5 5 4 0
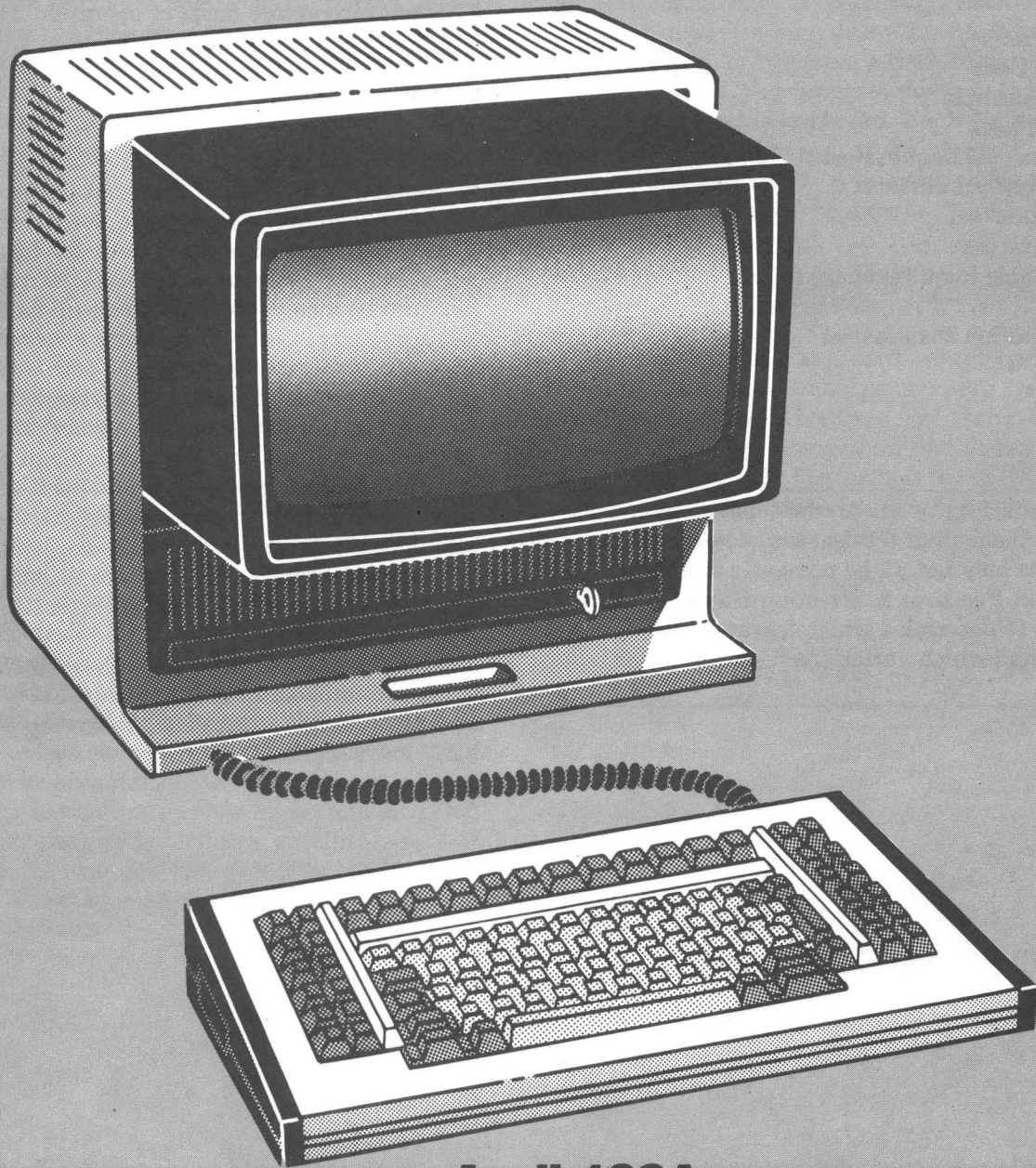
3270-Compatible
Information Display System

AT&T
Teletype Corporation

General Technical Reference
for SNA Systems

April 1984

CONTENTS

Not all variations of the product described in this
document have all of the features described, and
all features may not all be presently available.
See product Features & Selection Guide
document to determine which features are
available and which variations have which
features.

INTRODUCTION

This technical reference describes the 5540-30S version
of the 5540 family of synchronous data terminals.
This version permits remote communications with a
host computer via SNA-SDLC (Systems Network
Architecture using Synchronous Data Link Control)
protocol. The 5540-30B version, which permits remote
communications via BSC (Binary Synchronous Control)
protocol, is described in another technical reference.
Both versions are designed to be compatible with
IBM 3270-type host-software supported systems for
remotely-connected displays, and to enable users to
take advantage of the economies obtained by clustering
several devices onto a common cluster-controller. Their
efficient interactive mode of operation makes them
attractive for a variety of on-line computer input-output
applications, such as inquiry-response, data entry
and data retrieval.

5540-30S stations communicate via EBCDIC
(Extended Binary Coded Decimal Information Code),
whereas 5540-30B stations can use either EBCDIC or
ASCII (American Standard Code for Information
Interchange). Both are available in small and large
cluster versions, to accommodate up to 12 or 32
devices, respectively, if there are not more than 4 or 8
printers, respectively. Both also feature up to 9600
bit/sec operation, computer-controlled display
formatting and data entry on a choice of one and
four-color displays that are available in a variety of
screen sizes and display formats, print-out capability
on a choice of belt and daisy-wheel whole-character
and dot-matrix impact printers, display-menu option
selection, built-in station and device diagnostics,
modular construction, and modern styling.

5540-30S stations are compatible with IBM 3274
C-type controllers having attached 3178, 3278-2 & 5
and 3279-2A, 3A, S2A & 3X basic displays and
3287-1 & 2 and 3289 printers.

SNA-SDLC protocol permits a variety of stations to communicate with a variety of host-computers, over a variety of communications facilities. It has this capability because it is organized into a series of protocol layers, each of which controls a different and identifiable part of the overall communications. The communications facility (data-link) control layer uses SDLC protocol compatible with ANSI (American National Standards Institute) 3.66-1979(UN). It combines polling and data transfer over the data-link into efficient information exchanges between the host-computer and the stations in the system, and regulates data traffic by dividing data into information frames which are numbered by the sender and counted by the receiver to prevent any from being lost. It also includes a strong CRC (Cyclical Redundancy Checking) transmission-error checking scheme which, when coupled to automatic re-transmission of data frames containing errors, makes all transmissions virtually error-free.

Operating independently of this protocol layer, are other layers which divide lengthy sequences of data into messages and message segments which can be more efficiently responded to, tracked and transmitted; and then re-combines these messages and segments for delivery to the applications program or station device to receive them.

Operating independently of any of these layers, is a presentation services layer which adds to the data being sent so that it will be properly presented to the applications program in the computer or device at the station that will ultimately receive it. By operating independently of each other, this and the preceding layers permit variations to be introduced into the system without requiring the entire system protocol to be restructured. For example, different types of station devices and/or applications programs can generally be accommodated by making changes to just the presentation services layer; and different types of transmission facilities, satellite versus land-lines for example, can generally be accommodated by making changes to just the data-link control layer.

