"DATASPEED*" 40 OPERATOR CONSOLE
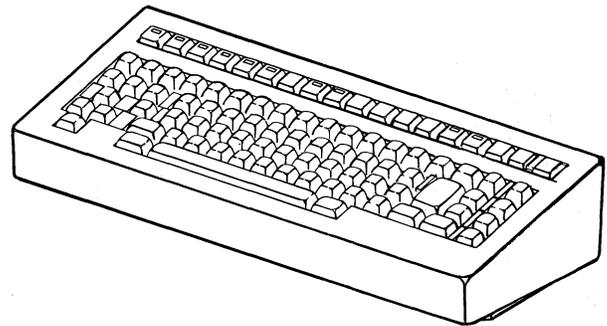
KD AND RO

DESCRIPTION AND OPERATION

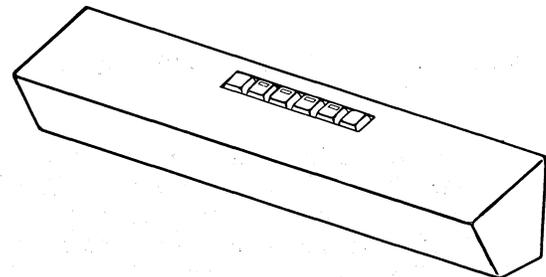Fig. 1—Typical KD Opcon
(With Keyboard)

Fig. 2—ROP Opcon
(Without Keyboard)

1. GENERAL

1.01 This section provides a general description and operation for the two basic types of DATASPEED 40 KD and ROP operator consoles (opcons), shown in Fig. 1 and 2. There are three basic KD opcons with keyboards: 40K101 for asynchronous 40/1, 40/2, and 40/3 application; 40K104/40K203 (external numeric entry); and 40Kl05 (internal numeric entry) for synchronous 40/4 applications. There are also three ROP opcons: 40K001, 40K004 (replaces 40K00l), and 40K003.

1.02 This section is reissued to include the description and operation of the 40K104, 40K105, 40K203, 40K004, and 40K003 opcons.

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2. DESCRIPTION

OPERATOR CONSOLE WITH KEYBOARD

2.01 The major components of the early design 40K101 and 40K104 operator consoles are Console Logic Circuit Card [1] and an Interface and Bell Circuit Card [2]. The two circuit cards are mounted together by locking stand-offs. Electrical connections are obtained through twelve interboard connectors (Fig. 3). The late design 40K101, 40K104/203, and 40K105 operator consoles contain a single card Console Logic Card only.
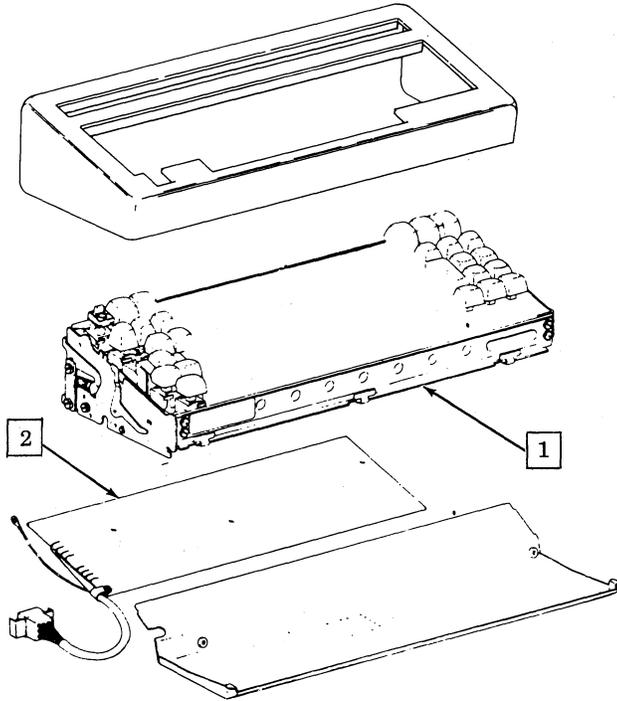
Fig. 3—Early Design 40K101 and 40K104 Opcons

2.02   The opcon utilizes a signaling scheme termed TELETYPE® Standard Serial Interface (SSI). This high speed signaling technique is intended to be used over normal telephone pairs. The interface provides the bidirectional communications between the controller logic and the opcon.

2.03   Data transfer between an opcon and the controller consists of an 18-bit character that is exchanged between units within a terminal at 56K baud rate.

2.04   The operator console keyboard can generate the 128 ASCII (American National Standard Code for Information Interchange) codes. The cursor left arrow (◄——) is the backspace (BS) key. The console is equipped with control and data editing keys.

