

REVISIONS					
ZONE	SYN.	DESCRIPTION	BY	DATE	APPROVAL
A		REL TO PROD. PLO # 4203	AW	10-16-74	16 H.
A1		ON SHT 6 OF 6, R21 WAS R27. PLO # 4739.	AW	1-28-75	16

NOTES:

- ALL INTEGRATED CIRCUITS (U) REFERENCE DESIGNATIONS ARE TO BE PREFIXED SN AND SUFFIXED N.
- ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, 5%. ALL CAPACITORS ARE 50V.
- THE FOUR MOST SIGNIFICANT BITS OF THE 6-BIT DEVICE UNIT ADDRESS ARE GENERATED BY INSERTION OR OMISSION OF THE FOUR JUMPER WIRES SHOWN. IF THE JUMPER IS OMITTED, THAT PARTICULAR BIT OF THE ADDRESS IS A ZERO. IF THE JUMPER IS INSERTED, THAT BIT IS A ONE. THE DEVICE UNIT ADDRESS FOR A SINGLE DISC UNIT MUST BE DIVISIBLE BY FOUR (OCTAL). IF SEVERAL DISC UNITS (UP TO FOUR) ARE OPERATED FROM ONE CONTROLLER CARD, THE FOUR DEVICE ADDRESSES CHOSEN MUST BE SEQUENTIAL WITH THE LOWEST ADDRESS DIVISIBLE BY FOUR (OCTAL). SEE SHEET 5.
- THE 3-BIT DEVICE CHANNEL ADDRESS IS GENERATED BY INSERTION OR OMISSION OF THREE JUMPER WIRES AS DESCRIBED IN NOTE #3, SEE SHEET 5.
- THE DATA FORMAT TO AND FROM THE DISC CONSISTS OF A CLOCK PULSE EVERY 0.7 SECS. IF THE DATA BIT IS A "ONE" THERE IS A DATA PULSE MIDWAY BETWEEN THE CLOCK PULSES. IF THE DATA BIT IS A "ZERO" THERE IS NO DATA PULSE BETWEEN THE CLOCK PULSES. THE WRITE DATA TO THE DISC IS A COMPOSITE CLOCK/DATA SIGNAL. THE READ DATA FROM THE DISC IS SEPARATED INTO SEPARATE SIGNALS WITHIN THE DISC. FLIP-FLOP U10 IS SYNCHRONOUSLY SET BY EVERY READ CLOCK SIGNAL. THIS FLIP-FLOP IS ASYNCHRONOUSLY RESET IF A "ONE" (GROUND) OCCURS ON THE READ DATA LINE BETWEEN THE CLOCK PULSES.
- STATUS INT LE OCCURS WHENEVER ONE OF THE DISCS BEING POLLED GOES FROM A NOT READY CONDITION (ZERO) AT THE PREVIOUS POLLING TIME TO A READY CONDITION (ONE) AT THE PRESENT POLLING TIME. THIS OCCURS AT THE SUCCESSFUL COMPLETION OF A SEEK OPERATION, OR WHEN A DISC DRIVE BECOMES READY AFTER TURN ON, OR WHEN A "SEEK INCOMPLETE" STATUS IS SENT FROM THE DISC.
- THE ORIGIN OF THE WRITE DATA SIGNAL IS DEPENDENT UPON THE CODING OF THE TWO INPUT LINES, SA AND SB, AS FOLLOWS:

SA	SB	WRITE DATA CONTENT
0	0	ALL ZEROS
0	1	ALL ONES
1	0	DATA REGISTER OUTPUT
1	1	CRC REGISTER OUTPUT

9. THE CRC REGISTER OPERATES IN THE FOLLOWING SEQUENCE:

A. FOR WRITING DATA ONTO DISC:

- MODE CONTROL AT 0 TO LOAD ALL ZEROS INTO CRC REGISTER.
- MODE CONTROL AT 1 WHILE WRITING 256 DATA WORDS. THIS GENERATES CRC WORD.
- MODE CONTROL AT 0 TO WRITE CRC WORD ON DISC IN 257TH LOCATION.

