

Application Note

**Replacing A  
Tandon TM848-1  
With An SA810**

Shugart



# APPLICATION NOTE FOR REPLACING A TANDON TM848-1 WITH A SHUGART SA810

## 1.1 INTRODUCTION

This application note provides the information required to replace a Tandon TM848-1 with a Shugart SA810. For a more detailed description of the SA810, refer to the SA810/860 OEM Manual (P/N 39216).

## 1.2 PHYSICAL MOUNTING

The SA810 has the same four bottom mounting holes as the TM848-1. The side mounting holes are located at different heights, but have the same position otherwise. See figure 1-1.

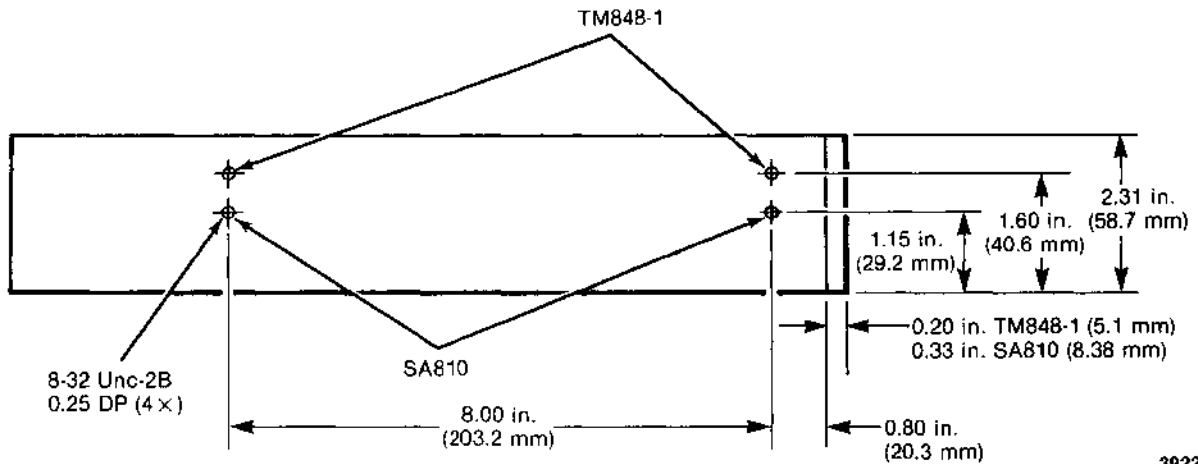


FIGURE 1-1. SIDE VIEW MOUNTING HOLE LOCATIONS

## 1.3 DC POWER REQUIREMENTS

Like the TM848-1, the SA810 requires +24 V and +5 V. DC power is supplied via a 5 pin AMP Mate-N-Lok connector, P/N 1-350945-0 (J2). The recommended mating connector (P2) is AMP P/N 1-480763 utilizing AMP pins P/N 350689-1.

The TM848-1 uses a 6 pin AMP connector, P/N 1-380999-0, connected to AMP P/N 1-480270-0 utilizing AMP pins P/N 61117-1. Because of this, the TM848-1 dc plug is not directly compatible with the SA810. Therefore, a dc plug adapter P/N 51438 must be used, or if preferred, the 6 pin connector may be replaced with the recommended P2 connector.

## 1.4 INTERFACE CONNECTIONS

The SA810 uses the same 50 pin cable as the TM848-1. All the interface lines used on the TM848-1 are also used on the SA810, except for the optional MOTOR OFF control lines. Note 3 of table 1-2 describes how the SA810 may be jumpered so that the MOTOR OFF control lines are not needed. The SA810 also has some I/O lines that are not present on the TM848-1 (see table 1-1). These lines may be used to enhance the system (depending on the capabilities of the controller and the operator's discretion), but are not required. To replace a TM848-1 (jumpered as shipped from the factory) with an SA810, follow these steps:

- a. If step rate is 6 ms or slower, jumper trace designator PD. This will ensure quiet stepping.
- b. If external write current switching is utilized, remove jumper SI, and jumper trace SE.
- c. Remove terminator pack at location U9 on all drives except for the last drive on the daisy chain.
- d. All other jumpers are positioned as shipped from the factory.

If the TM848-1 being replaced has been jumpered differently than the standard factory configuration, refer to table 1-2. This table can be used as a quick cross reference between the trace designators on the TM848-1 and the trace designators on the SA810.

For example, if the jumper configuration for the user's system calls for trace designator M3 to be jumpered, table 1-2 indicates that designator MS must be plugged on the SA810 PCB.

For a more detailed description of the SA810, refer to the SA810/860 OEM Manual.

## **1.5 TIMING CONSIDERATIONS**

Most of the timing requirements between the SA810 and the TM848-1 are identical. However, there are two notable exceptions: the READY line and motor start time.

The TM848-1 adds SPINDLE MOTOR ON as an additional qualification to the industry standard READY line of the SA810. This means that, during the time when the spindle motor is **not** up to speed and a diskette is properly inserted, the logical states of the READY line on the TM848-1 and the SA810 will differ. This creates no problem with most controllers designed to utilize the TM848-1 drives but there are exceptions. Figure 1-2 illustrates the timing relationship just described.

Motor start time for the TM848-1 is 800 ms maximum while the motor start time for the SA810 is only 165 ms maximum. A considerable improvement in access times can be attained by adjusting the motor start (HEAD LOAD) delay to the SA810 specification.

**TABLE 1-1. TM848-1 VERSUS SA810 INTERFACE CONNECTIONS**

PIN	TM848-1	SA810
2	EXTERNAL WRITE CURRENT SWITCH	EXTERNAL WRITE CURRENT SWITCHING*
4	MOTOR OFF CONTROL 1	ALTERNATE I/O
6	MOTOR OFF CONTROL 2	ALTERNATE I/O
8	MOTOR OFF CONTROL 3	TRUE READY
10	ALTERNATE I/O	TWO SIDED STATUS* †
12	DISK CHANGE*	DISK CHANGE*
14	ALTERNATE I/O	SIDE SELECT †
16	ACTIVITY INDICATOR*	IN USE*
18	MOTOR ON*	MOTOR ON*
20	INDEX	INDEX
22	READY	READY
24	MOTOR OFF CONTROL 4	SECTOR
26	DRIVE SELECT 1	DRIVE SELECT 1 (SIDE SELECT OPT) †
28	DRIVE SELECT 2	DRIVE SELECT 2 (SIDE SELECT OPT) †
30	DRIVE SELECT 3	DRIVE SELECT 3 (SIDE SELECT OPT) †
32	DRIVE SELECT 4	DRIVE SELECT 4 (SIDE SELECT OPT) †
34	DIRECTION SELECT	DIRECTION SELECT (SIDE SELECT OPT) †
36	STEP	STEP
38	WRITE DATA	WRITE DATA
40	WRITE GATE	WRITE GATE
42	TRACK 00	TRACK 00
44	WRITE PROTECT	WRITE PROTECT
46	READ DATA	READ DATA
48	ALTERNATE I/O	SEPARATED DATA
50	ALTERNATE I/O	SEPARATED CLOCK

\*Jumper enabled alternate I/O lines.

†The SA810 shares the same PCB as the SA860. These I/O lines only apply to SA860 drives, even though they are present on the SA810.

39220-03-A

**TABLE 1-2. CUSTOMER CUT/ADD TRACE OPTIONS**

DESCRIPTION	TM848-1				SA810		
	TRACE DESIGNATOR	SHIPPED FROM FACTORY		TRACE DESIGNATOR	SHIPPED FROM FACTORY		
		OPEN	SHORT		OPEN	SHORT	
DRIVE ADDRESS SELECT PINS	DS1-DS4	X	DS1	DS1-DS4	X	DS1	
IN USE FROM DRIVE SELECT	Z		X	Z	X		
IN USE FROM MOTOR ON	Y	X		Y		PLUGGED	
READY ALTERNATE OUTPUT PAD	R		X	R		X	
INDEX ALTERNATE OUTPUT PAD	I			NOTE 1			
ALTERNATE INPUT - IN USE	D	X		D	X		
ALTERNATE OUTPUT DISK CHANGE	DC	X		DC	X		
STEPPER POWER FROM DRIVE SELECT	DS	X		NOTE 1			
STEPPER POWER FROM HEAD LOAD	HL		X	NOTE 1			
DISKETTE LEVER (OPTIONAL)	DL	X		NOTE 1			
RADIAL READY	RR		X	RR		X	
READY MODIFIED	RM	X		N/A			
RADIAL INDEX	RI		X	N/A			
INHIBIT WRITE WHEN WRITE PROTECTED	WP		X	WP		X	
ALLOW WRITE WHEN WRITE PROTECTED	NP	X		NP	X		
SPINDLE MOTOR DELAY	M1		X	NOTE 2			
SPINDLE MOTOR CONTROL FROM MOTOR CONTROL	M2	X		NOTE 3			
SPINDLE MOTOR CONTROL FROM DRIVE SELECT	M3		X	MS		PLUGGED	
SPINDLE MOTOR CONTROL FROM HEAD LOAD (MOTOR ON)	M4	X(B)	(A,C,X)	MO	X		
SPINDLE MOTOR CONTROL FROM HEAD LOAD-MULTIPLEXED (MOTOR ON)	M4	X(X)	(A,B,C)	MMO	X		
MOTOR CONTROL SELECT	MC1-MC4	X		NOTE 3			
TERMINATIONS FOR MULTIPLEXED INPUTS	RP1		PLUGGED	U9		PLUGGED	
TWO SIDED STATUS OUTPUT†	2S	X		2S	X		
SIDE SELECT OPTION USING DIRECTION SELECT†	S1	X		S1	X		
STANDARD SIDE SELECT INPUT†	S2		X	S2		PLUGGED	
SIDE SELECT OPTION USING DRIVE SELECT*	S3	X		S3	X		
SIDE SELECT OPTION USING DRIVE SELECT†	1B,2B,3B,4B	X		1B,2B,3B,4B	X		
TRUE FM DATA SEPARATION	N/A			TS	X		
INTERNAL WRITE CURRENT SWITCH	N/A			SI		PLUGGED	
EXTERNAL WRITE CURRENT SWITCH	SHORTED TRACE	N/A	X	SE	X		
TRUE READY OUTPUT	N/A			TR		PLUGGED	
RADIAL TRUE READY	N/A			RTR		X	

39220-02/1-A

**TABLE 1-2. CUSTOMER CUT/ADD TRACE OPTIONS (CONTINUED)**

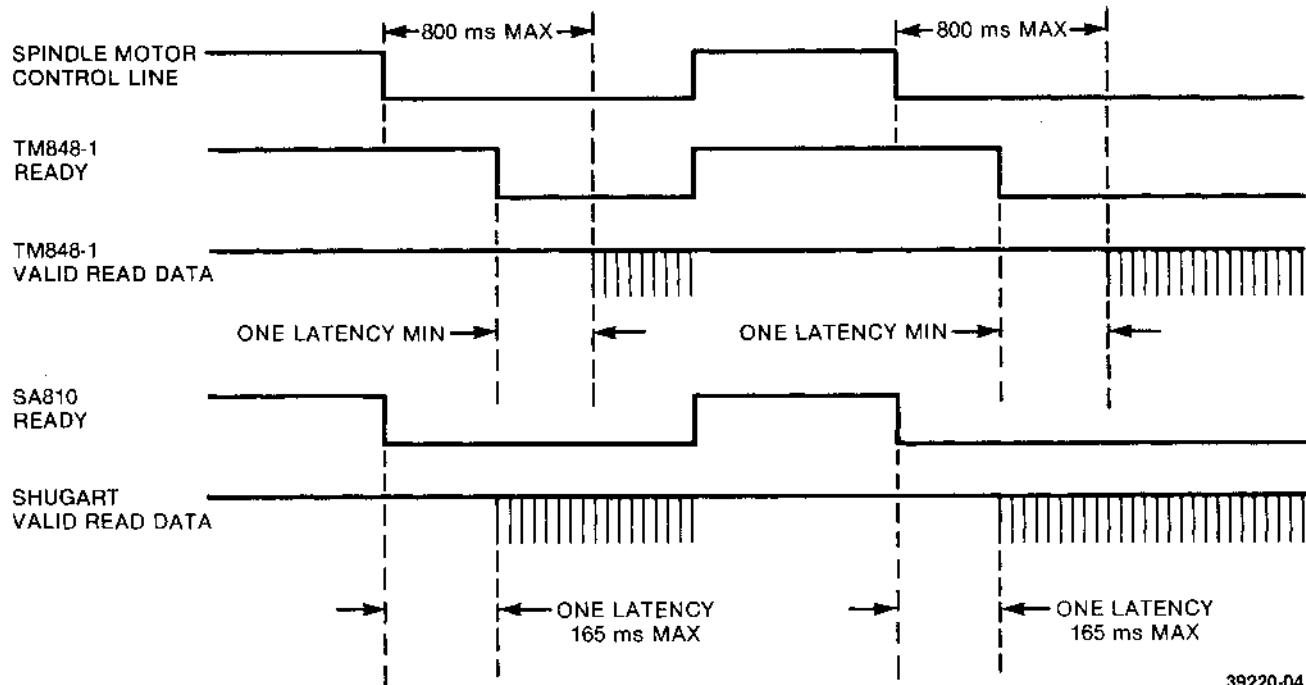
STANDARD READY	N/A			SR		PLUGGED
MODIFIED TRUE READY	N/A			MT	X	
MOTOR OFF DELAY	N/A			MD	X	
STEPPER POWER DOWN	N/A			PD	X	

†Since the SA810 uses the same PCB as the SA860, some jumpers on the SA810 apply only to double-sided operation. These cut trace options can then be ignored.

**NOTES**

1. The operation of the SA810 is automatically identical to that of the TM848-1 with this jumper installed.
2. The TM848-1 has the ability to delay turning off the spindle motor by timing-out 20 seconds after the line controlling the spindle motor goes false. This was done to reduce the effect of the slow motor start time on the TM848-1. Since the SA810 has a fast start spindle motor, the long delay used on the TM848-1 is not necessary. Eliminating the delay prolongs the life of the media. If a delay is required, the MD jumper may be used to delay MOTOR OFF by 2.6 seconds, or the delay can be performed by the drive controller.
3. The MOTOR CONTROL lines on the Tandon drive are used when it is necessary to keep the dc motor spinning when DRIVE SELECT is inactive. The SA810 has the ability to delay MOTOR OFF for 2.6 seconds after DRIVE SELECT goes inactive (high) by plugging the MD jumper. For most applications, this will preclude the need to use the optional MOTOR OFF lines. The MOTOR ON line of the SA810 may optionally be used to activate the dc spindle motor.

39220-02/2-A



39220-04

**FIGURE 1-2. SA810 AND TM848-1 TIMING RELATIONSHIPS**



# Shugart

Copyright 1982

475 Oakmead Parkway Sunnyvale, California 94086  
Telephone: (408) 733-0100 TWX: 910 339 9355 SHUGART SUVL

P/N 39220-1 7/82

PRINTED IN U.S.A.