2.05   The operator console features modular keyswitch assemblies that provide an audible click when depressed. This provides the keyboard attendant with sounds and touch similar to that of a standard typewriter.

2.06   The keyboard is designed to electronically and mechanically accommodate slow or fast typing speeds. Typing speed (fast as humanly possible) capability up to 2500 words per minute could be achieved with "N" key rollover and repeat keys.

- "N" key rollover — Ability which allows you to select a new key without releasing previously selected key. Only one key may be depressed to enter the repeat mode if it is a repeatable key.

- Repeat — Most keyswitches generate a single character output. Keyswitches designated as repeat keys produce a second output at the repeat rate of 28 characters per second. Repeat is accomplished by depressing keytop with additional force beyond its normal stop. See Fig. 4 for repeat keys.

2.07   The console can be placed into several modes. The modes are listed in the order of precedence, ie, CONTROL takes precedence over SHIFT and ALPHA takes precedence over NUMERIC, etc.
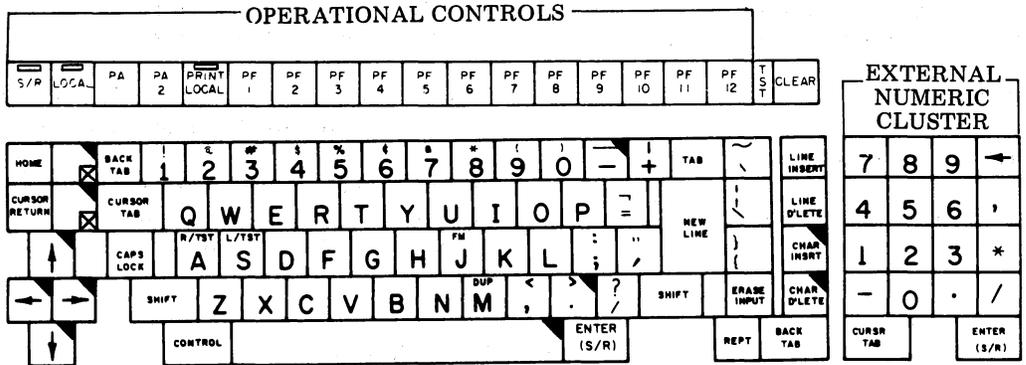
- CONTROL
- SHIFT
- CAPS
- UNSHIFT
- ALPHA
- NUMERIC ⎤——————40K105 Only
- NUM LOCK ⎦

CONTROL — To produce a control character from the opcon, simultaneously depress either left or right CONTROL key along with desired control character keytop, (ie, EOT — End of Transmission). Refer to Manual 999-300-121, How To Operate, for complete list of 40K101 opcon control characters. Also refer to Manual 999-300-123, How To Operate, for 40K104/105/203 opcons.

SHIFT — Performs normal shift operation as on a standard typewriter, but does not lock.
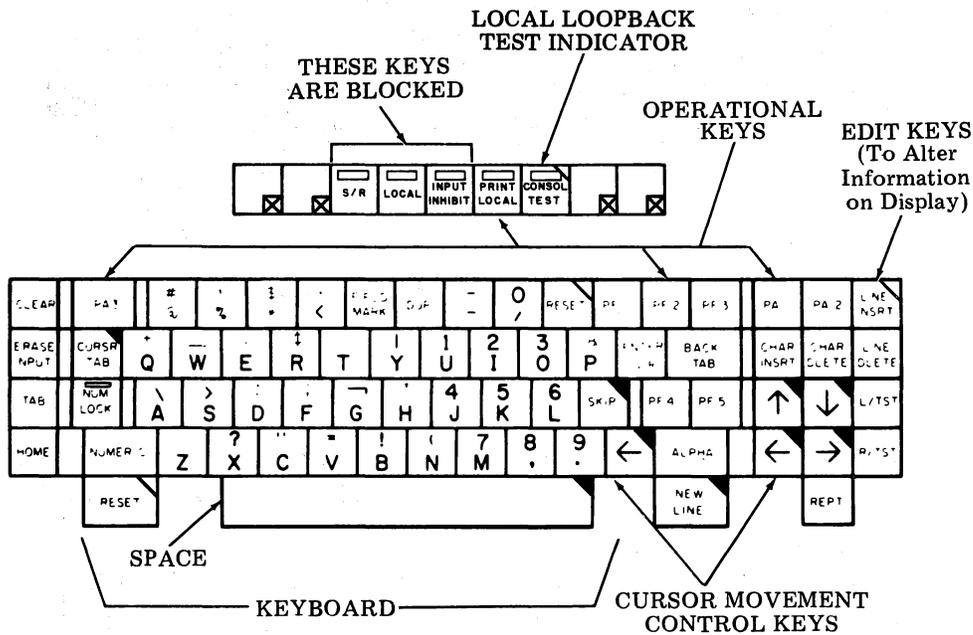
CAPS — The Caps mode is introduced by depressing the CAPS LOCK key which latches. In this mode all alpha characters are capitalized. A second depression unlatches the key. The Caps mode is not cleared by operation of the SHIFT key.