5540-30 stations employ both clustering and multi-point private-line communications facilities to provide two cost-saving advantages. With clustering capability, several communications devices can be grouped around a common controller at each station. With multi-point private-line facilities, several stations can be grouped onto a common communications circuit. Thus, in effect, each device shares the cost of its controller with other devices at the same station, and each station shares the cost of its data-link with other stations on the same circuit.

5540 stations use display terminals for data entry. This makes data communication both fast and accurate. Communication is accurate because data is entered prior to transmission on the display screen where it can be seen in its entirety and edited before it is sent. Communication is fast because displayed data is sent at maximum station speed rather than at the slower keyboarding speed at which it was entered. Also, the entire operation has the advantage of not consuming paper for either preparation or communication.

With computer-controlled displays, data entry is typically only a matter of filling out computer-provided forms. This makes data entry both easy and accurate because the form guides the user to the data to be entered, restricts the data entry to the type and amount of data called for, and saves the user the effort of entering repetitive data.

Aiding the display user during data entry are special function keys which can be used to cause the computer to perform host-software assigned functions such as calculations, next and previous form display, and local print-out. Also, the keyboard is available in external numeric cluster and internal numeric cluster (data entry), as well as typewriter styles, to make entry of numeric data easy and efficient. Other aids include a numeric-lock option, which prevents accidental entry of non-numerics in numeric display fields; highlighting and color which can be used to provide contrast between user-entered and computer-provided data or to draw attention to

computer generated data such as error messages; auto-skip, which moves the display-cursor to the start of the next field each time a display field is filled; and a user/status line which indicates computer-connection status, display-cursor row and column screen location, send and receive status, printer availability and print-out status, keyboard caps-lock, display character-insert mode, station configuration/option mode, and display and keyboard lock. A second status line, on command from the keyboard, indicates the computer's response time for the last message sent from the display, the number of sent and the number of received characters since the counters were last reset, and the number of messages having response times that are above, below and between two time values that can be set during options selection.

While entering data, a display user is never concerned with message transmission formats. All data necessary for system protocol, including station and device identification and proper interpretation of the data by the host-computer, is automatically generated.

The configuration of the station, the printer authorization matrix, and most station options can be entered on the station's master display, by entering choices presented on a series of displayed menus. These choices are stored on the same 5¼-inch diskette used to load the system protocol into the station. All choices are loaded into the station's operating program when stored on the diskette, except for station configuration choices. In order to load station configuration entries into the operating program, station operation must be interrupted; however the 5540 has an advantage in that it permits the entries and the interruption to be at different times; to permit, for example, a system manager to enter and store the station configuration during business hours when stations are in use, and someone else to load the stored entries after business hours when stations are not in use.

The storage of system protocol and display-selectable choices on 5¼-inch diskette is in itself a feature. It permits system protocol updates and changes to be made by merely changing the diskette, and it permits display-selectable choices to be made at one station location for any or all other locations.

STATION DESCRIPTION

Each 5540 station in the system consists of either a 5544 large cluster-controller with up to 16 or 32 devices, or a 5546 small cluster-controller with up to 6 or 12 devices. Each device can be one of several types of displays or one of several types of printers; except that at least 1 5548 or 5549 display is required at each station, to serve as master-display; and not more than 4 or 8 printers can be connected to a 16 or 32-device 5544, respectively, and not more than 4 printers can be connected to a 5546.

Each display at each 5540 station can be a 1-color 5548 or a 4-color 5549 cabinet-style display, or can be a 1-color 4503 round-base style display. Each 5548 & 5549 display can have a high or low-profile typewriter (T5) style keyboard, or can have a low-profile external numeric cluster (ENC5) or internal numeric cluster (data entry) (INC5) style keyboard. Each 4503 display can have one of 2 typewriter (T or TU) style keyboards, or one of 2 external numeric cluster (narrow or wide ENC) style keyboards. All 5548 & 5549 displays have a keylock and may have a selector pen. 4503 displays may have a keylock.

Each printer at each 5540 station can be a friction or tractor-feed belt printer, a standard or high-speed matrix-printer, or a daisy-wheel printer. See Device Description for additional features and Technical Facts for additional facts on printer and display devices. Consult the 5540 Features & Selection Guide document to determine which features are currently available and in what combinations they are available.

STATION OPERATION
Controls & Indicators

ON KEYBOARD

T & ENC Keyboards

S/R (Send/Receive)—Turns on LOCKED†
& causes transmission format data,
character associated with key,
& address of & data in each modified field
to be sent when display next sends.

LOCAL—If display not sending or receiving,
turns off LOCKED† & permits user data entry,
turns off INSERT†, cancels L/TST & IDENT,
clears error conditions not cleared by D/CNL
& turns off associated indicators†.

CONTROL—Permits entry of functions on top half of
keys. 2 keys on T keyboard.

TAB—Moves cursor to start of next unprotected field
& erases unprotected data en route.

FM or FIELD MARK—Enters character in an
unprotected field which can be used to denote a
sub-field within the field.

CHAR DLETE (Character Delete)—Erases character
at cursor in an unprotected field & moves data
displayed in same field to left (& from next line*)
to fill space.

IDENT (Identify)—Permits user to identify a printer
or a class of printers to perform PRINT LOCAL.
If ⑤† is:

PRINTER ?? — replaces ?? with newly assigned
class or LU#.

PRINTER 00 — replaces 00 with --
& moves cursor to 1st -,
ready for entry of desired printer class or LU#.

PRINT LOCAL—Produces printed copy
of protected & unprotected data on printer(s)
in class indicated by PRINTER 00.†

D/CNL (Device Cancel)—Cancels PRINT LOCAL
if incomplete because printer busy or unavailable;
clears printer error conditions & turns off associated
indicators†.

Keylock—Turns on KEYLOCK†, erases all displayed
data & prevents all display operation, when turned off.

Cursor ←→↑↓ , CHAR DLETE & INS keys
repeatable.

ENC Keyboards

ENTER S/R—Turns on LOCKED†
& causes transmission format data,
character associated with key,
& address of & data in each modified field
to be sent when display next sends.
2 keys.

REPT (Repeat)—Repeats any character key
depressed with it.

INC5 Keyboard

SKIP—Moves cursor to start of next
unprotected field.