B. FOR READING DATA FROM DISC:

- MODE CONTROL AT 0 TO LOAD ALL ZEROS INTO CRC REGISTER.
- MODE CONTROL AT 1 WHILE READING ALL 257 WORDS THROUGH CRC REGISTER.
- MODE CONTROL AT 0. IF DATA TRANSFER WAS OK, THEN OUTPUT OF CRC REGISTER SHOULD BE ALL ZEROS.

10. THIS CARD IS NORMALLY SUPPLIED WITH TRACES INSTEAD OF JUMPER WIRES AT THE FOLLOWING LOCATIONS:

JUMPER COLOR	JUMPERED WITH TRACE	FUNCTION PERFORMED
RED WIRE	D, A	GENERATE DEVICE UNIT ADDRESS 24 THRU 27
JUMPER	C	GENERATE CHANNEL ADDRESS 2

11. PLUG A1 CONTAINS HEADER SPECIFYING DEVICE TYPES. INSTALLATION OF JUMPER INDICATES 2.5 MB. LACK OF JUMPER INDICATES 10 MB.

- 3-12 DRIVE 0
- 4-11 DRIVE 1
- 5-10 DRIVE 2
- 6-9 DRIVE 3

1-14 MUST ALWAYS BE CONNECTED

STANDARD IS ASSUMED TO BE 2.5 MB DRIVES AT LOW DRIVE NUMBERS.

