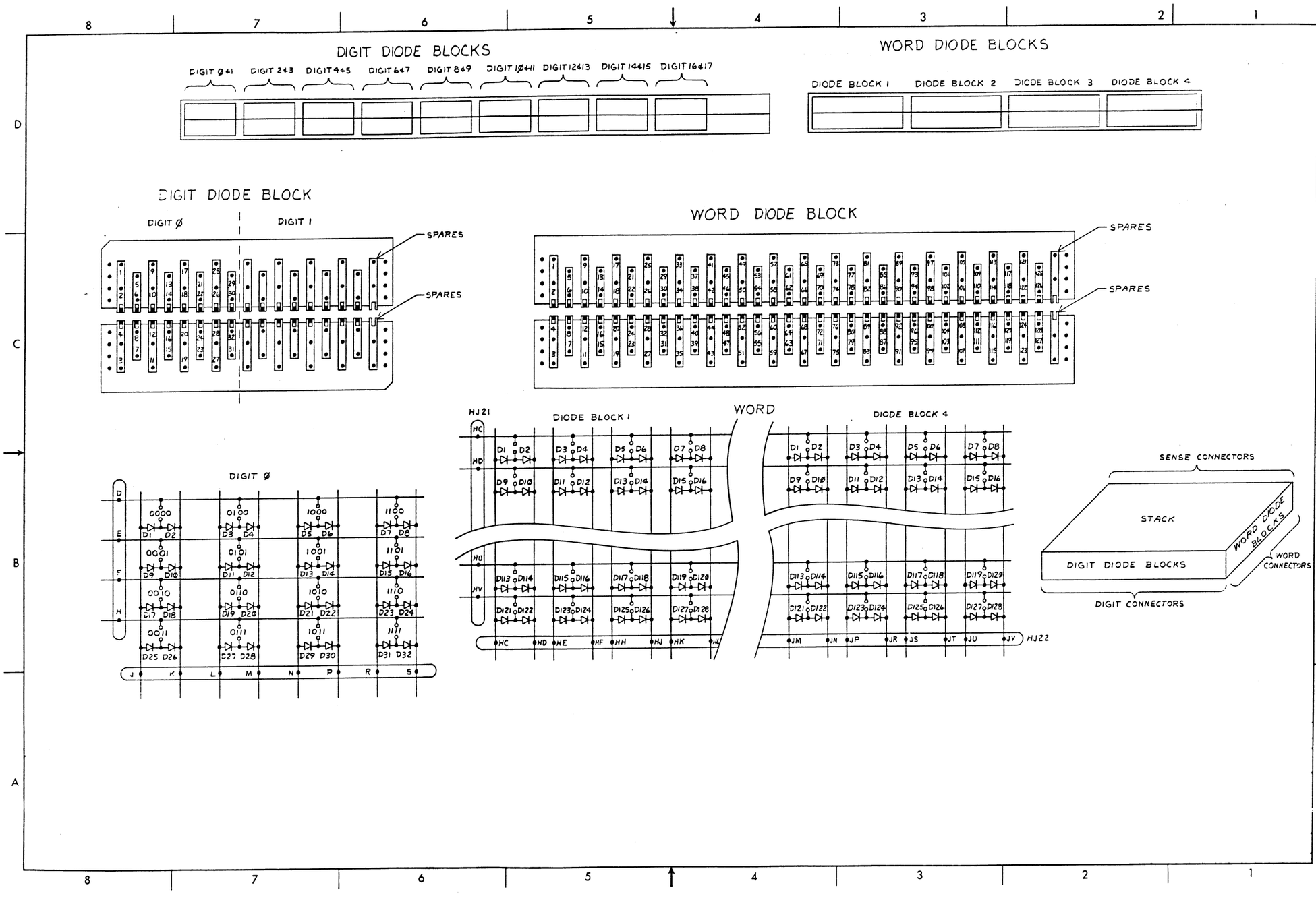
PDP-9 MEMORY INSTALLATION

FIG 1

CABLE LOCATION *		
1	C,D,7	W015
2	CD15	W015
3	CD14	W015
4	CD13	W015
5	CD12	W015
6	CD11	W015
7	CD10	W015
8	CD9	W015
9	CD8	W015
10	HJ21	W016
11	HJ22	W017
12	EF21	W025
13	CD21	W025
14	AB21	W025

*ALL CARDS ARE DOUBLE BOARDS

A-SP-MC70-B-18 EMI Memory Stack Installation Procedure (Sheet 2)



D-SP-MC70-B-19 EMI Diode Identification

DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS

ENGINEERING SPECIFICATION

DATE 8/1/67

TITLE "CORE MEMORY ON-LINE ADJUSTMENT PROCEDURE"

REVISIONS

REV	DESCRIPTION	CHG NO	ORIG	DATE	APPD BY	DATE
—	Original	89	D.Ringleb	7/67	R.DIETER	7/67

A-SP-MC70-B-20 Core Memory On-Line Adjustment (Sheet 1)

ENGINEERING SPECIFICATION

digital CONTINUATION SHEET

TITLE "CORE MEMORY ON-LINE ADJUSTMENT PROCEDURE"

All variables are adjusted to the specified settings in the memory off-line test. However, the following settings should be verified.

At room Temp. (25°C)

VOLTAGE NAME	NEG PROBE	POS PROBE	VOLTAGE
Memory Voltage	H01M	J01M	23.5V
2nd Stage Clamp	E25B	E25N	6.0V
Slice Level	E25H	E25A	≈ 4.2V*

*The 4.2V is only an approximate setting and obtaining the specified positive and negative spread on sense amp. margins in the off-line test may cause this setting to be 4.2 ±.2V.

Voltage adjustments to be made with a multimeter.

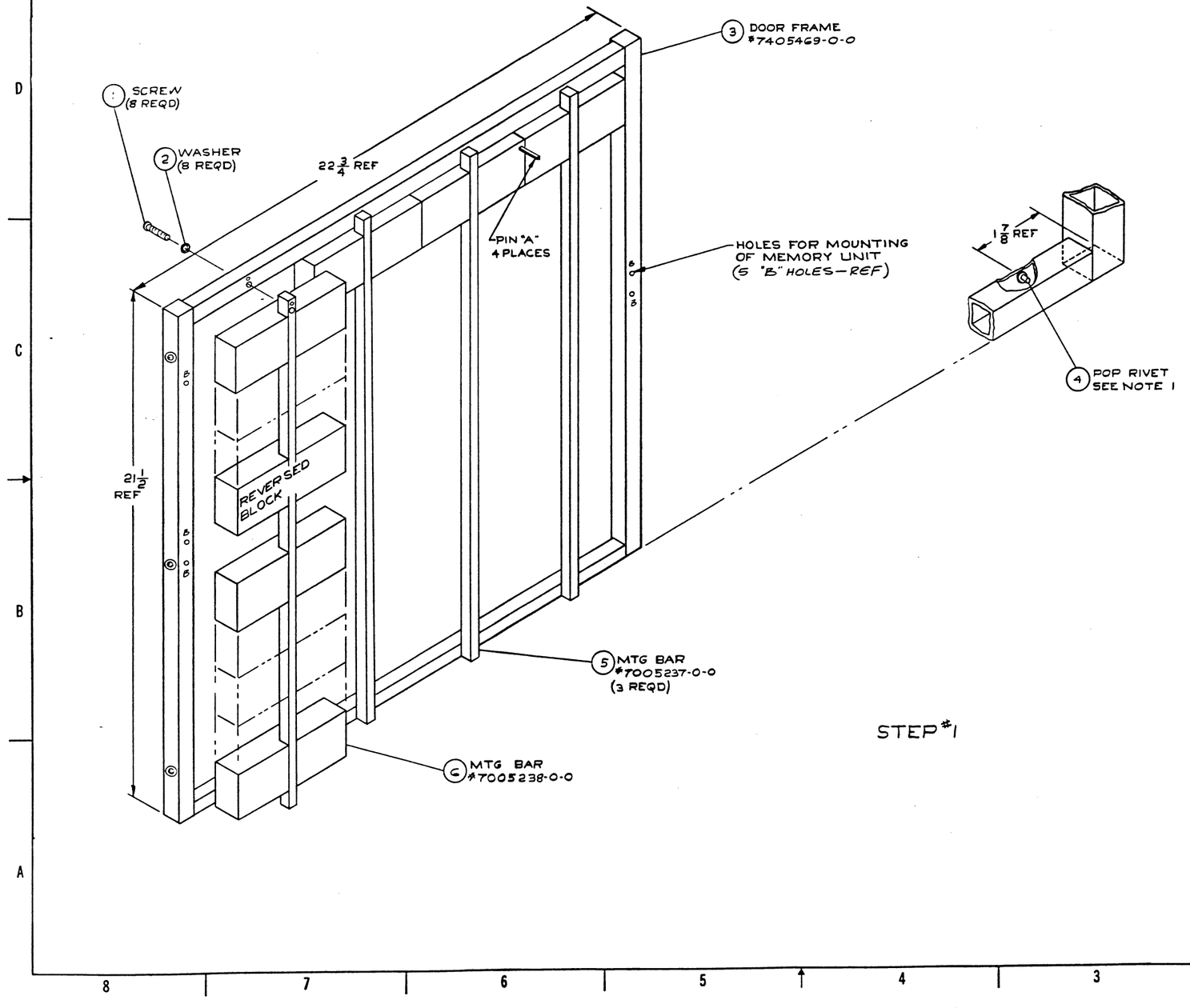
At room Temp. (25°C)

DLY NAME	LOC	PROBE1	PROBE2	DLY	COMMENTS
MA SET-UP	D35	F36M	C16D	180	All measurements from -1.5 V of leading edge going neg. except write; +260N, -1.5
STAGGER	D33	C16D	H33D	*80NS	
STROBE	E30	C16D	E32L	320NS	
PAUSE	F33	E32L	H32N	260N	
WRITE	F34	-	H32N	260NS	

*This in only an approximation. The actual STAGGER time is defined in the off-line test by optimizing Peak/Strobe (setting the strobe on the core output peak for maximum sense amp. margins).

If the MA SET-UP, PAUSE or WRITE delays are incorrect. They should be adjusted to the specified value by varying the appropriate delay. However, if the STROBE setting is off the STAGGER delay should be increased or decreased by the same amount. (This is to keep the Peak/Strobe optimization which the misadjusted memory can be assumed to have had.)

A-SP-MC70-B-20 Core Memory On-Line Adjustment (Sheet 2)

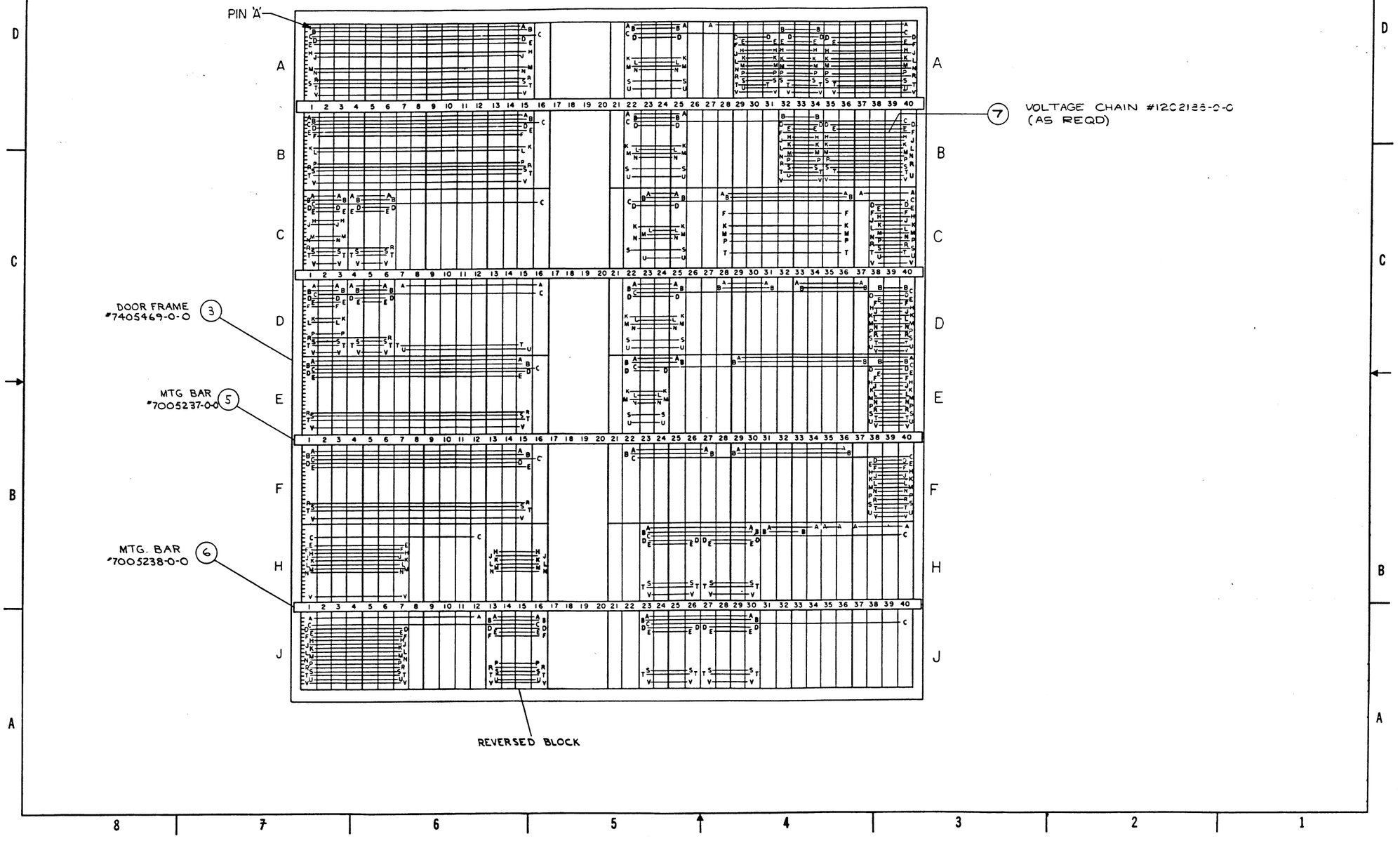


NOTES:

1. AFTER MOUNTING BARS INSTALL [illegible] (POP RIVET) AS SHOWN.

STEP #1

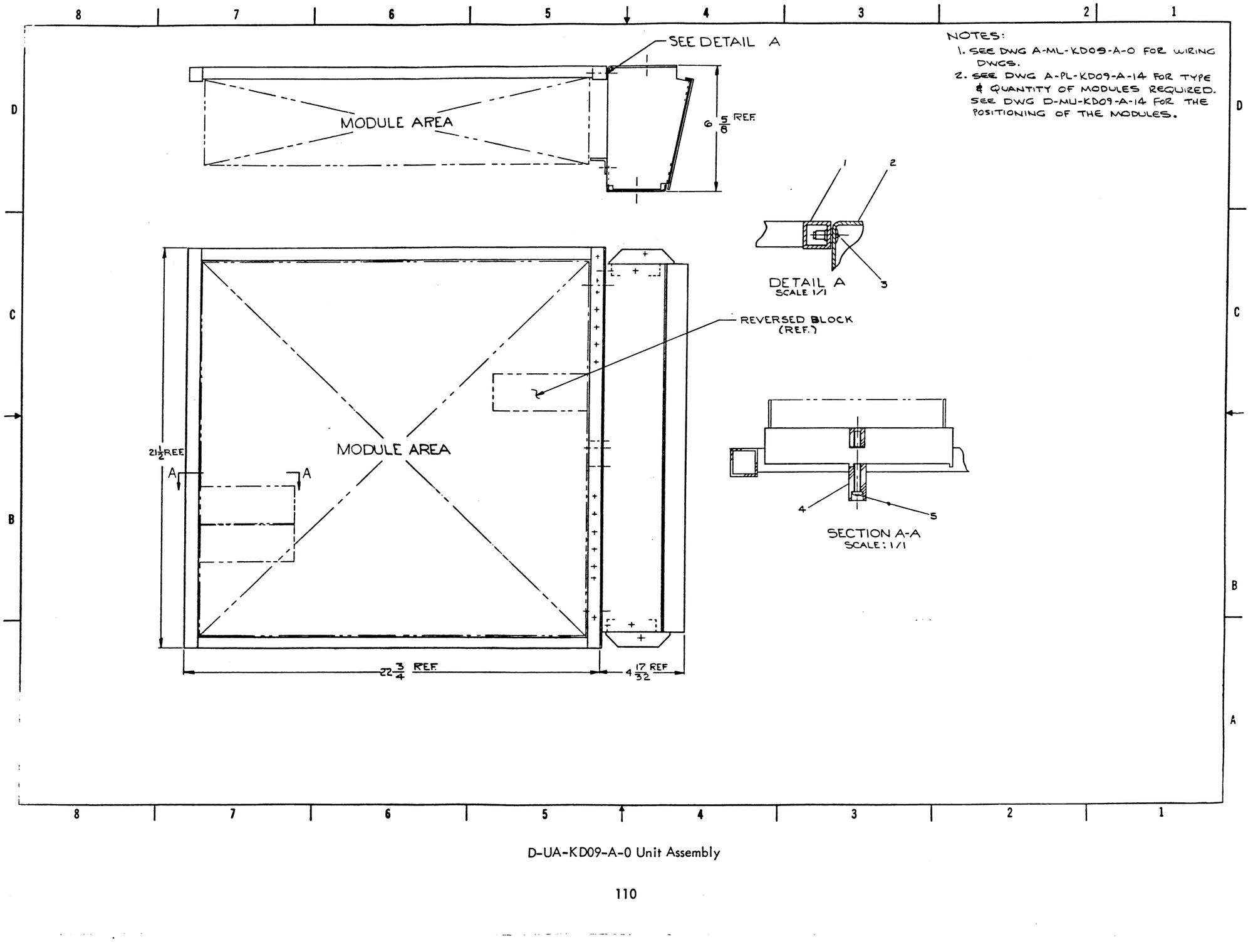
D-AD-7005219-0-0 Memory Bus Assembly (Sheet 1)



D-AD-7005219-0-0 Memory Bus Assembly (Sheet 2)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1		8	SCREW PHL PAN H 8-32 x 1 1/4 SST.	
2		8	WASHER LOCK INT #8- SST	
3	E-IA-7405469-0-0	1	DOOR FRAME (MEMORY)	
4		1	POP RIVET 1/8 DIA. x 3/16 LG.	
5	D-AD-7005237-0-0	3	MTG BAR (9 CONN BLOCKS)	
6	D-AD-7005238-0-0	1	MTG BAR (ONE REVERSED BLOCK)	
7		AR	VOLT CHAIN PUR SPEC #CHV 0001	1202188-0-0