NUMERIC—Permits entry of numeric & other
shift-position characters in alphanumeric unprotected
fields. On displays with numeric lock option,
also permits entry of shift-positions characters
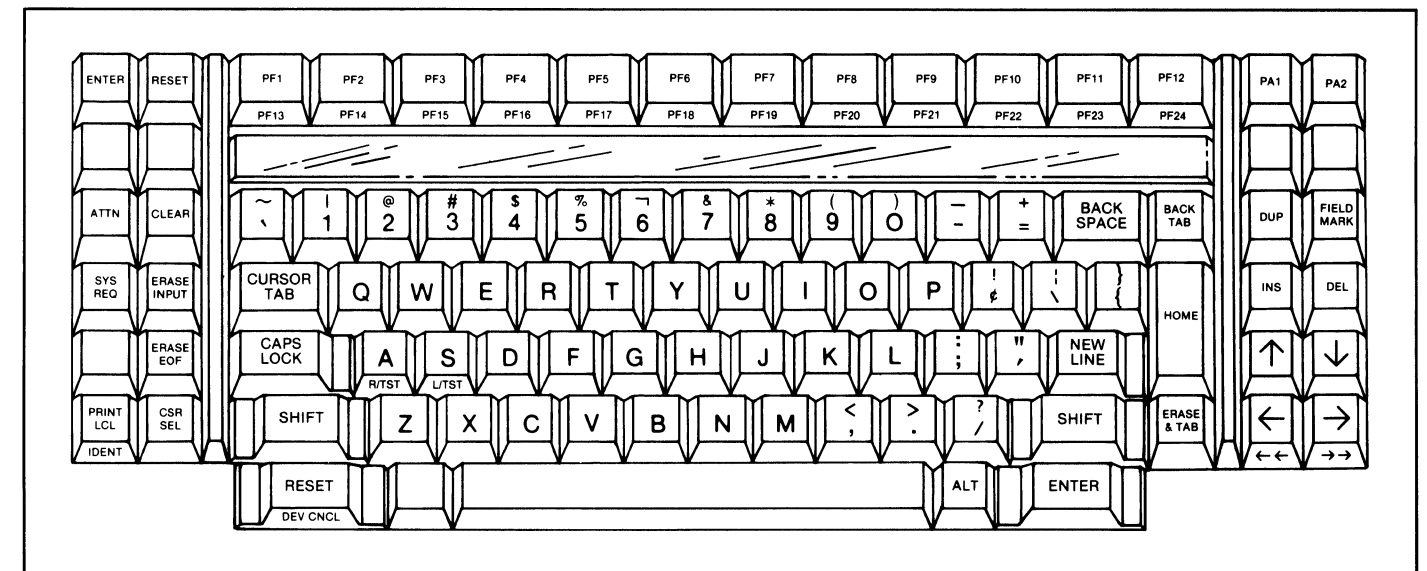other than those on numeric cluster keys.

ALPHA—Permits entry of alpha & other unshifted
characters when in numeric unprotected fields or
when NUM LOCK is on.

NUM LOCK—Locks keyboard in NUMERIC
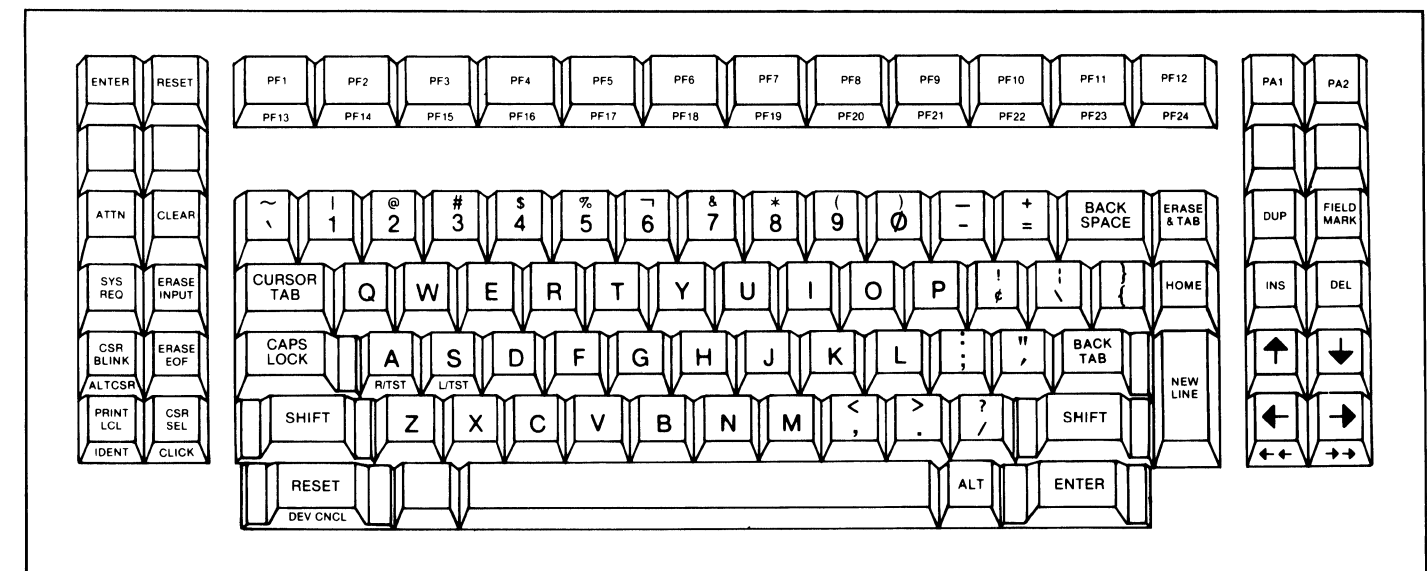except does not override numeric lock option.

*if field continues onto next line or if no fields.
†on display status line.
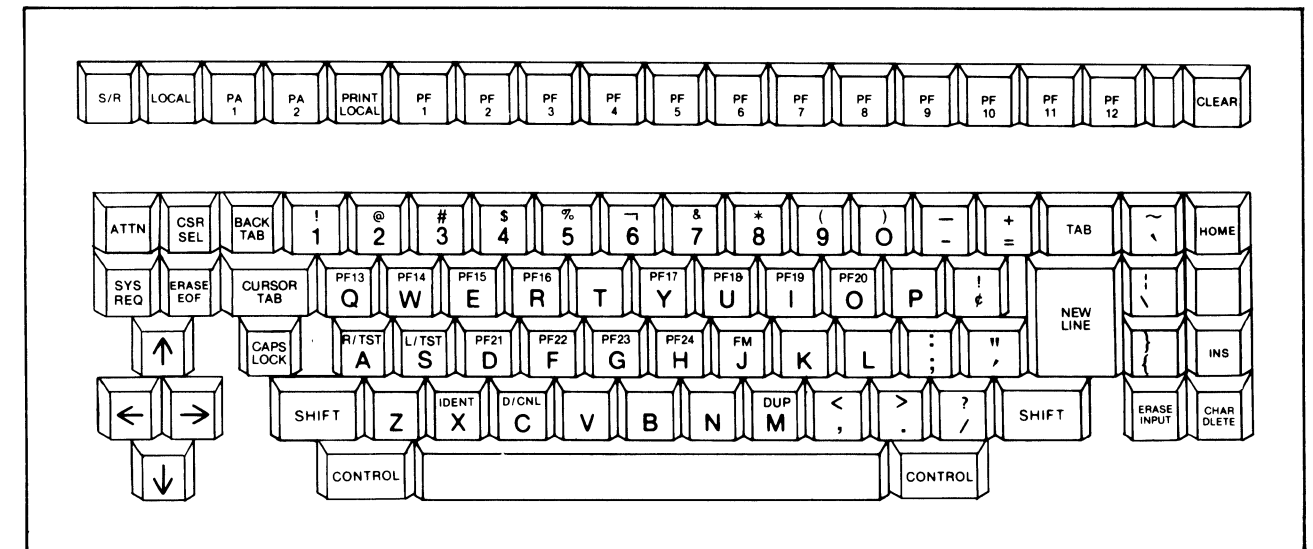
4503 Typewriter Keyboard (T)

4503 Unitized Typewriter Keyboard (TU)

5548 & 5549 Typewriter Keyboard (T5)

TU, T5, INC5 & ENC5 Keyboards

ENTER—Turns on LOCKED†
& causes transmission format data,
character associated with key,
& address of & data in each modified field
to be sent when display next sends.
2 keys, 3 on ENC5.