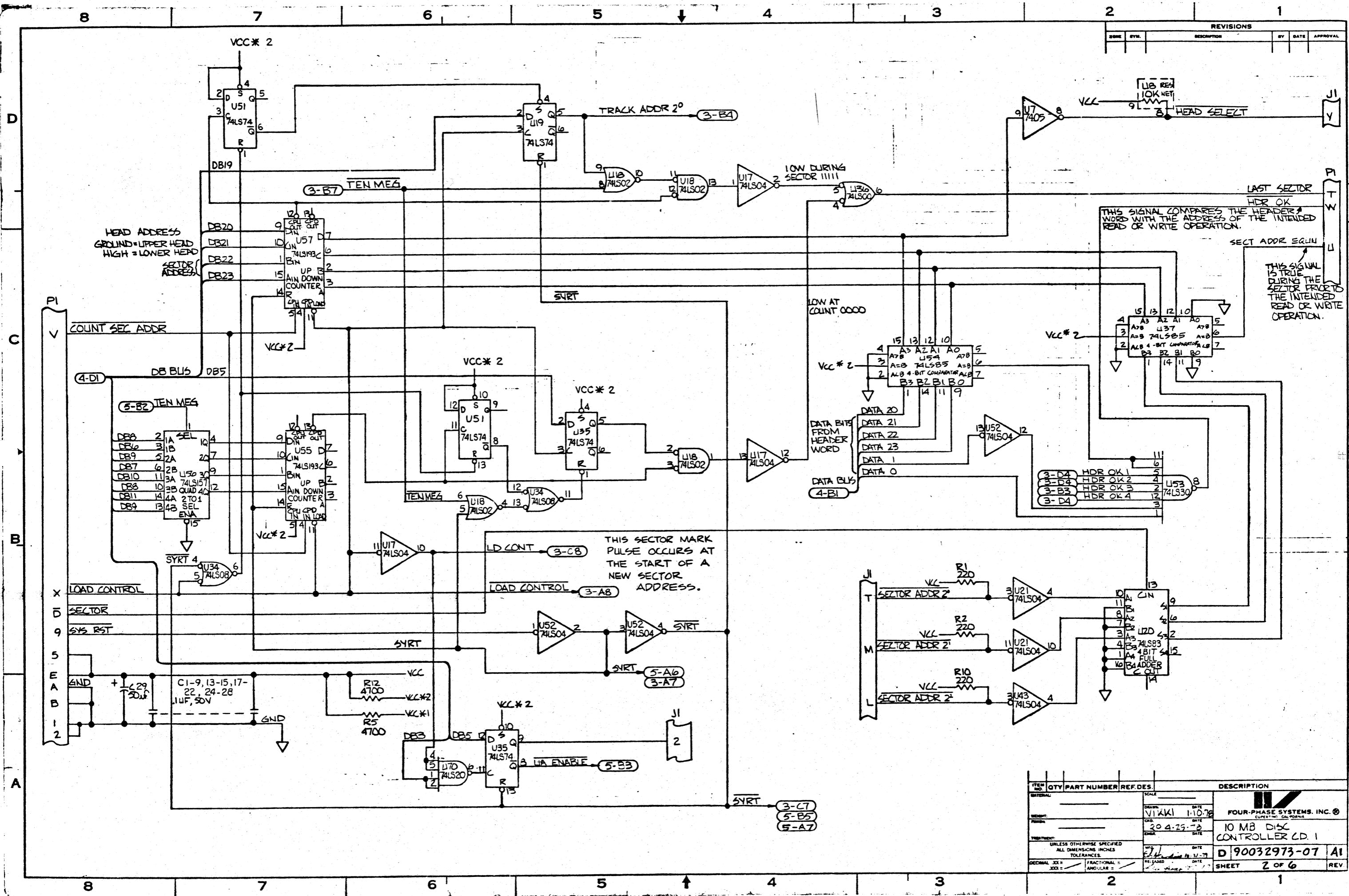
IC BIASING TABLE

DEVICE	VCC	GND
7405	14	7
7408	14	7
74LS02	14	7
74LS04	14	7
74LS08	14	7
74LS10	14	7
74LS20	14	7
7438	14	7
74LS73	4	11
74LS74	14	7
74LS83	5	12
74LS86	14	7
74LS95	14	7
74LS157	16	8
74LS193	16	8
74LS85	16	8
7437	14	7
74LS30	14	7
74LS164	14	7
74LS14	16	8

90032973-07 A1

ITEM NO.	QTY	PART NUMBER	REF. DES.	DESCRIPTION
				FOUR-PHASE SYSTEMS, INC. ®
				10 MB DISC CONTROLLER CD 1
				D 90032973-07 A1
				SHEET 1 OF 6 REV