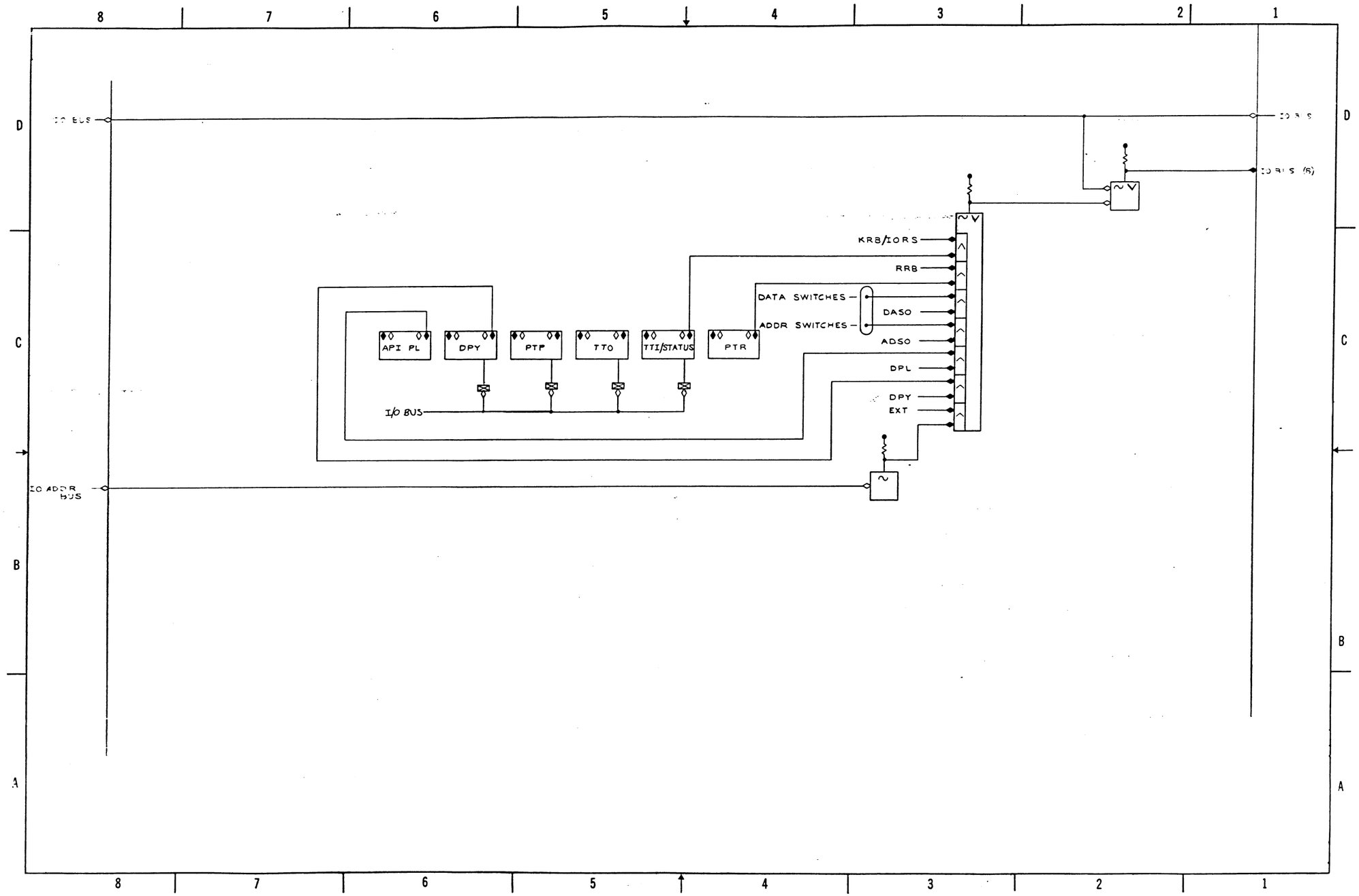
A-PL-7005219-0-0 Memory Bus Parts List



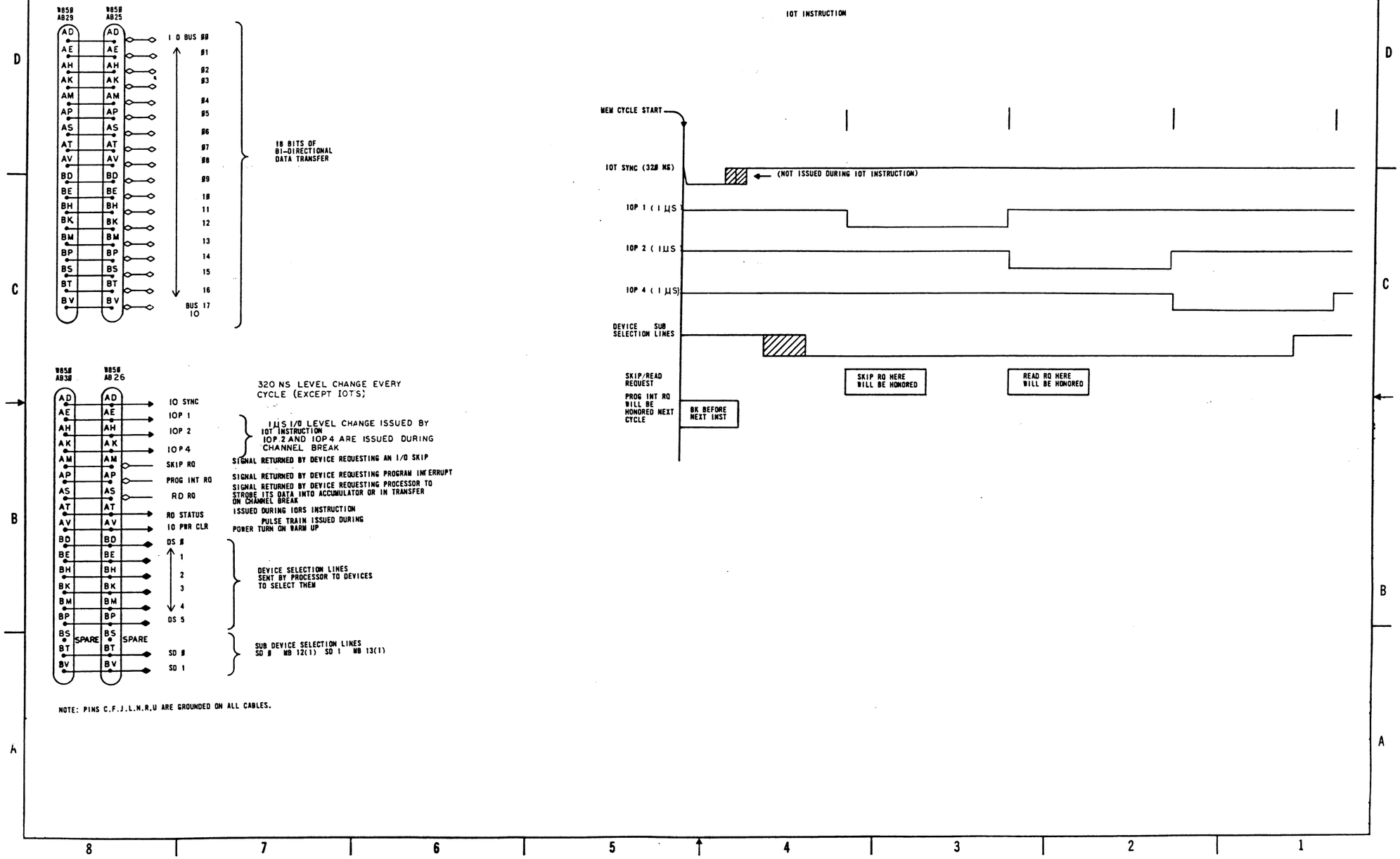
D-UA-KD09-A-0 Unit Assembly

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1	D-AD-7005302-0-0	1	I/O BUS ASSEMBLY	7005302-0-0
2	A-PL-7005229-0-0	1	FAN & MARGINAL CHECK ASSY	7005229-0-0
3		3	SCR PHL TRUS HD 1/4-20 x 5/8 SST	
	A-ML-KD09-A	REF	MDL (I/O ASSEMBLY)	
	D=MU-KD09-A-14	REF	MODULE UTILIZATION LIST	
	A-PL-KD09-A-14	REF	MODULE LIST	
4	B-MD-7406047-0-0	1	BLOCK RETAINER	7406047-0-0
5		2	SCR PHL HD PAN #8-32 x 1 5/8 SST	

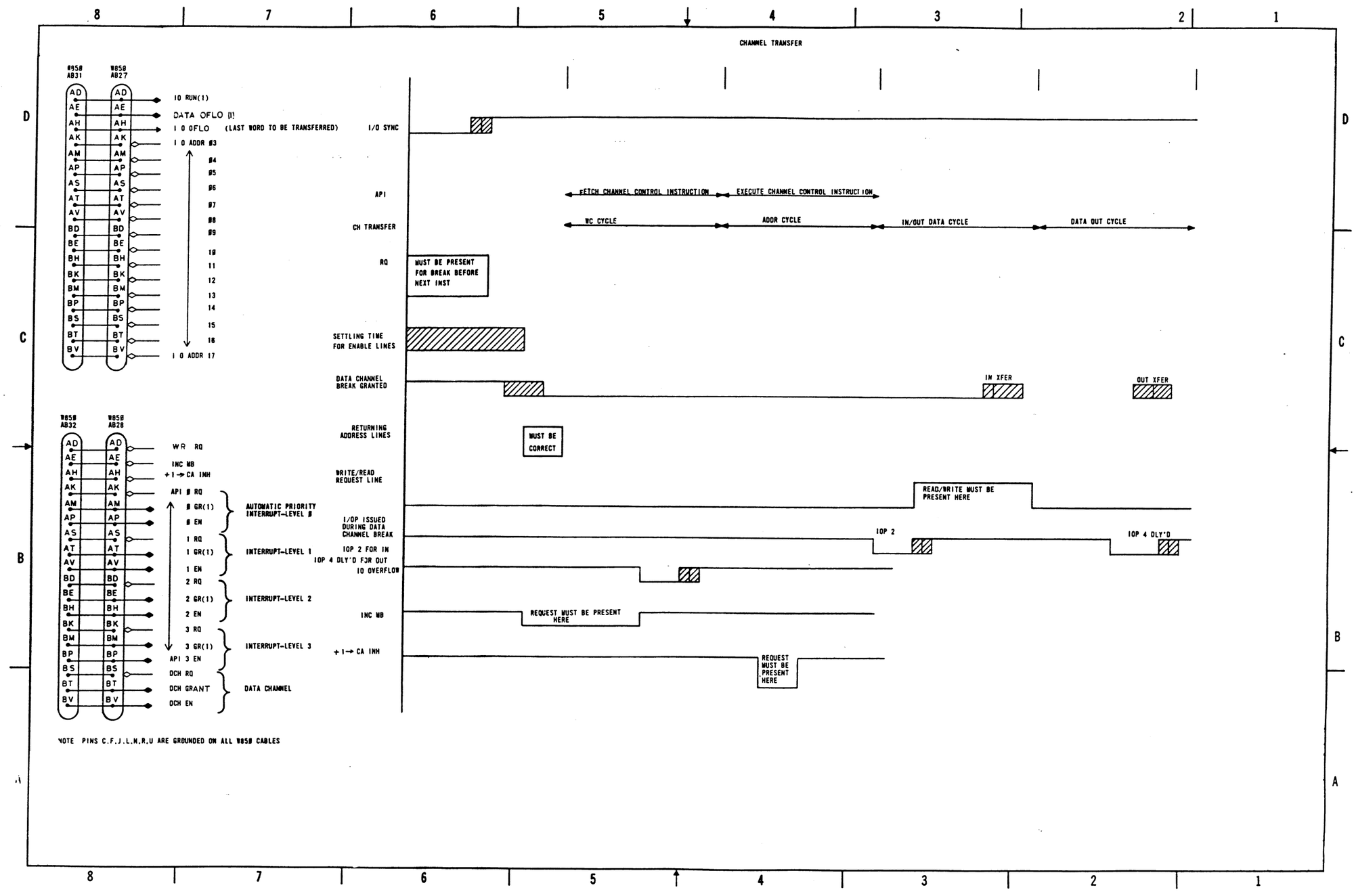
A-PL-KD09-A-0 Assembly Parts List



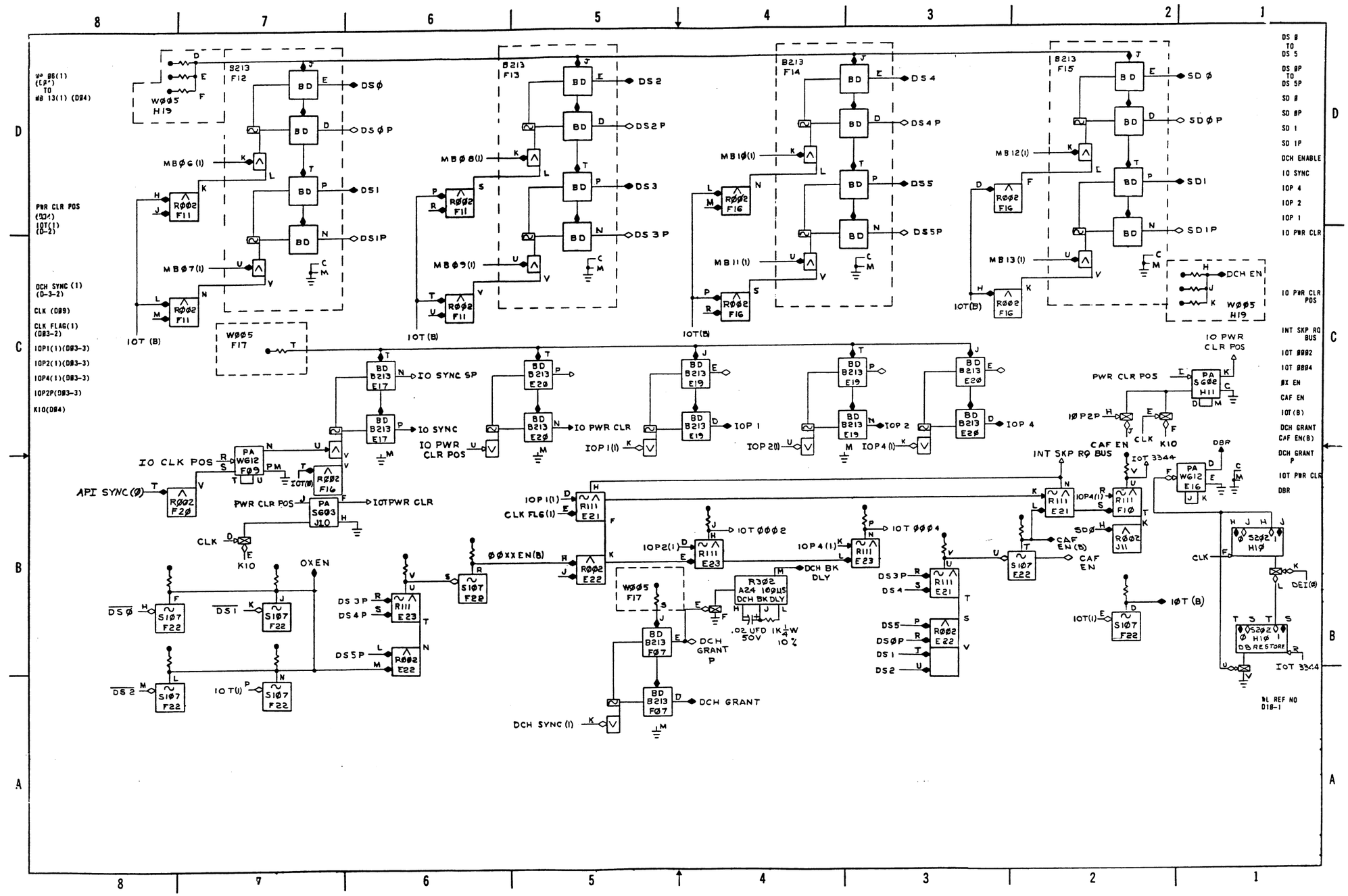
D-BS-KD09-A-1 IO Configuration



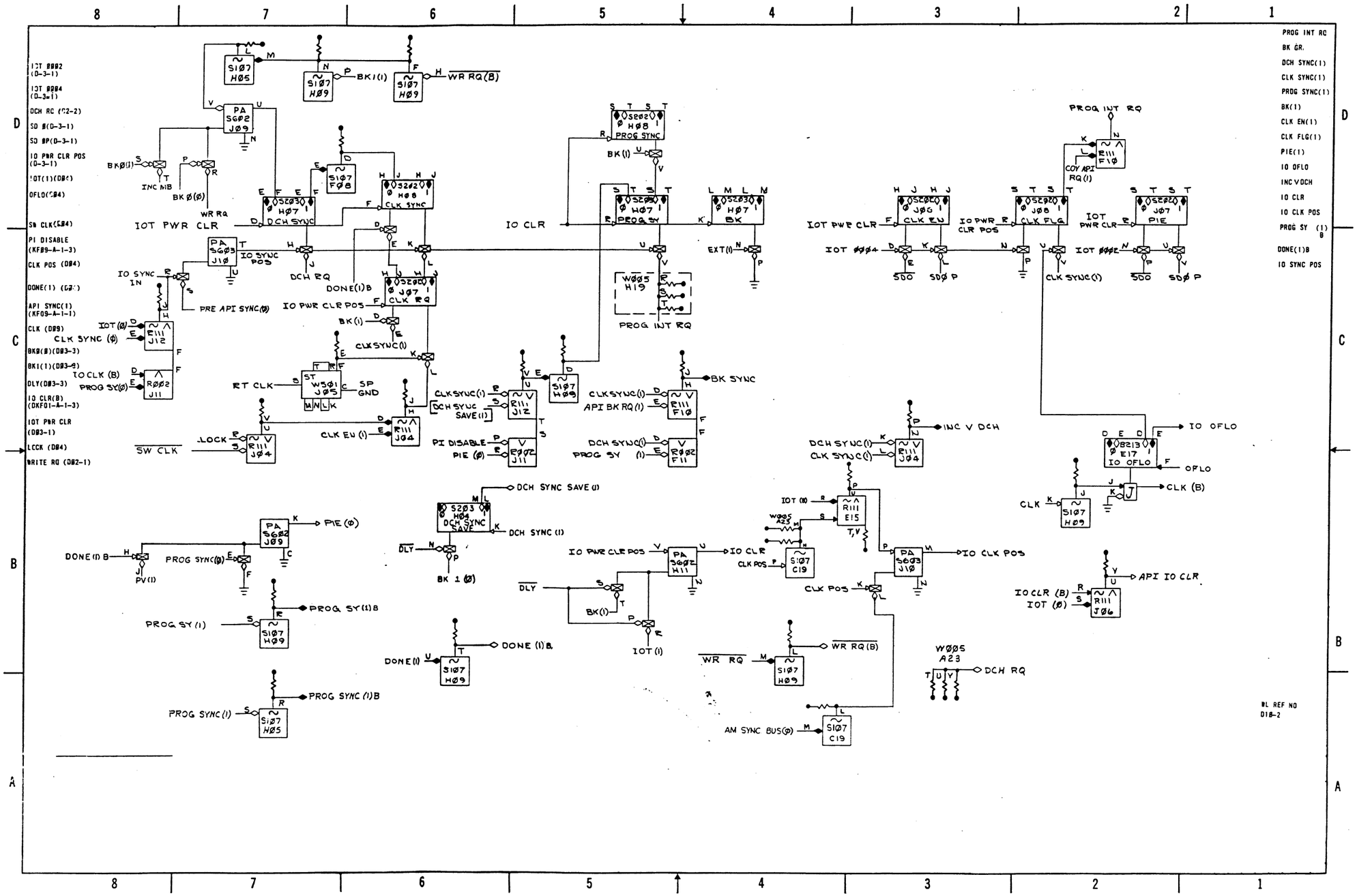
D-TD-KD09-A-2 IO Bus Interface (Sheet 1)