RESET—If display not sending or receiving,
turns off LOCKED† & permits user data entry,
turns off INSERT†, cancels L/TST & IDENT,
clears error conditions not cleared by DEV CNCL
& turns off associated indicators†. 2 keys.

ALT (Alternate)—Permits entry of functions on
fronts of keys.

BS or BACK SPACE—Causes ← or ⬅

ERASE & TAB—Moves cursor to start of next
unprotected field & erases unprotected data en route.

FIELD MARK—Enters character in an unprotected
field which can be used to denote a sub-field within
the field.

DEL (Delete)—Erases character at cursor in an
unprotected field & moves data displayed in same
field to left (& from next line* on 4503) to fill space.

IDENT (Identify)—Permits user to identify a printer
or a class of printers to perform PRINT LCL.
If ⑤† is:

PRINTER ?? — replaces ?? with newly assigned
class or LU#.

PRINTER 00 — replaces 00 with --
& moves cursor to 1st -,
ready for entry of desired printer class or LU#.

PRINT LCL (Print Local)—Produces printed copy
of protected & unprotected data on printer(s)
in class indicated by PRINTER 00†.

DEV CNCL (Device Cancel)—Cancels PRINT LCL
if incomplete because printer busy or unavailable;
clears printer error conditions & turns off associated
indicators†.

Repeatable keys—All except CLEAR
& any that do not cause cursor movement.

T5, INC5 & ENC5 Keyboards

CSR BLINK (Cursor Blink)—Causes cursor to start
or stop blinking.

ALT CSR (Alternate Cursor)—Changes cursor from
solid character-size rectangle to underline type or
vice versa.

CLICK—Turns key-click on or off.

T, TU, T5, ENC & ENC5 Keyboards

CAPS LOCK—Turns on CAPS† & puts display in
caps mode: Permits entry of upper-case letters
without having to depress SHIFT & without having
to re-depress CAPS LOCK in order to enter unshifted
characters such as numbers.

SHIFT—Permits entry of shift-position characters.
2 keys.

T, TU, T5, INC5, ENC & ENC5 Keyboards

PF (Program Function) 1 to 24—Turns on LOCKED†
& causes transmission format data,
character associated with key,
& address of & data in each modified field
to be sent when display next sends.
2 PF1 to 10 keys on INC5.

PA (Program Access) 1 & 2—Turns on LOCKED†
& causes transmission format data
& character associated with key
to be sent when display next sends.
Also PA3 on INC5.

CSR SEL (Cursor Select)—If character at start of
unmodified (or modified) & selectable field in which
cursor is placed is ? (or >), changes it to > (or ?)
& field to modified (or unmodified). If character is &,
turns on LOCKED† & causes transmission format
data, 1st of 2 characters associated with key, &
address of & data in each modified field to be sent
when display next sends; but if character is SP or
NUL, causes same result except 2nd character
associated with key sent & only address of each
modified field is sent. 2 keys on INC5.

CLEAR—Erases all fields, causes HOME,
& causes transmission format data
& character associated with key
to be sent when display next sends.
Also turns off INSERT† & turns on LOCKED†.

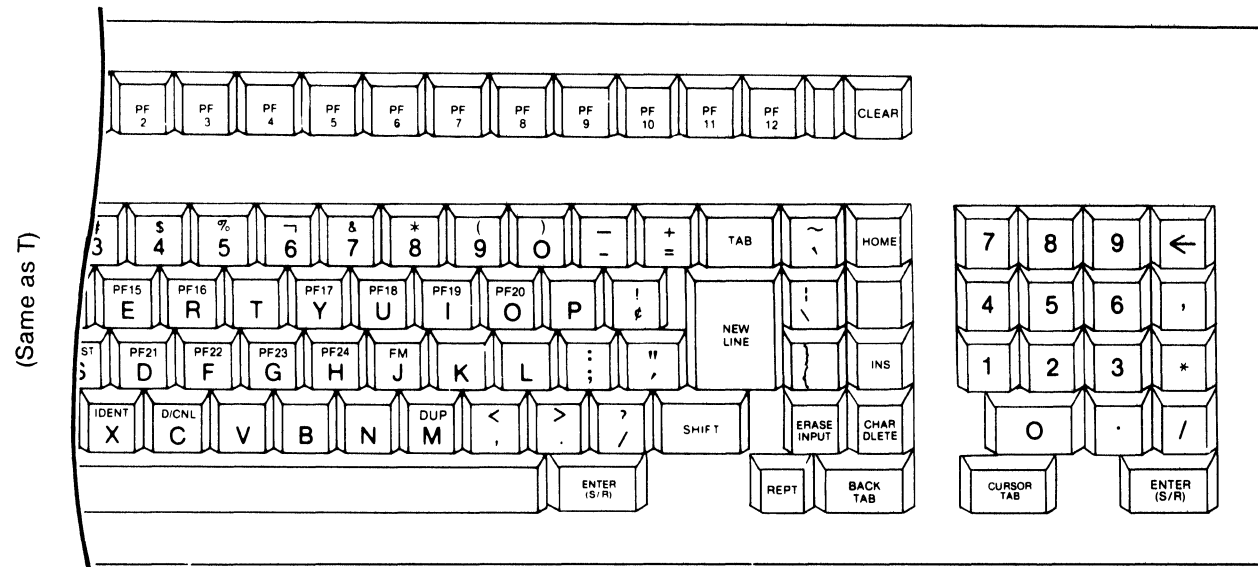ERASE INPUT—Erases all unprotected data from
display & causes HOME.

ERASE EOF (Erase to End of Field)—Erases data
between cursor & end of unprotected field.