REVISIONS				
NO.	SYN.	DESCRIPTION	BY	DATE

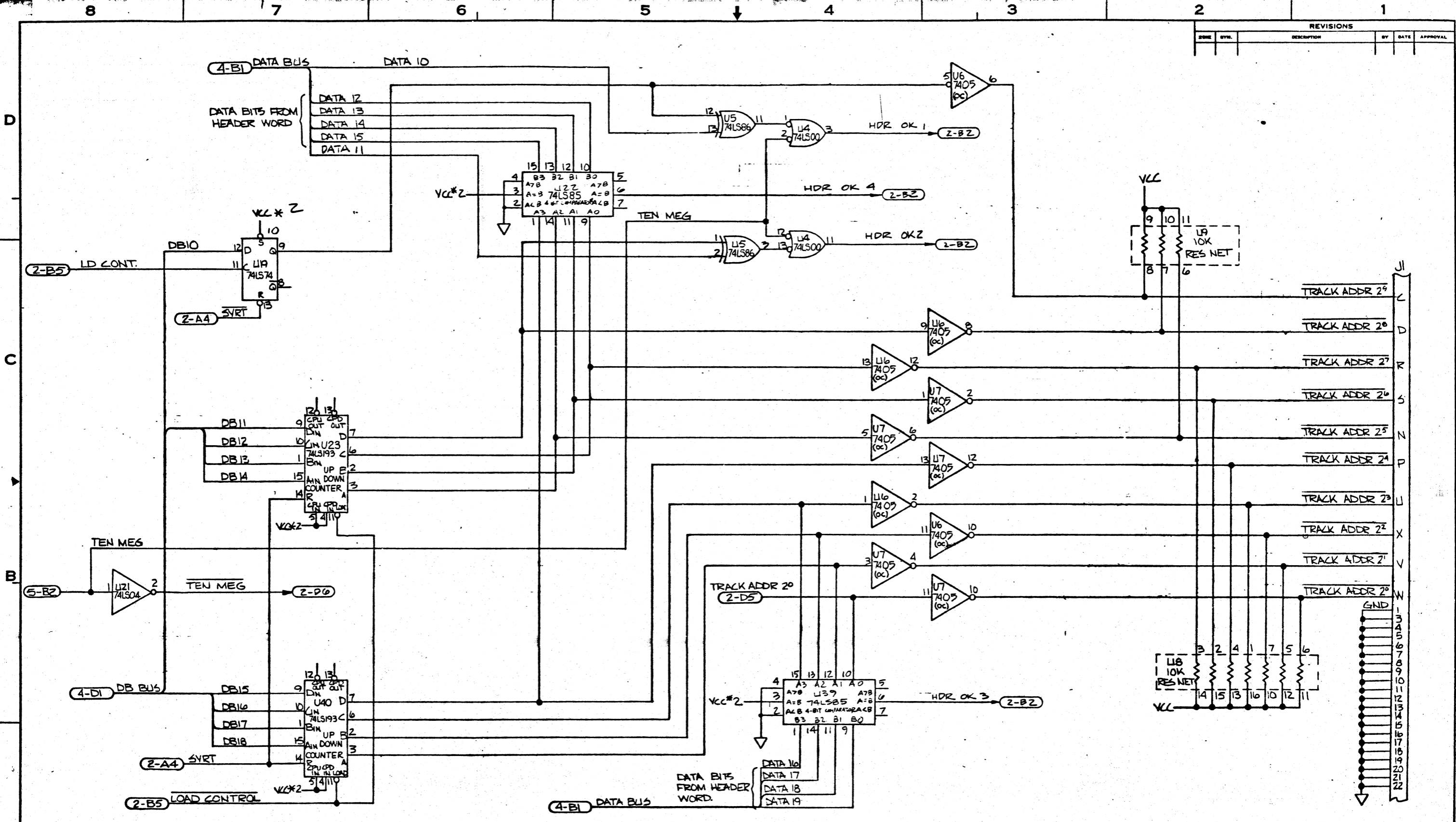


ITEM NO.	QTY	PART NUMBER	REF. DES.	DESCRIPTION

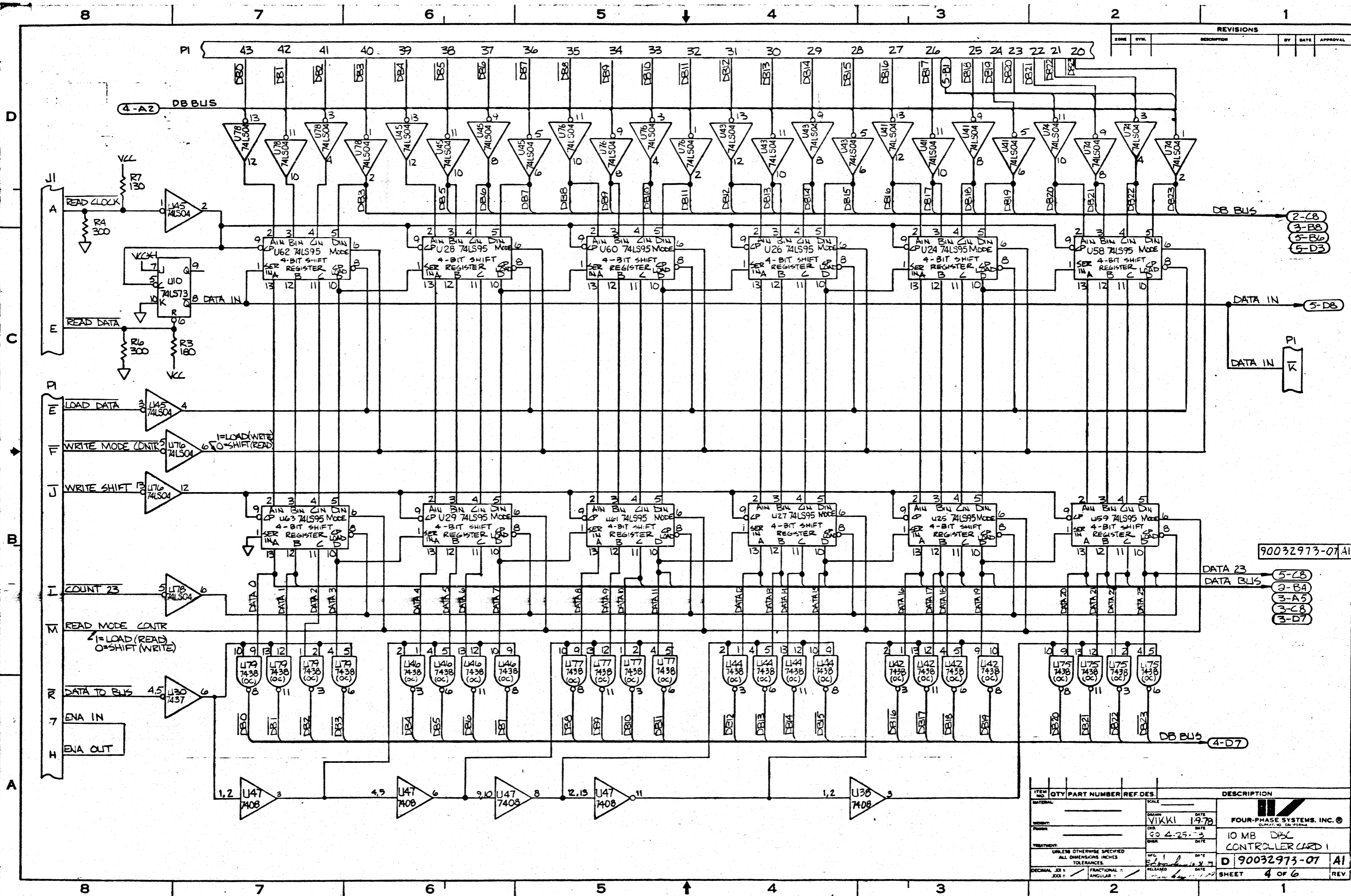
DRAWN: VIKKI
 DATE: 1.10.78
 CHECKED: 204-29-78
 DATE: 1.10.78
 INFO: 204-29-78
 DATE: 1.10.78
 REVISION: 1.10.78
 DATE: 1.10.78
 SHEET 2 OF 6
 REV.