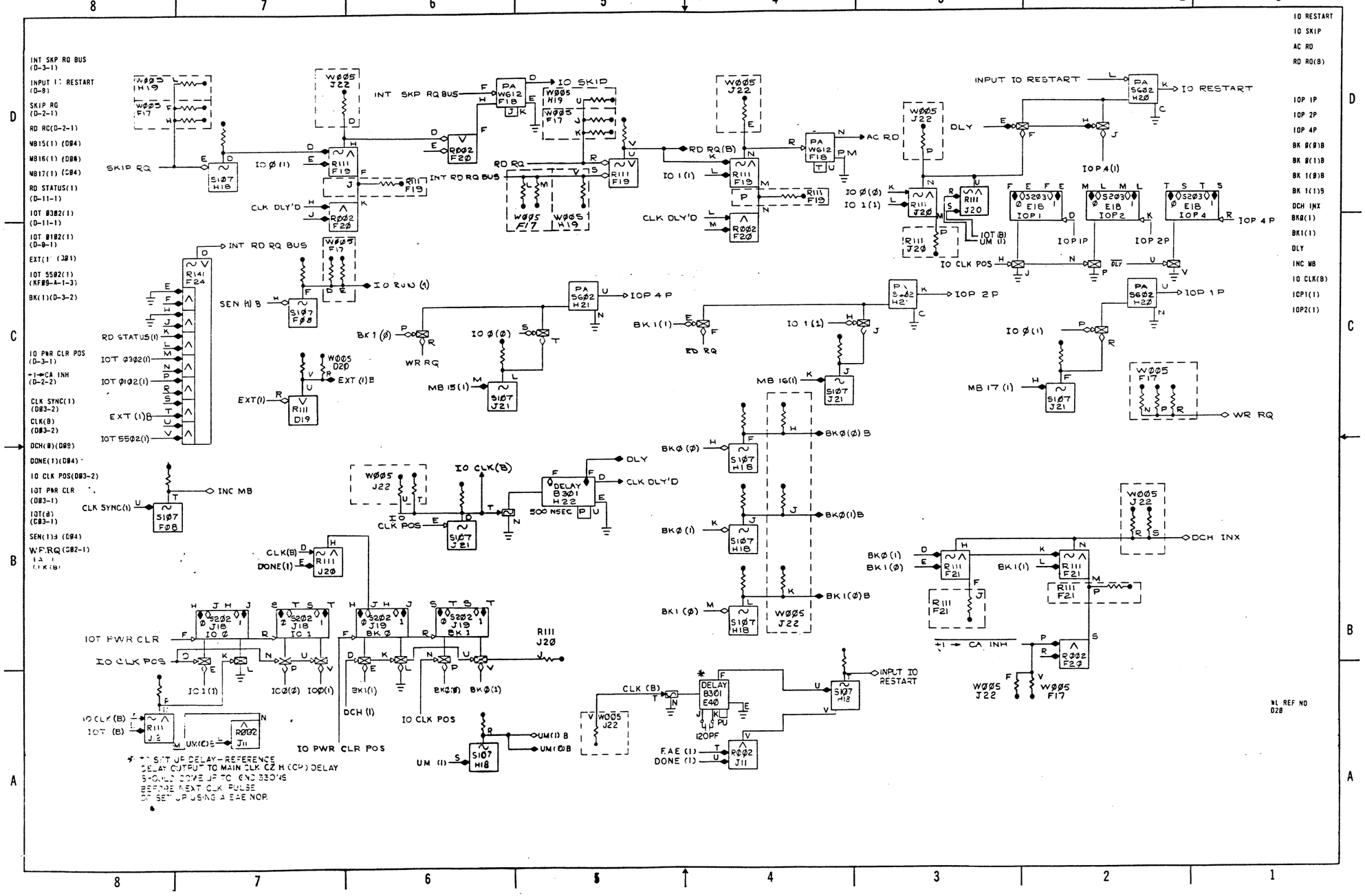
D-TD-KD09-A-2 IO Bus Interface (Sheet 2)



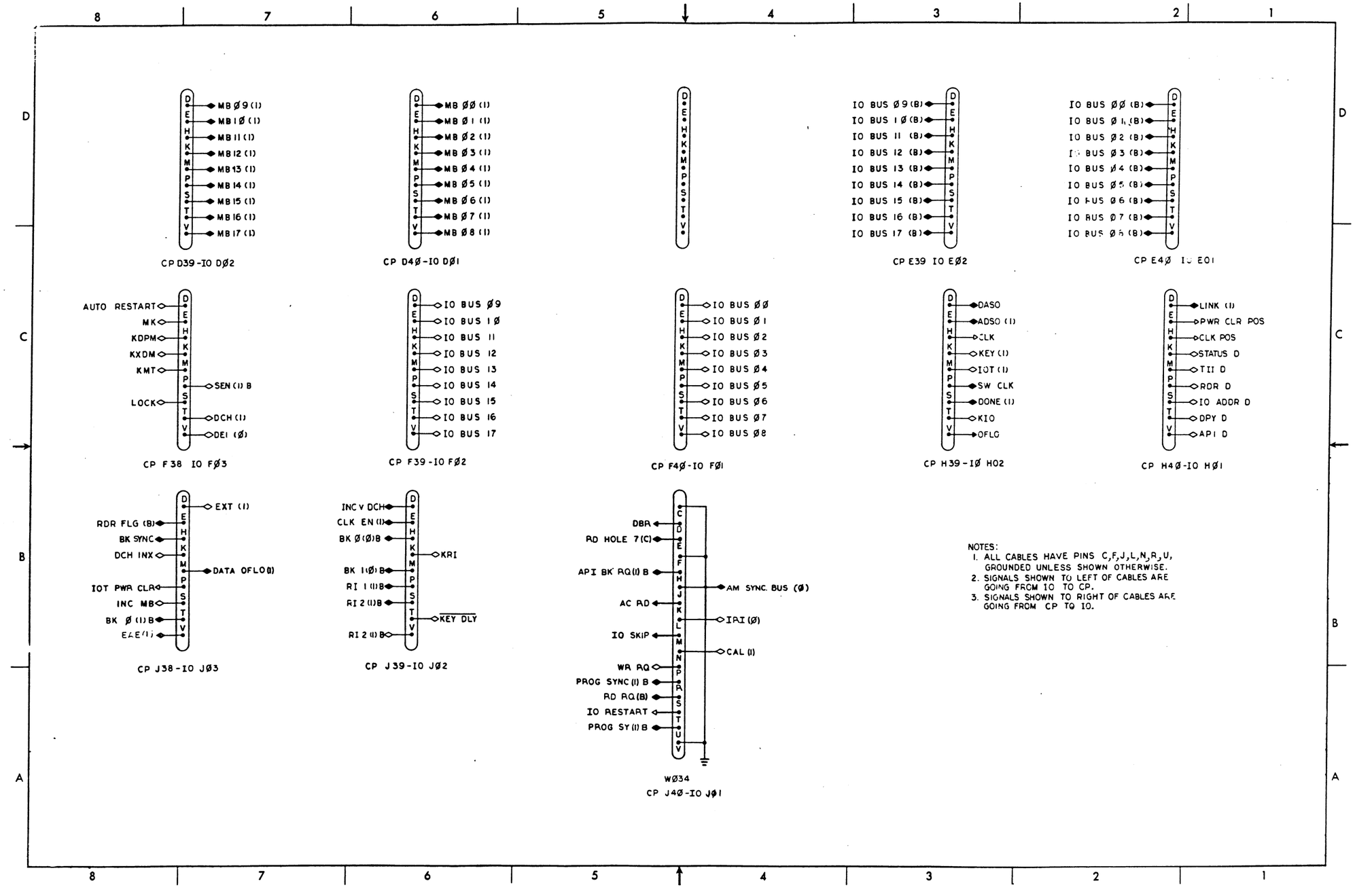
D-BS-KD09-A-3 IO Control (Sheet 1)



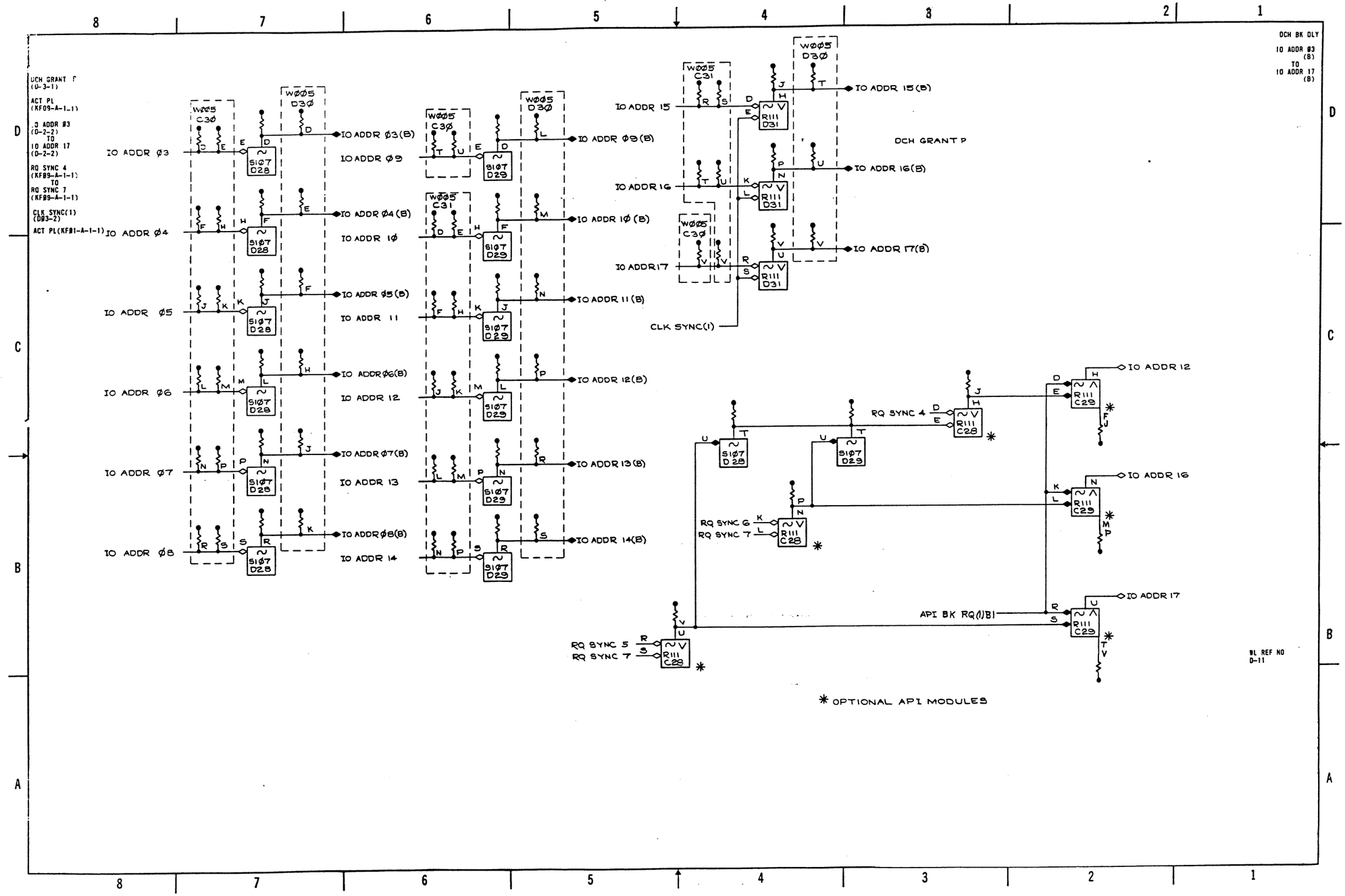
D-BS-KD09-A-3 IO Control (Sheet 2)



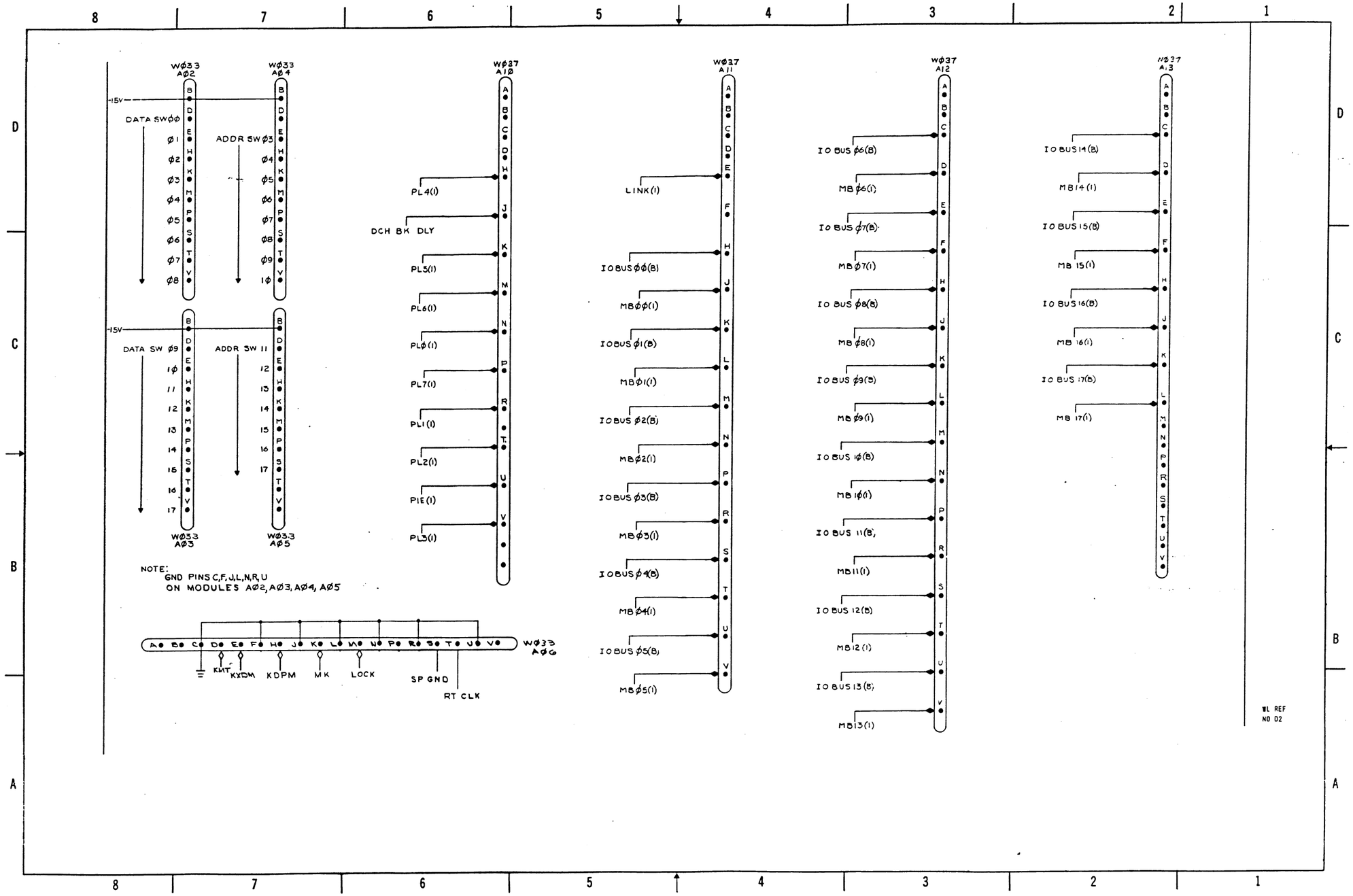
D-BS-KD09-A-3 IO Control (Sheet 3)