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*if field continues onto next line or if no fields.
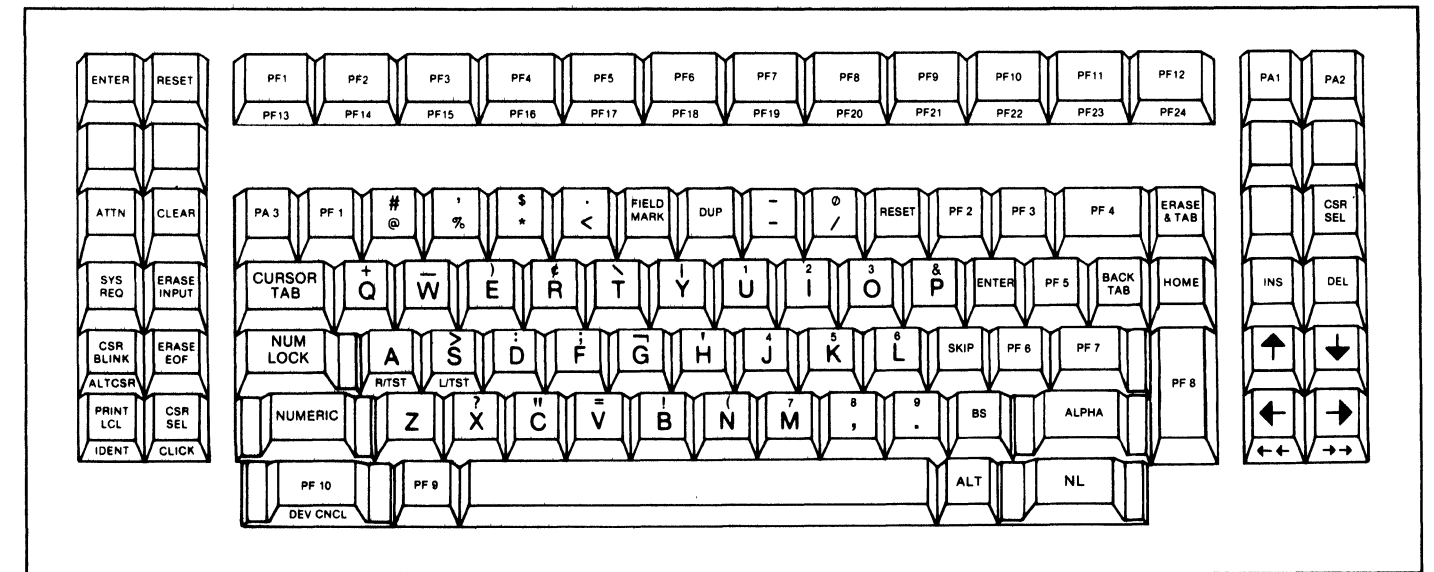†on display status line.

Controls & Indicators (cont'd)
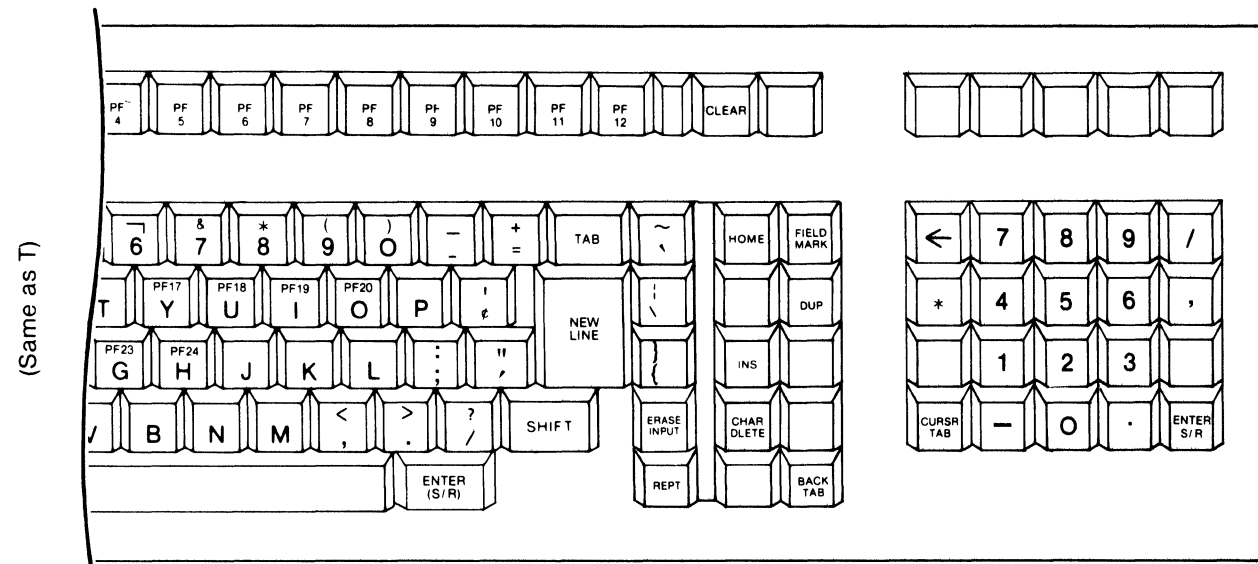
ON KEYBOARD (CONT'D)

(Fold this page onto itself to permit pages 5 through 10 to be viewed at the same time)
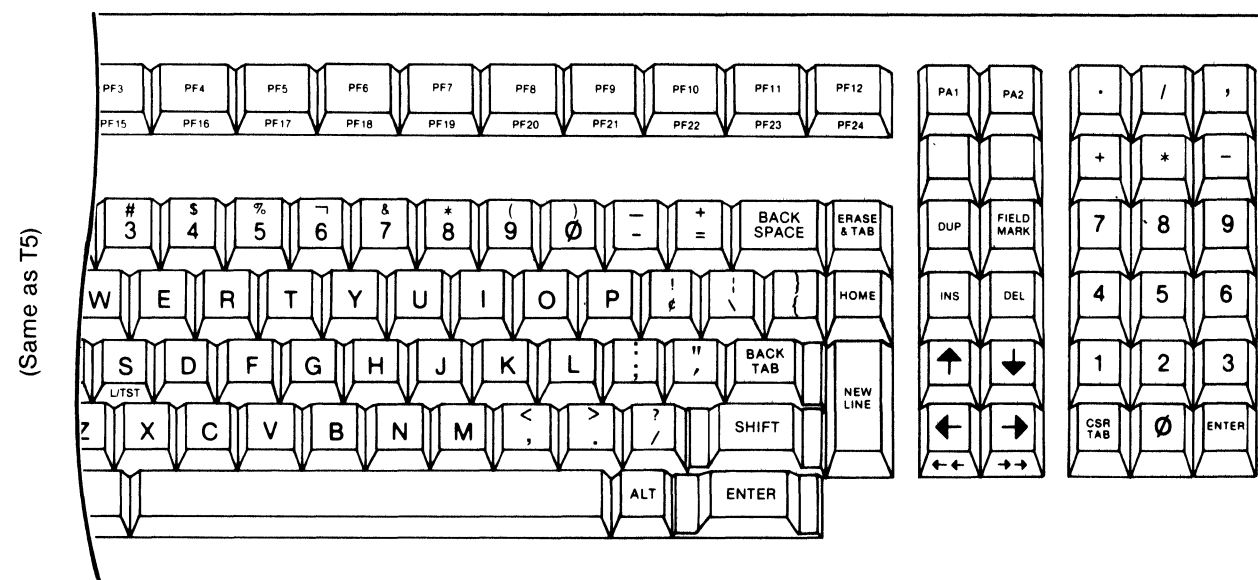
4503 Narrow External Numeric Cluster Keyboard (ENC, Narrow)

(Same as T)

4503 Wide External Numeric Cluster Keyboard (ENC, Wide)

(Same as T)

5548 & 5549 External Numeric Cluster Keyboard (ENC5)

(Same as T5)

5548 & 5549 Internal Numeric Cluster Keyboard (INC5)

T, TU, T5, INC5, ENC & ENC5 Keyboards (cont'd)

HOME—Moves cursor to upper-left corner of screen or to first unprotected position following.

