OPTIONS

In order to meet varying requirements of different customers, PerSci provides the following options:

Vertical Operation

If the Diskette drive is to be operated with the carriage moving in a vertical direction, jumper A to B on the positioner Servo PCB must be installed.

Chassis Ground

Jumper W1 provides a convenient means of tying the chassis to ground at the drive. If this jumper is not used, the chassis should be grounded via Pin 1 of the power connector J3. There is also a ground path to the chassis via the eject motor mounting hardware.

Write Protect

Optional write protect sensors are available for the Diskette drive. If a write protected Diskette is inserted, a write protect indication is given to the controller at P1 Pin 44 for Disk 0 and at Pin 30 for Disk 1. These pins go to ground when write protected.

The PerSci "write protect" option is based on the proposed Option 1 by ANSI utilizing a notched diskette. The PerSci drive provides an optional optical sensor at the notched position to determine that the diskette is write protected. To write on a "write protected diskette" an opaque tape (Avery #DGF-K1-D12 or equivalent) must be placed over the notch to prevent the optical sensor from being activated. Figure 1-6 represents the detailed measurements associated with a write protected diskette that the PerSci unit is designed to operate with in a satisfactory manner. I.B.M. does not offer "write protect" for their floppy and thus software write protection techniques must be used with I.B.M. Diskettes.

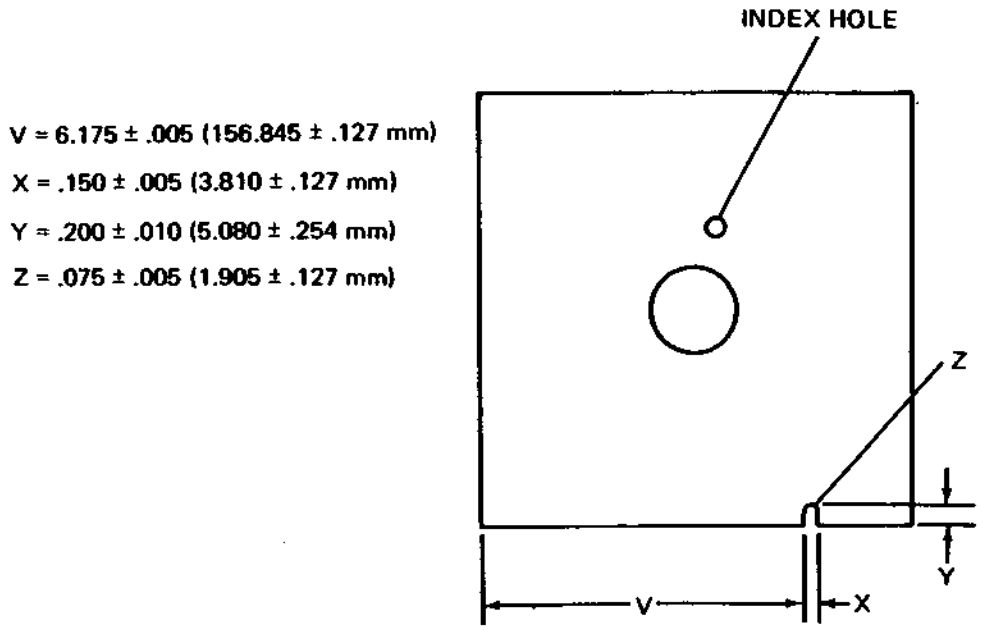

Figure 1-6. Write Protect Notch Location

Data Separator

A phase locked data separator for double frequency code (FM) is optional with PerSci Diskette drives. When this option is used, separated clock is presented to the controller interface at P1 Pin 50, and separated data at P1 Pin 48. The phase locked loop removes jitter due to peak shift from these signals. (P1-50 and P1-48 are at a logic low if this option is not installed.)

Separated clock is a 200 N-sec transition to a logic low state for every "clock bit" written on the Diskette. Separated data is a similar transition for every "data bit" written on the Diskette. A is connected to C on the data separator module for this output.

An alternative jumper connection on the data separator also provides data pulses on the clock line and clock pulses on the data line during a "soft sectored" address mark, to simulate the action of a "1-shot" type of data separator. B is jumpered to C on the data separator module for this option. Both connections work as described with "soft sectored" formats, and also work with hard sectored formats. Three bytes of data is required to synchronize the data separator.

Spindle Motor Enable

Pin 24 of the Diskette drive may be used to provide controller control of the spindle motor. A logic low on this line enables the spindle servo, such that the spindle turns when a Diskette is installed. A logic high inhibits the spindle motor, thus allowing the system to "stand by" at very low power consumption with a Diskette loaded. This option is selected by installing jumper AL to AM. If AM is instead jumpered to AN, the spindle will turn if a Diskette is present in either side.

Remote Eject

A remote eject option is available, allowing the controller to eject a Diskette. This option has a different interface for different drives. For a 270 drive, a low logic level on Pin 14 will eject a Diskette from side 0 if the option is installed; a low logic level on Pin 32 will eject a Diskette from side 1 if the option is installed. The Model 272 is similar to the Model 270, except that the option is only installed for side 0.

For the 277 drive, a logic low on Pin 14 will eject the selected Diskette.

Remote eject is not available on drives requiring external data separator sync, as Pin 14 is used for that purpose instead of remote eject.

Remote eject is a factory installed option only, and is not retrofitted. This is due to the fact that this option requires changes to early assembly stages, which become inaccessable on completed drives.

Remote eject is available if point BF is not jumpered to BH. Jumpering AY to AT creates the Model 270 select interface for this option. Jumpering AS to AT creates the 277 interface, when used in conjunction with other 277 select jumpers.

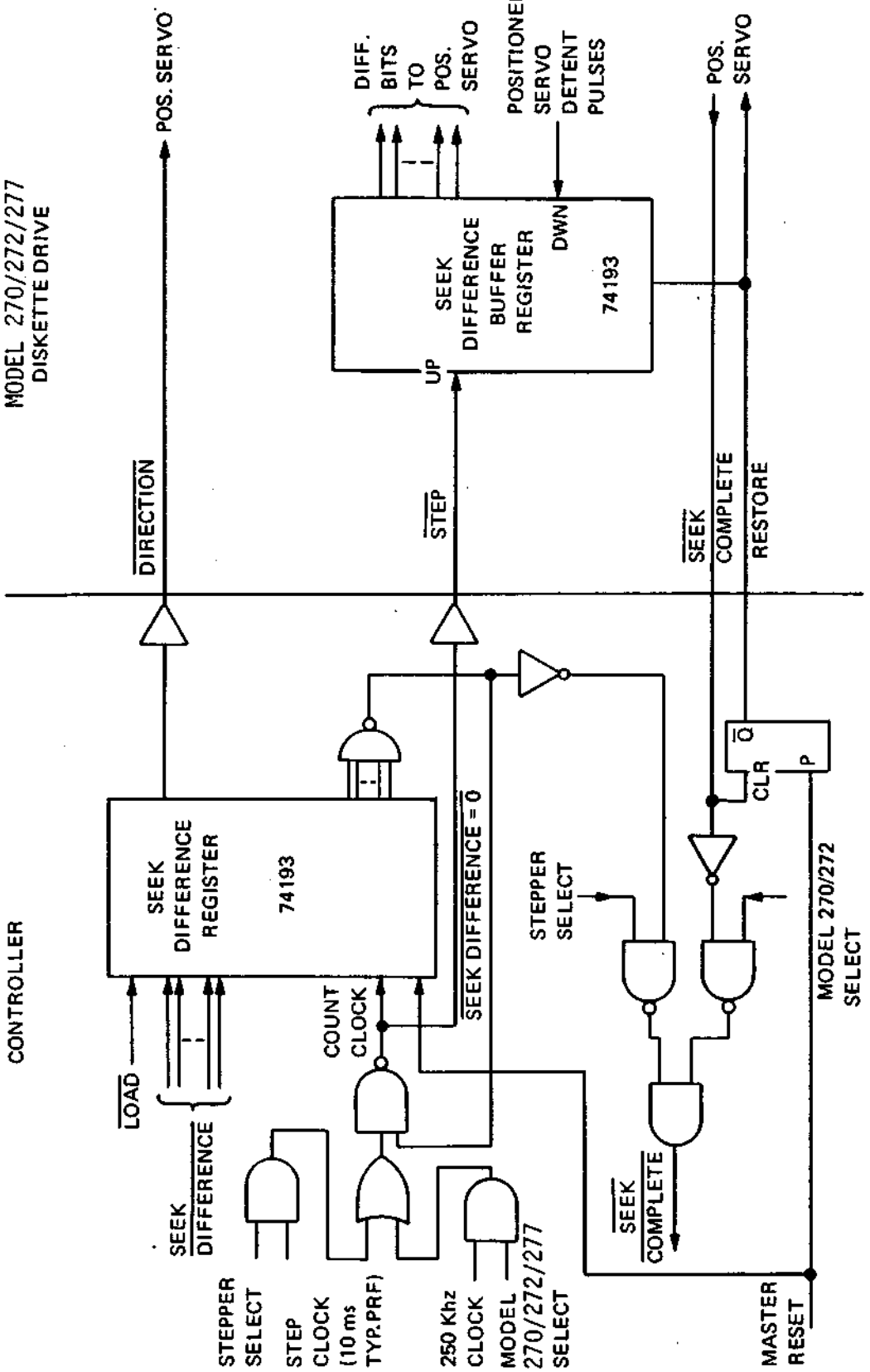

Figure 1-7. Simplified Controller Design Configuration with Fast Multi-Track Seek and Restore Option

High Speed Seek

A high speed seek option is available, shortening maximum seek time to 100 ms. This option makes use of the restore line and seek complete line as well as step and direction. Step pulses for high speed seek may be transferred at rates to 500Khz. A seek complete indication is given by a logic low on P1 Pin 10 when the drive has settled with 0.001" of track center. In the event of a missed seek, a logic low for 500 N-seconds or greater on Pin 12 will cause the drive to find Track 00. The drive automatically seeks Track 00 on power turn on.

The simplified Controller design configuration (Figure 1-7) illustrates utilization of the fast multi-track seed and restore-to-Track 00 option capability of the Model 270, 272, and 277, while simultaneously employing their conventional stepper motor interfaces. This option is selected by jumpering BD to BE.

Parallel Operation

Two dual Diskette drives can be operated with signal connectors in parallel on one signal cable (daisy chain). The drive electrically closer to the controller must have the line terminator resistor pack, U1, removed for this application. The terminator pack must be installed in the drive farther electrically from the controller. A select jumper module must be installed in U11.

The logic implementation of select is the major difference between a 270,272, and 277 drive. The 272 drive is a special case of the 270. The 277 is totally different in select implementation.

The 270 drive is selected if the select jumper module (U11) is removed. If the select jumper module is installed, the jumpers determine if the drive is a drive 1, selected by a logic low on Pin 28; or a drive 2, selected by a logic low on Pin 26. Side 1 of the selected drive is addressed by a logic low on "disk select" Pin 2.

The select module U11 is jumpered in the following manner for the 270 interface. Pin 7 is tied to Pin 8 in all 270 applications. Pin 12 is jumpered to Pin 3 for drive 1; this jumper is removed and Pin 10 is jumpered to Pin 5 for drive 2.

Separate write protect and ready lines for side 0 and side 1 are used in the 270 interface. Both side 0 and side 1 outputs on these four lines are active when the drive is selected. Index 0 and index 1 lines are also used in this same way, unless the separated index option is used, in which case index 0 becomes separated sector and index 1 becomes separated index. Separate head load input lines are provided in the 270 interface.

Jumpers H to J, D to E, F to G, M to P, R to S, BB to BC and BL to BM, must be installed to establish the Model 270 interface. Jumpers U to V, K to L, BK to BM, BA to BB, N to P, T to S, Z to J, and AP to AR must <u>not</u> be installed.

The 277 interface requires that the select module is installed. Ready, write protect, and index outputs from side 0 and side 1 are wire or'd, except Pin 20 becomes separated sector and Pin 8 becomes separated index if that option is installed. The ready, write protect, or index of the selected side is active.

There are four select inputs; select 1 left, Pin 26; select 1 right, Pin 28; select 2 left, Pin 18; and select 2 right, Pin 6. (Left and right refer to the drive in vertical operation looking at the bezel). The head is loaded by selecting a side.

The select module, U11, has Pin 2 tied to Pin 13, and Pin 4 tied to Pin 11, for drive 1; tying Pin 5 to Pin 10, and Pin 1 to Pin 14 for drive 2.

Jumper point AV must be tied to AW, Z to J, N to P, S to T, BK to BM, BA to BB, AP to AR, U to V, and K to L, for 277 operation. (An exception; for separated index options U to V, BA to BB, and BK to BM are not installed. BB to BC and BL to BM are installed instead. U to V is removed). Jumpers H to J, D to E, F to G, M to P, and R to S are not installed.

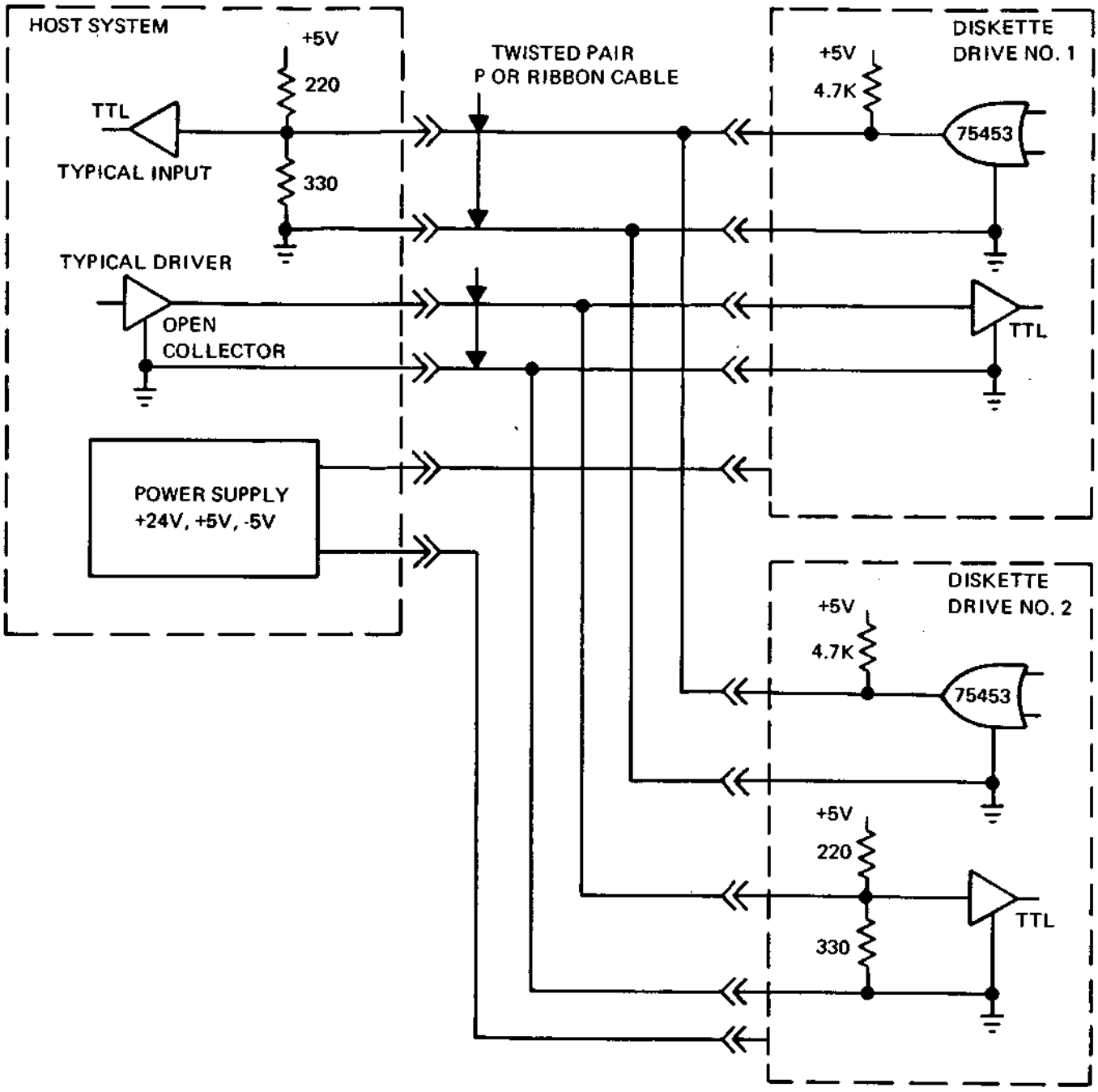

Figure 1-8. Parallel (Daisy-Chain) Drive Connection Wiring Diagram

Direct Head Load

A logic low on Pin 16 will simultaneously load all heads of both drives, overiding select functions. Drives are normally supplied with this function, which may be eliminated by removing U59. The direct head load feature allows copy without the delay caused by 4 ms. head load time.

Separated Index and Sector

Optional logic can be provided to separate the index pulse from the sector pulses of a 33 hole hard sectored Diskette, with this option installed 32 evenly spaced sector pulses per rotation will occur at the separated sector output, Pin 20. One index pulse per ratation will occur at Pin 8.

The separated sector option utilizes independent separation logic; therefore sector pulses are valid immediately after select. One rotation of a disk after insertion will synchronize the sector separation circuit; whether or not that disk is selected.

For unseparated sectors, R 8 and R 94 will be 36K, C 40 and C 41 will be 0.1 µfd, and jumpers W to X, AD to AE, AH to AJ, and AB to AC must be installed instead of the ones for separating index and sector pulses.

This option is implemented by installing optional values of 11K in R 88 and R 94; and 1µfd in C 40 and C 41. Also jumpers W to Y, AD to AF, AA to AB, AH to AK, and sector option jumpers 32 must be installed.

Sector Count Down

This option provides for dividing the sector pulses into 16, 8, 4, or 2 pulses per rotation. Separate counters are used for each side, so sector pulses are valid immediately after select. Two rotations of the disk after insertion will guarantee valid sector pulses whether or not the side was selected.

This option is obtained by the installation of optional chips U 16 and U 27 in conjunction with installing the sector option jumpers (one for each side) having the same number as the number of sectors desired.

Double Density Data Separator

PerSci Diskette drives can be equipped with a double density data separator. This will allow decoding of either MFM or M^2FM codes. This data separator is designed to synchronize to a field of 0's for 140 µ-seconds after a sync pulse. (a sector pulse or a sync generated by the controller)

Separated data and separated clock are presented to the controller at P1-48 and P1-50, respectively. Separated data is a 200 N-sec transition to logic low for each data bit written on the Diskette. Separated clock is a 250 Khz train of 200 N-sec pulses marking cell boundaries. It is derived from the phased locked oscillator, and exists whether or not clock bits are present in the encoded data.

The double density data separator replaces the single density data separator when this option is used. Drives cannot be equipped with both.

External Data Separator Sync

When the double density data separator is used, it must be synchronized either to a separated and divided sector pulses, or from sync pulses provided by the controller.

BH should tie to BV to synchronize from divided sector pulses.

BF should tie to BH if the external data separator sync is used. External data separator sync is presented to the drive at P1-14. When external data separator sync is used, remote eject cannot be used.

Decoded Select

The select module, U11, can be powered by installation of jumper auto AW, (normally AV is tied to AW for a select input) when U11 is powered. Customers can fabricate and install select decode modules of their own design.

Table 1-3. Option Jumpers

1. Located on data and interface PCB

COMPONENT AND VALUE, OR JUMPER	FUNCTION
C 40, 0.1μfd	Establishes timing of index one shot, side 0
C 40, 1.0μfd	Establishes timing of sector separation one shot, side 0
C 41, 1.0μfd	Establishes timing of index one shot, side 1
C 41, 1.0μfd	Establishes timing of sector separation one shot, side 1
R 88 36K	Establishes timing of index one shot, side 0
R 88 11K	Establishes timing of sector separation one shot, side 1
R 94 36K	Establishes timing of index one shot, side 1
R 94 11K	Establishes timing of sector separator one shot, side 1
U 16, 74193	Provides sector count down, side 1
U 27, 74193	Provides sector count down, side 0
BD to BE	Enables "seek complete" output
AL to AM	Provides spindle motor control from controller
AM to AN	Makes spindle motor independent of controller
AP to AR	Wire or's ready 0 and ready 1
AY to AT	Ties P1-32 to remote eject 1 driver
AS to AT	Ties P1-14 to remote eject 1 driver
W1	Ties signal ground to frame
W to X	Trigger to index one shot, side 0
AD to AE	Trigger to index one shot, side 1
W to Y	Trigger to sector separation one shot, side 0
AD to AF	Trigger to sector separation one shot, side 1
K to L	Wire OR's write protect output

Table 1-3. Option Jumpers

COMPONENT AND VALUE, OR JUMPER	FUNCTION
Sector 0 jumpers, 2 through 32	Selects number of sectors per rotation corresponding to number of jumper
Sector 1 jumpers, 2 through 32	Selects number of sectors per rotation corresponding to number of jumper
BH to BV	Ties sector pulse to double density data separator
BF to BH	Ties external sync (from P1-14) to double density data separator
AA to AB	Separated sector pulses to output driver (U4 Pin 7)
AB to AC	Side 0 index pulses to output driver (U4 Pin 7)
AK to AH	Separated index pulses to output driver (U4 Pin 2)
AH to AV	Side 1 index pulses to output driver (U4 Pin 2)
BA to BB	Select right to index 1 driver (U4 Pin 1)
BB to BC	Select for index 1/separated index driver (U4 Pin 1)
BK to BM	Select left to index 0 driver (U4 Pin 6)
BL to BM	Select to index 0/separated sector driver (U4 Pin 6)
U to V	Wire or index 0 and index 1
N to P	Select left to head load 0 driver (U3-2)
M to P	P1-18 to head load 0 driver (U3-2)
S to T	Select right to head load 1 driver (U3-7)
R to S	P1-4 to head load 1 driver (U3-7)
AV to AW	P1-4 to U11-14 (select 2 R to U11-14)
AV to AW	+5V to U11-14
H to J	Disk select (P1-2) to select 0 - select 1 logic
Z to J	Select right to select 0 - select 1 logic

Table 1-3. Option Jumpers

COMPONENT AND VALUE, OR JUMPER	FUNCTION
D to E	Select to select right line
F to G	Select to select left line
A to B	Read Data to read data output
A to C	PLO clock to read data output

2. Positioner servo PCB

A to B	-1V to vertical position Pins

3. Double F data separator

A to C	Normal operation
B to C	Simulates one shot output