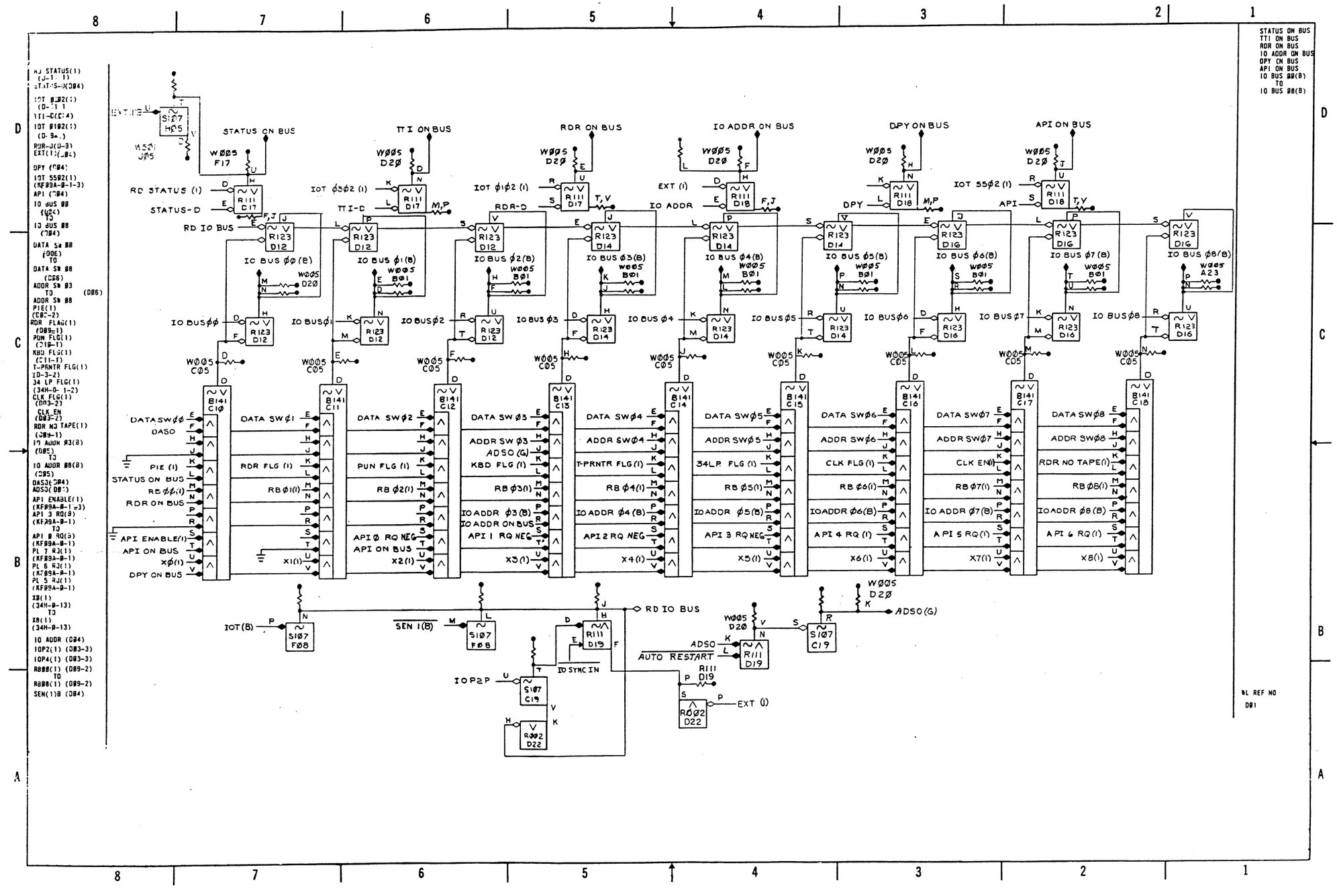
D-IC-KD09-A-4 IO/CP Cable Interface



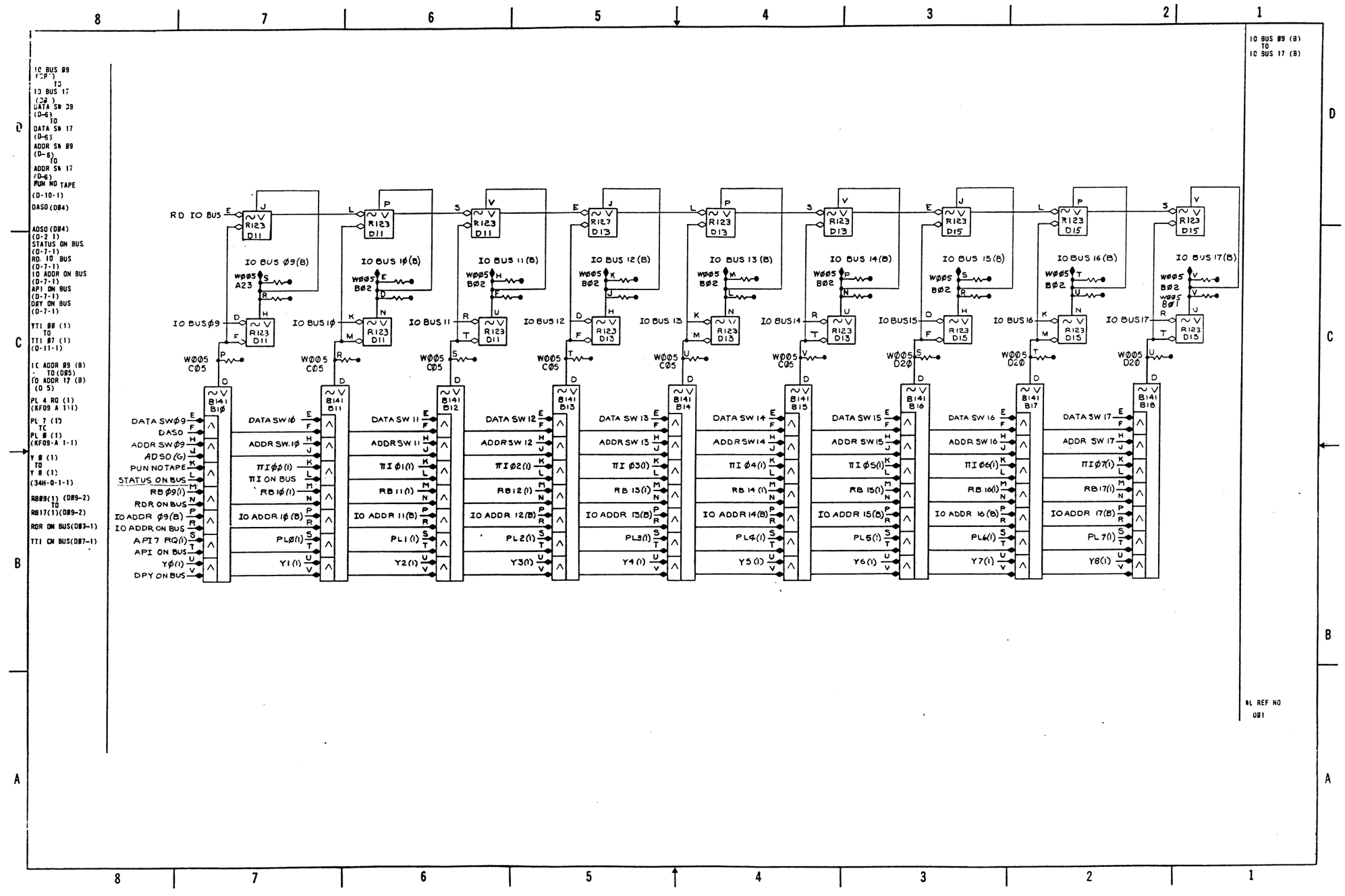
D-BS-KD09-A-5 ADDR Bus



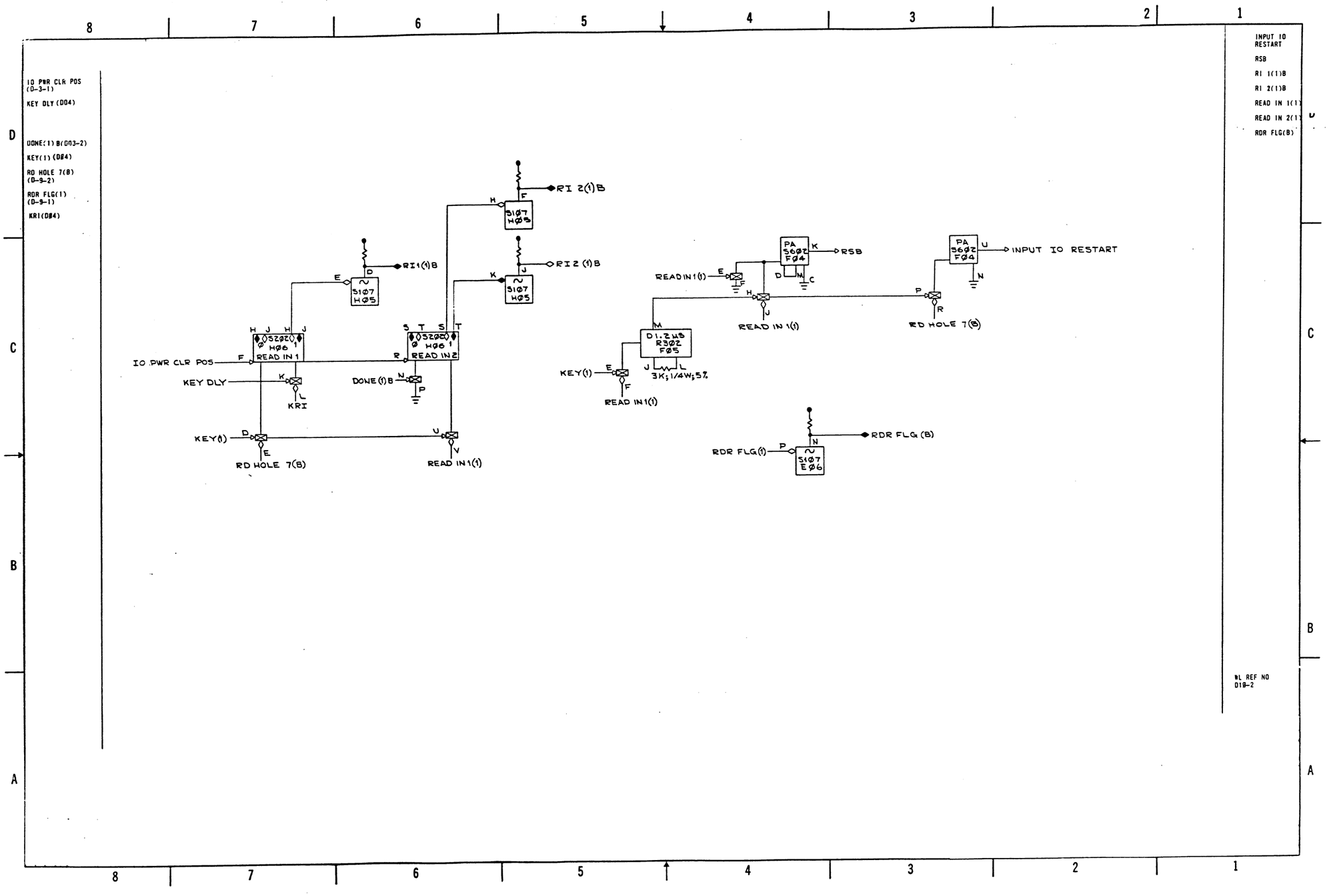
D-BS-KD09-A-6 IO/Console Interface



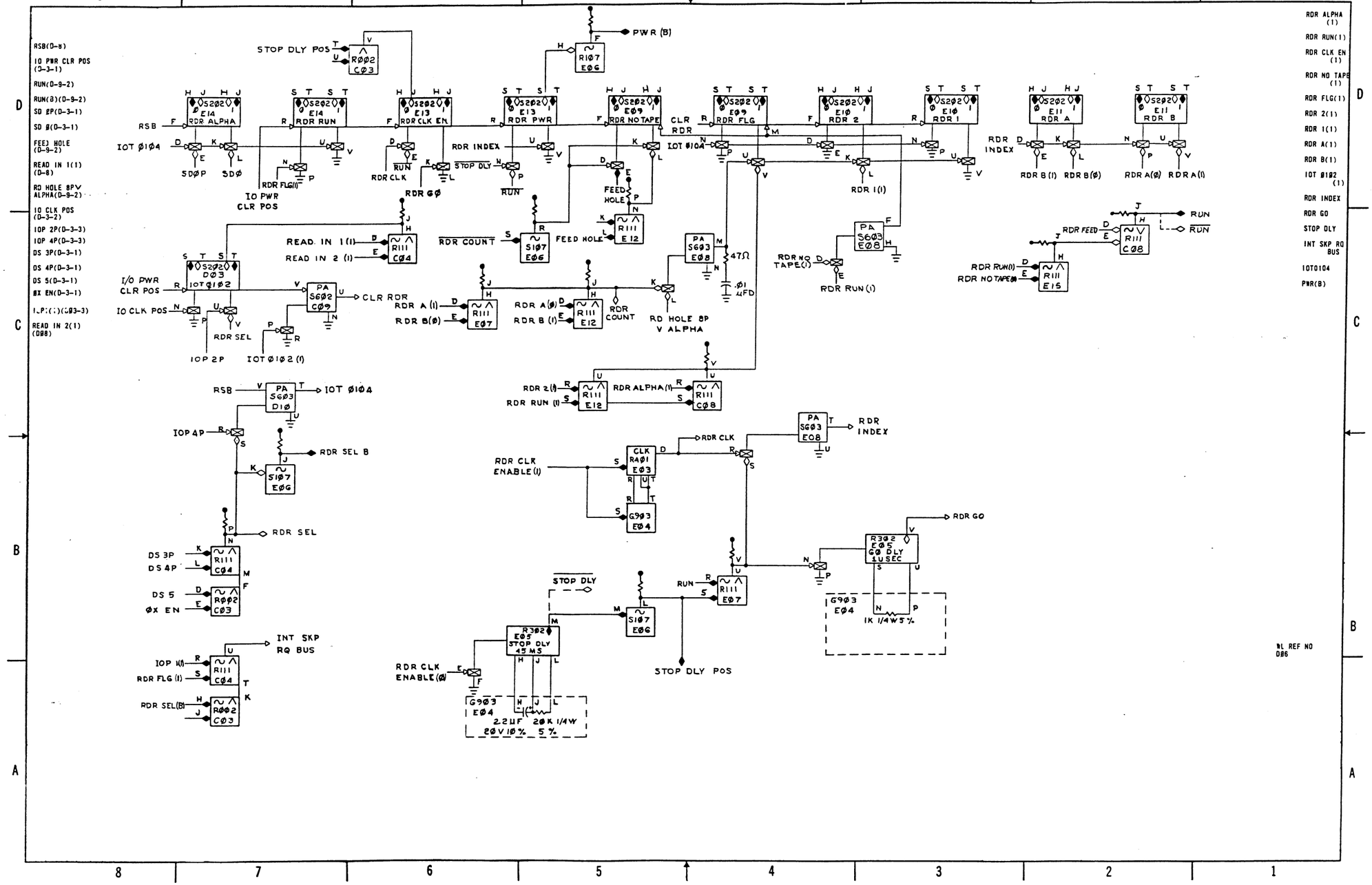
D-BS-KD09-A-7 Input Mixer (Sheet 1)



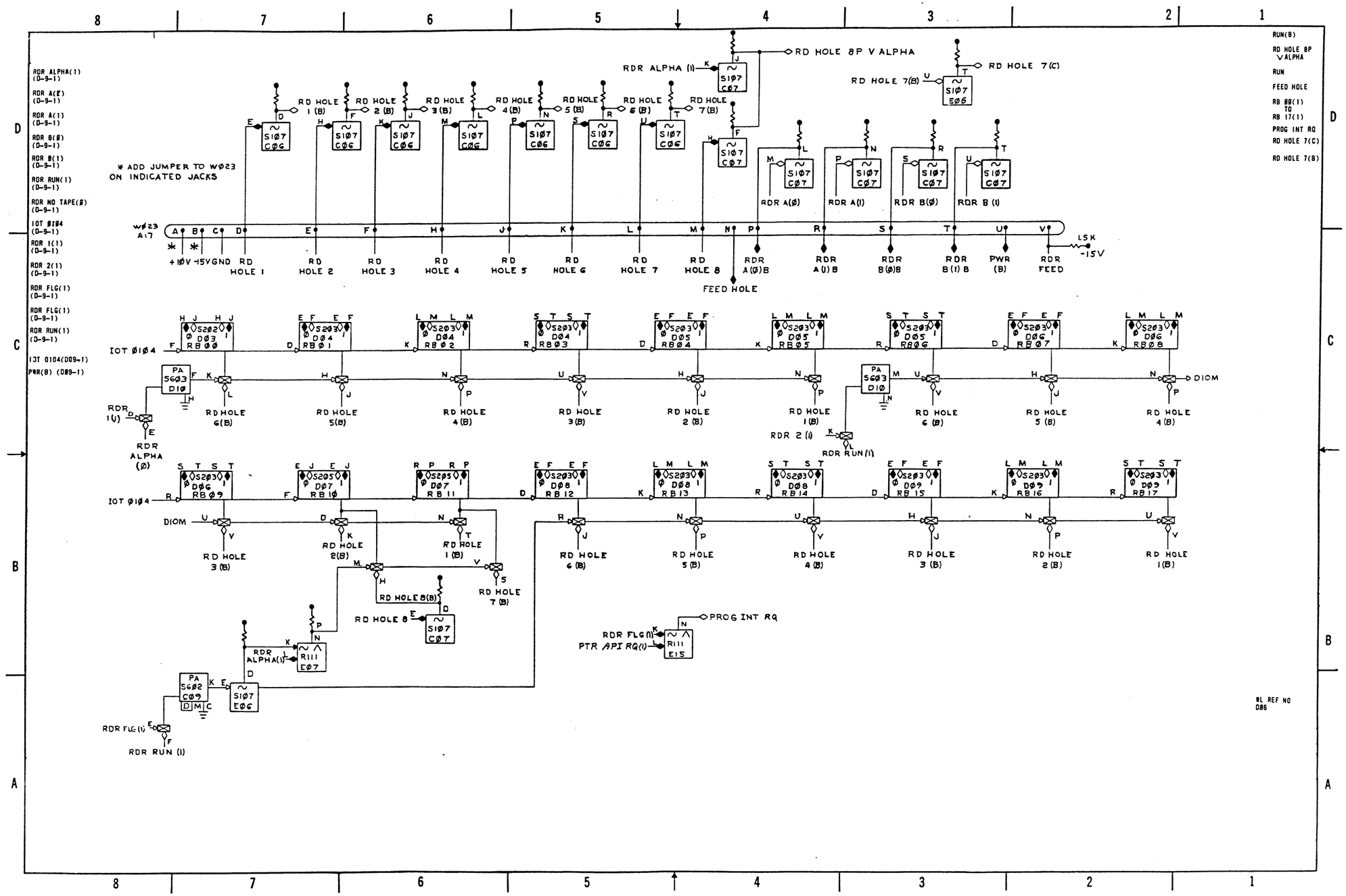
D-BS-KD09-A-7 Input Mixer (Sheet 2)



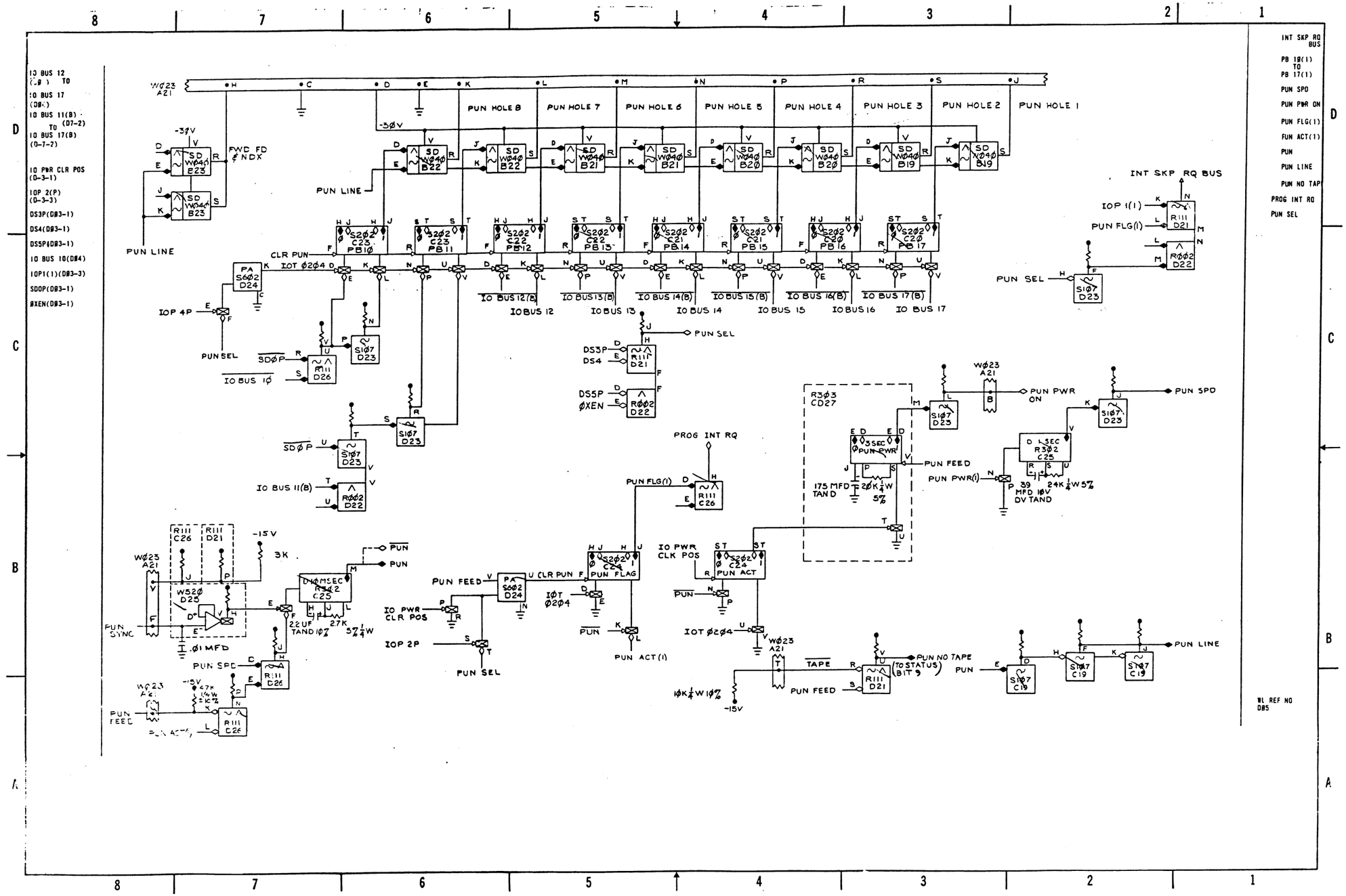
D-BS-KD09-A-8 Read-In-Mode



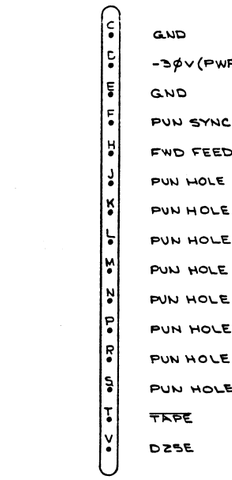
D-BS-KD09-A-9 Reader Control (Sheet 1)



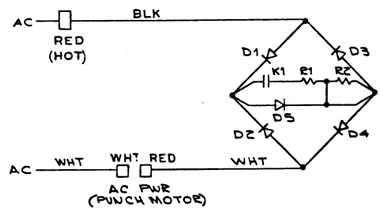
D-BS-KD09-A-9 Reader Control (Sheet 2)

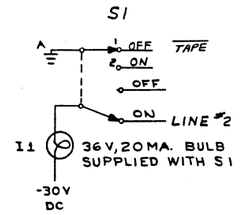


D-BS-KD09-A-10 Punch Control (Sheet 1)

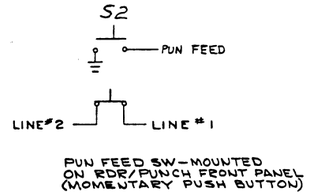


PUNCH CABLE
WØ23 CABLE CONNECTOR

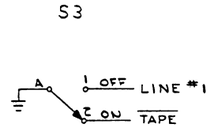




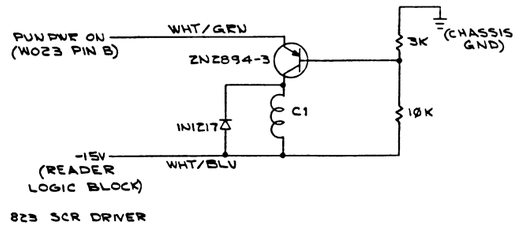
PUN PWR SW-MOUNTED ON RDR/PUNCH FRONT PANEL (PUSH BUTTON)



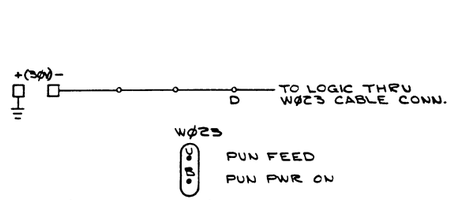
PUN FEED SW-MOUNTED ON RDR/PUNCH FRONT PANEL (MOMENTARY PUSH BUTTON)



OUT OF TAPE SW (PUNCH MOUNTED)