Cursor ↑↓←→ or ↑↓←→ —Moves cursor in directions indicated by arrows, character or line at a time.‡ 2 ← keys on ENC keyboards.

BACK TAB—Moves cursor to start of previous or present unprotected field, depending on whether cursor is or is not at start of field.‡ 2 keys on ENC keyboards.

CURSOR TAB, CURSR TAB or CSR TAB—Moves cursor to start of next unprotected field.‡ 2 keys on ENC & ENC5 keyboards.

NL or NEW LINE—Moves cursor to first unprotected display position on next line.

DUP (Duplicate)—Enters character in an unprotected field to denote that data in field is identical to data in corresponding field on previously sent form, or identical to data in previous field on same form. Also moves cursor to start of next unprotected field.

INS (Insert)—Turns on INSERT† & puts display in insert mode, wherein entry of a character at cursor location in an unprotected field moves data at & to right of cursor to right (& into next line*). Optionally, except on 4503, only moves data & enters space at cursor location.

ATTN (Attention)—Sends Sig command if permitted by computer.

SYS REQ (System Request)—Erases all data from display & switches station to or from SYSTEM†.

R/TST—Not functional.

L/TST (Local Test)—Turns on local test† per ④ & tests data paths between display & modem interface. Can be extended to include station or computer modem if the modems have analog & digital loop-back, respectively.

Volume control—On bottom of keyboard (not shown). Adjusts loudness of audible tone (see Other Display Controls & Indicators).

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‡Can cause cursor wraparound: If cursor is moved off the screen to the right, it will re-appear one line down on the left. If moved off to the left, it will re-appear one line above on the right. If moved off top or bottom, it will appear on bottom or top, respectively, in same column.
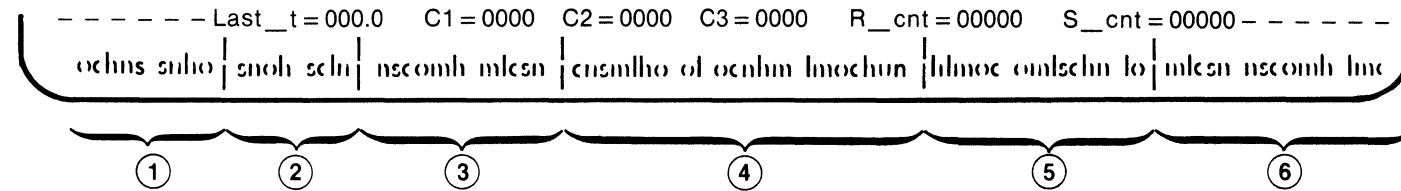
†on display status line.
*if field continues onto next line or if no fields.

Controls & Indicators (cont'd)

ON DISPLAY

User/Status Information Line:

As illustrated below, a user/status information line appears at the bottom of the display screen, which contains 6 fields; and, if the user depresses the ALT key with the X key on a 5548 or 5549 display, a response-time information line appears on the line above the status line.

```
- - - - - - Last_t = 000.0   C1 = 0000   C2 = 0000   C3 = 0000   R_cnt = 00000   S_cnt = 00000 - - - - - -
```

	①	②	③	④	⑤	⑥
5549 & 5548	SYSTEM PROGRAM UNOWNED CONFIG	SEND RECV ERROR SHUTD	Per field maintenance documentation	LOCKED CAPS INSERT KEYLOCK PROTECTED AREA NUMERIC FIELD FIELD FULL NOT MASTER KD ID NOT AUTHORIZED ID NOT IN MATRIX NO PRINTER ASSIGNED LOCAL TEST REQUESTED LU = 00 P = 00 – L/TST OK CONFIG REQUESTED	PRINT REQ PRINTER 00 PRINTING FAILURE BUSY BUSY + +	R00 C000
4503	SYSTEM PROGRAM UNOWNED	Per field maintenance documentation	CAPS L/TEST PEND	LOCKED INSERT KEYLOCK	PRINTER 00 PRINTING FAILURE BUSY BUSY + + PTR NOT AUTH	R00 C000

The possible status words that can be displayed in each field are listed beneath each field in the table above. They are grouped into categories and defined below. Where 2 words are shown for the same description, the 1st applies to a 5548 or 5549, the 2nd (in parenthesis) to the 4503.

Session Indicators—
① on 5548, 5549 & 4503:

SYSTEM - Display connected to computer system but not to an applications program

PROGRAM - Display connected to an applications program

UNOWNED - Display switches to PROGRAM on receipt of Bind command, or to SYSTEM on receipt of SSCP data or on depression of SYS REQ key

CONFIG - In configuration mode (if master display)

LU Mode Indicators—
② on 5548 & 5549:

SEND - Display is sending or has sent

RECV - Display is receiving or is about to receive

ERROR - Error, shown in ③

SHUTD - Received ShutD command. After end of bracket, prevents sending until SDT received

Error Indicators—
③ on 5548 & 5549; ② on 4503:

More than 15 error conditions displayed, as defined in field maintenance manual.

Local Test Indicators—
④ on 5548 & 5549; ③ on 4503:

LOCAL TEST REQUESTED (L/TEST PEND) - L/TST depressed. Depress RESET or LOCAL to cancel

LU = 00   P = 00-L/TST OK - L/TST successful for LU 00 at port 00

User-Error Indicators—
④ on 5548 & 5549 (briefly replaces Keyboard Mode Indicators); ⑤ on 4503:

PROTECTED AREA - Attempting to enter data in protected field or on an attribute character

NUMERIC FIELD - Attempting to enter alphabetic or other unshifted character in numeric field, if optioned to not permit

FIELD FULL - Attempting to insert data where space does not permit

NOT MASTER KD - Attempting to enter CONFIG mode from non-master display

ID NOT IN MATRIX ID NOT AUTHORIZED - Attempting to identify printer &/or display not specified in printer authorization matrix

NO PRINTER ASSIGNED (PTR NOT AUTH) - No printer assigned to PRINT LOCAL or PRINT LCL key

CONFIG REQUESTED - ALT & C depressed. Displayed until NOT MASTER KD or CONFIG displayed or RESET depressed