UNSHIFT — Performs normal unshift operation as on a standard typewriter.

ALPHA (40K105 only) — Characters produced are those on the lower portion of the keytops.

NUMERIC (40K105 only) — Characters produced are those on the upper portion of the keytops and include the DUP key.

NUM LOCK (40K105 only) — The NUM LOCK mode is introduced by depressing the NUM LOCK key. In this mode all characters are the same as in NUMERIC mode.

2.08 All keytops are easily removable for legend interchangeability, etc. In cases where certain keys are not needed, blocking keytops can be used to render the keyswitch inoperative. Refer to Section 582-211-700 for removal and conversion of keytops.

Fig. 4—KD Opcon Keytop Arrangments

OPERATIONAL CONTROLS

Note: The, (comma), *, and / keys located within the External Numeric Cluster are not functional with SDCs (Private Line Version Only) which employ the 410261 circuit card and, therefore may be covered with blocking keys.

40K203/GAB Keytop Layout

LOCAL LOOPBACK
TEST INDICATOR

THESE KEYS
ARE BLOCKED

OPERATIONAL
KEYS

EDIT KEYS
(To Alter
Information
on Display)

SPACE

KEYBOARD

CURSOR MOVEMENT
CONTROL KEYS

Note: The only locking keytop is NUM LOCK, depress to set (lights), depress to release (light goes out).

40K105/CAA Keytop Layout

Note: The 40K203-type opcon is basically the same as a 40K104-type opcon except for an additional numeric cluster located to the right of the keyboard data array. Hereafter, refer to 40K104 opcon information for 40K203 opcon unless otherwise described.

☒ BLOCKING
KEYTOPS

◹ REPEAT
KEYS

▭ LIGHTED
KEYS

◸ TEST
KEYS

Fig. 4—KD Opcon Keytop Arrangments (Cont)

2.09   The alarm volume is adjustable by the attendant by turning the knob under the right side of the opcon.

LOUDER   SOFTER
Fig. 5
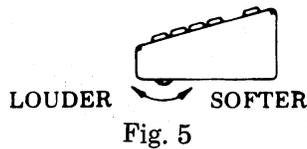
2.10   Local Loopback mode and power indication are provided to expedite testing of the opcon (refer to Section 582-211-500).

FEATURES

2.11   The following feature options can be implemented on the opcon (refer to Section 582-211-700 for conversion procedures):

   (a)   To implement the Monocase mode (all alpha capitals), depress and latch the CAPS LOCK keyswitch and install a blocking keytop. To implement the up-low (upper and lower alphabet) operation, install the CAPS LOCK keytop.

   (b)   The CONTROL and DATA EDITING keys can be altered to add or delete features by interchanging certain variable keytops and blocking keytops.

OPERATOR CONSOLE WITHOUT KEYBOARD

2.12   The major components of the 40K001 and 40K004 operator consoles are four indicator keyswitches hard wired to a 9-pin connector (Fig. 6). The major components of the 40K003 operator console are six indicator keyswitches, a 16-pin connector with a flat ribbon cable, and a built in alarm (Fig. 7).
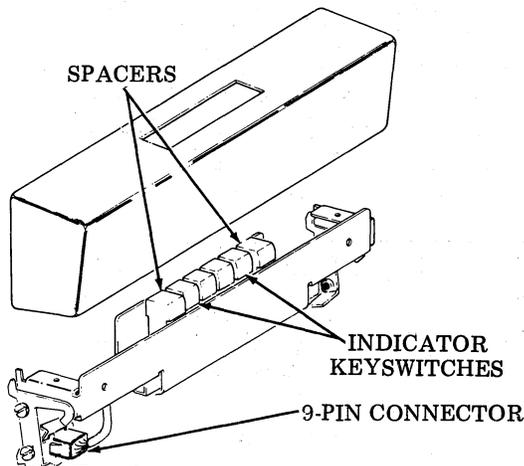