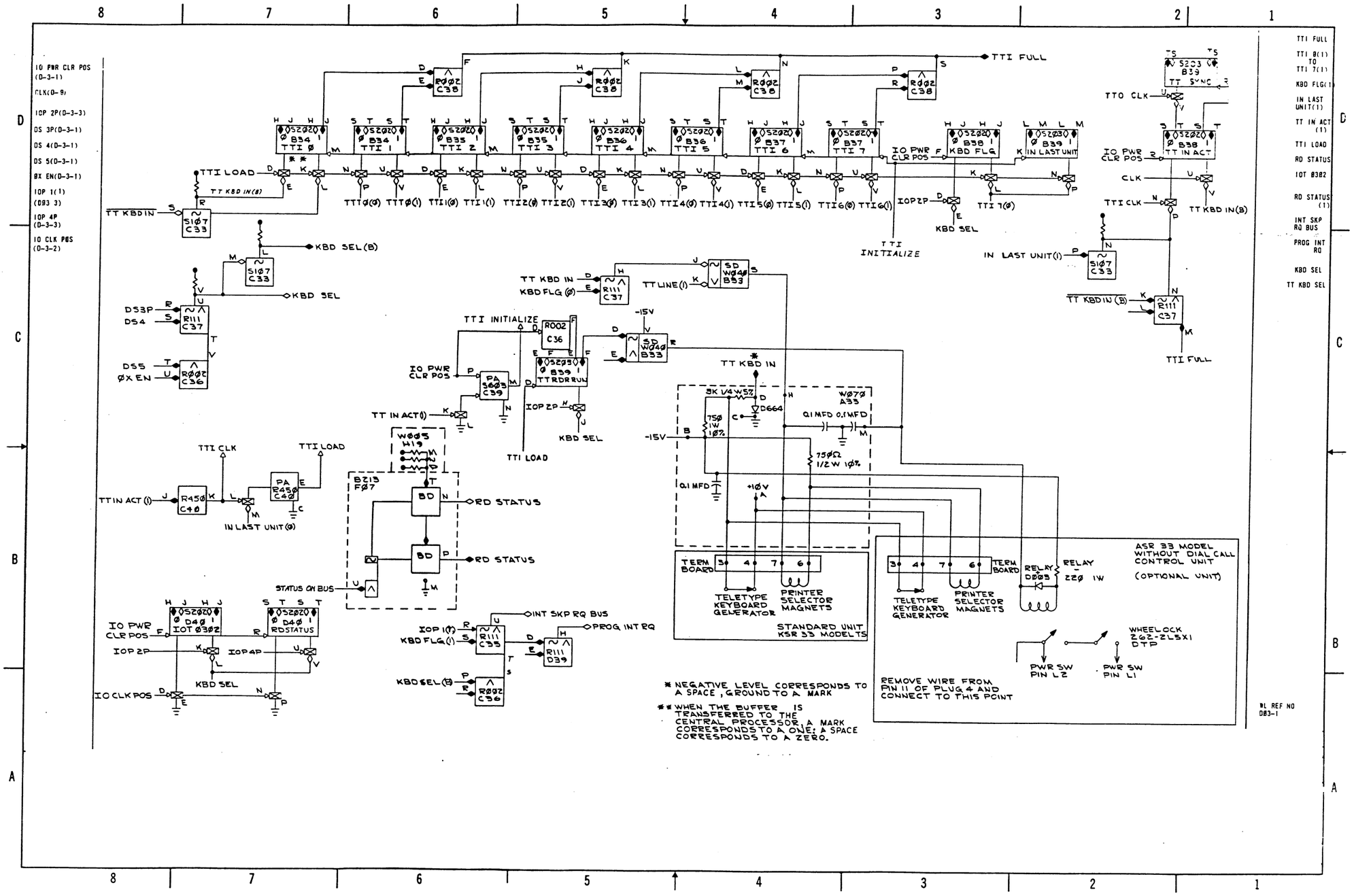
823 SCR DRIVER



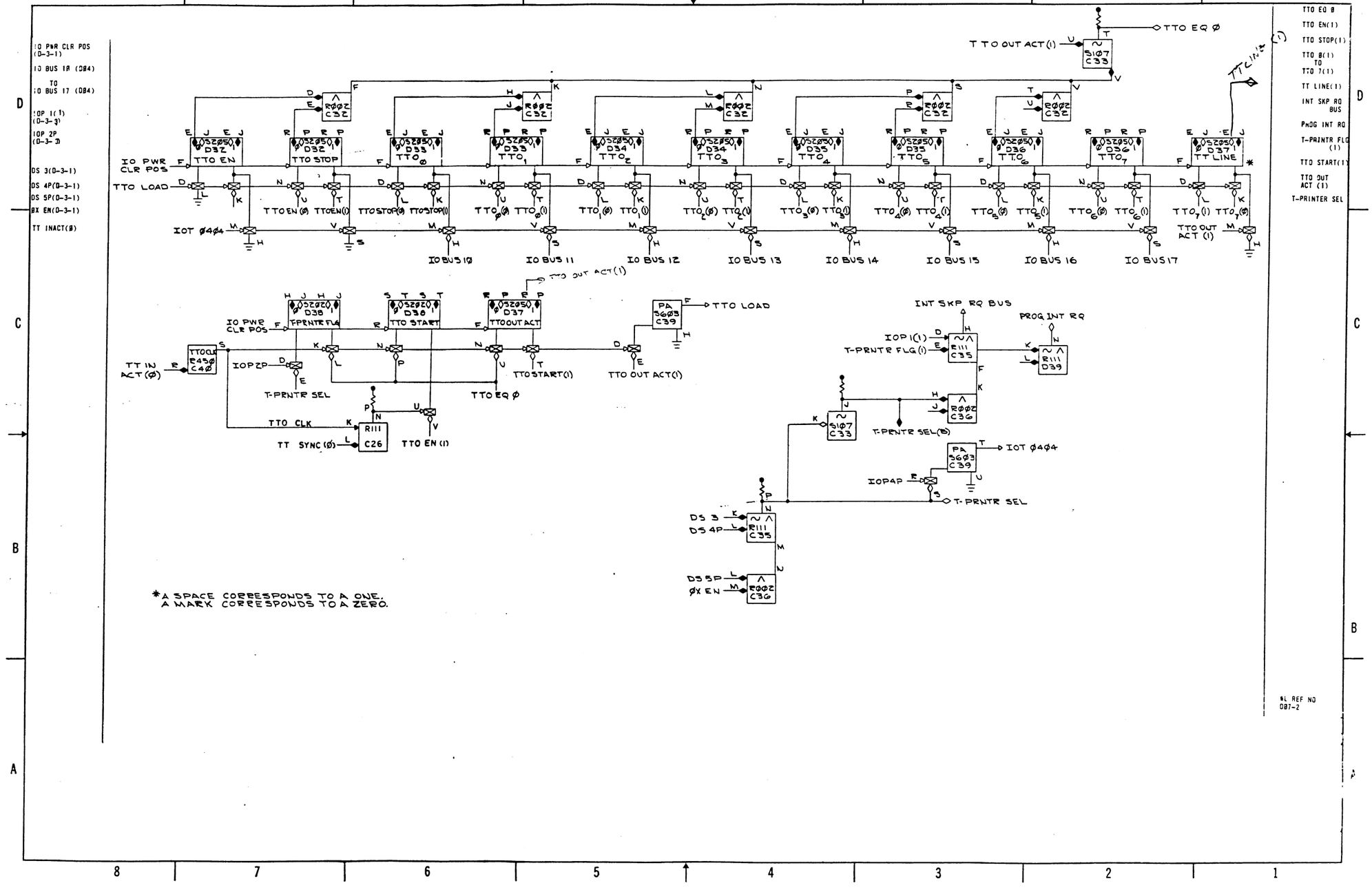
(-3Ø V PWR TABS) MOUNTED ON PUNCH

NOTES

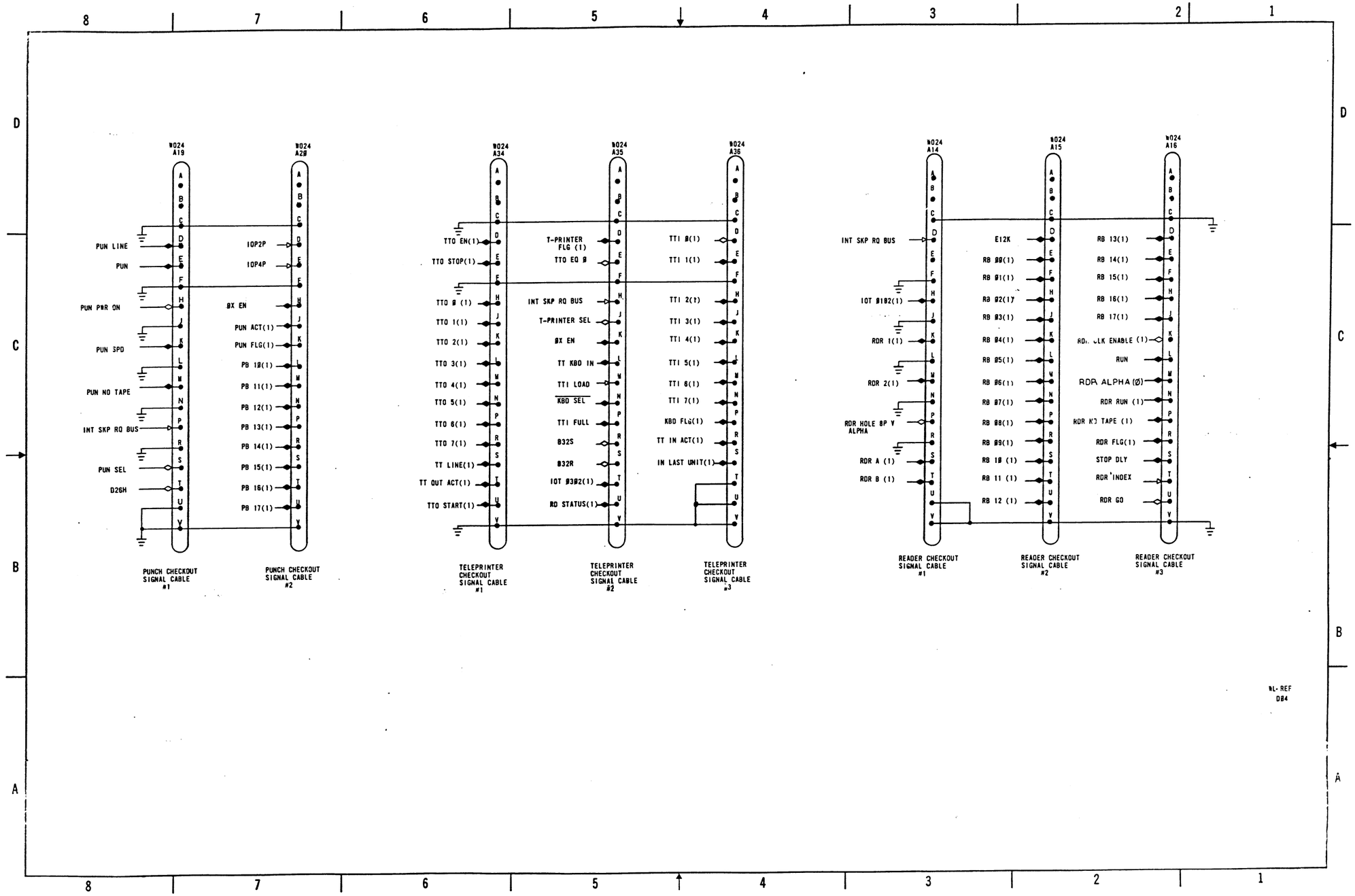
1. RESISTORS ARE 47Ω 1/2 W.
2. SCR BZ3 ON PUNCH MOTOR.
3. D1-D4 ARE MOTOROLA IN3ZIØ DIODES.
4. D-5 IS A GE SCR EJZZ68.
5. AC PWR TO PUNCH IS DLYD ON
6. C1 IS A DUNCO REED RELAY TYPE MRR-1A 12VDC.



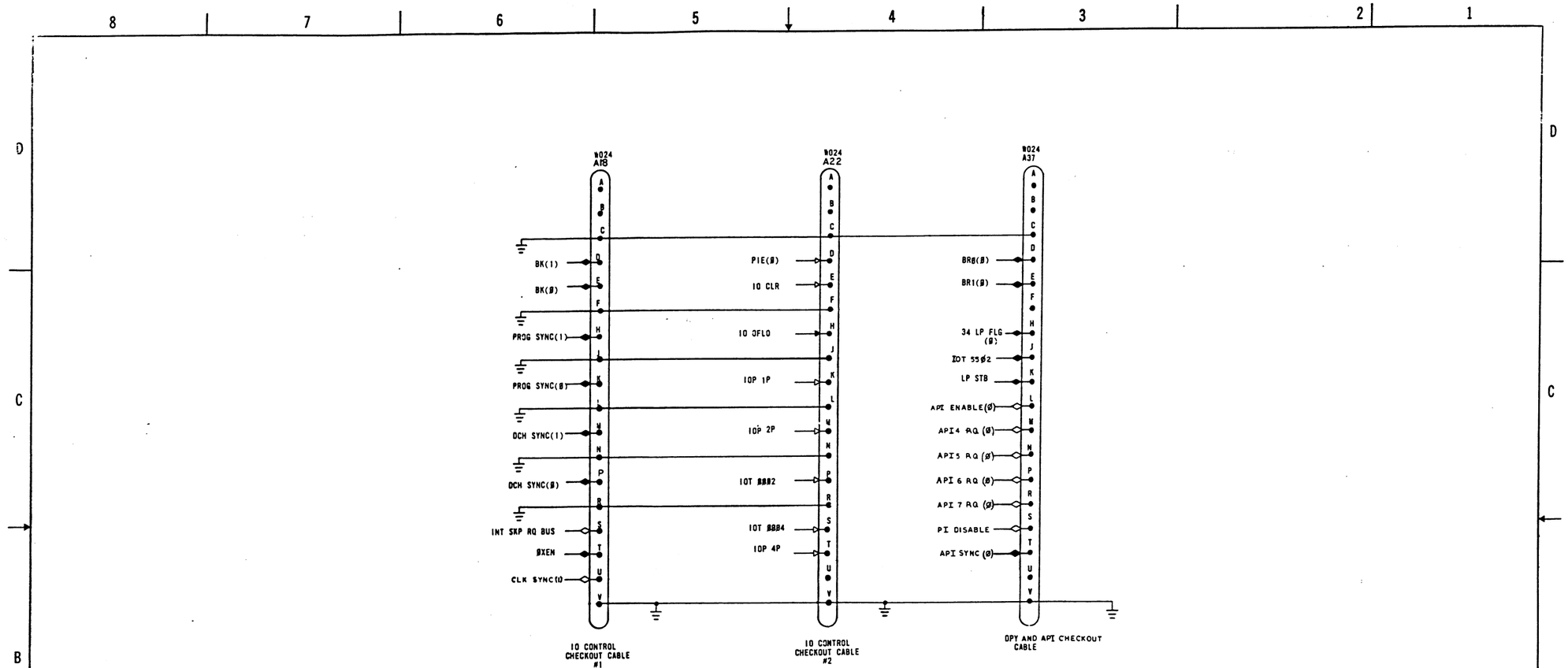
D-BS-KD09-A-11 Teletype Control (Sheet 1)



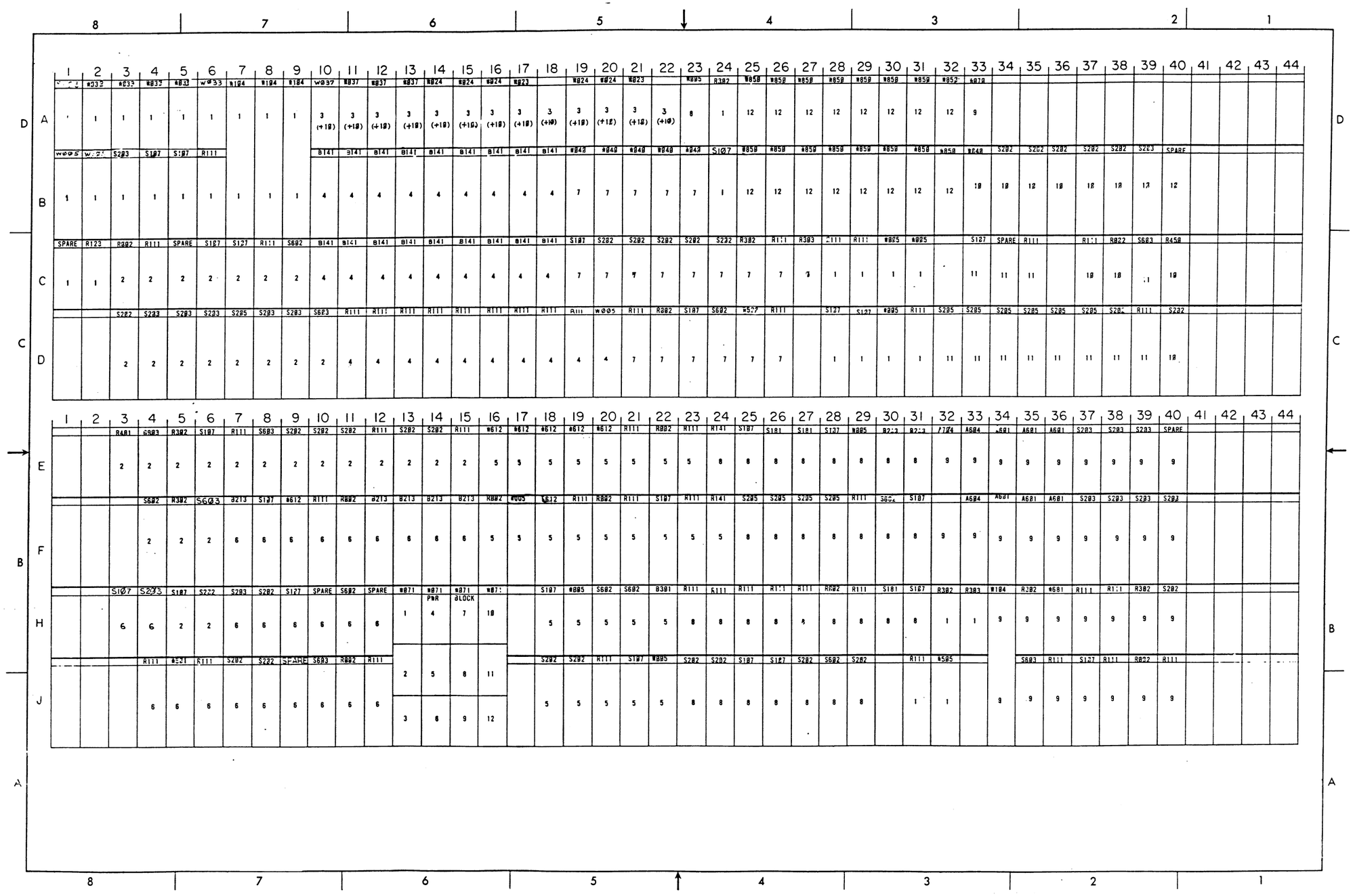
D-BS-KD09-A-11 Teletype Control (Sheet 2)



