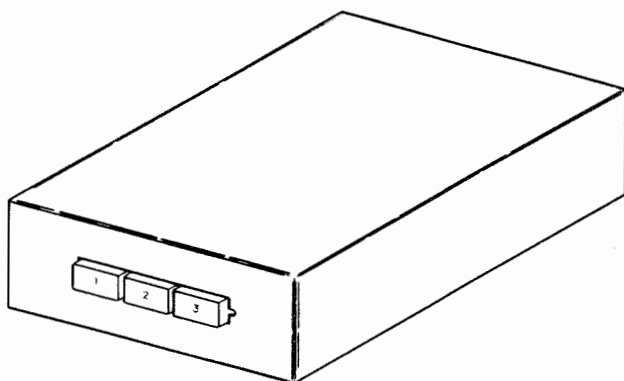


GENERAL INSTRUCTIONS, DESCRIPTION, PRINCIPLES OF OPERATION,
INSTALLATION, CHECKOUT, AND DISASSEMBLY AND REASSEMBLY FOR
THE 345630** EIA SWITCH ASSEMBLY

1. GENERAL

1.01 The Model 40 EIA (Electronic Industries Association) 345630** switch assembly provides a method of interconnecting five data terminals (EIA type) into three operating modes.

1.02 Each mode is established by operating one of the three pushbuttons (Figure 1). Signal and control interface leads are connected to the required terminations through banks of slide transfer switches activated by the pushbuttons. No signal limiting or modification takes place in the switch assembly.



(Right Front View).

Figure 1 - EIA 345630** Switch Assembly

1.03 Original application of the switch assembly interconnects a Model 40 Receive-Only Printer (ROP), a Model 40 Keyboard Display (KD), a 4210 Magnetic Tape (MT) Terminal with an auxiliary terminal, and a 202S-Type Data Set.

1.04 The switch is intended to fit under a 202S-Type Data Set, or may be mounted to the equipment in any applicable position desired (Figure 2).

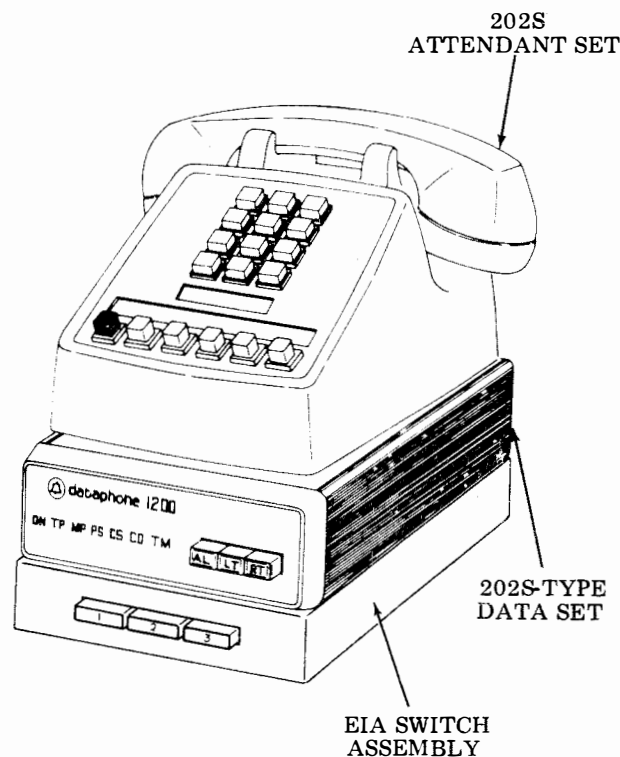


Figure 2 - Switch Assembly in Typical Installed Position

1.05 Other data equipment may be interconnected with the switch assembly, but interface arrangements must be resolved before the switch assembly is connected to any terminal. This is particularly important due to features in the circuitry. Figures 3 through 6 illustrate some practical switch applications.

1.06 Operating mode one allows one local terminal-to-terminal connection. All other mode connections are terminal to data set (line port to local port). This arrangement allows data to be loaded into or unloaded out of a 4210 MT Terminal through an auxiliary terminal, while the Model 40 KD is in a conversational mode with the 202S-Type Data Set.

1.07 Mode switching during on-line operation is possible, but not recommended. Full operating details may be found in Part 3 of this specification, Principles of Operation.

Station Arrangements

1.08 The system may be engineered to use substitute terminal equipment, or modify the station configurations within the limits of the switch assembly. The basic switch configuration is shown in Figure 3 and provides three interconnecting modes by the switch assembly.

1.09 Mode one provides a KD to RO arrangement coupled to the data set (Figure 3). This mode also provides interconnections between MT and an auxiliary terminal through connectors 2 and 7 (Table B, Part 3) that simulates the presence of data sets. This condition enables bi-directional (terminal-to-terminal) signaling.

1.10 Mode two connects the RO to the data set, and the KD to the MT to permit preparation of messages on the KD that may be accumulated on the MT. Alternately, the KD and RO may retrieve messages stored on the tape. (See Figure 3.)

1.11 Mode three connects the RO and KD to MT which is connected directly to the data set. This configuration allows the station to batch data on-line through the MT. If the MT is equipped with an auto-rewind feature, messages from the line can be automatically transferred to the display or printer (Figure 3).

4210 Magnetic Tape Terminal With Model 40 KDP

1.12 The Model 40 Keyboard Display Printer (KDP) used with 4210 MT Terminal is shown in diagram form in Figure 4. Mode one provides a KDP connection to the data set and the line port of the MT connected to an optional auxiliary terminal with interface connections arranged for bi-directional data transfer.

1.13 In mode two, the KDP accumulates messages in the MT terminal or retrieves previously stored messages. The data set is not used in this mode. Any Model 40 Terminal, or equivalent, could be added to the station configuration to be used in this mode.

1.14 Mode three uses the 4210 MT between the KDP and data set. The messages may be prepared on the KDP and stored on the MT and released for batch transmission. If the MT is equipped with an auto-rewind feature, on-line messages received may be automatically transferred to the display or printer.

1.15 If printed copy is not required, a KD may be substituted for the KDP. The KDP should be assigned to switch assembly port 4 and the local port on the MT to switch port 3 (Figure 4).

1.16 Switch ports 3 and 4 provide the additional interface connections (Table A, Part 3) required for KDP control of the MT. This control feature allows the MT to act as a line buffer for the printer, and eliminates the need for line length formatting and preventing data stacking.

4210 Magnetic Tape Terminal With Model 40 and a Model 33 or 35 RO Printer

1.17 Mode one permits an optional auxiliary terminal to transfer data to and from the KD which can deliver data to the MT. The data set is not used in this mode (Figure 5). Any Model 40 Terminal could be connected to switch assembly port 4 for on-line operations in the mode.