SPACERS

INDICATOR KEYSWITCHES

9-PIN CONNECTOR

Fig. 6—40K001 and 40K004 ROP Opcons

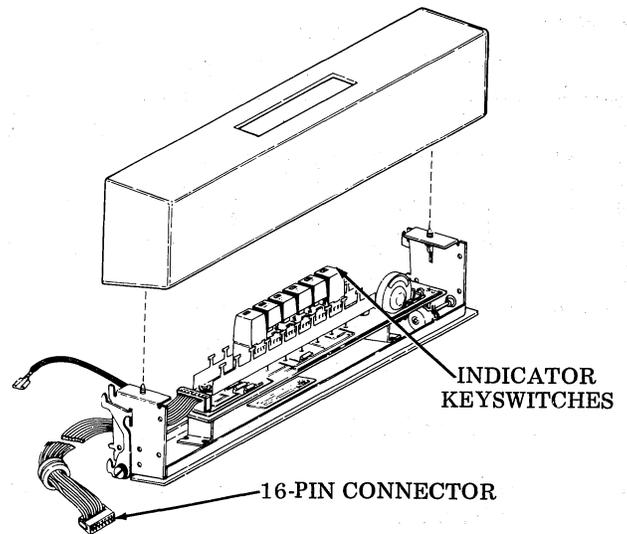INDICATOR KEYSWITCHES

16-PIN CONNECTOR

Fig. 7—40K003 ROP Opcon

2.13   These opcons are used on receive-only printer terminals and will initiate commands and receive status information by means of indicators.

2.14   The opcon indicator keyswitches are sealed and wholly integrated devices.

2.15   On 40K001 or 40K004 opcons the INTRPT and DATA ERROR keyswitch indicators are red, and the TEST (TRANS START in early 40K001 opcon) and IN SERVICE keyswitch indicators are green. On 40K003 opcons the ALARM and TEST keyswitch indicators are red, and IN SERVICE and POL/SEL keyswitch indicators are green.

2.16   Removable blocking keytops are used to render keyswitches inoperative. These keyswitches are optionally functional in parity error detection and local testing in 40K001/004 opcons only.

2.17   The following features are performed at the station:

LOCAL TEST — The TEST keytop shown in Fig. 8 and 9 initiates a Local Test function between the associated controller and printer.

PARITY ERROR — The DATA ERROR keytop shown in Fig. 8 and 9 indicates parity error detection.

2.18   All keytops are removable for legend interchangeability. Refer to Section 582-211-700 for removal of keytops.

SPACER RED LED GREEN LED RED LED SPACER

INTRPT · TEST · IN SERVICE · DATA ERROR

OPTIONS · OPCON COVER

Fig. 8—40K001 and 40K004 Layout

Note: TEST key was TRANS START key in early 40K001 opcon.

GREEN LED · RED LED · GREEN LED · RED LED · GREEN LED

ALARM · POLL. SEL. · IN SERVICE · TEST

BLOCKING KEYTOP · BLOCKING KEYTOP

Fig. 9—40K003 Layout

TECHNICAL DATA

Operator Console With Keyboard (KD)

2.19   Electrical and physical characteristics

Supply Voltage . . . . ±12 V dc ±10%
(Referenced to 0 V dc)

Power . . . . 20 watts maximum

Weight. . . . . 7-1/2 pounds
9-1/2 pounds (40K203 only)

2.20   Output:

•Standard Serial Interface
•18 data bit words
•Rate: 56 kilobits/second

2.21   Codes:

•ASCII Array -- Standard ASCII codes
•Control Array — Internal data codes (the cursor left arrow (←——) is the BACKSPACE (BS) key).

Operator Console With or Without Keyboard (KD and ROP)

2.22   Environmental Characteristics

Note: This equipment is intended to be operated in a room environment within the temperature range of +40°F to +110°F. Serious damage to it could result if this range is exceeded.

Temperature
Storage . . . . -40°F to +150°F
Operating . . . . +40°F to +110°F

Relative Humidity
Storage and Operating . . . . 2% to 95%
(Noncondensing)

Operator Console Without Keyboard (ROP)

2.23   Electrical and physical charactistics

Indicator current is limited to 13 mA ±10% @ 12 V dc.

Weight . . . . 2 pounds

3.   OPERATION

OPERATOR CONSOLE WITH KEYBOARD (KD)

3.01   The keyboard characters located in the center of the opcon (Fig. 10) operate as on a standard typewriter.

40K101 KEYBOARD

40K104 KEYBOARD

40K105 KEYBOARD

Fig. 10--KD Opcon Keyboards

3.02   40K101 Opcon — Operate the SHIFT key (with CAPS LOCK unlatched) to generate capital letters and shift position characters; ! @ # $?, etc. 40K104 Opcon — Operate the SHIFT key together with each nonalpha key (ie, ! @ # $?, etc) on the keyboard and then the upper portion of the depressed keys are displayed (except R/TST, L/TST, FM, and DUP).

3.03   40K101 Opcon — Operate the CONTROL key together with a control character key to generate ASCII control characters that appear on the control character keys (the upper portion of letter A through Z). 40K104 Opcon — Operate the CONTROL key together with a CONTROL CHARACTER key (R/TST, L/TST, FM, and DUP). Then the display will be Test Messages, < , or Ø respectively.

3.04   40K105 Opcon — Depress the ALPHA key and hold. At the same time depress the keys in the 40K105 opcon keyboard, and

then the lower portion of the depressed keys are displayed. Depress the NUMERIC key and hold. At the same time depress the keys in the 40K105 opcon keyboard, and then the upper portion of the depressed keys are displayed.

3.05   If lower case characters are not needed, depress and lock down the CAPS LOCK key. This permits generation of capital letters, numbers and other unshifted characters without having to operate SHIFT key. This feature is an advantage over a standard typewriter.

Control Keys

3.06   The following control keys may include station status indicators. The indicator normally lights when key is depressed indicating mode of device (Fig. 11, Fig. 12, and Fig. 13).
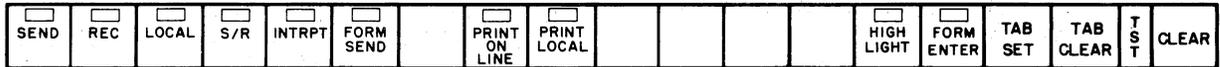
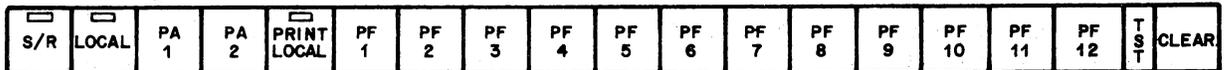| SEND | REC | LOCAL | S/R | INTRPT | FORM SEND | | PRINT ON LINE | PRINT LOCAL | | | | HIGH LIGHT | FORM ENTER | TAB SET | TAB CLEAR | T S T | CLEAR |

Fig. 11—40K101 KD Opcon Control Keys

| S/R | LOCAL | PA 1 | PA 2 | PRINT LOCAL | PF 1 | PF 2 | PF 3 | PF 4 | PF 5 | PF 6 | PF 7 | PF 8 | PF 9 | PF 10 | PF 11 | PF 12 | T S T | CLEAR |

Fig. 12—40K104 KD Opcon Control Keys

| | | S/R | LOCAL | INPUT INHIBIT | PRINT LOCAL | CONSOL TEST | | |

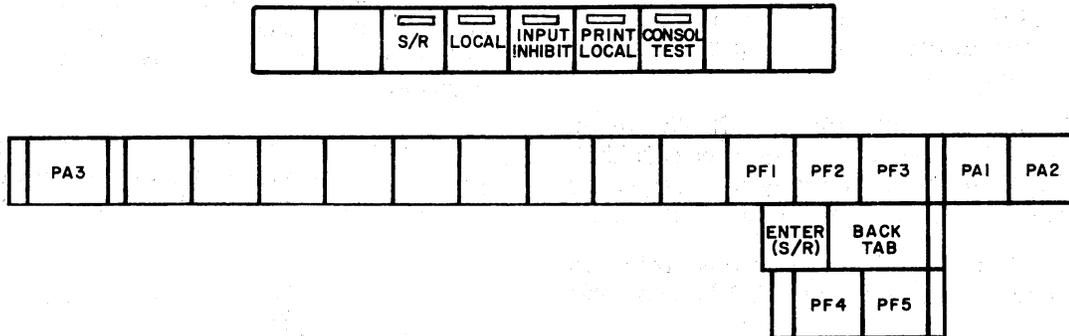| PA3 | | | | | | | | | PF1 | PF2 | PF3 | PA1 | PA2 |
| | | | | | | | | | ENTER (S/R) | BACK TAB | | | |
| | | | | | | | | | | PF4 | PF5 | | |

Fig. 13—40K105 KD Opcon Control Keys

Note: The LOCAL lamp extinguishes each time a PA or PF key is depressed and will remain off until the LOCAL key is depressed.

SEND — Puts terminal in the Send mode. Message can be sent when the key is lit.

PRINT LOCAL — When lit, the printer will copy printable data from the local display.