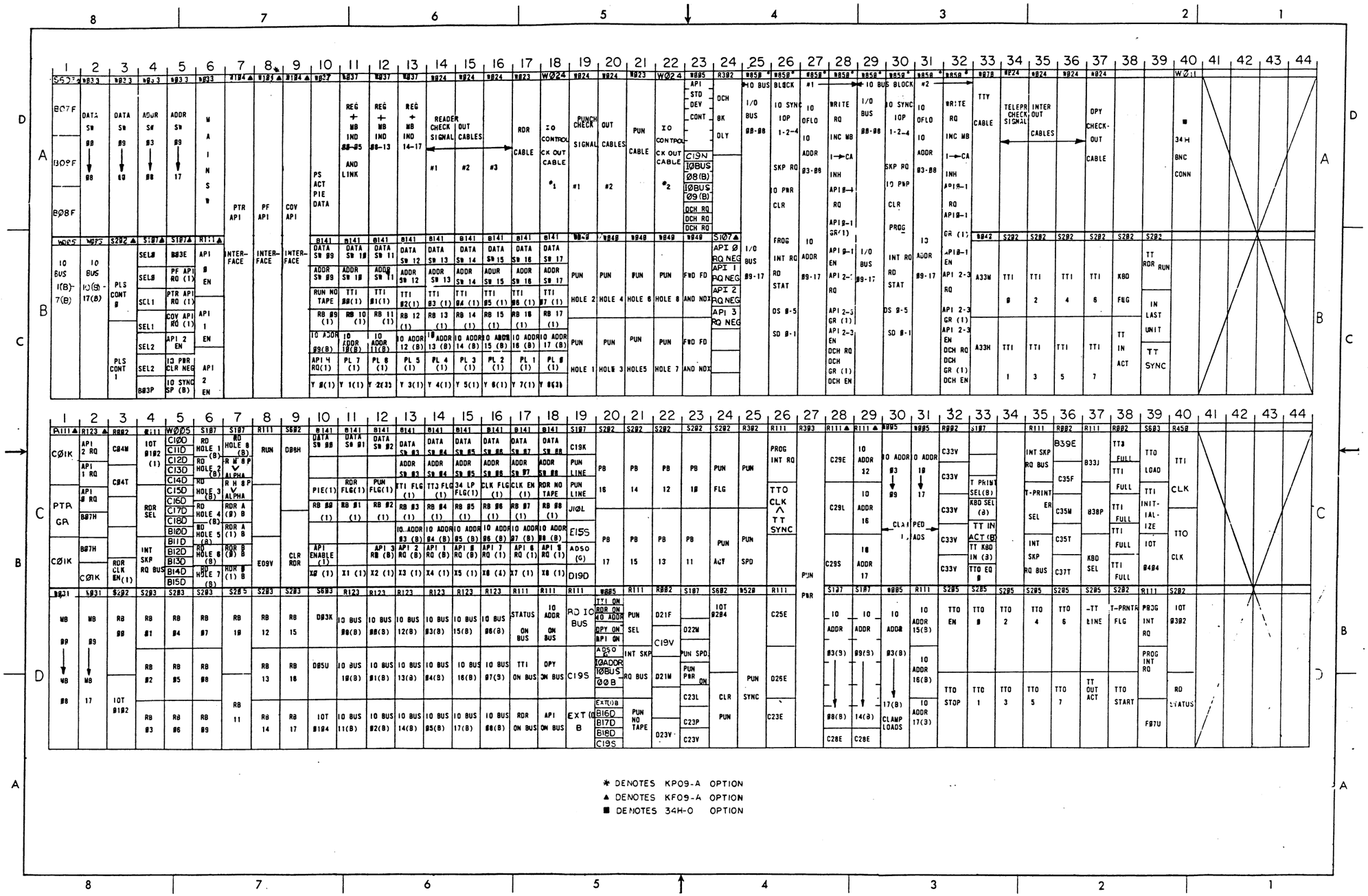
D-IC-KD09-A-12 IO Checkout Cables (Sheet 1)



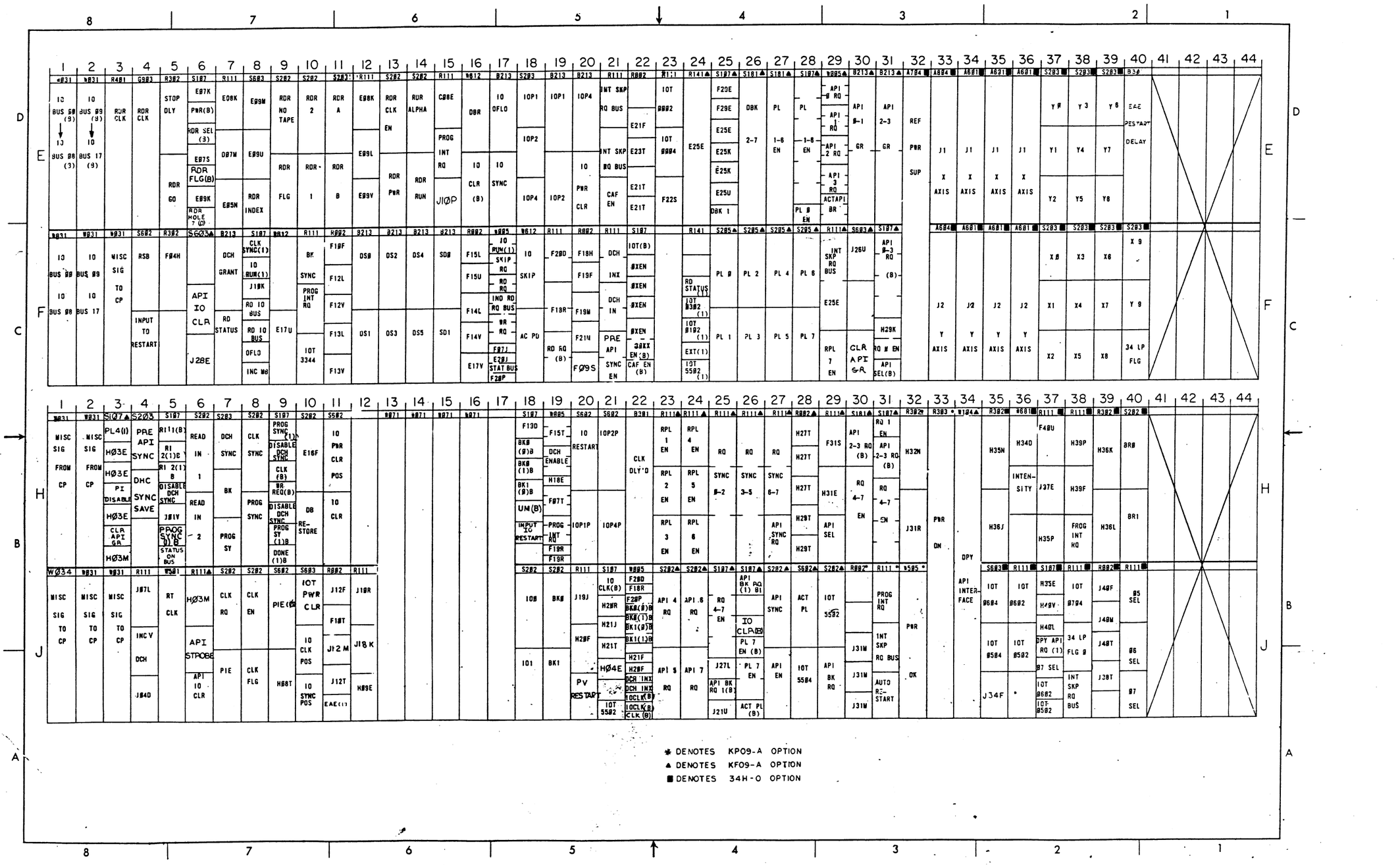
D-IC-KD09-A-12 IO Checkout Cables (Sheet 2)



D-SP-KD09-A-13 MC Switch Configuration



D-MU-KD09-A-14 Module Utilization List (Sheet 1)



D-MU-KD09-A-14 Module Utilization List (Sheet 2)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
		8	B213 - FLIP FLOP	
		2	B301 - DELAY (ONE SHOT)	
		1	G903 CLOCK ACCELERATOR	
		10	R002 - DIODE CLUSTER	
		22	R111 - DIODE GATE	
		19	R141 - DIODE GATE	
		4	R302 - DELAY (ONE SHOT)	
		1	R303 - INTEGRATING ONE SHOT	
		1	R401 - CLOCK	
		1	R450 VARIABLE CLOCK	
		14	S107 INVERTER	
		24	S202 - DUAL FLIP FLOP	
		8	S203 - TRIPLE FLIP FLOP	
		7	S205 - DUAL FLIP FLOP	
		7	S602 - PULSE AMPLIFIER	
		4	S603 - PULSE AMPLIFIER	

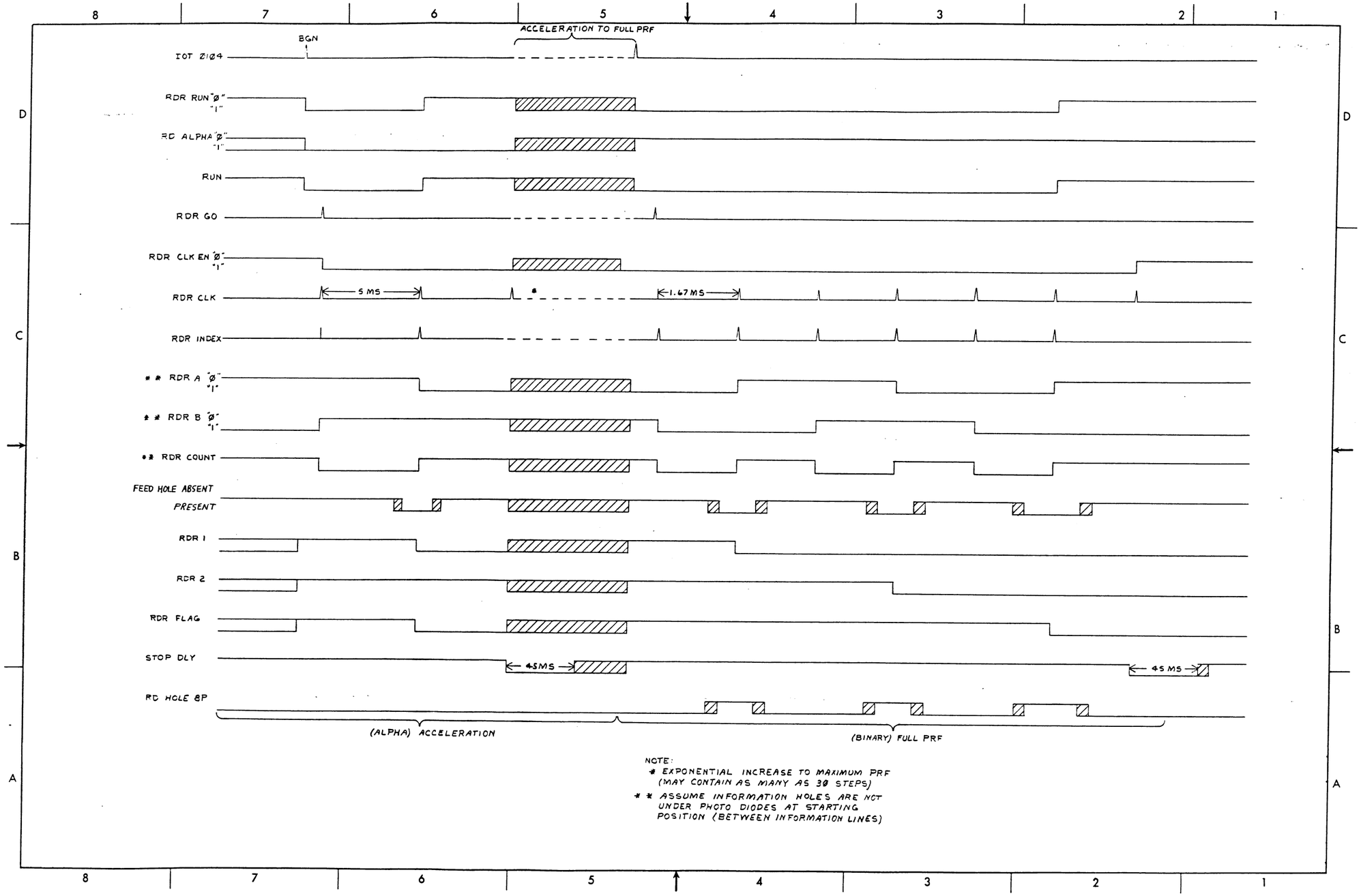
A-PL-KD09-A-14 Module Parts List (Sheet 1)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
		7	W005 - CLAMPED LOAD	
		1	W021 - SIGNAL CABLE CONN.	
		2	W023 - CONNECTOR BOARD	
		11	W024 - CONNECTOR BOARD	
		13	W031 - SIGNAL CABLE CONN	
		6	W040 - SOLENOID DRIVER	
		7	W990 - INDICATOR DRIVER	
		1	W070 - TELETYPE CONNECTOR	
		4	W071 - POWER CONNECTOR	
		1	W501 - SCHMITT TRIGGER	
		1	W520 - COMPARATOR	
		3	W612 - PULSE AMPLIFIER	
		10	WO33 SIGNAL CABLE CONN.	
		6	R123 DIODE GATE	

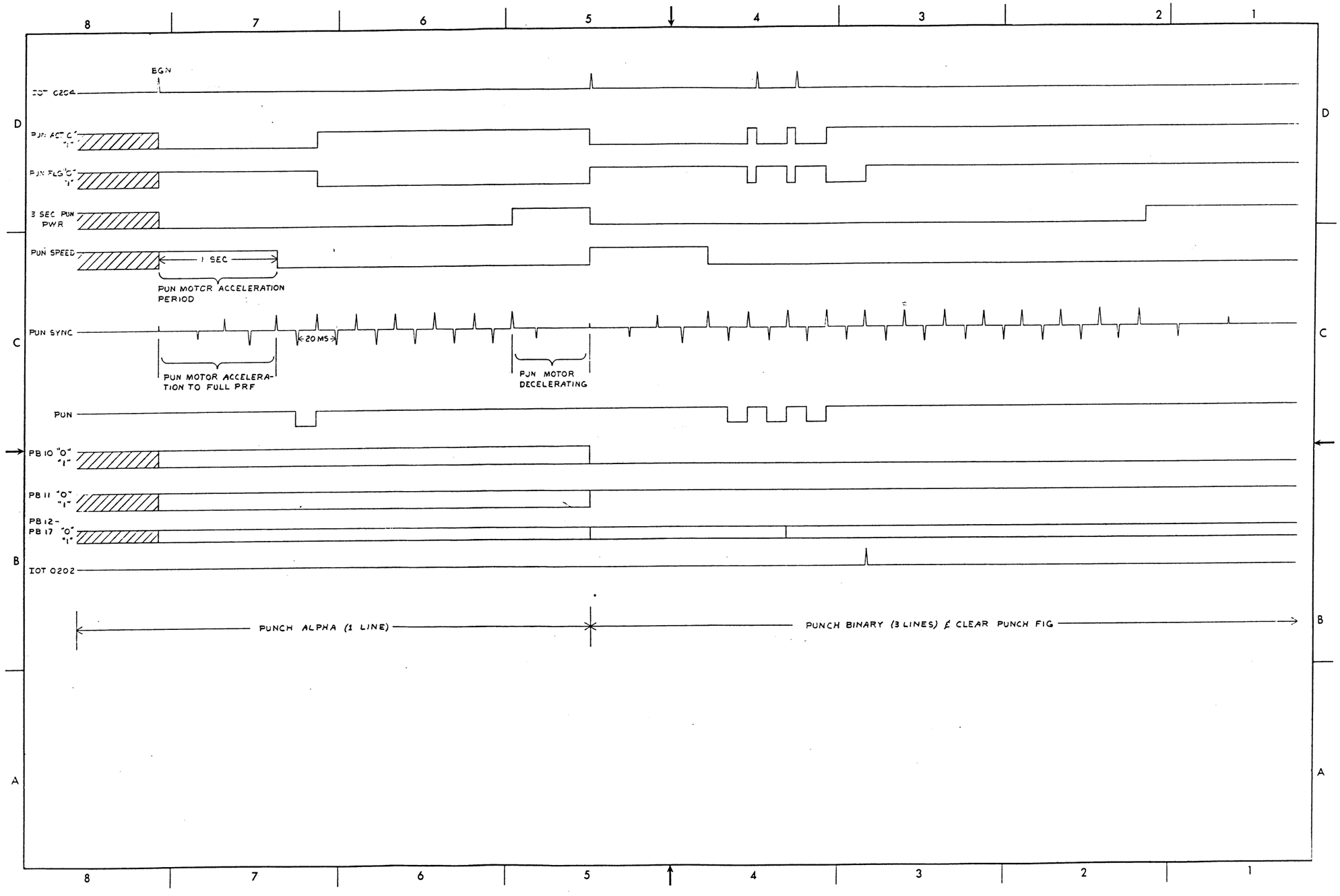
A-PL-KD09-A-14 Module Parts List (Sheet 2)

COMPONENT NAME	VALUE	POL.	FROM PIN	TO PIN	POL.
CAPACITOR	2.2 MF TAND ± 10%	-	C25H	C25J	+
RESISTOR	2.7K±5%1/4W		C25J	C25L	
CAPACITOR	.01 MFD	-	D25E	D25C	+
RESISTOR	4.7K±10%1/4W		D26K	D26B	
RESISTOR	10K1/4W ± 10%		A21T	B21B	
CAPACITOR	175 MFD TAND± 10%	-	C27J	C27C	+
RESISTOR	20K1/4W ± 5%		C27P	C27S	
CAPACITOR	39MFD 10VTHND ± 10%	-	C25R	C25S	+
RESISTOR	24K1/4W ± 5%		C25S	C25U	
CAPACITOR	.02 MFD 50V	-	A24H	A24J	+
RESISTOR	3K 1/4W ± 5%		F05J	F05L	
RESISTOR	1.5K 1/4W		A17V	B17B	
RESISTOR	1K 1/4W ± 10%		A24J	A24L	
RESISTOR	3K 1/4W ± 5%		D21P	B21B	
CAPACITOR	120PF ± 5%		E40J	E40K	
* PRE API SYNC	JUMPER		J10S	J10C	
** 34 DISPLAY	JUMPER		F40T	F40C	
** REMOVE JUMPERS WHEN 34 DISPLAY INSTALLED.					
* REMOVE JUMPERS WHEN API INSTALLED.					

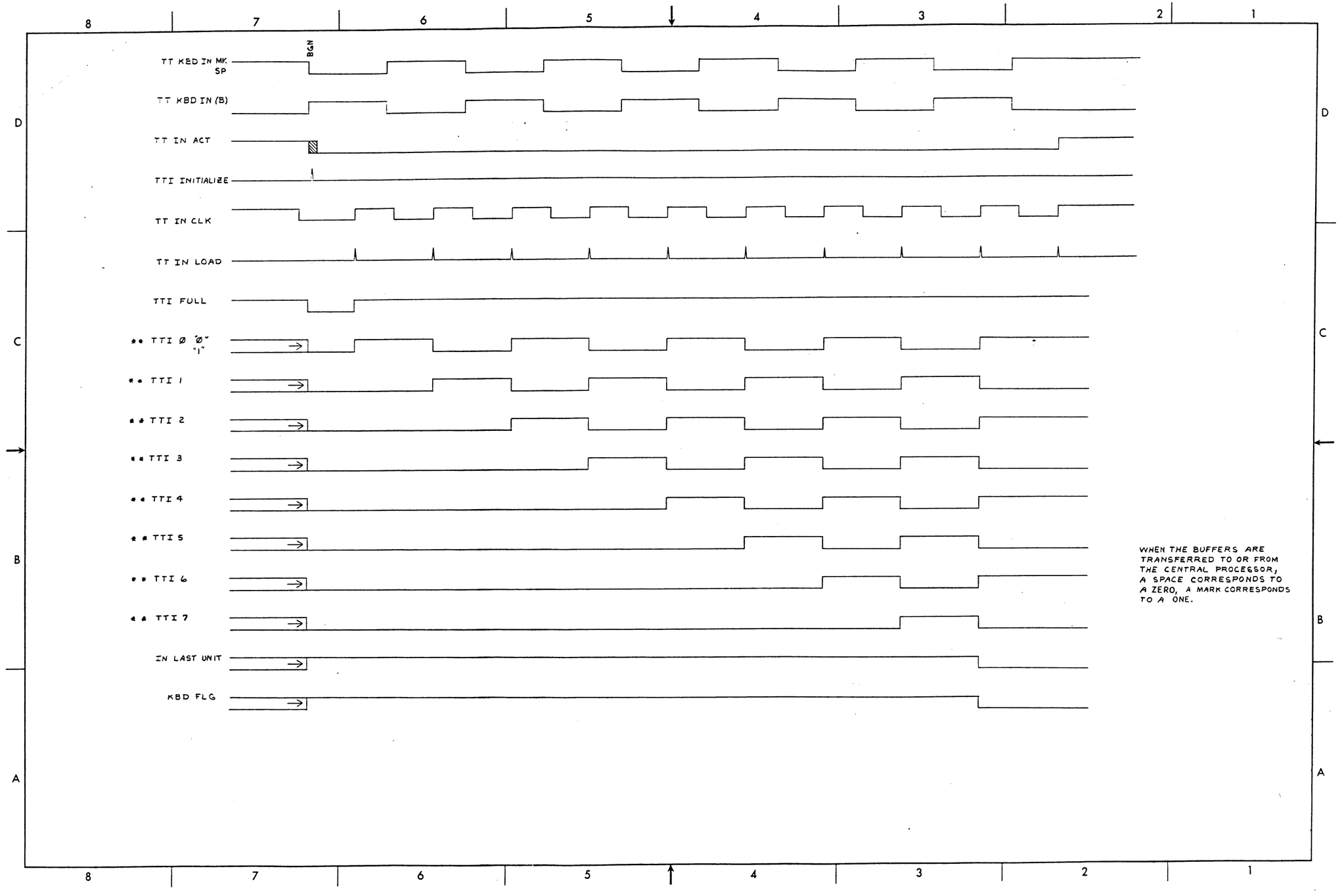
A-CP-KD09-A-16 External Component List



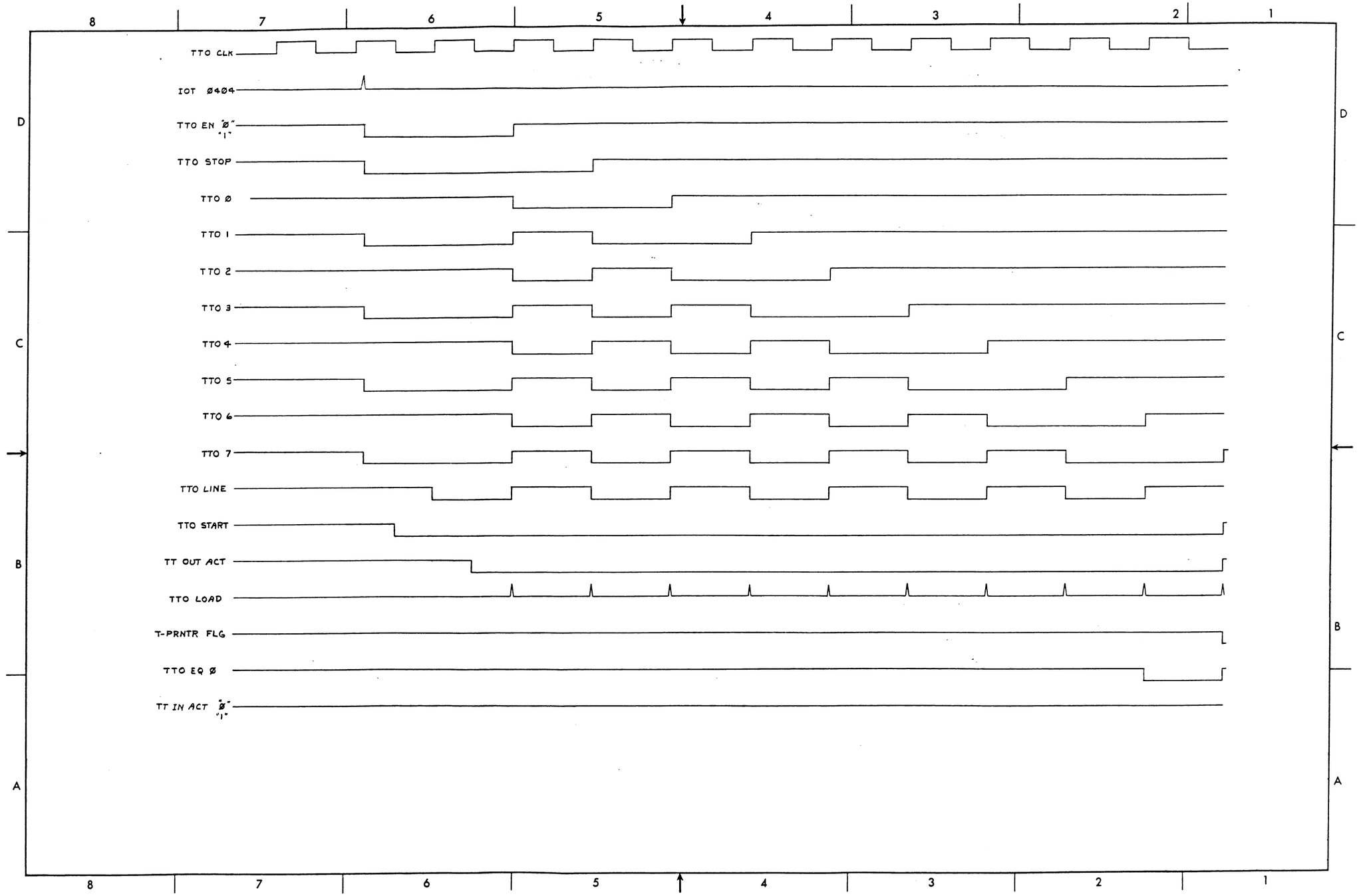
D-TD-KD09-A-20 Reader Timing



D-TD-KD09-A-21 Punch Timing



D-TD-KD09-A-22 Teletype Timing (Sheet 1)



D-TD-KD09-A-22 Teletype Timing (Sheet 2)

COLOR	NAME	PIN	PIN	REMARKS
BUSS BAR	+10A	A01A	A02A	
↓		A02A	A03A	
↓		A03A	A04A	
BUSS BAR	+10B	B01A	B02A	
↓		B02A	B03A	
↓		B03A	B04A	
BUSS BAR	-15A	A01B	A02B	
↓		A02B	A03B	
↓		A03B	A04B	
BUSS BAR	-15B	B01B	B02B	
↓		B02B	B03B	
↓		B03B	B04B	
BUSS BAR	GROUND A	A01C	A02C	
↓		A02C	A03C	
↓		A03C	A04C	
BUSS BAR	GROUND B	B01C	B02C	
↓		B02C	B03C	
↓		B03C	B04C	
BUSS BAR	-30 A	A03V	A04V	
↓	-30 B	B03V	B04V	
↓	POWER A	A03E	A04E	
↓	POWER B	B03E	B04E	
↓	FEED HOLE F INPUT	B01D	B02D	
↓	8	B01E	B02E	
↓	7	B01F	B02F	

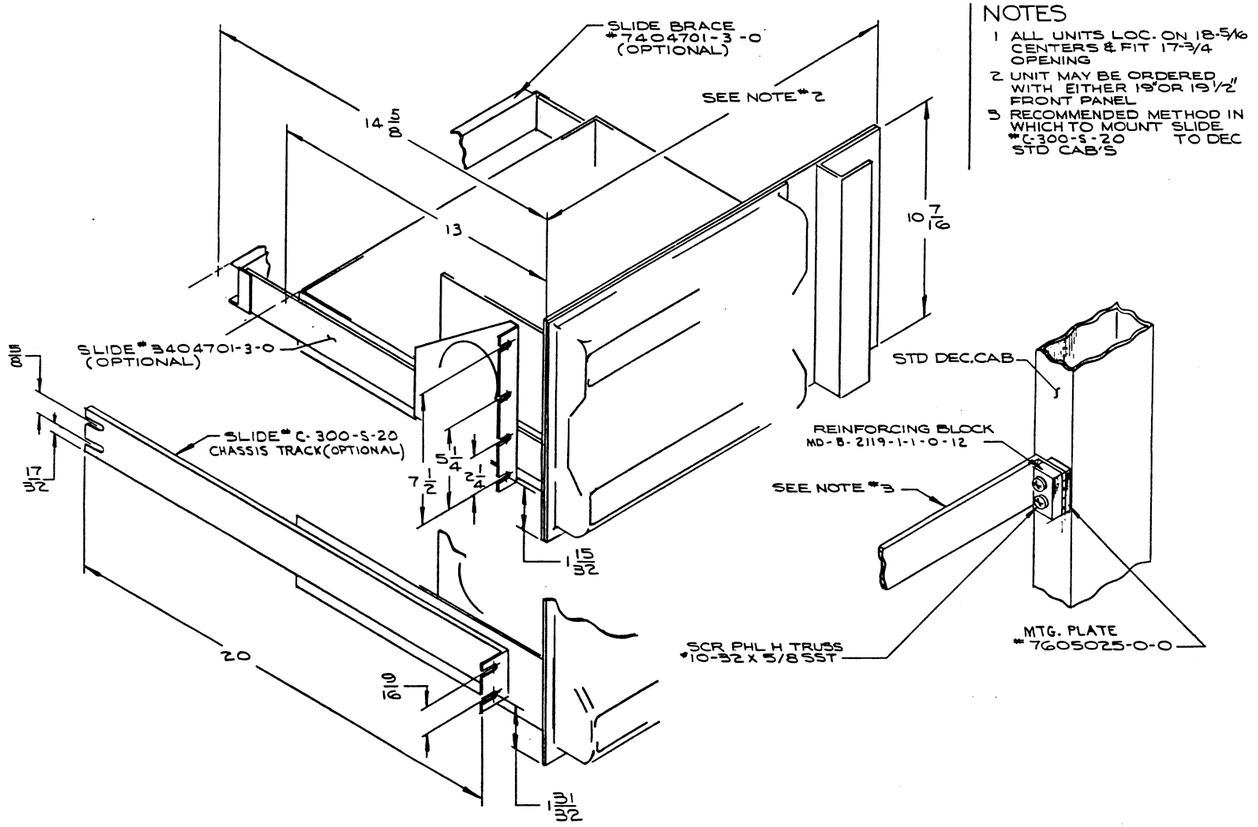
A-WL-PC01-0-1 Reader Block Wiring List (Sheet 1)

COLOR	NAME	PIN	PIN	REMARKS
BUSS BAR	HOLE 6 INPUT	B01H	B02H	
↓	5	B01J	B02J	
↓	4	B01K	B02K	
↓	3	B01L	B02L	
↓	2	B01M	B02M	
↓	1	B01N	B02N	
↓	COMMON	B01P	B02P	
↓	HOLE 1 OUTPUT	A01D	A02D	
↓	2	A01E	A02E	
↓	3	A01F	A02F	
↓	4	A01H	A02H	
↓	5	A01J	A02J	
↓	6	A01K	A02K	
↓	7	A01L	A02L	
↓	8	A01M	A02M	
↓	FEED HOLE OUT	A01N	A02N	
#22 AWG YEL	A(0)	A01P	A04D	
↓		A04D	A04K	
↓	A(1)	A01R	A03D	
↓		A03D	A03K	
↓	B(0)	A01S	B04D	
↓		B04D	B04K	
↓	B(1)	A01T	B03D	
↓		B03D	B03K	
↓				

A-WL-PC01-0-1 Reader Block Wiring List (Sheet 2)

SIGNAL NAME	FROM PIN	TO PIN	COLOR	REMARKS
Power (1)	A01U	A04E	Yellow	
	A04E	B04E		
-30	A04V	B04V		
GND	A01C	B01C		
	A02C	B02C		
	A03C	B03C		
	A04C	B04C		
+10	A01A	B01A		
-15	A01B	B01B		

A-WL-PC01-0-1 Reader Block Wiring List (Sheet 3)



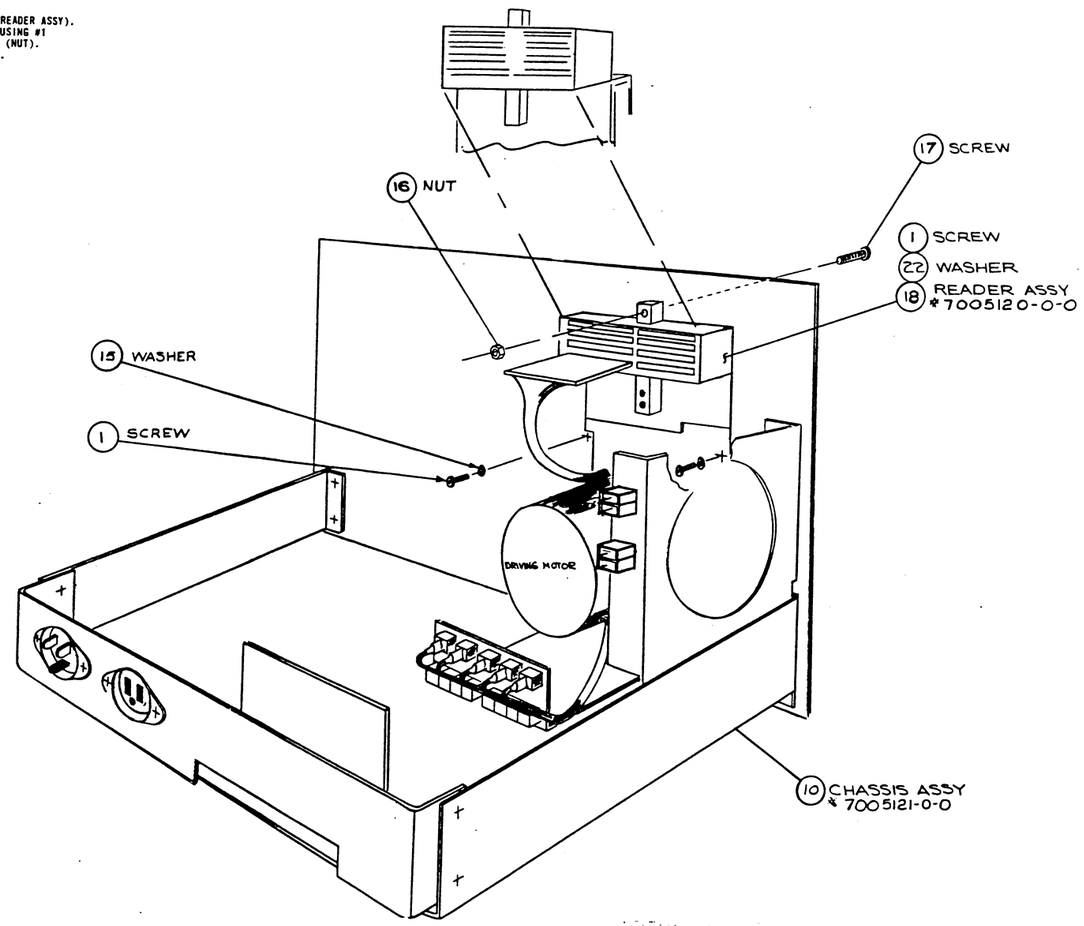
NOTES

1. ALL UNITS LOC. ON 18-5/16 CENTERS & FIT 17-3/4 OPENING
2. UNIT MAY BE ORDERED WITH EITHER 19" OR 19 1/2" FRONT PANEL
3. RECOMMENDED METHOD IN WHICH TO MOUNT SLIDE *C-300-S-20 TO DEC STD CAB'S

C-OD-PC01-0-4 Reader Outline Drawing

READER ASSY

STEP 1: DISCONNECT RESISTOR BRKT FROM EXISTING #18 (READER ASSY). INSTALL READER ASSY INTO #21 (CHASSIS ASSY) USING #1 (SCREW) #13 & 15 (WASHERS) #17 (SCREW) & #16 (NUT). REATTACH RESISTOR BRKT. TO ORIGINAL POSITION.



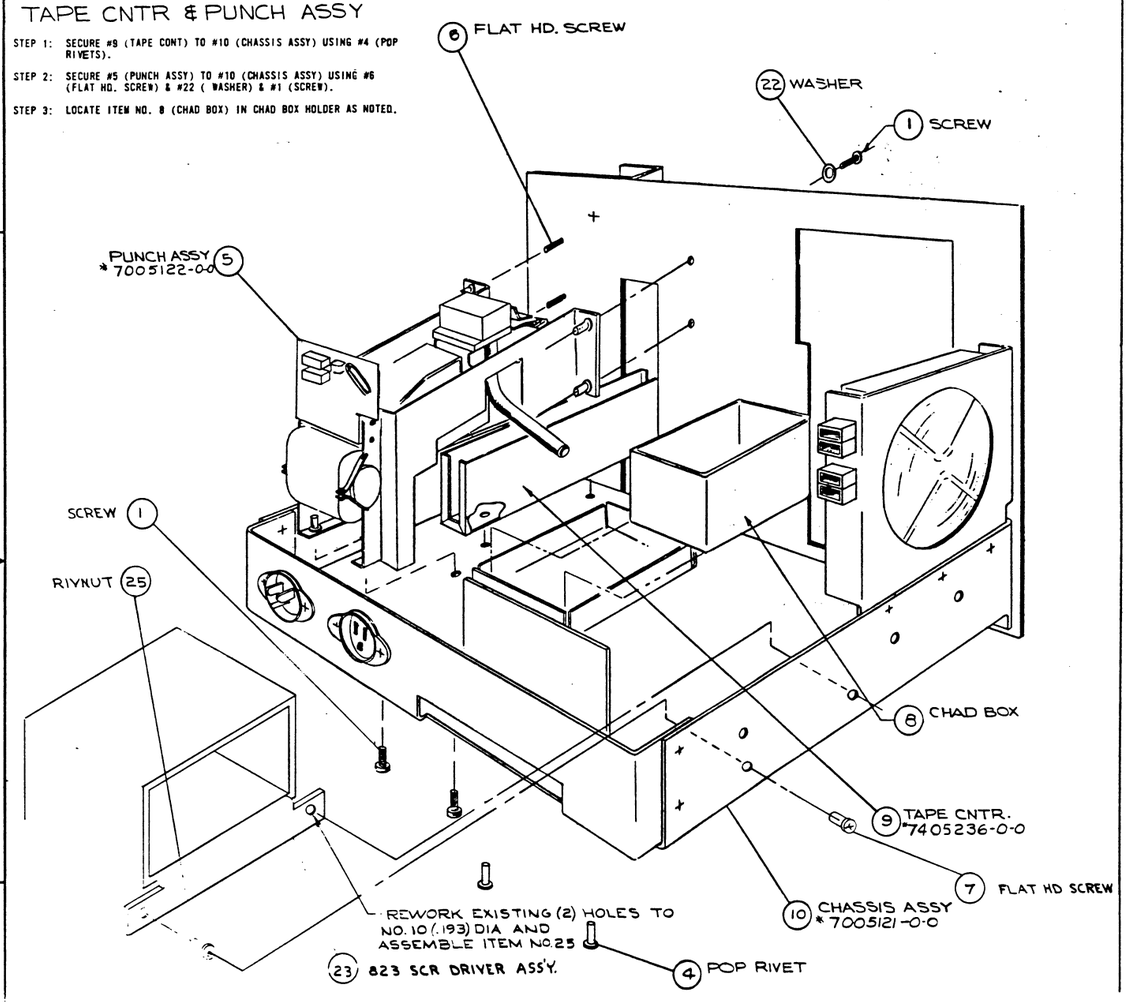
D-UA-PC09-0-0 Reader Punch Unit Assembly (Sheet 1)

TAPE CNTR & PUNCH ASSY

STEP 1: SECURE #9 (TAPE CONT) TO #10 (CHASSIS ASSY) USING #4 (POP RIVETS).

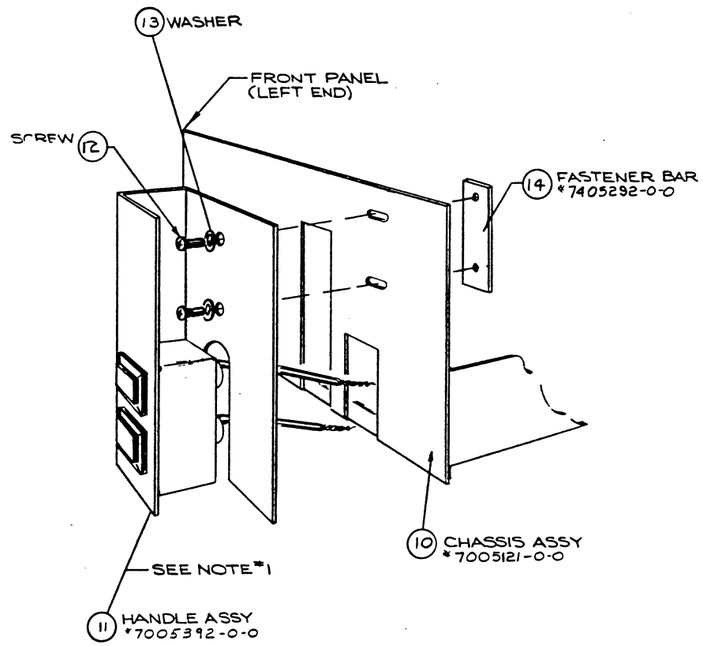
STEP 2: SECURE #5 (PUNCH ASSY) TO #10 (CHASSIS ASSY) USING #6 (FLAT HD. SCREW) & #22 (WASHER) & #1 (SCREW).