Keyboard Mode Indicators—
④ on 5548 & 5549; ③ & ④ on 4503:

KEYLOCK - All display operation prevented until keylock turned on

LOCKED - Keyboard entry prevented until RESET or LOCAL depressed

CAPS - In CAPS LOCK mode per key

INSERT - In INSERT mode per key until RESET or LOCAL depressed

Printer Status Indicators—
⑤ on 5548 & 5549; ⑤ on 4503:

PRINTER 00 - Display has printer class or LU 00 (2-char hex) presently assigned to it. If ?? instead of 00, a new class or LU number has been assigned. Use IDENT key to display newly assigned or change present class or LU number. LU number displayed instead of class number during print-out

PRNT REQ[‡] - Displayed after PRINT LOCAL or PRINT LCL depressed, until replaced by one of following:

BUSY[‡] - Printer busy

BUSY + +[‡] - Printer very busy

FAILURE[‡] - Printer failed to respond (completely) to PRINT LOCAL or PRINT LCL key

PRINTING - Printing occuring per PRINT LOCAL or PRINT LCL key

Cursor Location Indicator—
⑥ on 5548 & 5549; ⑥ on 4503:

R00   C000 - Row & column number of cursor location; except depression of IDENT key causes location of 00 in PRINTER 00 to be displayed instead

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[‡]Depress D/CNL or DEV CNCL to cancel request causing indication

Response-Time Information Line (5548 or 5549):

– – – – – – – Last__t = 000.0   C1 = 0000 C2 = 0000 C3 = 0000   R__cnt = 00000 S__cnt = 00000 – – – – – – –

As illustrated above, a response time information line is displayed above the status line on a 5548 or 5549 display, if the user depresses the ALT with the X key. In the sequence shown, this line indicates the response time from the computer in seconds for the last message sent from the display, the number of messages whose response time is < t1, the number of messages whose response time is between t1 and t2, the number of messages whose response time is > t2, and the number of characters (in 100s) received and sent since the counters were last reset; where t1 and t2 are values that can be entered and changed at the master display.
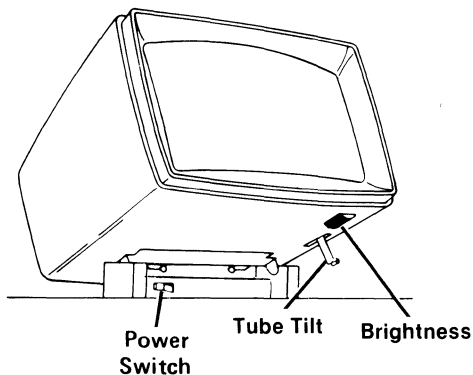
Other Display Controls & Indicators:

5548:
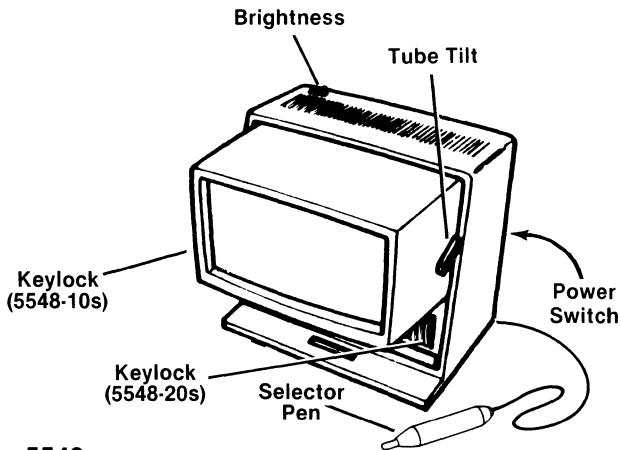
5549:
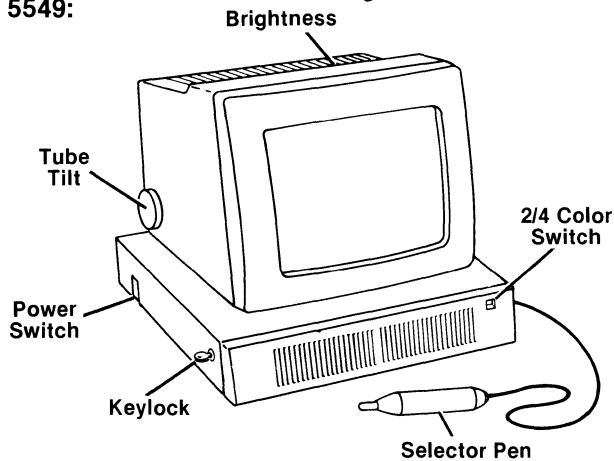
4503:

Tube Tilt & Brightness
(5548, 5549 & 4503):
Permits user to compensate for nearby lighting glare.

Audible tone
(5548, 5549 & 4503):
Sounds on any of the following conditions to assist user:
Attempting to enter data in a protected field or on an attribute character, attempting to insert data where space does not permit, attempting an unassigned print-local, attempting to enter other than numerics (0 to 9, −, . & DUP) in a numeric field if numeric-lock option was elected, attempting to send data when not permitted by computer, attempting to repeat non-repeatable functions, when power turned on (except on 4503), attempting to enter data when keyboard locked. Tone loudness adjustable, on keyboard.

Keylock (5548, 5549 & 4503):
5548 & 5549: Turns on KEYLOCK†,
turns off display screen except for status line, & prevents all display operation.
4503: Erases displayed data & prevents all display operation. Located on keyboard.
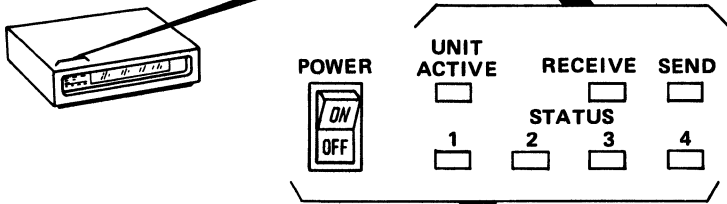
Selector Light-Pen
(5548 & 5549)
Performs function described for CSR SEL (Cursor Select) key except switches cursor to underline type and causes a horizontal line to be displayed through all characters in the selected field, until selector pen removed.

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†on display status line

13

Controls & Indicators (cont'd)

ON CONTROLLER

5546:

UNIT ACTIVE — turns on after successful diskette load.

SEND — on if in send mode or flashing if sending.

RECEIVE — on if in receive mode or flashing if receiving.

5544:
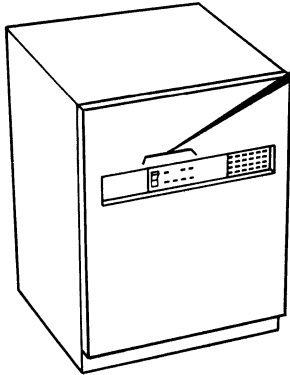
STATUS 1 — flashes during diskette loading. Load unsuccessful if 2, 3 &/or 4 turns on.

After diskette loading: STATUS 1 flashes whenever diskette is active & 2, 3 &/4 turn on to indicate status conditions.