HIGH LIGHT — Causes characters that follow to be displayed as highlighted characters (blink).

FORM ENTER — When this key is lit, characters entered in the Local mode will be protected after key is turned off.

TAB SET — Sets tab stops at cursor location on that line and all lines below (does not include status indicator).

TAB CLEAR — Clears all tab stops from the cursor location to the end of the line, on that line, and all lines below (does not include status indicator).

REC — Puts terminal in the Receive mode. Message can be received when the key is lit.

LOCAL — Puts terminal in Local mode and permits data to be entered.

S/R (Send/Receive) — Puts terminal in Conversational mode enabling single or multiple line transmission (two additional ENTER (S/R) keys for 40K203 opcon only).

INTRPT — Stops transmission from remote device by sending interrupt signal.

FORM SEND — When lit, a message will be sent as displayed and will be received at remote location.

PRINT ON LINE — When lit and in the Data mode, the page printer will copy printable data being sent or received.

CONSOLE TEST — To place 40K105 opcon into local Loopback Test mode, depress CONSOL TEST key with LINE INSRT key simultaneously with additional force and the indicator will be lit.

Important: For specific instructions, refer to How to Operate Manuals 999-300-121 and 999-300-123.

Data Editing Controls

3.07   These keys (shown following) position cursor or displayed data, but do not alter information on page. They operate only in Local mode.

HOME — Positions cursor and no. 1 segment marker in upper-left corner of the screen.

SCROL UP — Moves display up one line at a time until last segment marker appears at the top of the display (40K101 only).

SEGMT ADV — Removes the 24 line segment being displayed and displays the next 24 line segment (40K101 only).

CURSR RETRN — Returns cursor to the first position on the same line.

SCROL DOWN — Moves display down one line at a time until first segment marker appears at top of display (40K101 only).

CURSR TAB — Advances cursor to next tab stop, ie, tab mark, next line, next unprotected field (40K104/105 only), etc.

←↑→↓ — These four keys move cursor in the direction indicated.

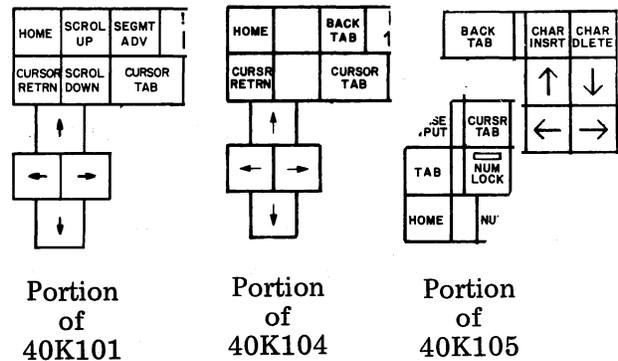Portion of 40K101   Portion of 40K104   Portion of 40K105

Fig. 14

BACK TAB — Moves cursor to beginning of current or preceding unprotected field. On unformatted display moves cursor to home position.

←↑→↓ or ↑↓ — Attempts to move the cursor off the screen with 40K104 and 40K105 opcons will result in wraparound as shown below.
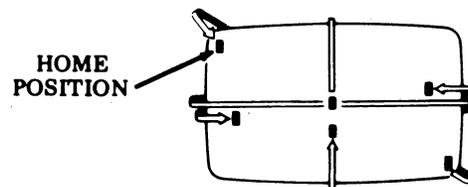

HOME POSITION

Fig. 15

3.08 Operation of these keys (shown following) can be affected when protected data or tab marks are present. They operate only in Local mode. These keys alter information on the page.
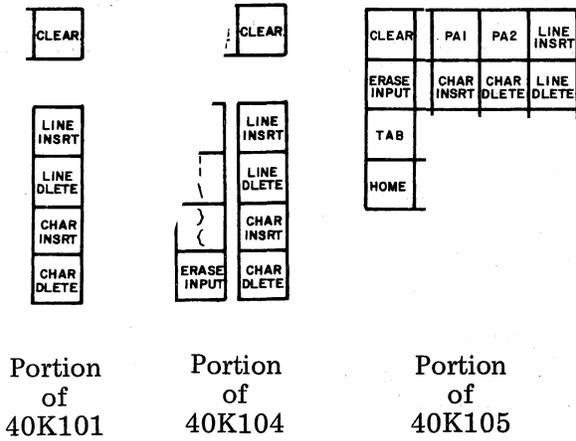

| Portion of 40K101 | Portion of 40K104 | Portion of 40K105 |

Fig. 16

[CLEAR] 40K101 — Removes data from the cursor position to right and down to bottom of page. 40K104/105 — Removes all data from display and moves cursor to home position (the LOCAL key turns off).

[LINE INSRT] 40K101 — Line that cursor is on and following lines move down. Cursor moves fully left. LINE INSRT only occurs when bottom line of last segment is blank (all unprotected spaces). 40K104/105 — Line that cursor is on and following lines move to bottom of display. Cursor does not move. LINE INSRT operates only on unformatted displays.

[LINE DLETE] 40K101 — Line that cursor is on is removed. Cursor moves fully left. Following lines move up. 40K104/105 — Line that cursor is on is removed and following lines move up. Cursor does not move. LINE DLETE operates only on unformatted displays.

[CHAR INSRT] 40K101 — Character that cursor is over and succeeding characters move to right. Only the line that the cursor is on is affected. 40K104/105 — Unprotected character at cursor location moves to right. All succeeding characters with the same field move to right and down to succeeding lines within the same field (4-line limit is mini-cluster arrangement).

[CHAR DLETE] 40K101 — Removes character at cursor location. Characters to right of cursor move left. Only the line at cursor location is affected. 40K104/105 — Removes character at cursor location. All succeeding characters and succeeding lines within the same field move to the left and up (4 line limit in mini-cluster arrangement).

OPERATOR CONSOLE WITHOUT KEYBOARD

3.09 40K001/40K004 ROP Opcons — These opcons are used with receive-only printer terminals. The basic operation consists of INTRPT and IN SERVICE. The terminal has provisions for two additional features: TEST and DATA ERROR. (See Fig. 17.)

Important: For specific instructions, refer to How to Operate Manuals 999-300-121 and 999-300-123.
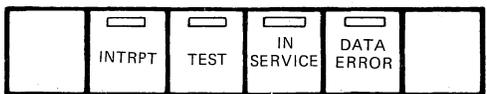

Fig. 17—40K001 and 40K004 ROP Opcons

INTRPT — Indicator (red) lights when key is depressed. Sends reverse channel signal to halt remote sender, should reception become garbled or unwanted.

TEST (or TRANS START) — Indicator (green) lights when key is depressed. Sends discrete calling code to remote device when terminal is on-line. Generates test data when terminal is off-line and under direction of the Test Center. Depress again to stop test.

IN SERVICE — Indicator (green) is lit during normal operation of station. Indicator extinguishes when key is depressed, a low-paper supply lid opened, or power is off.

DATA ERROR — Indicator (red) lights only during operation of RO printer detecting wrong parity. Depress again to extinguish.

3.10 40K003 ROP Opcon — This opcon is used with integrated controller (40C303) receive-only printer terminals. Only four of six switch and indicator assemblies are presently used in this opcon. The opcon provides both audible and visual indications of the terminal status and trouble conditions. (See Fig. 18.)
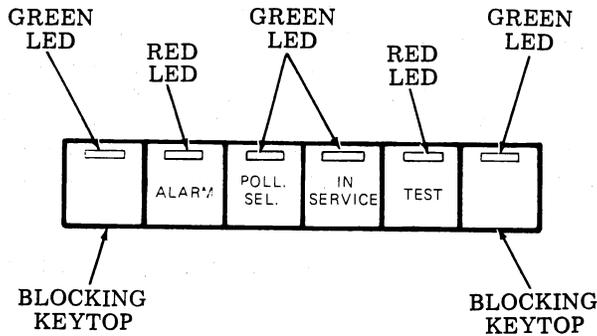
Fig. 18—40K003 ROP Opcon

ALARM — Indicator (red) lights when various trouble conditions are detected. The indicator may be flashing or steady. The steady indicator will be maintained for an 8 to 18 second interval accompanied by an audible tone for the last 8 seconds. The audible tone may be halted by depressing the ALARM key.

TEST — Indicator (red) lights when the TEST key is depressed. This will initiate a self-test routine and cause printing of columns 2 through 5 of the ASCII code. During this time the terminal will not respond to traffic from the LCU.

POL/SEL — Indicator (green) provides a one second flash in response to a polling sequence (future use).

IN SERVICE — Indicator (green) indicates that the ROP terminal is capable of receiving messages. Indicator extinguishes when the associated controller has detected failure to properly complete the Power On Routine (POR), an alarm condition exists, a paper supply problem exists, or the key is depressed to place terminal out of service.

INTERFACE

3.11   Block diagrams of interconnecting cables for the three basic arrangements of the operator consoles (KD and ROP) are shown in Fig. 19.
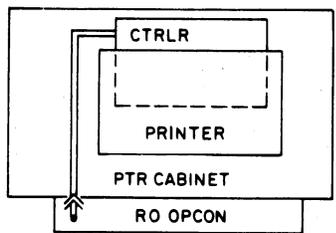
KDP

KD
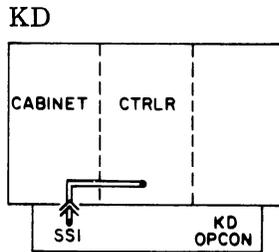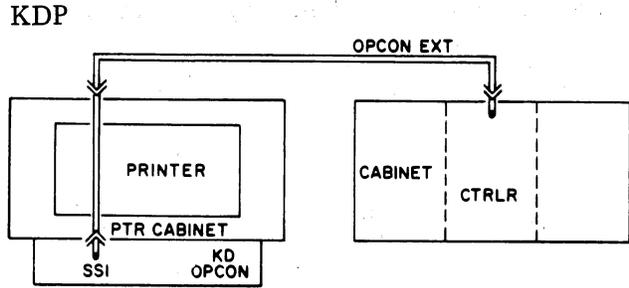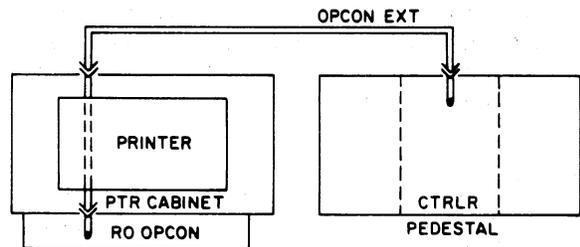
40K001/004
  ROP

40K003
  ROP

Fig. 19—General Interconnection Diagrams

3.12 The connector (Fig. 20) is the electrical connection from the KD or 40K001/004 ROP opcon that interfaces to the controller.

Connector Pin Assignments — KD Opcon:

(SSI) Leads
1. ITD (see Note 1) (Normal) -0.5 V to -2 V dc
2. ITD (Inverted) -2 V to -0.5 V dc
3. ITC (see Note 2) (Normal) -0.5 V to -2 V dc
4. Signal Ground (Spare in Early Design)
5. Spare
6. ITC (Inverted) -2 V to 0.5 V dc

Power Leads
7. Positive Supply +12 V dc ±10% (V_{SS}) (see Note 3)
8. Negative -12 V (V_{DD}) (see Note 4)
9. Frame Ground

Note 1: ITD — Information to Device (Opcon)

Note 2: ITC — Information to Controller

Note 3: V_{SS} — The V_{SS} terminal is the reference point for the device. It must always be the most positive potential applied to the device.

Note 4: V_{DD} — The negative power supply potential required for proper device operation.

Connector Pin Assignments — 40K001/004 ROP Opcon:

1. INTRPT indicator
2. INTRPT keyswitch contacts
3. TRANS START indicator
4. TRANS START keyswitch contacts
5. IN SERVICE indicator
6. IN SERVICE keyswitch contacts
7. DATA ERROR indicator
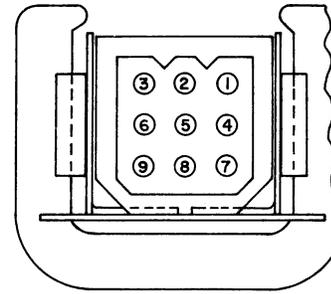8. DATA ERROR keyswitch contacts
9. Frame Ground

Fig. 20— Interface Connector

3.13 The connector (Fig. 21) is the electrical connection from the 40K003 ROP opcon to the associated controller.
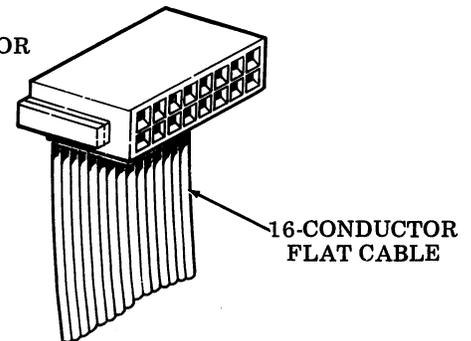

16-PIN CONNECTOR

16-CONDUCTOR FLAT CABLE

Fig. 21—Interface Connector

Connector Pin Assignments:

1. TEST indicator
2. —
3. IN SERVICE indicator
4. —
5. POL/SEL indicator
6. —
7. ALARM indicator
8. —
9. POL/SEL keyswitch contacts
10. —
11. IN SERVICE keyswitch contacts
12. TEST keyswitch contacts
13. Signal Ground
14. ALARM keyswitch contacts
15. —
16. AUDIBLE ALARM volume control