STEP 3: LOCATE ITEM NO. 8 (CHAD BOX) IN CHAD BOX HOLDER AS NOTED.



HANDLE ASS'Y

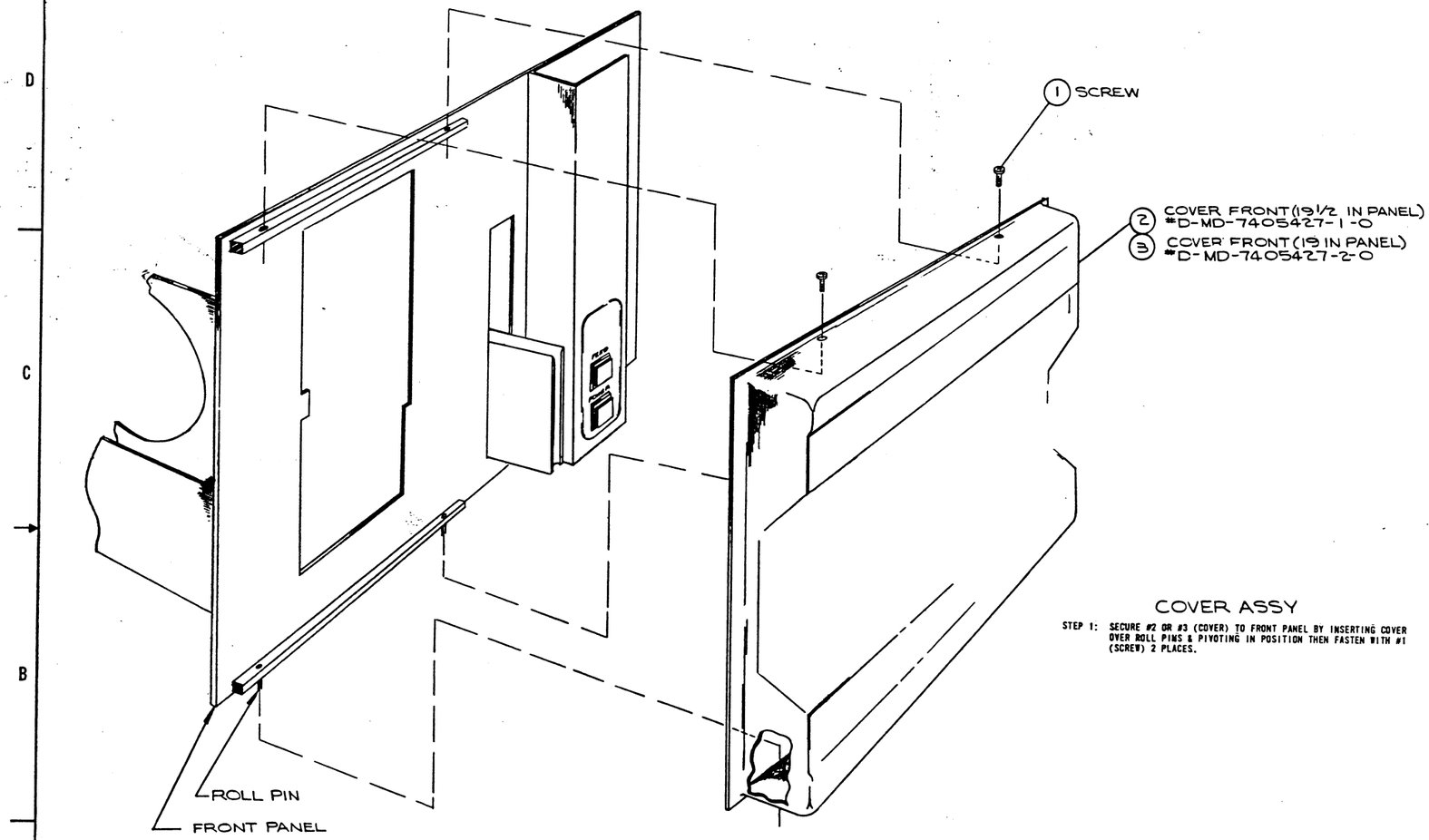
STEP 1: SECURE #11 (HANDLE ASSY) TO #10 (CHASSIS ASSY) USING #12 (SCREW) #13 (WASHER) & #14 (FASTENER BAR).



NOTES

1. IF 19 1/2" FRONT PANEL IS REQD MOVE HANDLE ASSY TO RIGHT WHEN MTG. SO IT MEAS. 19 1/4 FROM LEFT END OF FRONT PANEL

D-UA-PC09-0-0 Reader Punch Unit Assembly (Sheet 2)

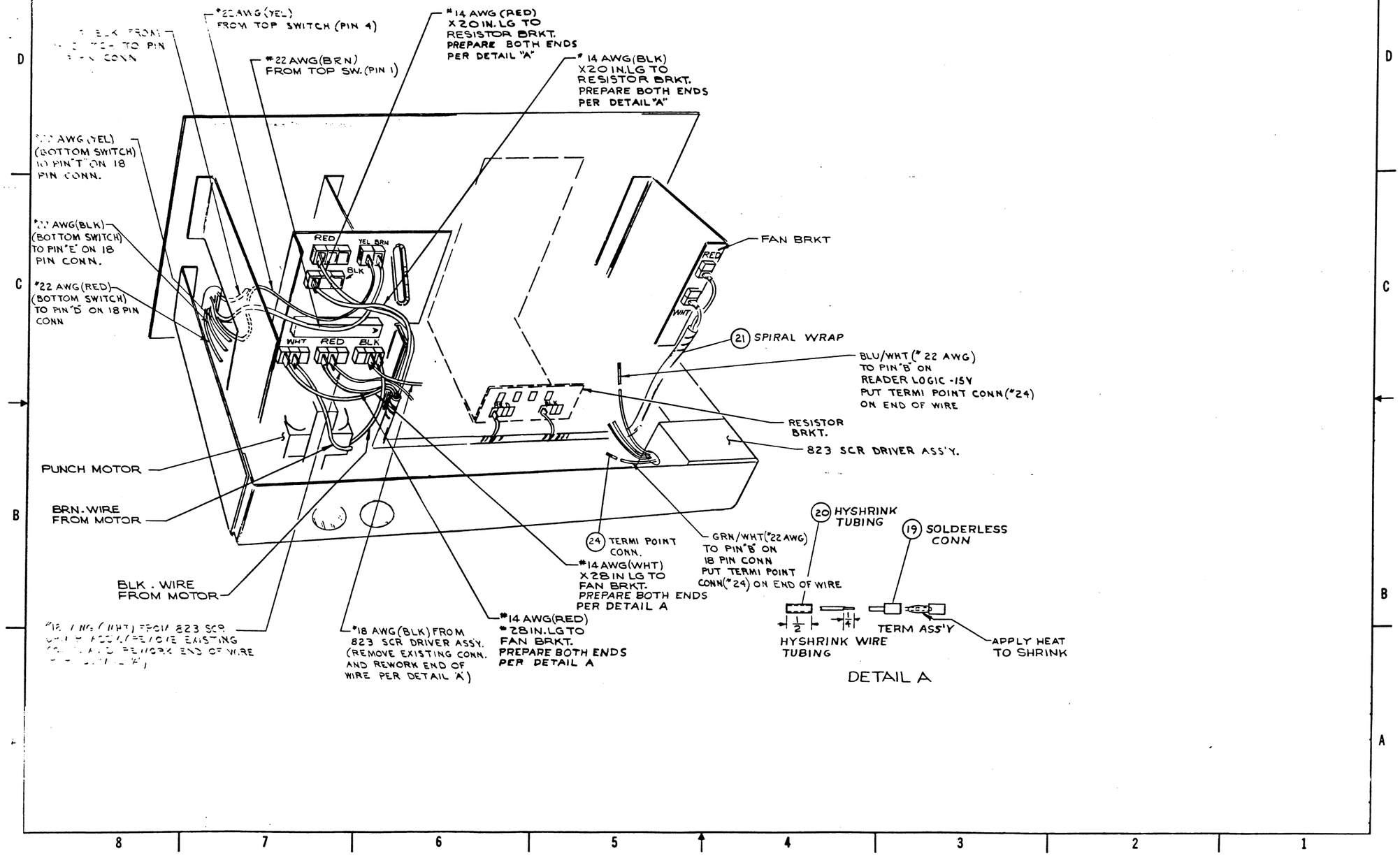


COVER ASSY

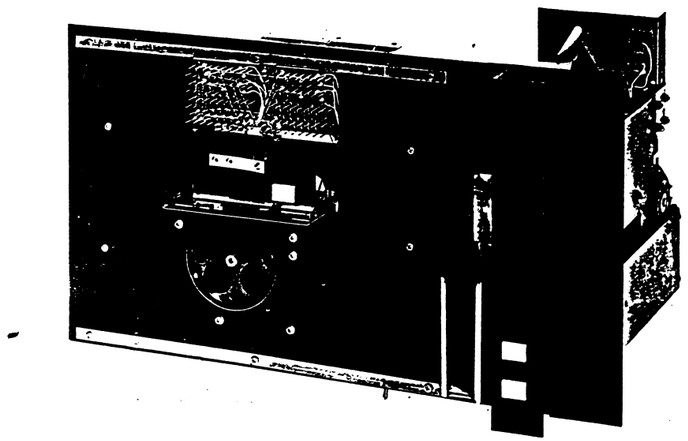
STEP 1: SECURE #2 OR #3 (COVER) TO FRONT PANEL BY INSERTING COVER OVER ROLL PINS & PIVOTING IN POSITION THEN FASTEN WITH #1 (SCREW) 2 PLACES.

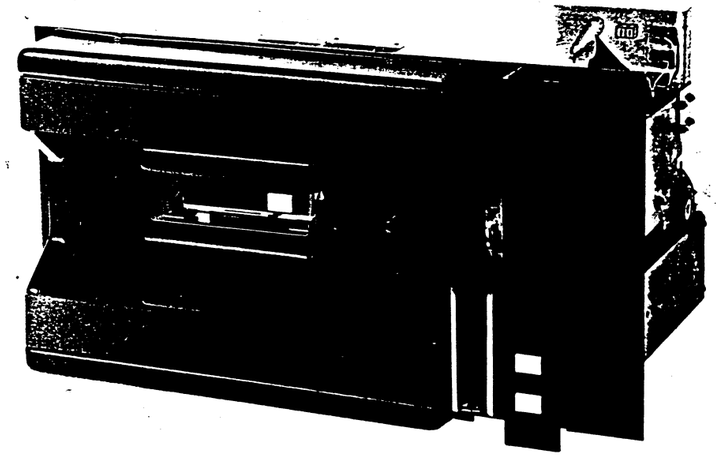
D-UA-PC09-0-0 Reader Punch Unit Assembly (Sheet 3)

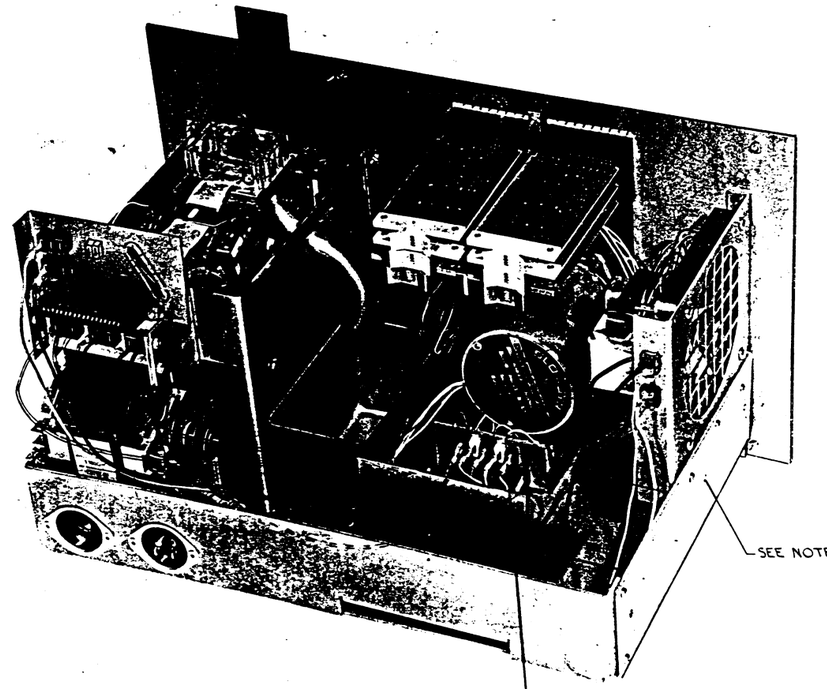
NOTES:



D-UA-PC09-0-0 Reader Punch Unit Assembly (Sheet 4)







NOTES:

1. HOLES PROVIDED IN CHASSIS FOR CHASSIS TRACK (*C-300-5-20) AND/OR (*D-SC-3404701-0-0)

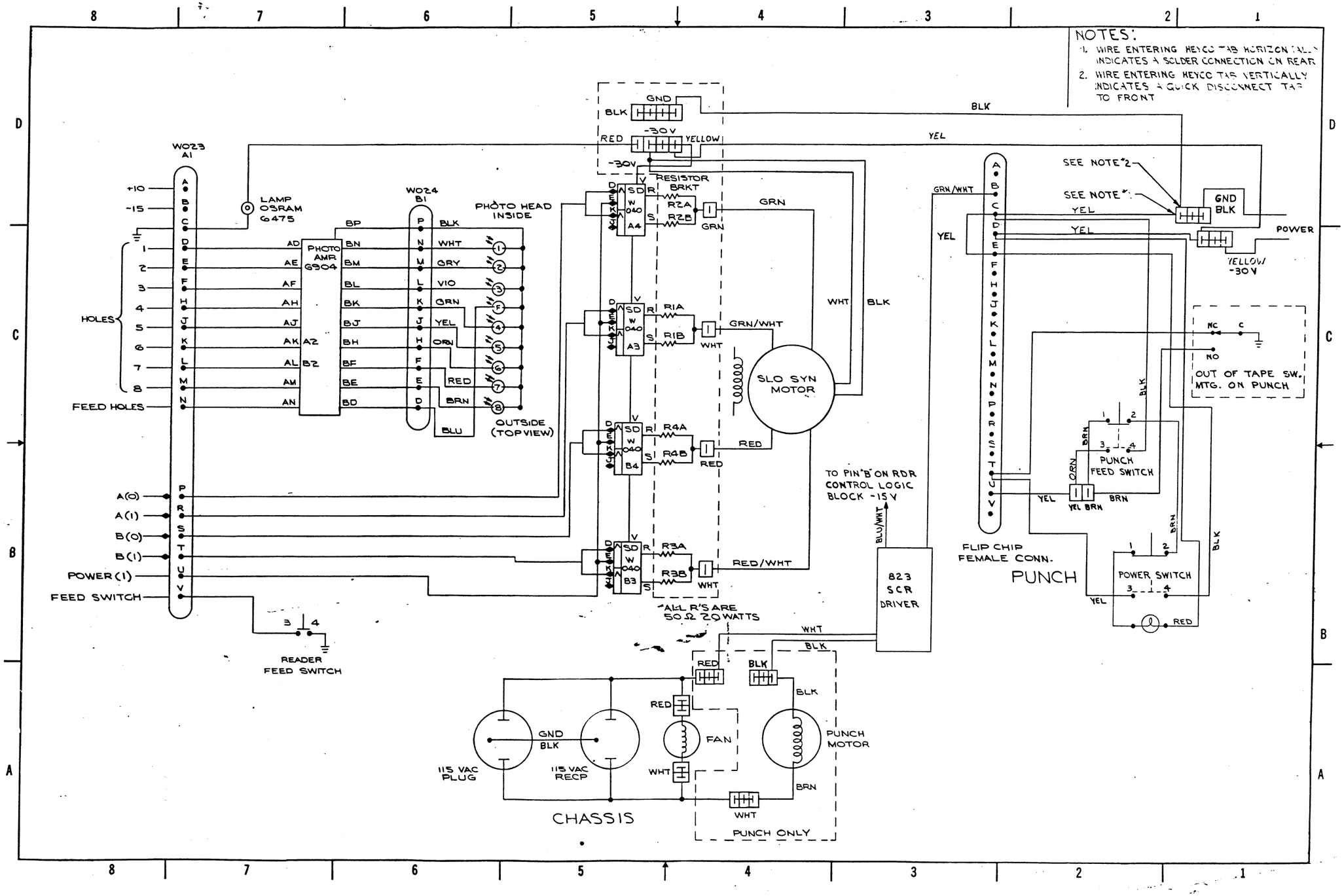
D-UA-PC09-0-0 Reader Punch Unit Assembly (Sheet 5)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
1		10	PHILLIPS PAN HEAD MACHINE SCREW #6-32 x 3/8 LG. SST.	
2	D-MD-7405427-1-0	1	COVER, FRONT WITH CUTOUT (19 1/2" PANEL)	
3	D-MD-7405427-2-0	1	COVER, FRONT WITH CUTOUT (19" PANEL)	
4		2	POP RIVETS 1/8 DIA. x 3/8 LG. #AD46ABS UNITED SHOE & MACHINERY CORP.	
5	D-AD-7005122-0-0	1	PUNCH ASS'Y	
6		2	PHILLIPS FLAT HEAD MACHINE SCREW #6-32 x 3/8 LG SST.	
7		2	PHILLIPS FLAT HD MACH SCR. #6-32 x 5/8 LG. SST.	
8	C-MD-7405300-0-0	1	CHAD BOX	
9	D-MD-7405236-0-0	1	TAPE CONTAINER (PC01)	
10	D-AD-7005121-0-0	1	CHASSIS ASS'Y	
11	D-AD-7005392-0-0	1	HANDLE ASS'Y	
12		2	PHILLIPS PAN HEAD MACHINE SCREW #8-32 x 1/2 LG. SST.	
13		2	WASHER, #8, CL. HOLE, NYLON	
14	A-MD-7405292-0-0	1	FASTENER BAR (HANDLE)	
15		2	INTERNAL TOOTH LOCK WASHER #6 CL HOLE SST	
16		1	KEPS HEX NUT, #6-32 THD SST.	

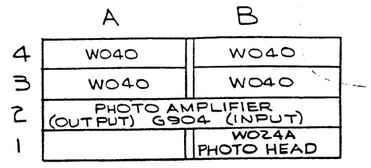
A-PL-PC09-0-0 Reader and Punch Parts List (Sheet 1)

PART NO.	DRWG. NO.	NO. REQD.	DESCRIPTION ITEM —— STOCK SIZE —— CAT. NO. —— MFG.	DEC. STOCK NO.
17		1	PHILLIPS PAN HEAD MACHINE SCREW #6-32 x 1 1/4 LG. SST.	
18	D-AD-7005120-0-0	1	READER ASSY	
19		12	SOLDERLESS CONN #42025-1 AMP INC.	
20		12	#14 x 1/2 LG HY SHRINK TUBING (RED)	
21		1	SPIRALLY CUT CABLE WRAP 1/4 DIAx20"LG	
22		4	WASHER, #6 CL HOLE, NYLON	
23	D-UA-823-0-0	1	823 SCR. DRIVER ASSY	
24		2	TERMI POINT CONN.	
25		2	RIVNUT, #6-32 THD, #S-6-160 B.F. GOODRICH	

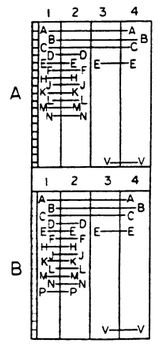
A-PL-PC09-0-0 Reader and Punch Parts List (Sheet 2)



D-BS-PC09-0-2 Reader and Punch Block Schematic



B-MU-7005120-0-1 Reader Module Utilization List



B-AD-7005160-0-0 Reader Bus Bar