ON PRINTER

Daisy-Wheel Printer
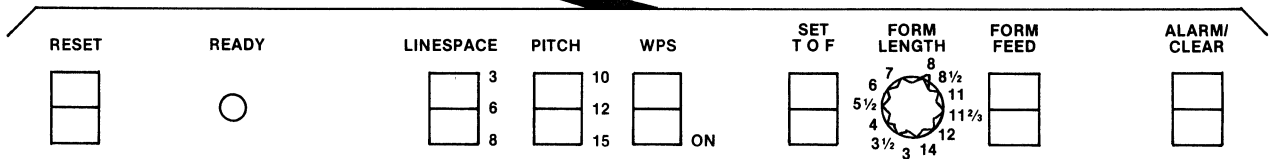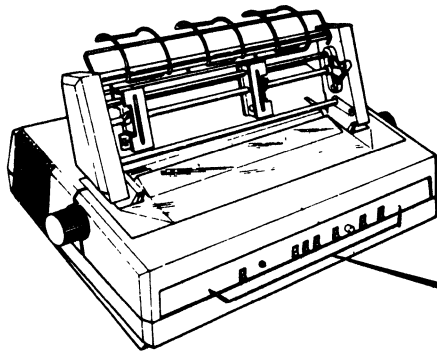
RESET† — Depress after setting opitons

READY — Flashes fast if in alarm; slow if in printer test

LINESPACE — Sets printer for 3, 6 or 8 line/in printing

PITCH — Sets printer for 10, 12 or 15 char/in printing

WPS (Word Proportional Spacing) — Overrides PITCH & causes char's to be printed proportional to their width

SET TOF† (Set Top Of Form) — Depress after changing FORM LENGTH or LINESPACE

FORM LENGTH — Sets printer for 3, 3-1/2, 4, 5-1/2, 6, 7, 8, 8-1/2, 11, 11-2/3, 12 or 14-in long forms

FORM FEED† — Feeds paper to top of next form

ALARM/CLEAR† —Depress after cause of alarm removed

---

†Spring-held

14

High-Speed Matrix Printer
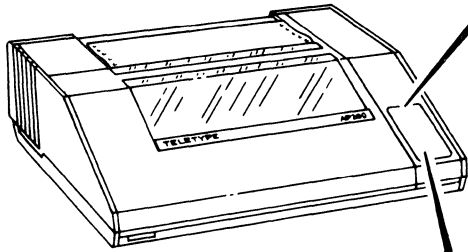
6–8 LPI — Sets printer for 6 or 8 lines/in

TEST — Causes test message print-out

10–16 PITCH — Sets printer for normal 10 or condensed 16.7 char/in printing

FORM LGTH — Sets printer for 3, 3-1/2, 4, 5-1/2, 6, 7, 8, 8-1/2, 11, 12 or 14" long forms
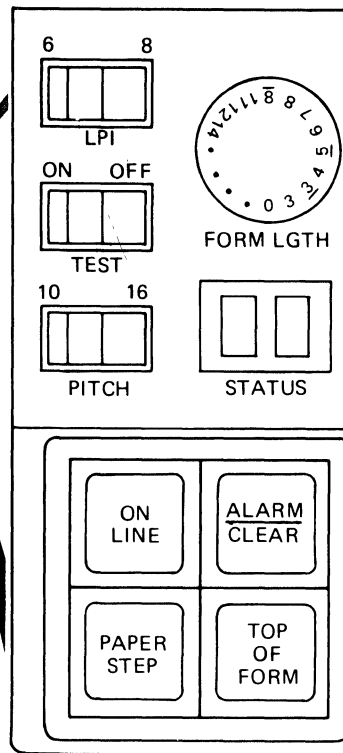
STATUS — Indicates maintenance status, e.g.:

00 — Ready
01 — Paper Out
03 — Cover Open
04 — Bail up
. . . others in Service Manual

ON-LINE — Depress off before depressing PAPER STEP or TOP OF FORM, otherwise leave on.

PAPER STEP — Feeds paper until released

ALARM/CLEAR — Removes alarm if cause of alarm removed

TOP OF FORM — Feeds paper to top of next form.

Belt Printers
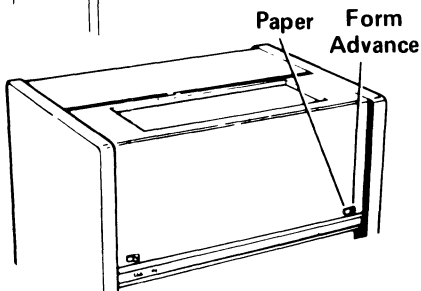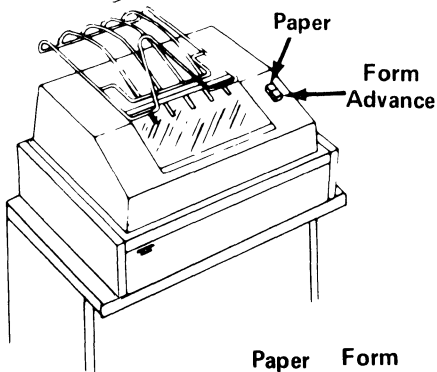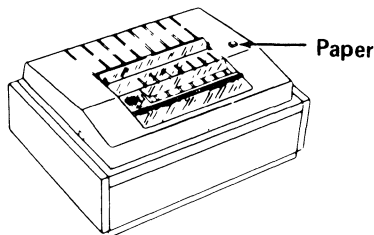
PAPER — Feeds paper until released. Lights when paper supply needs refilling. Floor model also lights if tractor feed pins move to feed paper but paper does not move, which condition prevents further printer operation in order to prevent a paper jam from occurring.

FORM ADVANCE — Feeds paper to beginning of next form.

PAPER OUT — Lights when paper supply needs refilling

FORM — Feeds paper to beginning of next form
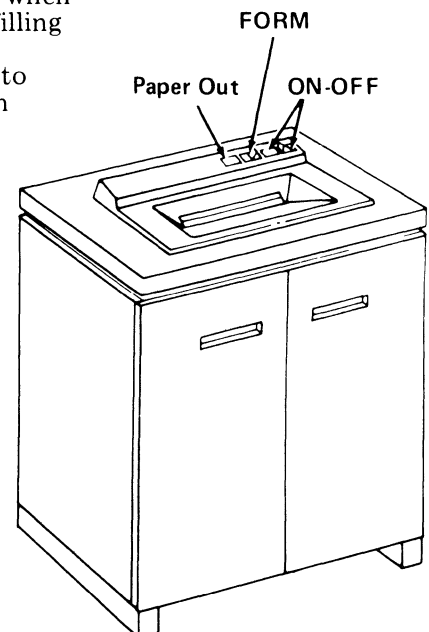
Options

STATION & DEVICE OPTIONS

```
                    ***STATION FUNCTION MENU***

          1 — Stored Station Configuration
          2 — Printer Authorization Matrix
          3 — Loaded Station Configuration & