"DATASPEED*" 4500 KEYBOARDS

TESTING AND TROUBLESHOOTING
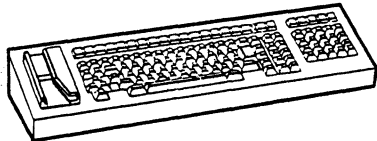
1. GENERAL

1.01 This section provides testing and trouble-shooting for the DATASPEED 4500 series keyboard as in Fig. 1.
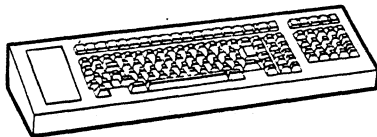
45K301GAA/03 Keyboard
Without Magnetic Stripe Reader

45K301GAA/02 Keyboard
With Magnetic Stripe Reader

Fig. 1—DATASPEED 4500 Keyboards

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

Note: When ordering replaceable parts, prefix each part number with the letters "TP" (ie, TP123456), unless otherwise specified.

1.03 The extent of the testing and trouble-shooting procedures are limited to that which is required for correction of troubles or replacement of parts in field locations.

1.04 Refer to Section 582-311-100 for information providing description and operation of DATASPEED 4500 series keyboards, Section 582-311-400 for wiring, and Section 582-311-700 for adjustments, disassembly/reassembly and parts information.

1.05 The reference manual associated with the DATASPEED 4500 series keyboard is:
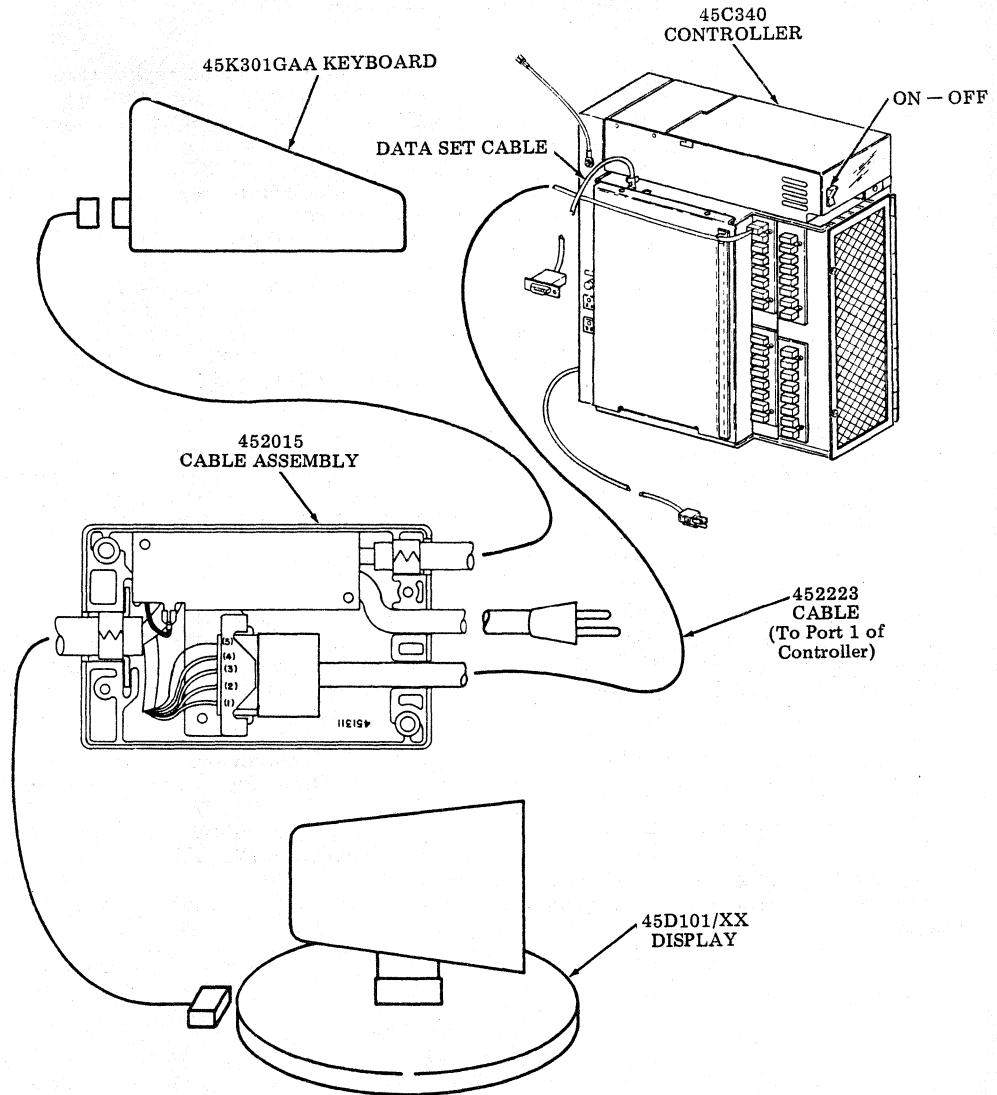999-300-140 How to Operate Synchronous DATASPEED 4540 Keyboard Display.

2. TESTING

2.01 Operational checkout procedures are presented in Tables A through D. Use all applicable tables to assure complete operation after maintenance or to isolate a poorly defined trouble area.

2.02 Perform the checkout in the order presented. The required response for each test step is shown. If the unit under test fails to respond correctly to a test step, go to 3. TROUBLESHOOTING.

2.03 The keytop identification can be found in Fig. 4.

*Registered Trademark of AT&TCo.

2.04 Typical setup for testing a 45K301GAA keyboard is shown below.

45C340
CONTROLLER

45K301GAA KEYBOARD

DATA SET CABLE

ON — OFF

452015
CABLE ASSEMBLY

452223
CABLE
(To Port 1 of
Controller)

45D101/XX
DISPLAY

Note: Neither a 45CAB501 cabinet or a 45B301 base is required.

Fig. 2

2.05   Tables A and B should be performed for any KD device having trouble. Table C is only used for keyboards equipped with a magnetic stripe reader (MSR). See Section 582-300-500 for KD/CONTROLLER LOCAL TEST.

Caution: When the SCC is on-line, and a KD is attempting to perform the loopback portion (Step 6) of the test, the SCC will ignore the line (from computer) for 500 ms. During this time, poll or select sequences may be missed. If two or more KDs are attempting to perform the loopback portion of the test simultaneously, the SCC will ignore the line for 500 ms for each KD attempting the test. This may cause the SCC to miss several poll or select sequences and therefore fail to respond to the computer, thus causing the computer to stop polling the SCC. For this reason, it is suggested that an interval of at least ten seconds be provided between performing the loopback portion of the test at each KD being tested.

2.06   Power up in the following sequence:

SCC (45C340 Controller, Fig. 2),
Display Base AC Power Switch,
Monitor AC Power Switch, then adjust to full brightness.
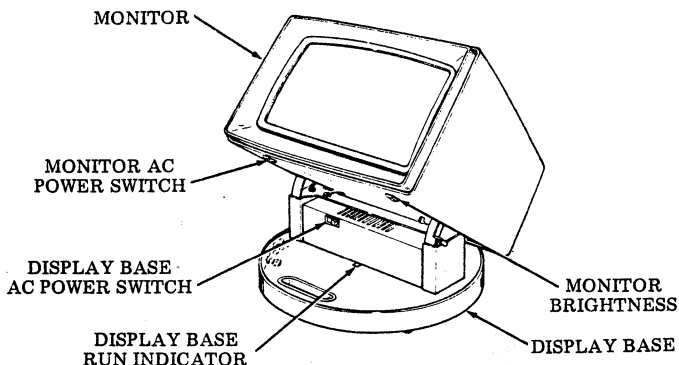
Fig. 3—Display Base and Monitor
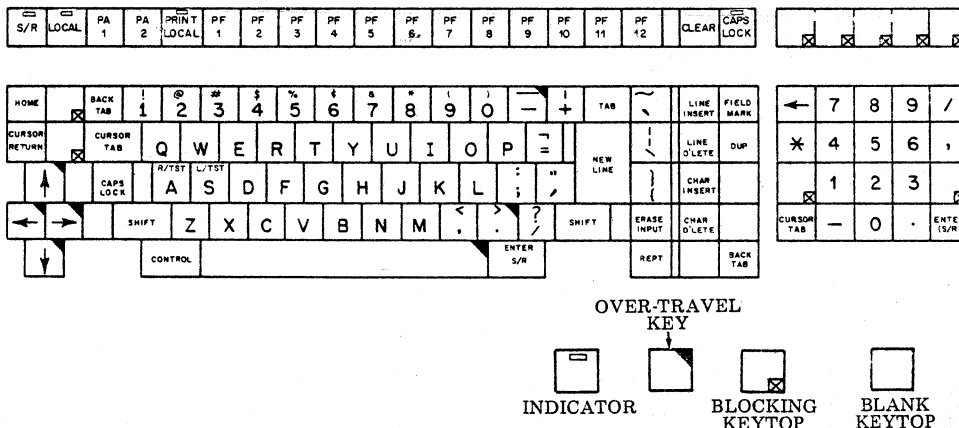
Fig. 4—Keytop Layout for 45K301/GAA

TABLE A

OPERATIONAL CHECKS FOR THE 45K301 KEYBOARD

| TEST STEP	PROCEDURE	RESPONSE
1	[LOCAL] indicator is on.	If not, depress it.
2	Depress the [ERASE INPUT] and [-] keys simultaneously and then release.	[T S T] indicator lamp lights (brightly) and remains lighted indicating the loopback test mode is activated. Alarm sounds, until keys are released.
3	Depress the following keys while observing lights for proper indication. (a) Depress [-] briefly, (in cluster). Depress [REPT] release. (b) Depress [> .] fully. Depress [↓] fully and release. (c) Depress [H] briefly. Depress [LINE INSRT] and release. (d) Depress [PF 8] briefly. Depress [PA 2]	[S/R] flashes. [S/R] on steady and then off. [LOCAL] flashes. [LOCAL] on steady and then off. [PRINT LOCAL] flashes. [PRINT LOCAL] on steady and then off. [CAPS LOCK] flashes. [CAPS LOCK] on steady and then off. *Note:* Ignore any characters that may appear on your screen during test.
4	Depress [ERASE INPUT] and [> .] keys simultaneously and then release.	[T S T] indicator lamp extinguishes. Alarm may sound. *Note:* No status word on exit of test mode.
5	Depress [LOCAL] if not on. Depress [CAPS LOCK] key. Depress each key (shown on next page).	[LOCAL] on. [CAPS LOCK] on. CAPS characters displayed on monitor.

TABLE A (Contd)

OPERATIONAL CHECKS FOR THE 45K301 KEYBOARD
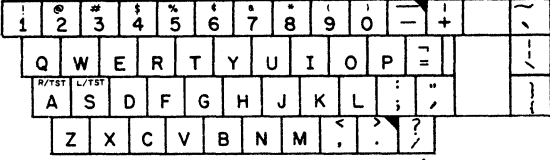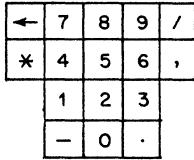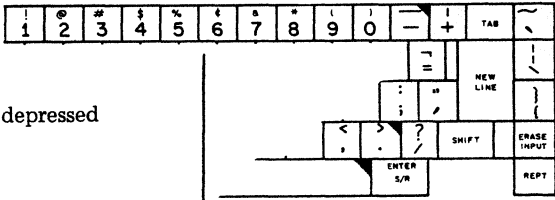
TEST STEP	PROCEDURE	RESPONSE
5 (Contd)	Lower portion of depressed keys are displayed. 	
6	Disengage [CAPS LOCK] key by depressing it again momentarily. Again depress each alpha key.	Alpha characters described in Step 5 are displayed in lower case (ie, abcdef, etc).
7	Depress the right [SHIFT] key together with each nonalpha key (ie, !@*$,etc) on the keyboard portion of the opcon. [ ] Key repeats, when depressed with additional force. 	Upper portion of depressed keys are displayed.
8	Depress the left [SHIFT] key together with one of the keys depressed in Step 7.	Character on the upper portion of depressed key is displayed.
9	With the LOCAL lamp lit, depress the [PA 1] key, then depress the [LOCAL] key. Continue to depress the [PA 2] , [PF 1] , [PF 2] , through [PF 12] keys and [CONTROL] key together with [A R/TST] key in the same manner.	The [LOCAL] lamp extinguishes each time a [PA] or [PF] key is depressed and will remain off until the [LOCAL] key is depressed.

TABLE A (Contd)

OPERATIONAL CHECKS FOR THE 45K301 KEYBOARD

TEST STEP	PROCEDURE	RESPONSE
10	With LOCAL lamp lit, depress SPACE bar, with force. Depress [FIELD MARK] . Depress [DUP] . Depress [ENTER (S/R)] .	Repeat cursor movement to right. FM is displayed. DU is displayed. Cursor moves home. Local Indicator goes out.
11	Depress [LOCAL] , [REPT] , and [Q] .	LOCAL lights. Repeated Qs displayed.
12	Depress [S/R] , [LOCAL] , [PRINT LOCAL] , If there is a printer in system and if available. If there is no printer or is unavailable.	[LOCAL] off. [LOCAL] on. [PRINT LOCAL] and [S/R] on, [LOCAL] off. Then [PRINT LOCAL] and [S/R] off, [LOCAL] on. [PRINT LOCAL] flashes until [LOCAL] depressed
13	Turn keylock to off (if present). Depress [ERASE INPUT] and [−] simultaneously. *Warning: Do not depress any key while turning the keylock on or off.* Turn keylock on, and depress LOCAL.	[LOCAL] off. [T S T] lamp does not light. [LOCAL] lights.

TABLE B

OPERATIONAL CHECKS FOR KEYBOARD TO MONITOR
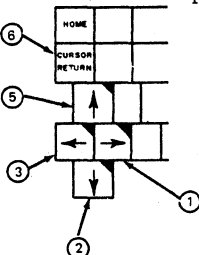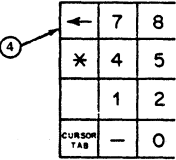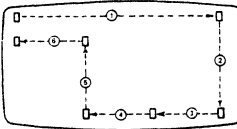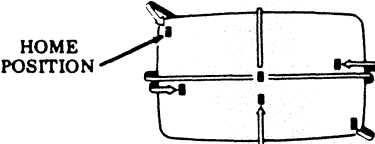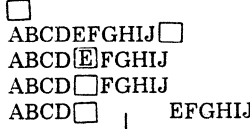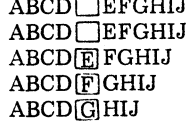
TEST STEP	PROCEDURE	RESPONSE
1	Depress left [CONTROL] key together with keys [L/TST S] containing control characters.	Test Functions (Local Test message displayed)
2	Depress [HOME] key. Then in sequence depress momentarily, with more force than normally required, each cursor movement key shown. The left arrow in the cluster must be depressed 4 or 5 times as it is not repeating.	*Note:* Attempts to move cursor off display will result as shown below. **HOME POSITION**
3	Home cursor and type alpha characters A through J. Place cursor over the character E and depress [CHAR INSRT] key momentarily; then depress it fully, releasing it after characters stop moving.	□ ABCDEFGHIJ□ ABCD[E]FGHIJ ABCD□FGHIJ ABCD□ EFGHIJ
4	Depress [CHAR DLETE] key momentarily; then depress it fully.	ABCD□EFGHIJ ABCD□EFGHIJ ABCD[E]FGHIJ ABCD[F]GHIJ ABCD[G]HIJ
5	Depress [LINE INSRT] key once.	Cursor remains in position and the line of data moves down one line.
6	Depress [LINE DLETE] key once; then depress [CLEAR] key.	Cursor remains in position and the line of data moves up. Display is then cleared of all characters.

TABLE B (Contd)

OPERATIONAL CHECKS FOR KEYBOARD TO MONITOR

TEST STEP	PROCEDURE	RESPONSE
7	Move cursor away from home position and depress the [CURSOR TAB] key.	Cursor returns to home position (unformatted display). Cursor advances to the next, current, unprotected field in the display (formatted display).
8	Move cursor away from home position and depress [BACK TAB] key.	Cursor returns to home position (unformatted display). Cursor reverses location to preceding start of an unprotected field on the display (formatted display).
9	Move cursor away from home position and depress [TAB] key.	Nulls are written (Displayed as Spaces) from cursor to end of display and cursor returns to home position (unformatted display). Cursor advance to next, current, unprotected field on the display and replaces remainder of field from cursor location with nulls (formatted display).
10	Home cursor and type alpha characters A through J. Depress [NEW LINE] once, and then several more times.	ABCDEFGHIJ when New Line depressed, cursor moves to beginning of next line. Additional depressings cause cursor to move the next line.
11	Type a line of characters and depress [HOME] and depress [ERASE INPUT] key.	Cursor returns to home position. Line of characters are cleared from display (unformatted display).

(Test Ended)

TABLE C

OPERATIONAL CHECK FOR MAGNETIC STRIPE READER (MSR)

TEST STEP	PROCEDURE	RESPONSE
	Note: These steps apply only to keyboards equipped with a magnetic stripe reader (MSR).	*Note:* MSR affects on-line operation, not off-line operation. Use in on-line operation is system dependant.
1	Depress ERASE INPUT and UNDERLINE keys together with additional force.	TST indicator lights and remains on.
2	Insert 406303 test card into reader smoothly.	CAPS LOCK indicator flashes repeatedly.
3	Remove test card.	CAPS LOCK indicator stops flashing.
4	End test by depressing ERASE INPUT and PERIOD keys together with additional force.	LOCAL indicator lights. TST indicator goes out.

3. TROUBLESHOOTING

3.01 Troubleshooting is based on the use of a series of questions to determine possible causes for the trouble. Depending on the response to the questions, instructions are then given to correct the trouble.

3.02 To isolate a trouble to a specific area, start with the operational checkout procedures given in TESTING, Table A, Page 4, or start with the following series of questions given in Table D.

3.03 Before attempting to troubleshoot the unit, make sure the trouble is not caused by interconnected equipment.

3.04 If a trouble is isolated to the logic card, the troubleshooting instructions will recommend that the unit be replaced.

3.05 Repair of the keyboard is not to be attempted without proper shop facilities. Repackage the keyboard to be repaired in the box of the replacement unit. Tag the unit, listing the found trouble.

TABLE D

TROUBLESHOOTING PROCEDURES FOR KEYBOARDS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. Is LOCAL lamp on? (Depress LOCAL key.)	Go to 2.	Go to 11.
2. Can characters be entered from keyboard and displayed correctly on the screen?	Go to 3.	Check terminals 1, 2, 3 and 6 at J1 interface connector. Replace keyboard.
3. Do [⎯] [?] [↑] [↓] [←] [→] and space bar keys repeat when lightly depressed? (Not fully depressed on repeat keys.)	Check operation of REPT keyswitch. Replace keyboard, if necessary. Check operation of all repeat keys. Replace repeat keyswitch(s). Replace keyboard.	Go to 4.
4. Do all repeatable character keys repeat when fully depressed?	Go to 5.	Go to 7.
5. Does a character appear on the screen when power is first turned on? (Turn power off then on again several times.)	Check operation of that keyswitch associated with character being displayed (go to 7).	Go to 6.

TABLE D (Contd)

TROUBLESHOOTING PROCEDURES FOR KEYBOARDS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
6. Are any characters displayed when key is not depressed? (ie, key touched, opcon vibrated, or other keys operated.)	Replace keyboard.	Go to 7.
7. Do any keys fail to operate mechanically? • All keys click when depressed and click again when released. • Repeat or test keys click a second time when fully depressed and click again when released slightly. • Spacebar must return to its unoperated position fully when depressed and released slowly.	Check clearance between keyboard cover and keytops (adjust if necessary). Replace defective keyswitch or entire keyboard. Check spacebar mechanism and replace any parts necessary, or entire keyboard.	Go to 8.
8. Do any keys fail to generate characters to the screen?	Check for short between keyswitch terminals. Replace keyswitch, or keyboard. Replace keyboard, if any groups of keys fail to operate or more than one character is generated when one key is depressed.	Go to 9.
9. Do any indicators fail to light?	Go to 11.	Go to 10.
10. Does alarm sound (loudness controlled by thumbwheel) when test mode is entered?	Go to 11.	Go to 12.
11. Does the TST lamp light when test mode is entered?	Go to 14 if indicator failed to light. Simultaneously depress the RETURN and PERIOD keys fully, to extinguish lamp if no further testing is required.	Go to 12.

TABLE D (Contd)

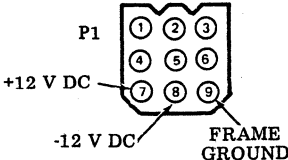TROUBLESHOOTING PROCEDURES FOR KEYBOARDS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
12. Is +12 V dc (pin 7) and -12 V dc (pin 8) present with respect to frame ground (pin 9) on connector. P1 [diagram of pins 1-9] +12 V DC — pin 7 -12 V DC — pin 8, FRAME GROUND pin 9	Go to 15.	Proper voltage not being supplied to the opcon: Check 45BSE301 and its cable (Section 582-300-400). Check power supply voltages. Go to 12 (a).
(a) Check connector pins of J1.	Go to 12 (b).	Replace 453956 cable.
(b) Check ground wires are properly placed.	Try Question 2, if yes, go to 14. If no, go to 15.	Repair grounds.
13. Does keyboard operate in TEST mode (loopback test)?	Keyboard ok, go to 16.	Go to 14.
14. Do indicators light in loopback test mode?	Go to 16.	Check indicator keyswitch, as in Question 7. Check "NO" responses of Question 12.
15. Is +24 V dc present at pins 3 and 4 of indicator keyswitch or [symbol] indicator terminals when lamp should be lit?	Replace 341088 indicator assembly keyswitch or [symbol] indicator that has defective 346235 indicator lamp.	Replace keyboard.
16. If keyboard has security keylock modification kit, does keyboard become inoperative when lock is in off position?	Keyboard ok.	Replace security keylock modification kit.

TABLE E

TROUBLESHOOTING PROCEDURES FOR MAGNET STRIPE READER (MSR)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. Does TST indicator light.	Go to 2	Go to Table D, question 11.
2. Does CAPS LOCK indicator flash with card in place.	Go to 3	Replace 406302 magnetic stripe reader assembly. Replace keyboard.
3. CAPS LOCK stops flashing with card removed.	Reader ok.	Replace keyboard.