FOUR-PHASE SYSTEMS, INC. ©
 10 MB DISC
 CONTROLLER CD. 1
 D 90032973-07 A1

REVISIONS				
ZONE	BY	DESCRIPTION	DATE	APPROVAL



ITEM NO.	QTY	PART NUMBER	REF. DES.	DESCRIPTION
FOUR-PHASE SYSTEMS, INC. © OPERATING DIVISION OF PDP-A				10 MB DISC CONTROLLER CD 1
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES TOLERANCES:				D 90032973-07 A1
SHEET 3 OF 6				REV.



REVISIONS				
ZONE	SYN	DESCRIPTION	BY	DATE

90032973-07 A1

ITEM NO.	QTY	PART NUMBER	REF DES.	DESCRIPTION

DATE: VIKKI 1978
 DATE: 80 4-25-78
 DATE: 80 4-25-78
 DATE: 80 4-25-78

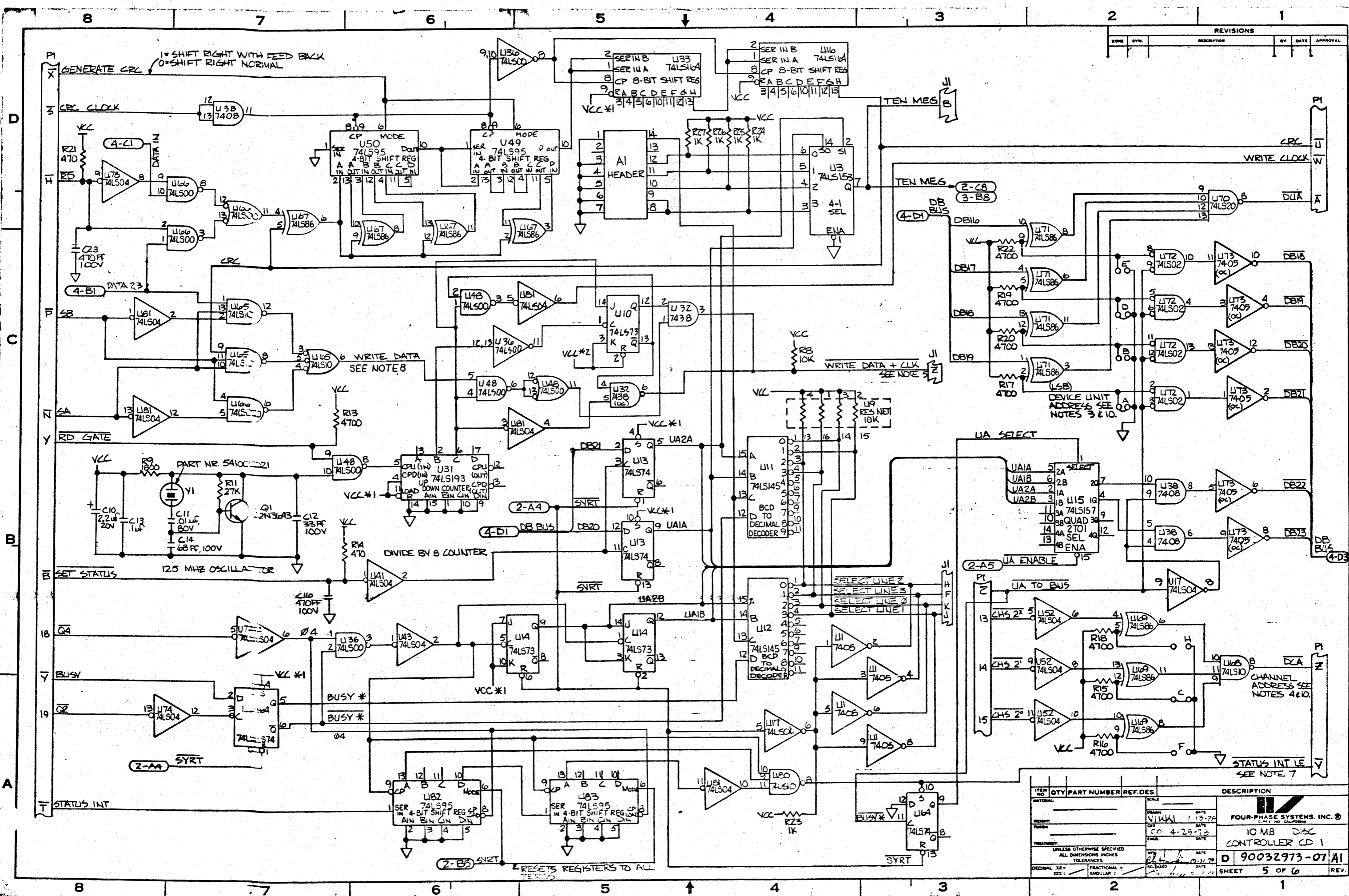
UNLESS OTHERWISE SPECIFIED
 ALL DIMENSIONS INCHES
 TOLERANCES:

DECIMAL: .01 = FRACTIONAL: 1/16 = ANGULAR: 1/16

DATE: 80 4-25-78
 DATE: 80 4-25-78

FOUR-PHASE SYSTEMS, INC. ©
 10 MB DBC
 CONTROLLER CARD 1
 D 90032973-07 A1
 SHEET 4 OF 6 REV

REVISIONS				
ZONE	SYN.	DESCRIPTION	BY	DATE



ITEM NO.	QTY	PART NUMBER	REF. DES.	DESCRIPTION

MATERIAL:		SCALE:	DATE:
DESIGN:		DATE:	DATE:
PARTS:		DATE:	DATE:
VENUE:		DATE:	DATE:
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS IN INCHES TOLERANCES:		DATE:	DATE:
DECIMAL .XX ±	FRACTIONAL ±	DATE:	DATE:
XXX ±	ANGULAR ±	DATE:	DATE:

FOUR-PHASE SYSTEMS, INC. ©	
10 MB DISC CONTROLLER CD 1	
D 90032973-07 A1	
SHEET 5 OF 6	REV.