1.18 Mode two connects the MT to the data set either sending or receiving data. The KD is not used in this mode.

1.19 In mode three, the KD is connected between MT and the data set. The KD can send or receive on-line and transfer data to the MT through the PRINT LOCAL or PRINT ON-LINE function keys. In all three modes, the MT can be put into operation permitting transfer of data to the Model 33 or 35 RO printer.

4210 Magnetic Tape Terminal With Model 33 or 35 RO Printers

1.20 With the 343762 jumper cable connected to switch assembly ports 5 and 7, two MT terminals share one data set (Figure 6). A Model 33 or 35 RO is connected directly to the local port of each MT.

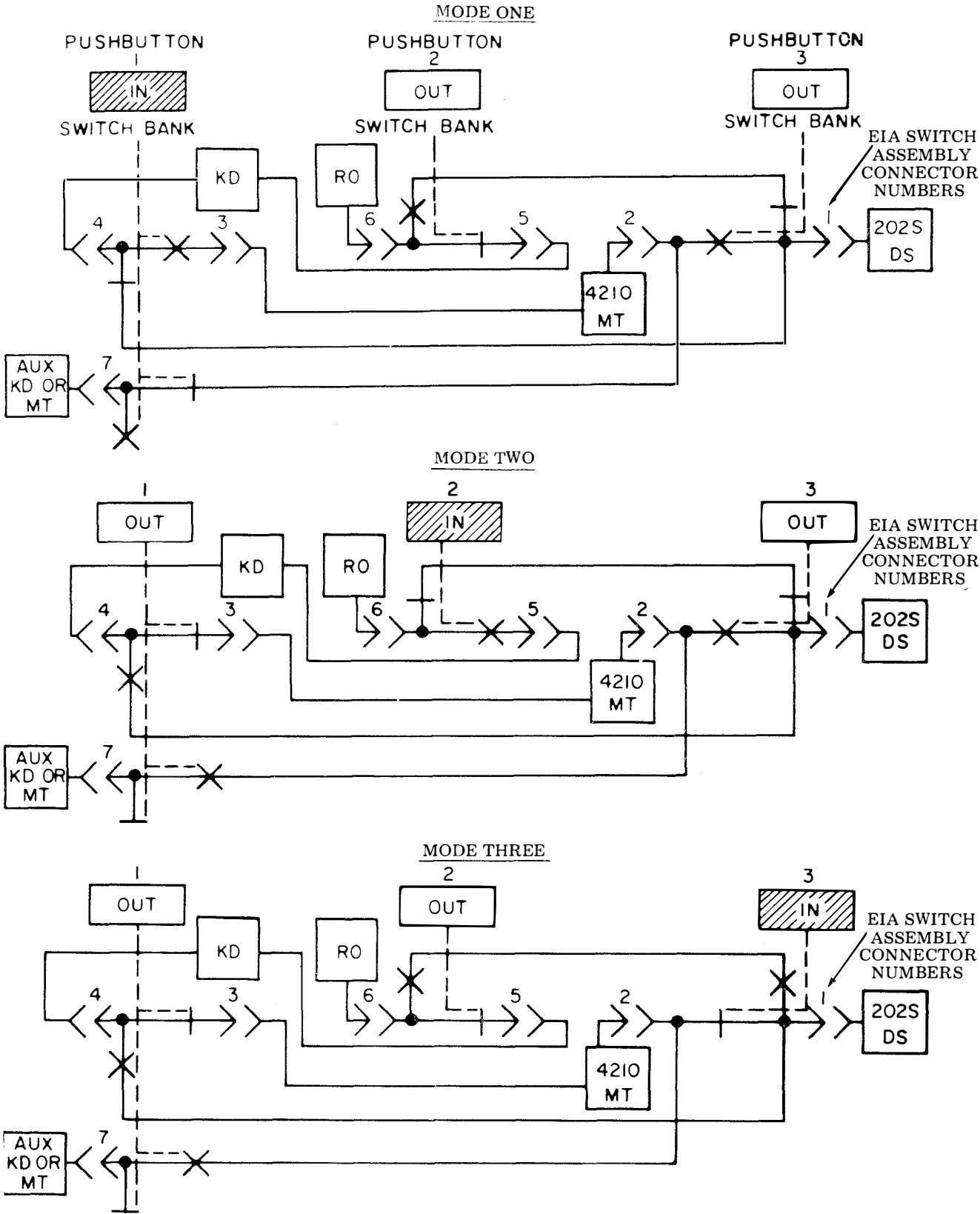
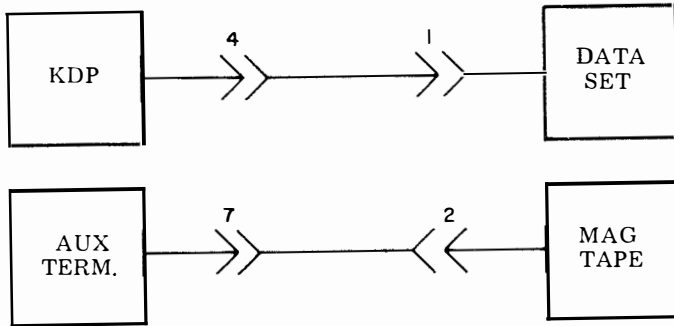
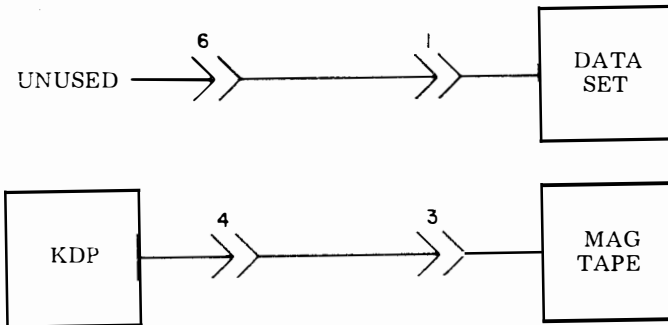


Figure 3 - Basic Switch Configuration With Three Interconnecting Modes

MODE ONE



MODE TWO



MODE THREE

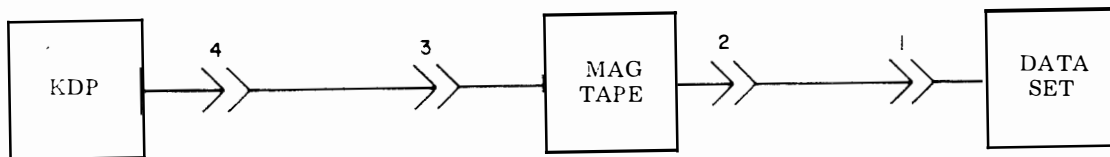
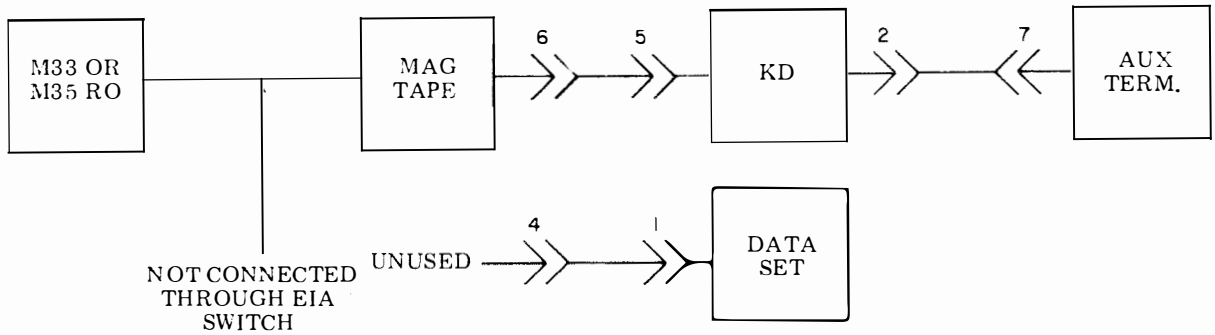
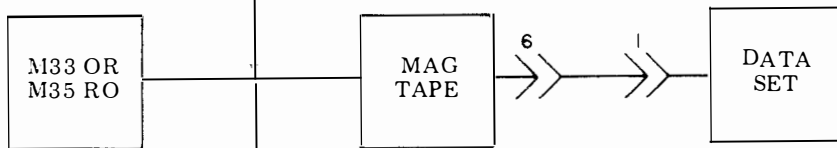


Figure 4 - Magnetic Tape Terminal With Model 40 KDP

MODE ONE



MODE TWO



MODE THREE

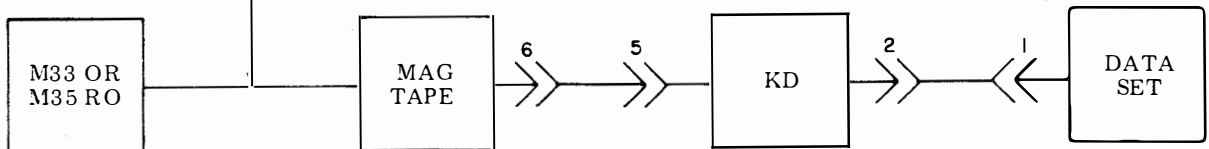
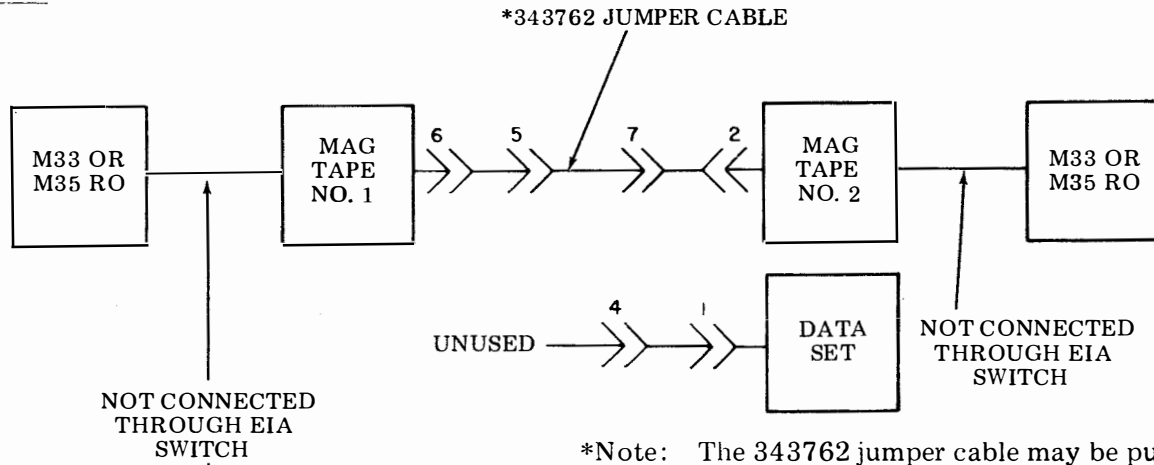
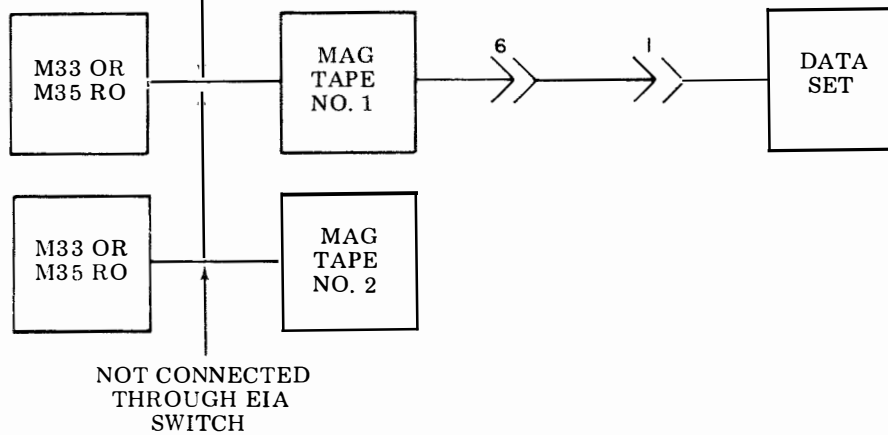


Figure 5 - Magnetic Tape With Model 40 KD and Model 33 or 35 RO Printer

MODE ONE



MODE TWO



MODE THREE

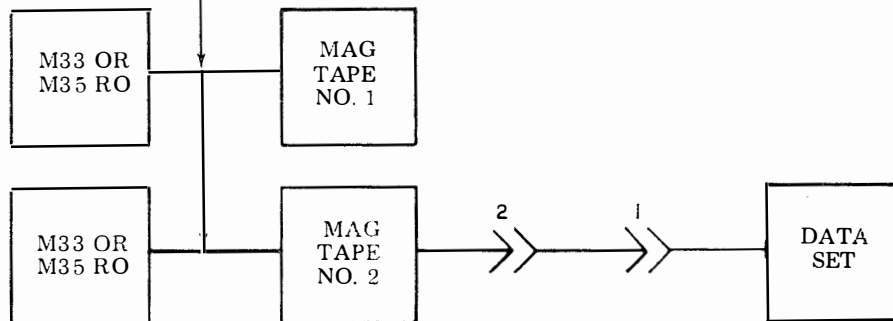


Figure 6 - Magnetic Tape and Model 33 or 35 RO Printer

1.21 Mode one permits the transfer of data between two MT terminals. The data set is not used in this mode. Any Model 40 Terminal, or equivalent, may be connected to switch assembly port 4 for on-line operation.

1.22 Mode two interconnects MT terminal no. 1 to the data set for on-line data sending and receiving. MT terminal no. 2 is not connected to either device through the switch assembly.

1.23 Mode three interconnects MT terminal no. 2 to the data set for on-line data sending and receiving. MT terminal no. 1 is not connected to any other device through the switch assembly. The MT terminal transfers data to Model 33 or 35 RO printer in any of the three modes.

1.24 The 345630** switch assembly comes fully assembled from the factory accompanied by the 341896 cable assembly.

2. DESCRIPTION

2.01 The Model 40 EIA 345630** switch assembly consists of three interlocking slide switches mounted between two circuit cards. All interconnections between switches are made through the circuit cards. The circuit card terminals connect to connectors that are wired to the EIA receptacles on the back of the switch assembly (Refer to Figure 7.)

2.02 The switch assembly consists of four sections, each comprised of 12 transfer-type switches. Three pushbuttons activate the switch sections (Figure 8). Pushbuttons no. 2 and no. 3 operate one switch section each (with two spare sets of contacts for each section). Pushbutton no. 1 operates two switch sections (with two spare sets of contacts, one set for each section). These spare contacts may be used for locally engineered applications (refer to Figure 8 for illustrated details).

2.03 A pushbutton interlocking feature provides that when operating one pushbutton another will be released. Either of the two buttons that had previously been operated will be released by the depressed button. There is no lockout feature preventing two buttons from being operated at the same time — this would cause an invalid condition.

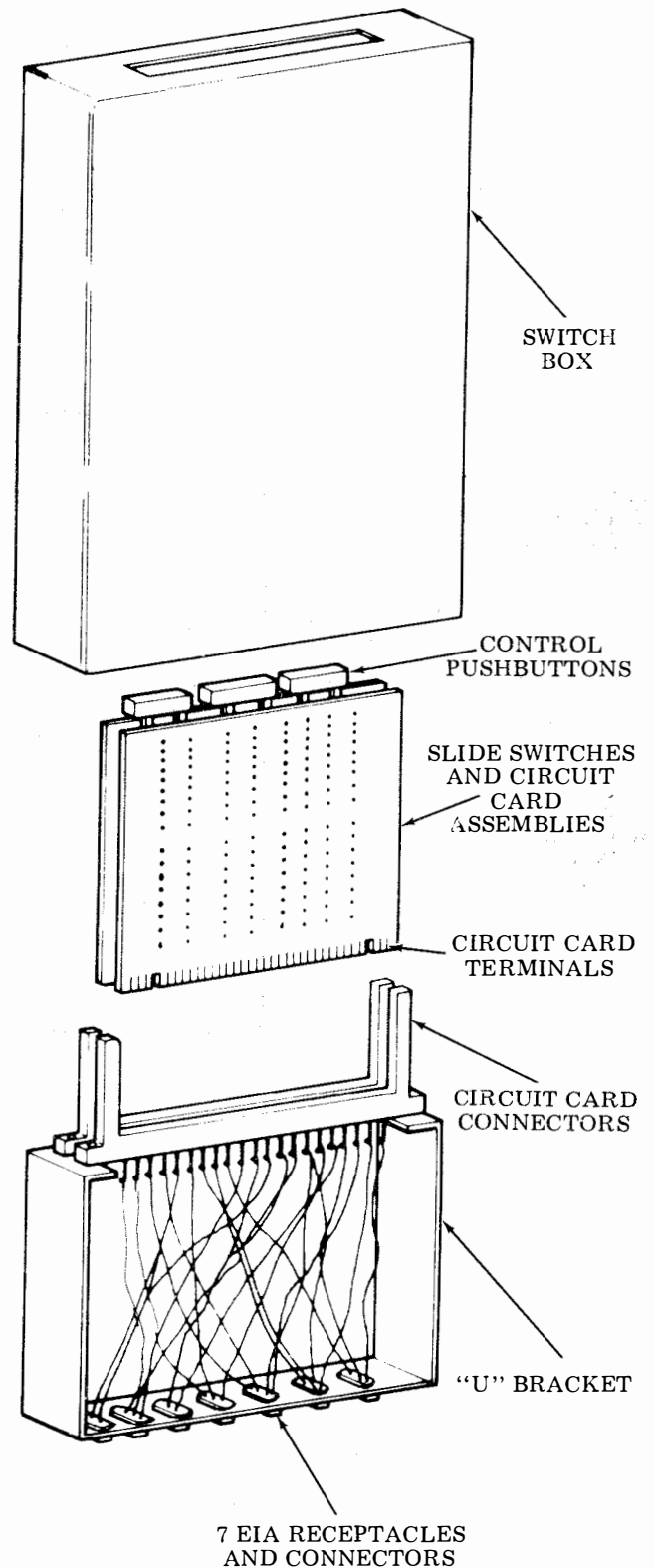


Figure 7 - Component Configuration

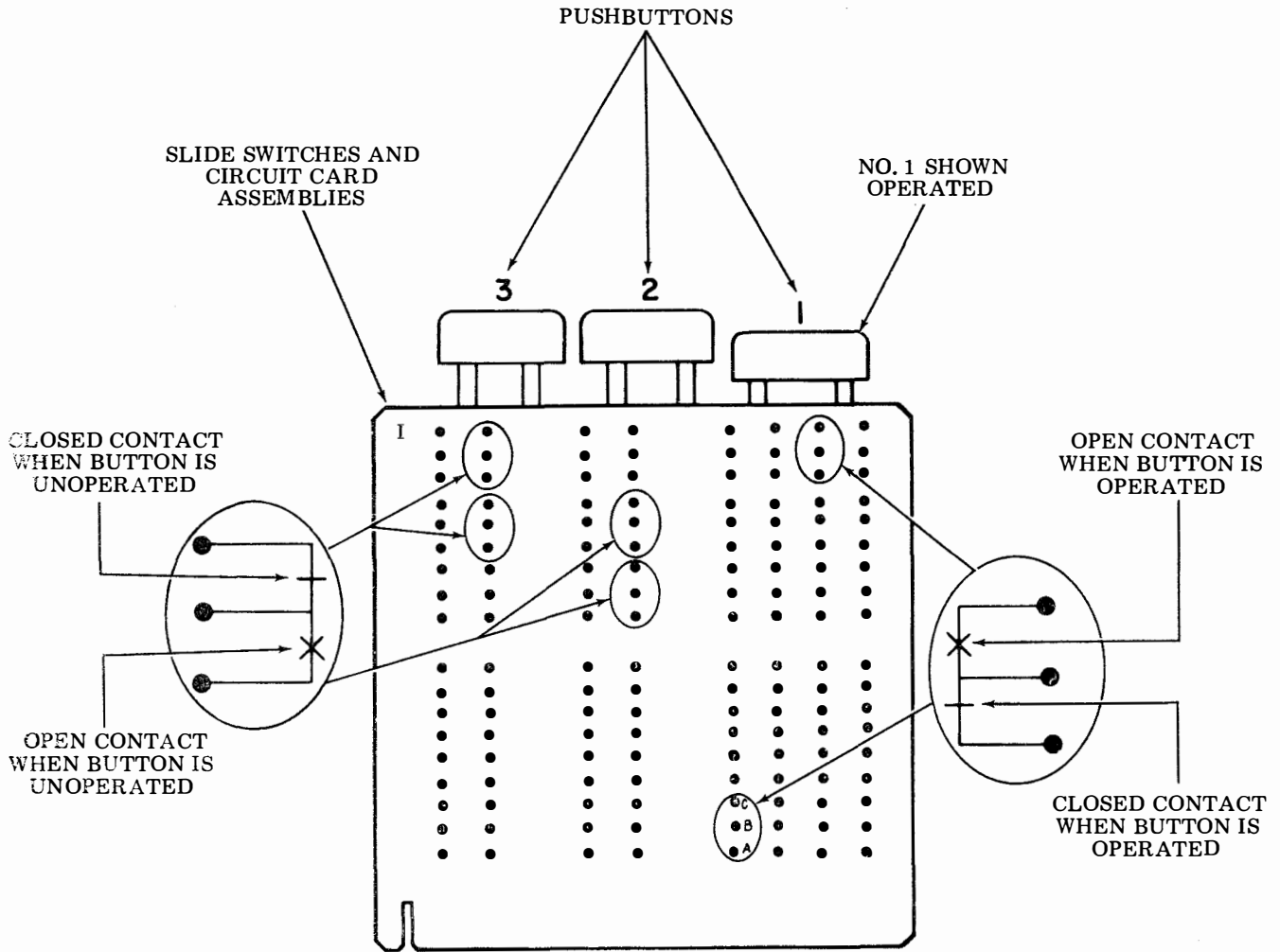


Figure 8 - Spare Switch Contacts

2.04 The switch assembly is contained in a rectangular metal box (see Figure 13 for dimensions). The rear plate of the box (which includes the EIA receptacles and connectors, Figure 9) is formed by the bottom of the "U" bracket; two 36-pin circuit card connectors are mounted to the top of the bracket (Figure 7). Wiring from the card connectors goes to the seven EIA receptacles and connectors mounted in the bottom of the "U" bracket.

2.05 The switches and circuit cards plug into the circuit card connectors and the complete assembly slides into the box (Figure 10). The bottom plate (with four rubber feet) is then placed on the box and attached with six sheet metal screws and two tapped-in screws to secure the "U" bracket in place, as shown in Figure 10.

2.06 The pushbuttons are identified 1, 2, and 3 from left to right. Attach a label to the switch assembly to indicate the significance of the three modes in relation to the station equipment.

2.07 Interface cables (EIA) from station equipment are plugged into the switch ports and secured to the locknuts on the switch ports mounted on the rear of the switch assembly (Figure 11). One 7-foot interconnecting cable (341896) is shipped with the switch assembly for connecting to a data set.

2.08 Additional cables (if required) must be provided separately if not included with terminal or data set. Cables must not be over 50 feet in length. The typical interconnecting cable arrangement shown in Figure 12 corresponds to the basic switch configuration shown in Figure 3.

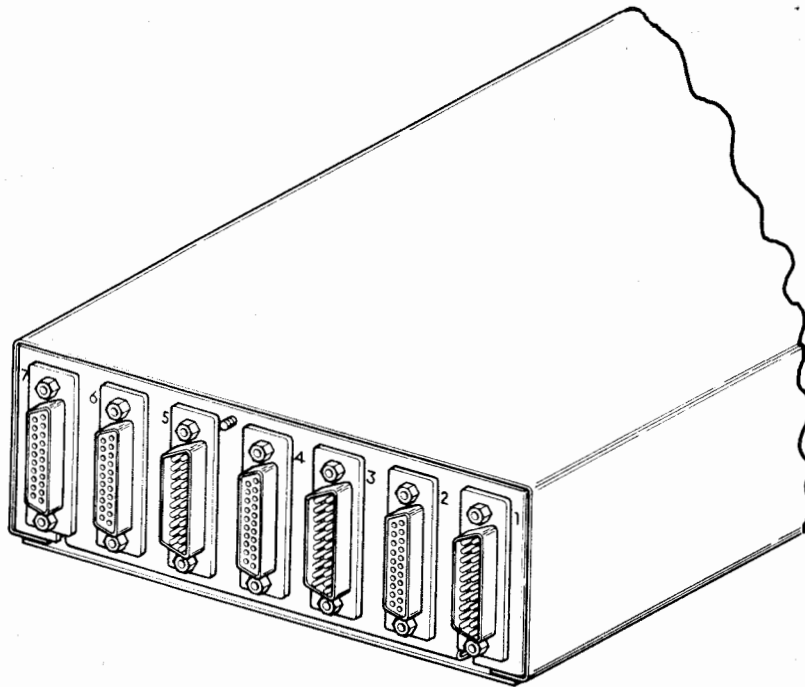


Figure 9 - Switch Assembly Receptacles

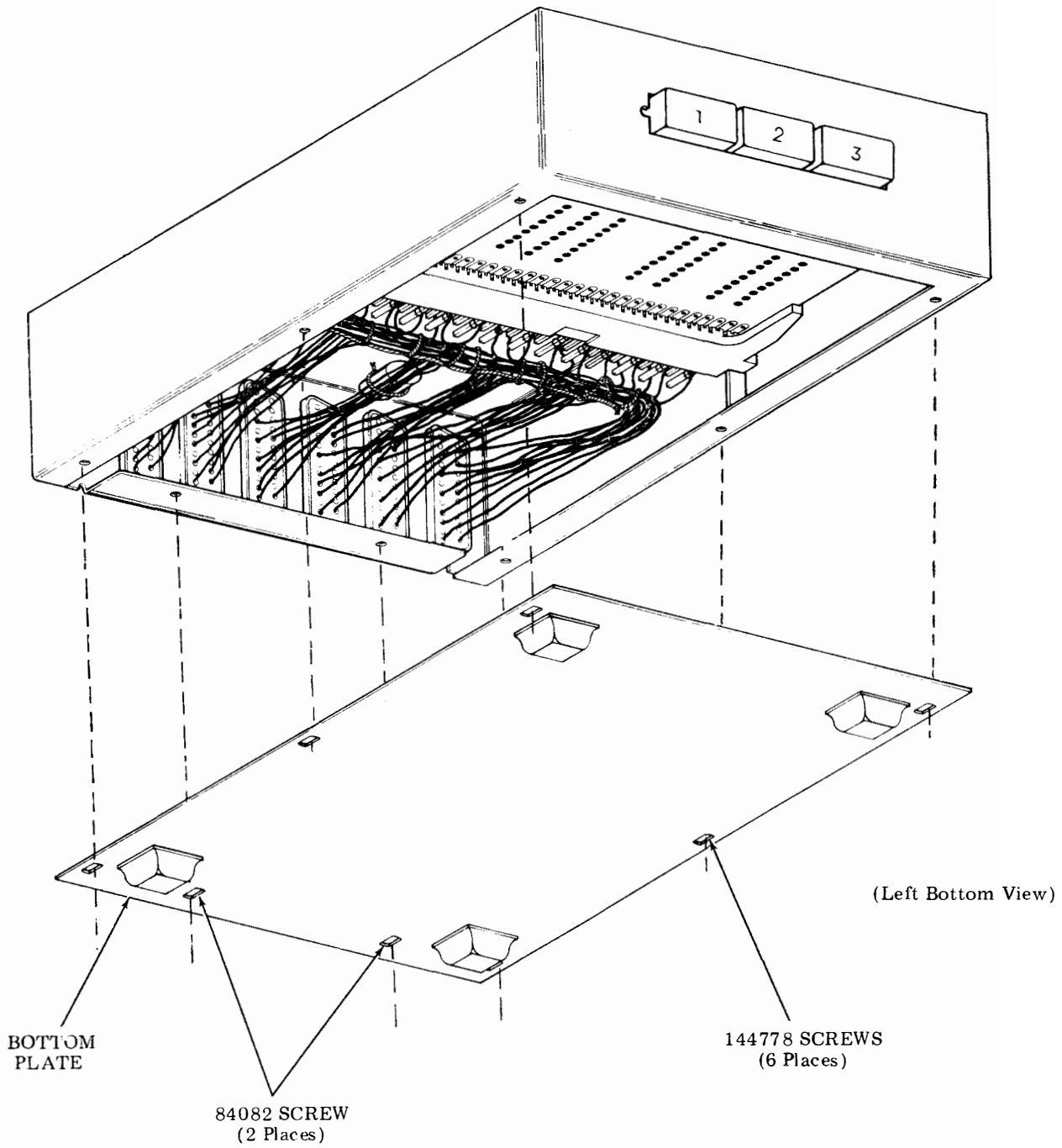


Figure 10 - Switch Assembly With Bottom Plate

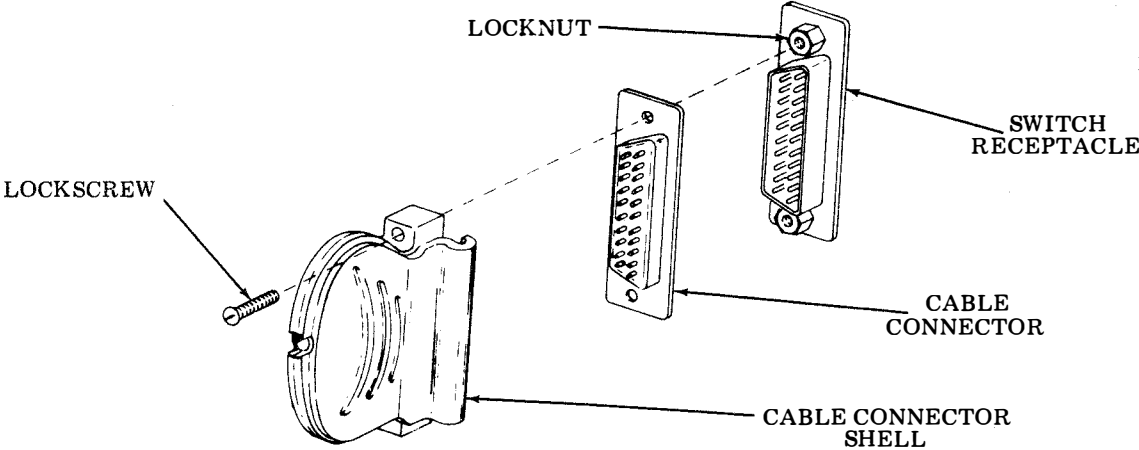
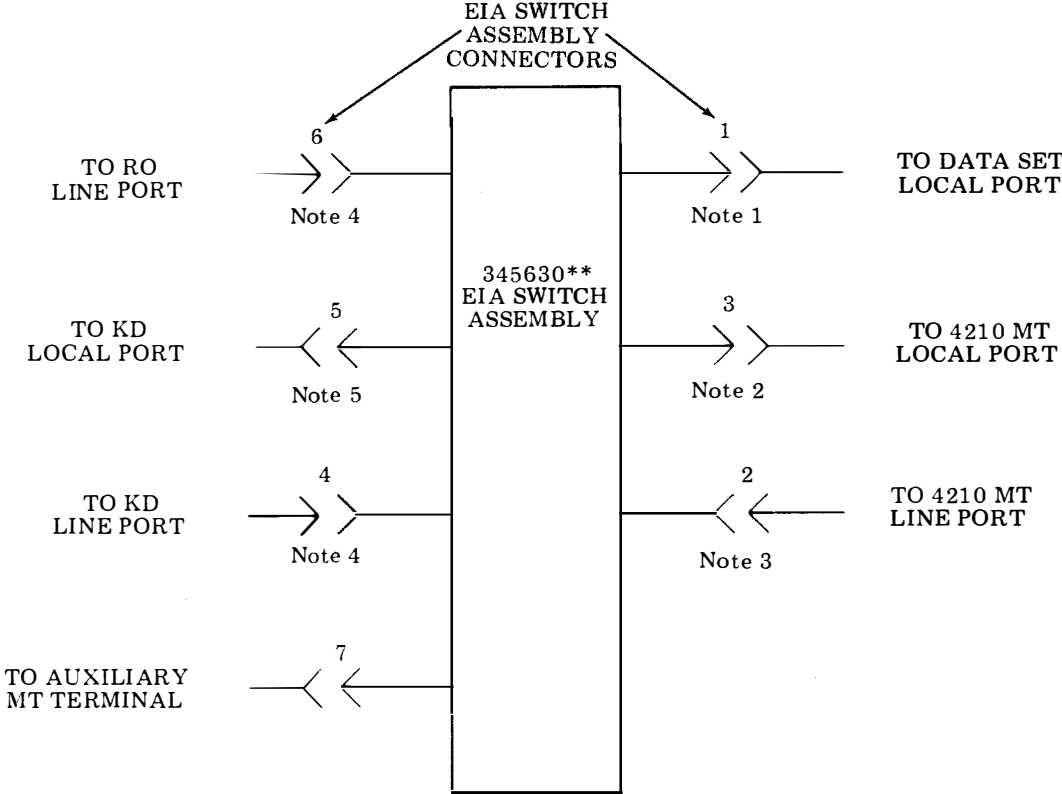


Figure 11 - Terminating Connectors on Switch Assembly



- Note 1: Cable 341896 provided with switch assembly (7 foot).
- Note 2: Cable 344375 provided with Model 40 Magnetic Tape Terminal (8 foot).
- Note 3: Cable 337380 provided with Model 40 Magnetic Tape Terminal (6 foot).
- Note 4: Cable 341896 provided with Model 40 Terminal (7 foot).
- Note 5: Cable 341896 ordered separately for this configuration (7 foot).

Figure 12 - Switch Assembly Cabling

3. PRINCIPLES OF OPERATION

3.01 The Model 40 EIA 345630** switch assembly changes station operating modes without interchanging station equipment cables. The following information shows how the switches connect Model 40 station equipment in three operating modes.

Mode One

3.02 With the mode one pushbutton depressed, the following EIA connectors are interconnected through the switch: 6 and 5, 4 and 1, and 7 and 2.

Note: Refer to Table B for connections between 2 and 7.

3.03 The Model 40 RO is connected to the local port of the KD through switch ports 6 and 5 (connectors on switch assembly) and the closed contacts in switch bank number 2 (Figure 3, mode one).

3.04 The Model 40 KD line port connects to the 202S-Type Data Set through connectors 4 and 1 and switch banks 1 and 3 respectively. The KD is not in conversational mode with the data set, and copy may be monitored on the RO.

3.05 While operations in the preceding paragraph are taking place, the 4210 Magnetic Tape line port is connected to an auxiliary terminal (another KD or MT) through connectors 2 and 7 (Table B) and switch banks 1 and 3. Data may be loaded in and unloaded out of the 4210 at this time.

Mode Two

3.06 When pushbutton no. 2 is depressed (pushbutton no. 1 or no. 3 is released depending on the mode used previously) the following EIA connectors are interconnected through the switch: 6 and 1, and 4 and 3.

3.07 In this mode, the KD is connected to MT for local operation (through connectors 3 and 4 in switch bank 1) to permit preparation of messages on the KD that may be accumulated on the MT terminal.

3.08 During this time, the RO may receive on-line from the data set through connectors 1 and 6, and switch banks 2 and 3. Alternately the KD-RO may retrieve messages previously stored on the tape (Figure 3, mode two).

3.09 When pushbutton no. 3 is depressed, the following EIA connectors are interconnected through the switch: 6 and 5, 4 and 3, and 2 and 1.

3.10 In this mode the Model 40 RO connects to the KD local port, the KD line port connects to MT local port, and the MT line port connects to the 202S-Type Data Set. These connections are accomplished through switch banks 1, 2, and 3, and connectors 1 through 6.

3.11 This mode (three) features 4210 MT automatic answering, which allows multiple messages to be sent or received on-line (Figure 3, mode three). If the MT terminal is equipped with auto-rewind feature, on-line messages may be automatically transferred to the display or printer.

EIA Lead Connections

3.12 The EIA lead connections shown in Table A are between the connectors previously mentioned in modes one, two, and three, except for connectors 7 and 2 which are listed in Table B.

Terminal To Terminal

3.13 The connections shown in Table B for mode one switch arrangement provides terminal-to-terminal operation through switch port receptacles 2 and 7.

3.14 On-line switching of terminal arrangements using a data set (connector No. 1) is not part of the EIA switch design intent. To avoid possible equipment damage, the switch contacts break-before-make. Accordingly, the data terminal ready (DTR) lead on pin 20 will experience a break (OFF) condition during switching which may cause a data set disconnect. The break time interval is dependent upon individual switch characteristics and operator speed in operating the pushbuttons. A 10 mfd. capacitor present in the DTR lead provides some integration so that a momentary break (milliseconds) in the DTR lead may not cause a disconnect. Generally speaking, however, switching between modes while on-line is not recommended, and any use in that manner must be with full realization of the limitations.

TABLE A
EIA CONNECTIONS

PIN NUMBER TO PIN NO.	CIRCUIT DESCRIPTION
2	Transmitted Data
3	Received Data
4	Request to Send (RTS)
5	Clear to Send (CTS)
6	Data Set Ready (DSR)
8	Data Carrier Detect (DCD)
11	Reverse Channel Send (RCS)
12	Reverse Channel Receive (RCR)
20	Data Terminal Ready (DTR)
22	Ring Indicator
*23	Character Control

*Note: Special non-EIA connection on pin 23 between switch ports 3 and 4 is used to supply character control between a KDP and MT operation.

4. INSTALLATION

CAUTION: DISCONNECT ALL POWER TO THE STATION.

- 4.01 Electrical compatibility of the data equipment on which the 345630** switch assembly is to be used must be determined before use in a given data station arrangement.
- 4.02 The 345630** switch assembly may be placed in any convenient location. The EIA data terminal cables are plugged into the switch ports (Figure 12) and fastened to the locknuts on the switch connectors (Figure 11).
- 4.03 As stated previously in this specification there are many mounting possibilities, however, these must be locally engineered in the field.
- 4.04 Restore power to the station and perform the switch assembly checkout given in Part 6 of this specification.

TABLE B
TERMINAL TO TERMINAL CONNECTIONS

CONNECTOR 2 PIN NO.	CONNECTOR 7 PIN NO.	CIRCUIT DESCRIPTION
8 ←	→ 8	Data Carrier Detect
6 ←	→ 6	Data Set Ready
20 ←	→ 20	Data Terminal Ready
4 ←	→ 4	Request to Send
5 ←	→ 5	Clear to Send
11 ←	→ 11	Reverse Channel Send
12 ←	→ 12	Reverse Channel Receive
2 ←	→ 2	Transmitted Data
3 ←	→ 3	Received Data
22 ←	→ 22	Ring Indicator

Note: Station equipment signal grounds (pin 7) which are tied together, and frame grounds (pin 1) which are tied together in all 7 receptacles are at different levels and kept separate.

5. TECHNICAL DATA

Physical Characteristics

5.01 The switch assembly which includes two circuit cards, three pushbutton switch assemblies, factory wiring from circuit cards to receptacles, and a metal box enclosure weighs approximately 3 pounds. Switch assembly dimensions are shown in Figure 13.

Operating Environment

5.02 Temperature requirements are:

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

Operating Temperature — This equipment is intended to be operated in a room environment within the temperature range of 40° F to 110° F. Service damage to it could result if this range is exceeded.

Humidity Range 2% to 95%
(noncondensing)

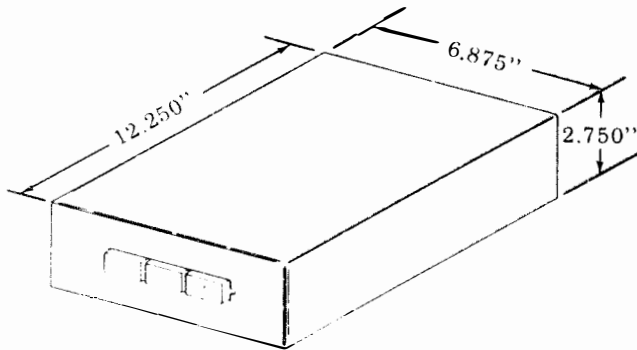


Figure 13 — DATASPEED EIA Switch Assembly Dimensions

Reference Drawings

5.03 Refer to the following drawings for additional information:

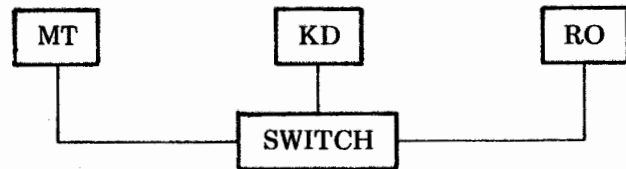
- Wiring Information — 9553WD
- Assembly Information — 345636
- Schematic Drawing — 1287SD

6. SWITCH ASSEMBLY CHECKOUT

6.01 The checkout for the EIA switch is done after terminal installation is completed. The EIA switch is then used to change the terminal apparatus interface to the data set.

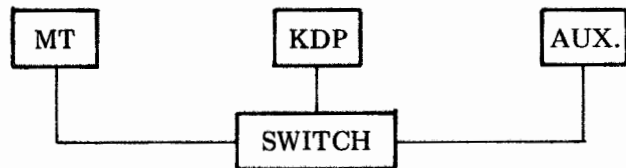
6.02 Terminal action is checked by simply engaging pushbutton 1, 2, or 3 and checking the interface of apparatus to the data set. Check the following listing for proper terminal configuration and refer to the proper paragraph for terminal operation in each mode.

4210 Magnetic Tape Terminal With Model 40 KD and Model 40 RO Printer



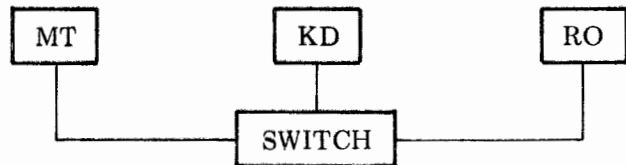
Refer to paragraph 1.08 for required terminal action.

4210 Magnetic Tape Terminal With Model 40 KDP and optional auxiliary terminal



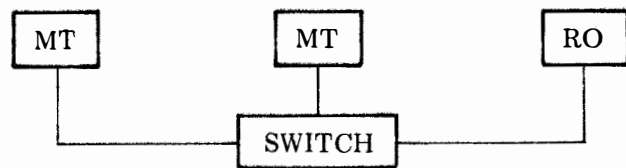
Refer to paragraph 1.12 for required terminal action.

4210 Magnetic Tape Terminal With Model 40 KD and a Model 33 or 35 RO Printer



Refer to paragraph 1.17 for required terminal action.

4210 Magnetic Tape Terminals With Model 33 or 35 RO Printers



Refer to paragraph 1.20 for required terminal action.

6.03 A system may be designed to use substitute terminal equipment or modify the station arrangements within the limits of the switch assembly. Checkout is then done by the use of TABLE C and reference to paragraphs 3.02, 3.06 and 3.09 for terminal action in modes 1, 2, or 3.

TABLE C

SWITCH MODE (OPERATED)	EIA CONNECTORS (INTERCONNECTED)
1	6 to 5 4 to 1 7 to 2
2	6 to 1 4 to 3
3	6 to 5 4 to 3 2 to 1

7. DISASSEMBLY AND REASSEMBLY

7.01 The disassembly or reassembly procedure is straight forward and involves only the use of a screwdriver. Major components are shown in Figure 14. The slide switch and circuit card assembly is removed and replaced as a unit. If possible, replacement of the assembly is advised if any part needs repair.

7.02 Disassembly procedures cover only sub-assemblies that may be removed and replaced for correcting troubles in field locations. The switch assembly should be disassembled and reassembled under clean conditions; oil, grease, and dust should not come in contact with circuit cards, cables, and connectors.

7.03 Do not force or pry parts to provide the necessary clearance for removal. Forcing is not required to remove any sub-assembly or part. Follow the removal procedure to be sure that reassembly will be accomplished properly. Reverse disassembly procedure for reassembly, except where different instructions are given.

7.04 Due to the various mounting applications of the switch assembly, dismounting the switch assembly from the equipment is left up to the ingenuity of the person working on the equipment.

Disassembly Procedure

7.05 Remove the eight mounting screws securing the bottom plate (Figure 10) to the switch box. The switch assembly may then be removed from the receptacle end by sliding the assembly away from the box (Figure 14).

7.06 The circuit cards and pushbutton switches may be separated from the assembly by grasping the circuit cards at the pushbutton end with one hand, and grasping the "U" bracket at the EIA receptacle end with the other hand and pulling the circuit cards out of the circuit card connectors.

7.07 Switches and circuit cards may be ordered from the factory as a pre-assembled unit. Do not attempt to disassemble and repair circuit cards and switches in field locations.

7.08 Circuit card connectors should not be removed in the field. If card connectors or EIA receptacles or connectors are damaged, the switch assembly should be sent to a Service Center for repair or replaced with a new switch assembly.

8. OPERATION

8.01 These operating instructions are for the 345630 EIA Switch Assembly, only. Operating instructions for any data equipment interconnected with the switch assembly are not covered in this specification.

8.02 The attendant instructions below are written to cover general use. Information covering unique terminal equipment arrangements, may be added on the lines following the initial instructions. Example: ROP (Receive-Only Printer) connected at J7, pushbutton 1 turns on printer motor and pushbuttons 2 and 3 turn motor off.

CUT ON DASHED LINES
PLACE IN ATTENDANT'S HOW TO OPERATE MANUAL

ATTENDANT SELECTABLE 345630 EIA SWITCH ASSEMBLY

The control panel contains three pushbuttons. Each pushbutton controls a mode of terminal operation.

When depressing a pushbutton, it may be necessary to hold down the switch assembly, if it is not physically attached to the terminal. When depressed the pushbutton locks in a down position and will release the previously selected pushbutton.

Pushbutton 1 — Used for the local off-line condition of the terminal.

Pushbutton 2 — Establishes a connection to the data set of terminal equipment.

Data equipment not connected to the data set may now be used to prepare messaging.

Pushbutton 3 — Establishes a connection to the data set of terminal equipment.

Data equipment now available for auto-answering

CAUTION: Depressing two pushbuttons at the same time sets up an invalid condition.

