

SECTION VII CUSTOMER INSTALLABLE OPTIONS

7.1 INTRODUCTION

The SA810/860 can be modified by the user to function differently than the standard method outlined in Sections I and II. These modifications can be implemented by adding or deleting connections and by use of the alternate I/O pins. Some options are capable of being connected by use of a shorting plug, Shugart P/N 15648 or AMP P/N 53013-2. This section will discuss a few examples of modifications and how to install them. The modifications discussed in the following paragraphs are:

- a. External Write Current Switch
- b. Two-Sided Status Output (SA860 only)
- c. Disk Change Option
- d. Side Select Option Using Direction Select (SA860 only)
- e. Side Select Option Using Drive Select (SA860 only)
- f. In Use Alternate Input
- g. Motor On Without Selecting Drive
- h. Motor On by Optional Motor On and Drive Select
- i. Motor Off Delay
- j. Radial Ready
- k. Stepper Power Down
- l. Write Protect Optional Use

Table 7-1 summarizes these options and the component designators indicating their PCB location in figure 7-1 and 7-2.

TABLE 7-1. CUSTOMER CUT/ADD TRACE OPTIONS

TRACE DESIGNATOR	DESCRIPTION	SHIPPED FROM FACTORY	
		OPEN	SHORT
U9	TERMINATIONS FOR MULTIPLEXED INPUTS		PLUGGED
SI	INTERNAL WRITE CURRENT SWITCH		PLUGGED
SE	EXTERNAL WRITE CURRENT SWITCH	X	
TR	TRUE READY OUTPUT		PLUGGED
RTR	RADIAL TRUE READY†		X
2S	TWO-SIDED STATUS OUTPUT***	X	
DC	DISK CHANGE OPTION	X	
S1	SIDE SELECT OPTION USING DIRECTION SELECT***	X	
S2	SIDE SELECT INPUT***		PLUGGED
S3	SIDE SELECT OPTION USING DRIVE SELECT***	X	
1B,2B,3B,4B	SIDE SELECT OPTION USING DRIVE SELECT***	X	
D	ALTERNATE INPUT-IN USE	X	
MS	MOTOR ON FROM DRIVE SELECT*		PLUGGED
MO	ALTERNATE INPUT-MOTOR ON*	X	
MMO	ALTERNATE INPUT-MULTIPLEXED MOTOR ON*†	X	
MD	MOTOR OFF DELAY	X	
R	READY OUTPUT		X
RR	RADIAL READY		X
SR	STANDARD READY†		PLUGGED
MT	MODIFIED TRUE READY† (OUTPUTS TRUE READY ON PIN 22)	X	
DS1	DRIVE SELECT 1 INPUT		PLUGGED
DS2,3,4	DRIVE SELECT 2,3,4 INPUT	X	
Y	DOOR LOCK/ACTIVITY LIGHT ACTIVATED FROM MOTOR ON†		PLUGGED
Z	DOOR LOCK/ACTIVITY LIGHT ACTIVATED FROM DRIVE SELECT†	X	
PD	STEPPER POWER DOWN	X	
WP	INHIBIT WRITE WHEN WRITE PROTECTED		X
NP	ALLOW WRITE WHEN WRITE PROTECTED	X	
TS	DATA SEPARATION OPTION SELECT**	X	

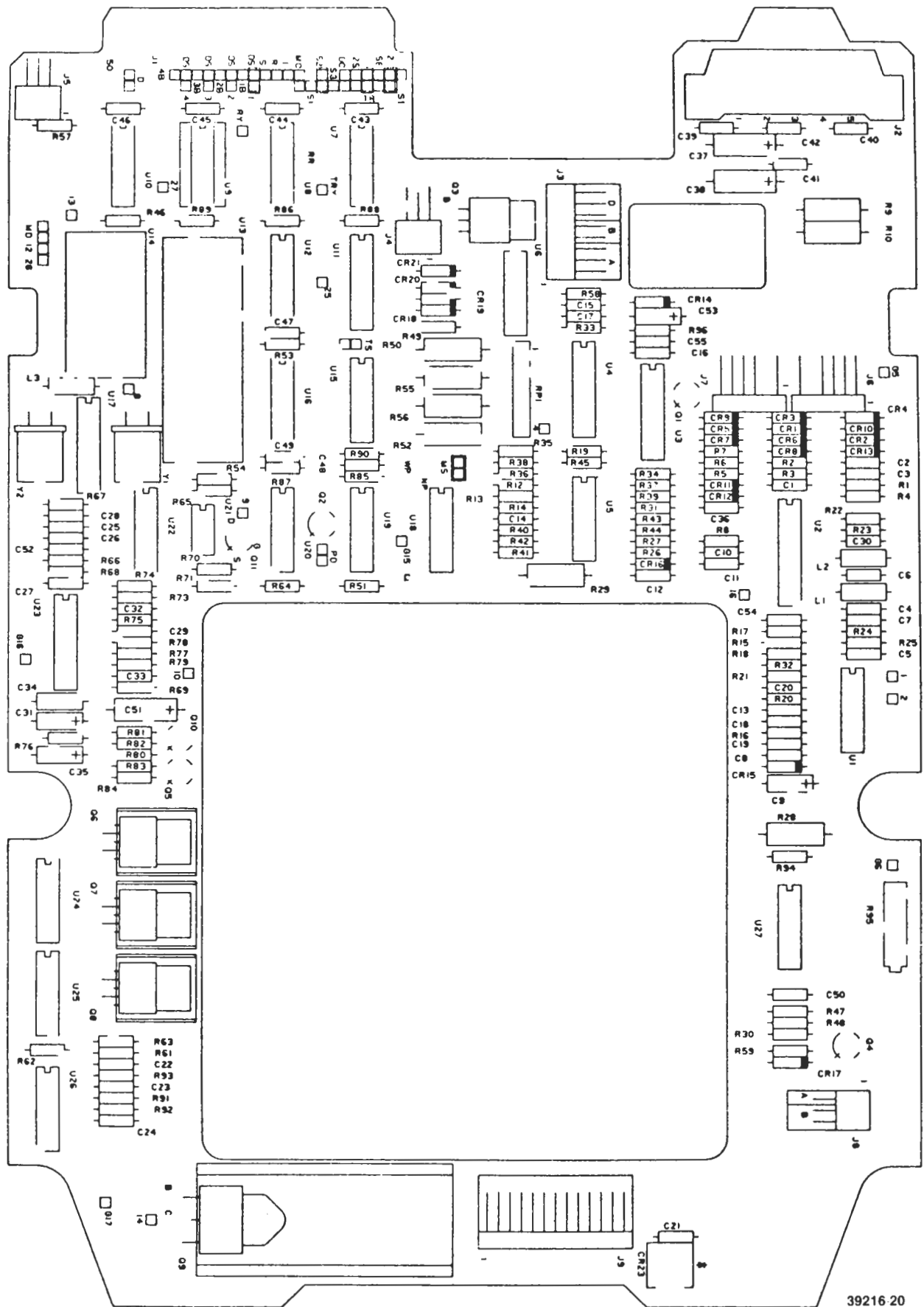
*MOTOR ON is the complement of HEAD LOAD on the SA801 and SA851 disk drives. The only difference in the operation of MOTOR ON compared with HEAD LOAD is that MOTOR ON requires a 165 ms minimum delay (or TRUE READY must be monitored) before R/W activity is begun. HEAD LOAD on the SA801 and SA851 requires 35 ms or 50 ms minimum delay.

**The SA810/860 offers an optional data separator which properly separates data and clock bits through the soft-sectored IBM standard format and address mark area. Trace "TS" offers the optional separator.

***Applies to SA860 only.

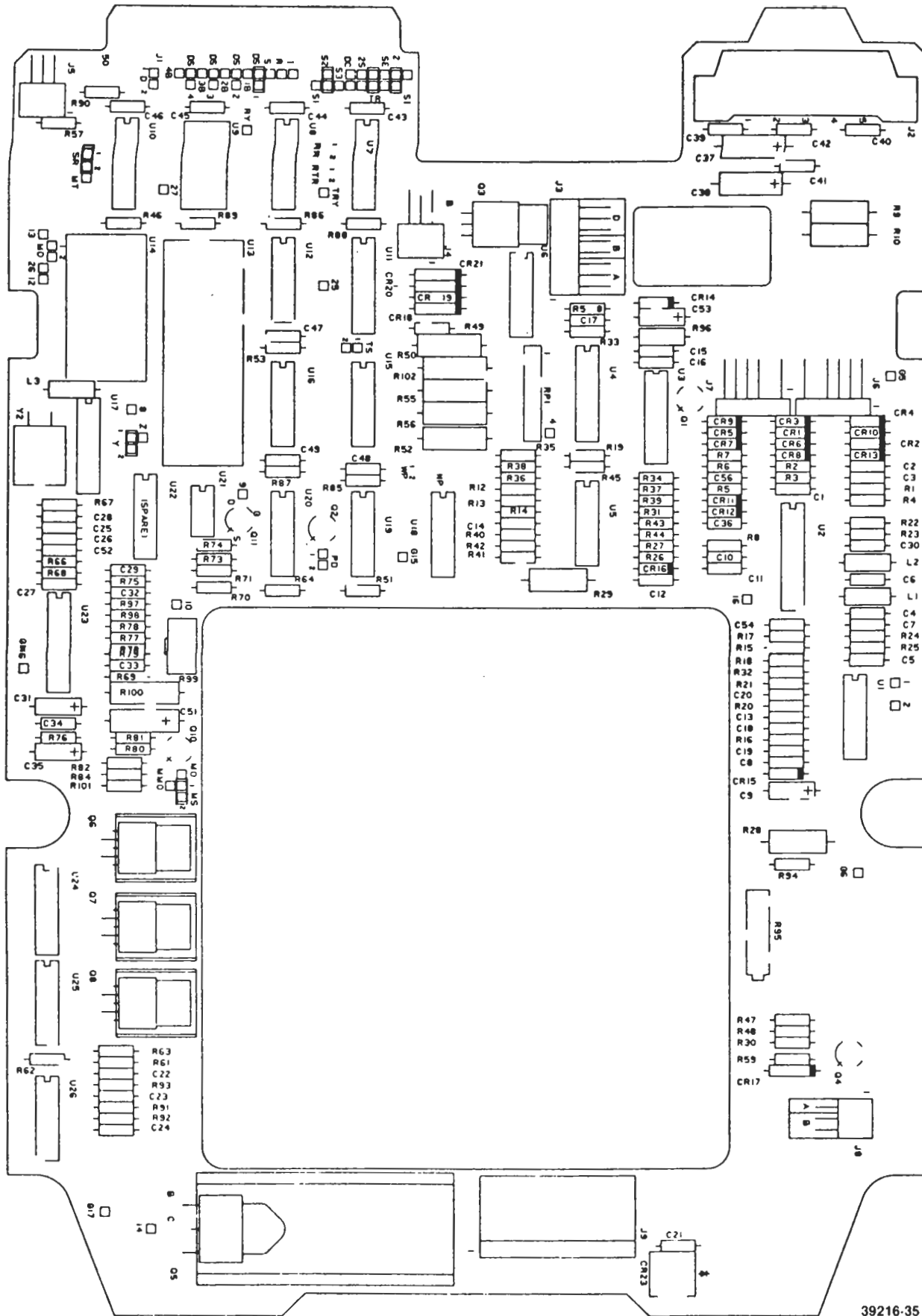
†Available on PCB P/N 25249 only.

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FIGURE 7-1. PCB COMPONENT LOCATIONS (P/N 25227 AND 25247)



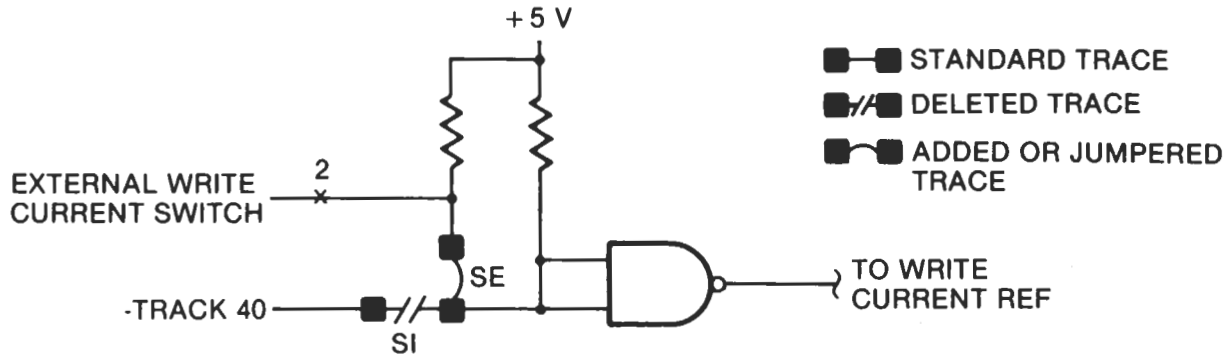
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FIGURE 7-2. PCB COMPONENT LOCATIONS (P/N 25249)

7.2 EXTERNAL WRITE CURRENT SWITCH

This option permits write current switching via the optional WRITE CURRENT SWITCHING interface line (pin 2). When the interface signal is activated to a logical zero level, the lower value of the write current is selected. Selecting this option replaces internal write current switching at track 40.

To enable external write current switching, move the shorting plug at trace SI to the SE position. See figure 7-3.



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FIGURE 7-3. EXTERNAL WRITE CURRENT OPTION

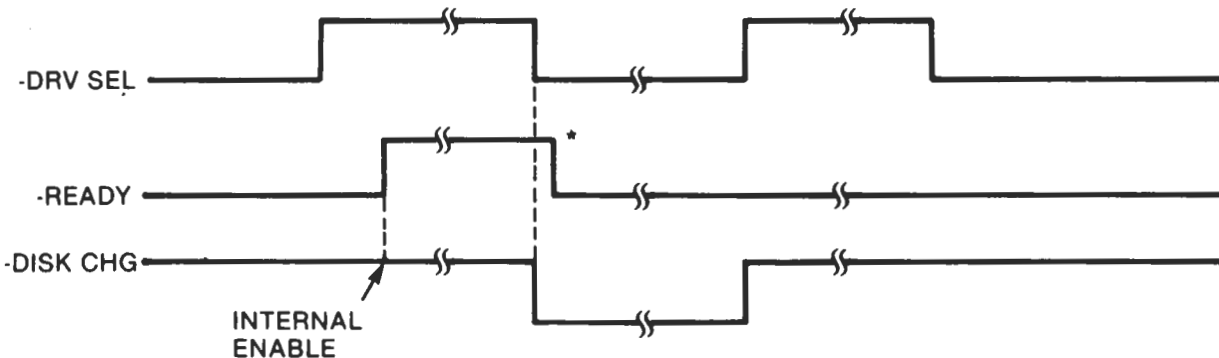
7.3 TWO-SIDED STATUS (OPTIONAL OUTPUT SA860 ONLY)

When the drive is selected and the diskette is spinning, this line will indicate a logical zero level for two sided media, and a logical one for single sided media.

To install this option on a standard drive, jumper trace 2S.

7.4 DISK CHANGE (OPTIONAL OUTPUT)

This customer installable option is enabled by jumpering trace DC. When DRIVE SELECT is activated, it will provide a true signal (logical zero) onto the interface (pin 12) if, while deselected, the drive has gone from a READY to a NOT READY (door open) condition. This line is reset on the true to false transition of DRIVE SELECT if the drive has gone READY. Timing of this line is illustrated in figure 7-4. The circuitry is illustrated in figure 7-5.



*READY will not return until two index transitions after DRIVE SELECT (MOTOR ON).

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FIGURE 7-4. DISK CHANGE TIMING

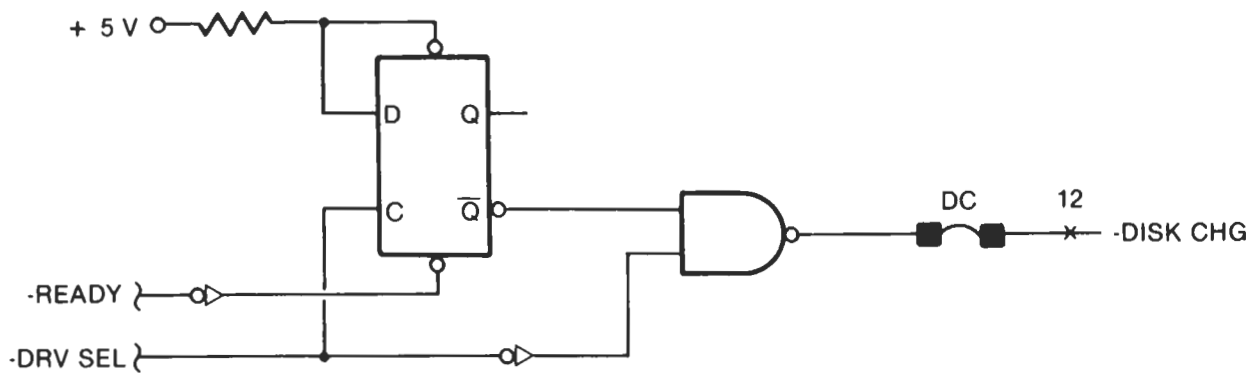


FIGURE 7-5. DISK CHANGE CIRCUIT

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7.5 SIDE SELECTION USING DIRECTION SELECT (SA860 ONLY)

The SIDE SELECT function can be controlled via the DIRECTION SELECT line, if desired. With this option, the DIRECTION SELECT line controls the direction of head motion during stepping operations and controls side (head) selection during read/write operations. To implement this option, simply move jumper S2 to location S1. Figure 7-6 illustrates the circuitry.

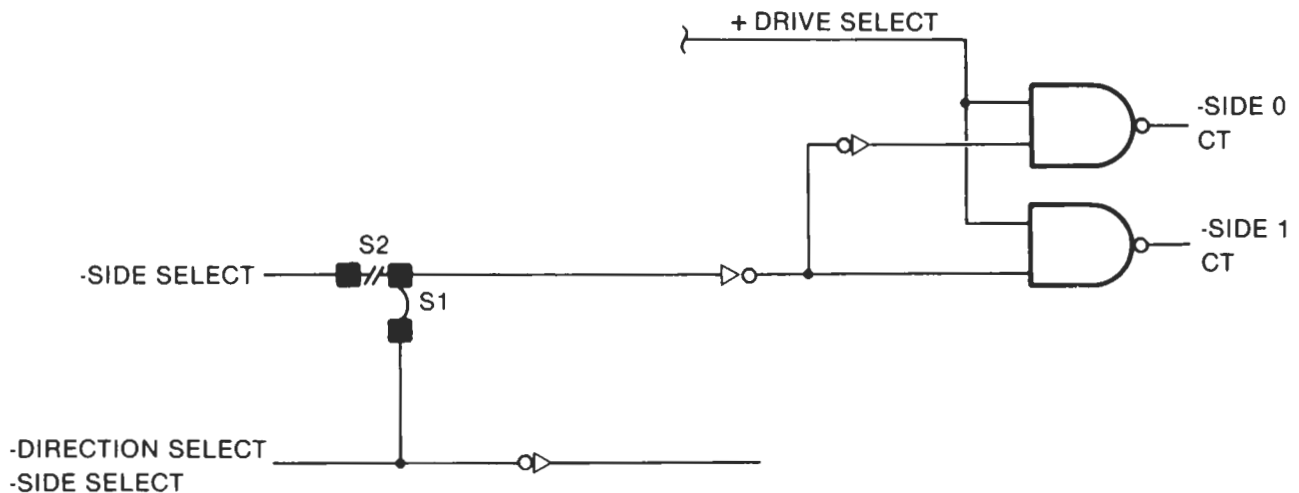


FIGURE 7-6. SIDE SELECTION USING DIRECTION SELECT

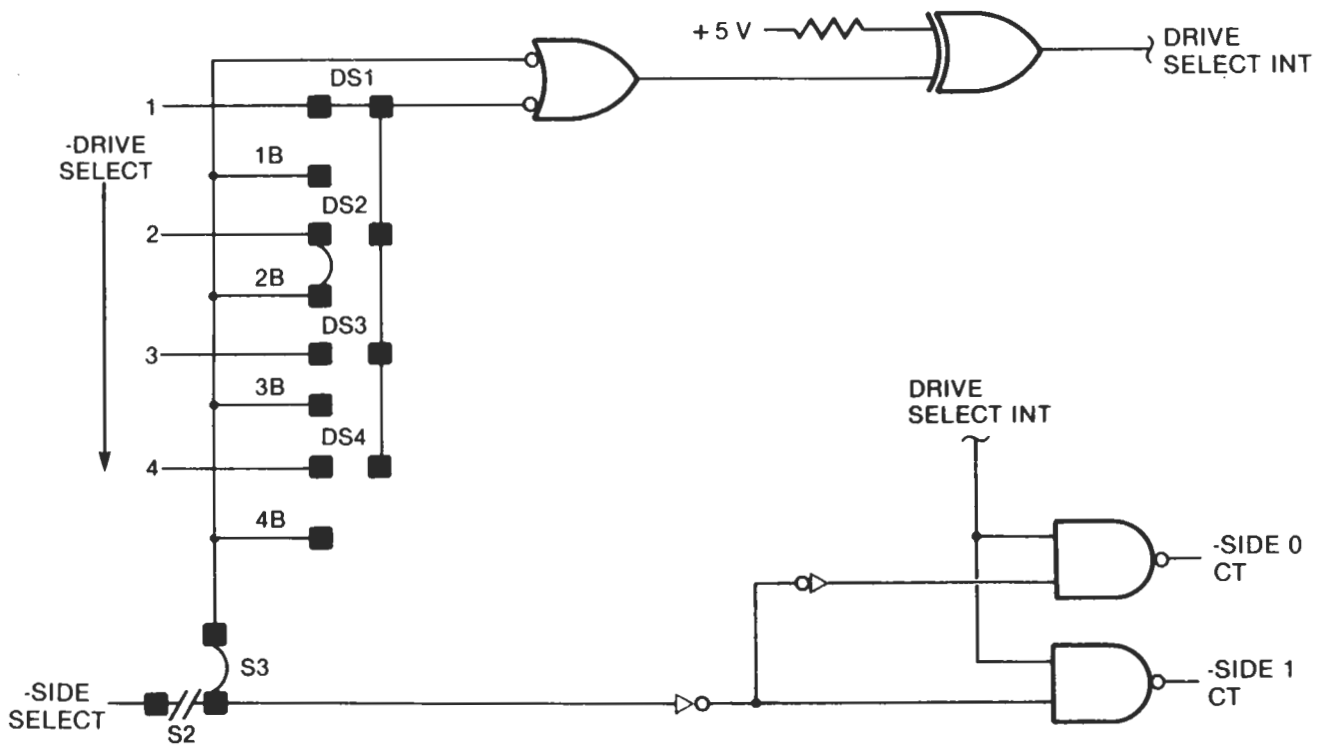
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7.6 SIDE SELECTION USING DRIVE SELECT (SA860 ONLY)

In systems containing no more than two SA860 drives per controller, each read/write head can be assigned a separate drive address. In such cases, the four DRIVE SELECT lines can be used to select the four read/write heads. To implement this option, move jumper S2 to S3 and add a jumper to nB (n = 1, 2, 3, or 4). For example, the first drive may have jumpers installed at DS1 and 2B while the second drive has jumpers at DS3 and 4B. With this jumper configuration installed, the four DRIVE SELECT lines have the following side selection functions:

- a. DRIVE SELECT 1 selects side 0 of first drive.
- b. DRIVE SELECT 2 selects side 1 of first drive.
- c. DRIVE SELECT 3 selects side 0 of second drive.
- d. DRIVE SELECT 4 selects side 1 of second drive.

Figure 7-7 illustrates the circuitry.



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FIGURE 7-7. SIDE SELECTION USING DRIVE SELECT

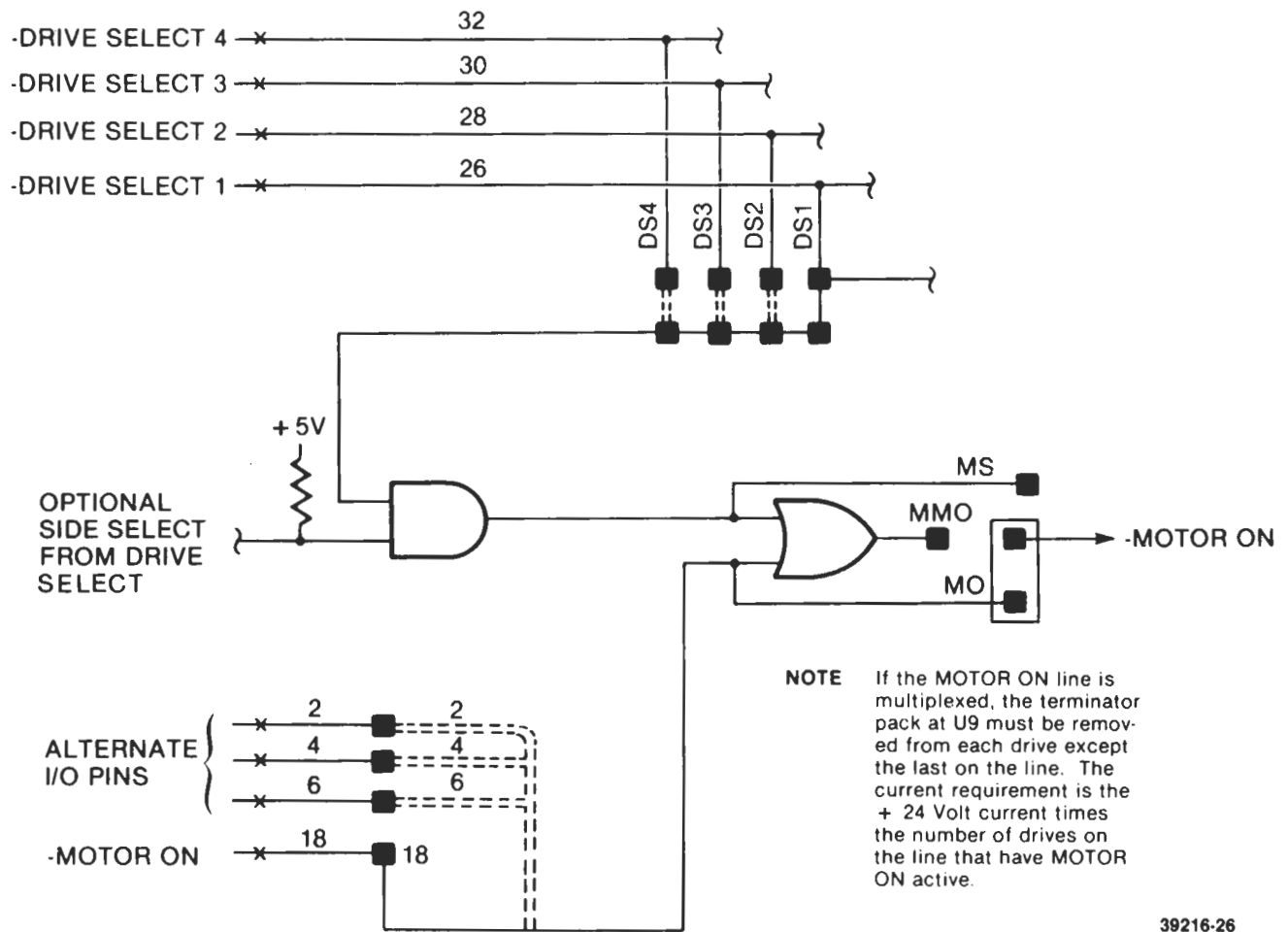
7.7 IN USE ALTERNATE INPUT

This alternate input (pin 16) when activated to a logical zero level enables the Activity LED and door lock latch if the door is closed. If IN USE is low upon deselection, the door remains locked. If IN USE is high upon deselection, the door unlocks. To install this option, jumper trace D and move the shorting plug at trace Y to the Z position.

7.8 MOTOR ON WITHOUT SELECTING DRIVE

This option is useful in disk to disk copy operations. It allows the user to keep the motor on for all drives, thereby eliminating the motor start time. The motor is started on each drive via an Alternate I/O (pin 18). Each drive may have its own MOTOR ON line (Radial or Simplexed) or they may share the same line (Multiplexed). When the drive is selected, a 1 μ s delay must be introduced or TRUE READY must be monitored before a read or write operation can be performed.

To install this option on a standard drive, move the shorting plug at trace MS to the MO position. See figure 7-8.



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FIGURE 7-8. MOTOR ON WITHOUT SELECTING DRIVE CIRCUIT

7.9 MOTOR ON BY OPTIONAL MOTOR ON AND DRIVE SELECT

This option would be advantageous to the user who requires one drive to be selected at all times, but does not wish to keep the motor on for all drives. In this configuration, the dc spindle motor is controlled from DRIVE SELECT and the optional MOTOR ON line. The advantage of this option would be that the output control signals could be monitored without spinning the diskette thereby extending the head and media life. When the system requires the drive to perform a read or write, the controller would activate the MOTOR ON line (pin 18) which in turn would activate the spindle motor. After the MOTOR ON line is activated, a 165 ms delay must be introduced or the TRUE READY line must be monitored before a read or write operation can be performed.

To install this option on a standard drive, move the shorting plug at trace MS to the MMO position. Figure 7-9 illustrates the circuitry.

7.10 MOTOR OFF DELAY

This jumper option delays the spindle motor from turning off for 16 revolutions (2.6 seconds) after the DRIVE SELECT or optional MOTOR ON signal goes false (high). This allows the user to be able to read or write within 1 μ s after the drive has been reselected, thereby eliminating the motor start time. This option is advantageous for the user who wishes to perform copy routines, but does not wish to use the optional MOTOR ON input signal.

To enable the MOTOR OFF DELAY on the standard drive, jumper trace MD.

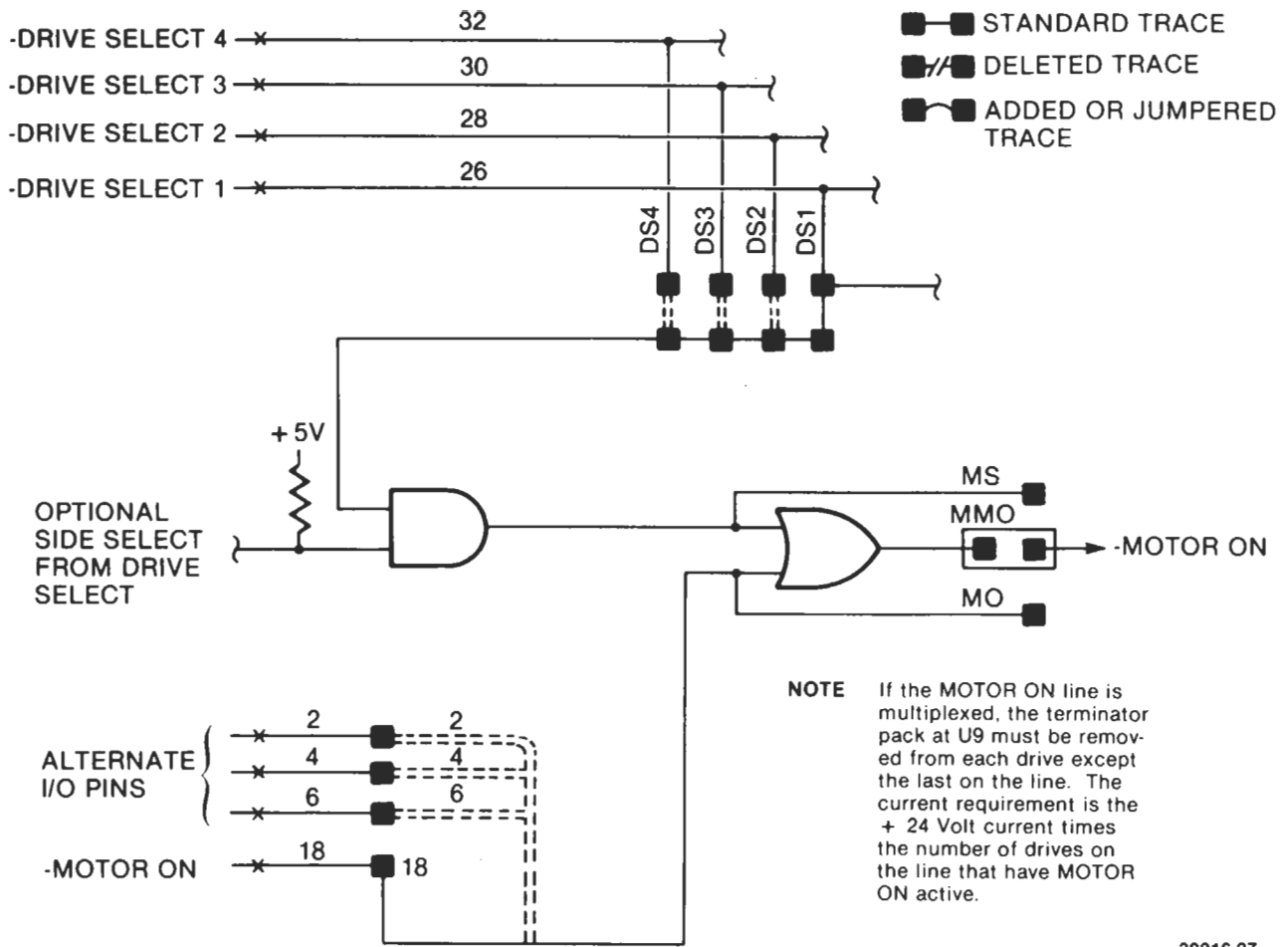


FIGURE 7-9. MOTOR ON BY OPT. MOTOR ON AND DRIVE SELECT CIRCUIT

7.11 RADIAL READY

This option enables the user to monitor the READY line of each drive on the interface. This can be useful in detecting when an operator has removed or installed a diskette in any drive. Normally, the READY line from a drive is only available to the interface when it is selected.

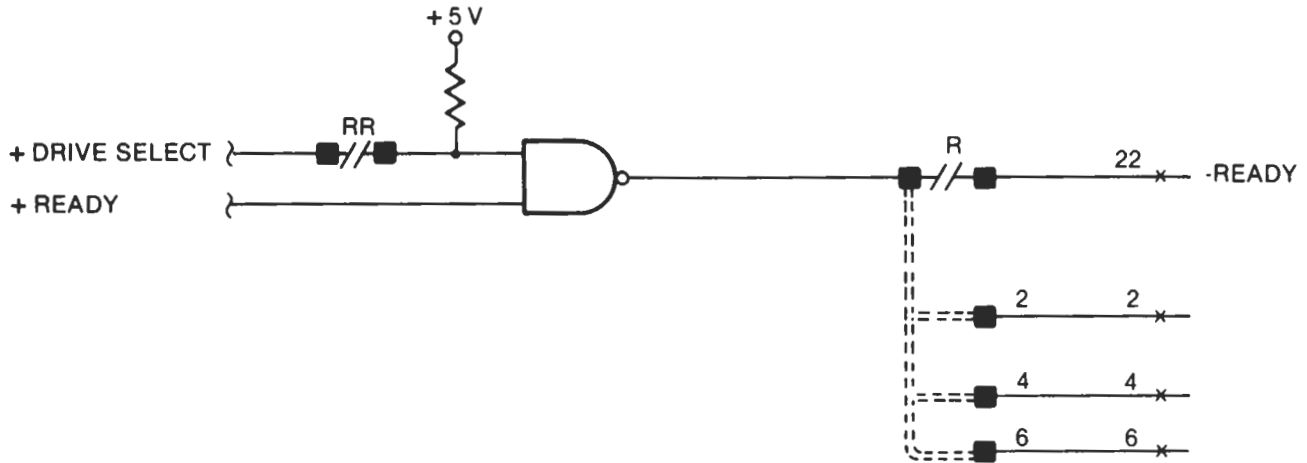
To install this option on a standard drive, the following traces should be deleted or added:

- Cut trace RR.
- Cut trace R.
- Add a wire from R to one of the Alternate I/O pins.

NOTE

One of the drives on the interface may use pin 22 as its READY line, therefore steps b and c may be eliminated on this drive. All the other drives on the interface must have their own READY line, therefore steps b and c must be incorporated.

Figure 7-10 illustrates the circuitry.



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FIGURE 7-10. RADIAL READY CIRCUIT

7.12 STEPPER POWER DOWN

If the user wishes to step the drive at a step rate of 6 ms or slower, enabling this option will allow the drive to maintain a low noise emission level.

To install this option on a standard drive, jumper trace PD.

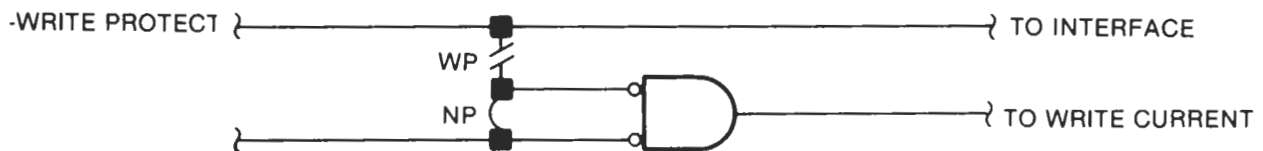
7.13 WRITE PROTECT OPTIONAL USE

As shipped from the factory, the write protect feature will internally inhibit writing when a write protected diskette is installed. With this option installed, a write protected diskette will not inhibit writing, but it will be reported to the interface. This option may be useful in identifying special use diskettes.

To install this option on a drive with the write protect feature, the following traces should be added or deleted.

- a. Cut trace WP.
- b. Connect trace NP.

Figure 7-11 illustrates the circuitry.



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FIGURE 7-11. WRITE PROTECT CIRCUIT