11005401-57 57

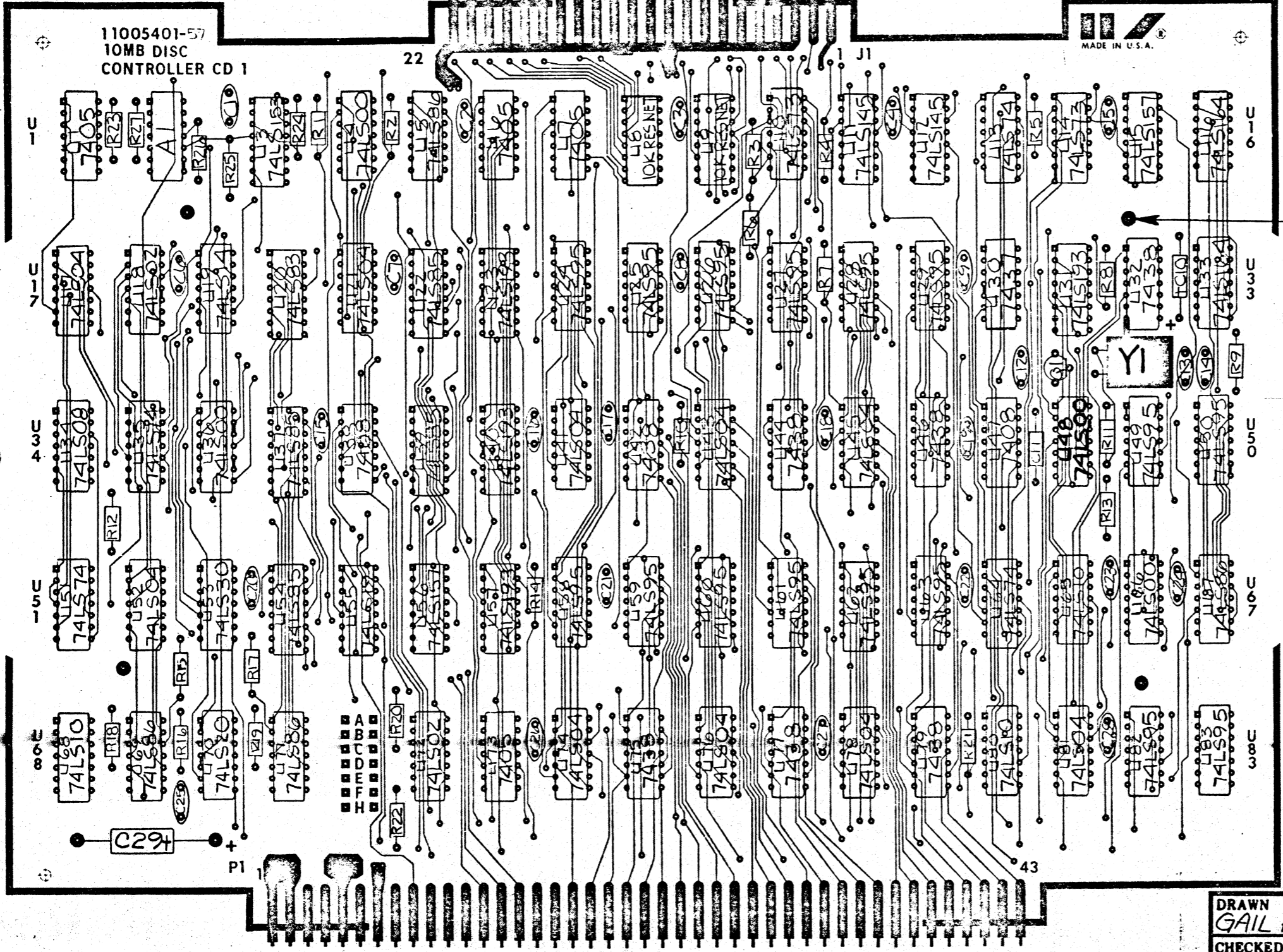
11005401-57
10MB DISC
CONTROLLER CD 1


MADE IN U.S.A.

REDUCE TO 11,500 ± .005

REDUCE TO 11,500 ± .005

P/N 22100920 - LUG TURRET
(TYP 4 PLACES)



DRAW GAIL K	DATE 10.29.79	 FOUR-PHASE SYSTEMS, INC. CUPERTINO, CALIFORNIA	10 MB DISC CONTROLLER CARD 1
CHECKED R. SHEARER 10/31/79	ENGINEER		
MFG Bob Hawkins 10/31/79	RELEASED Shawhan 10/31/79	90032973-07	AI
SHEET 6 OF 6		REV	

REVISIONS					
REV.	BY	DESCRIPTION	DATE	APPROVAL	
50		REL TO PLO #4003	11/10/77		
51		REL TO PLO #4227	12/10/77		
A		RELEASE TO PROD PLO 4975	5/7/80		

NOTES:

- ALL INTEGRATED CIRCUITS (U) REFERENCE DESIGNATIONS ARE TO BE PREFIXED SN AND SUFFIXED N.
- ALL RESISTOR VALUES ARE IN OHMS, 1/4 WATT, 5%. ALL CAPACITORS ARE SOV.
- THE FOUR MOST SIGNIFICANT BITS OF THE 6-BIT DEVICE UNIT ADDRESS ARE GENERATED BY INSERTION OR OMISSION OF THE FOUR JUMPER WIRES SHOWN. IF THE JUMPER IS OMITTED, THAT PARTICULAR BIT OF THE ADDRESS IS A ZERO. IF THE JUMPER IS INSERTED, THAT BIT IS A ONE. THE DEVICE UNIT ADDRESS FOR A SINGLE DISC UNIT MUST BE DIVISIBLE BY FOUR (OCTAL). IF SEVERAL DISC UNITS (UP TO FOUR) ARE OPERATED FROM ONE CONTROLLER CARD, THE FOUR DEVICE ADDRESSES CHOSEN MUST BE SEQUENTIAL WITH THE LOWEST ADDRESS DIVISIBLE BY FOUR (OCTAL). SEE SHEET 5.
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1	0	DATA REGISTER OUTPUT
1	1	CRC REGISTER OUTPUT

- THE CRC REGISTER OPERATES IN THE FOLLOWING SEQUENCE
 - FOR WRITING DATA ONTO DISC
 - MODE CONTROL AT 0 TO LOAD ALL ZEROS INTO CRC REGISTER
 - MODE CONTROL AT 1 WHILE WRITING 256 DATA WORDS. THIS GENERATES CRC WORD.
 - MODE CONTROL AT 0 TO WRITE CRC WORD ON DISC IN 257TH LOCATION.
 - FOR READING DATA FROM DISC.
 - MODE CONTROL AT 0 TO LOAD ALL ZEROS INTO CRC REGISTER.
 - MODE CONTROL AT 1 WHILE READING ALL 257 WORDS THROUGH CRC REGISTER.
 - MODE CONTROL AT 0. IF DATA TRANSFER WAS OK, THEN OUTPUT OF CRC REGISTER SHOULD BE ALL ZEROS.
- THIS CARD IS NORMALLY SUPPLIED WITH TRACES INSTEAD OF JUMPER WIRES AT THE FOLLOWING LOCATIONS:

JUMPER COLOR	JUMPERED WITH TRACE	FUNCTION PERFORMED
RED WIRE	D, A	GENERATE DEVICE UNIT ADDRESS 24 THRU 27
JUMPER	C	GENERATE CHANNEL ADDRESS 2J

- PLUG A1 CONTAINS HEADER SPECIFYING DEVICE TYPES. INSTALLATION OF JUMPER INDICATES 2.5 MB. LACK OF JUMPER INDICATES 10 MB.

3-12	DRIVE 0
4-11	DRIVE 1
5-10	DRIVE 2
6-9	DRIVE 3
1-14	MUST ALWAYS BE CONNECTED

 STANDARD IS ASSUMED TO BE 2.5 MB DRIVES AT LOW DRIVE NUMBERS.

90032974-07A

IC BIASING TABLE

DEVICE	VCC	GND
7405	14	7
7406	14	7
74LS02	14	7
74LS04	14	7
74LS08	14	7
74LS10	14	7
74LS20	14	7
7438	14	7
74LS73	2	11
74LS74	14	7
74LS83	5	12
74LS86	14	7
74LS95	14	7
74LS157	16	8
74LS193	16	8
74LS85	16	8
7437	14	7
74LS30	14	7
74LS164	14	7
74LS145	16	8

ITEM NO.	QTY	PART NUMBER	REF DES.	DESCRIPTION
				FOUR-PHASE SYSTEMS INC. © 10 MB DISC CONTROLLER CD 1 D 90032974-07 A SHEET 6 OF 6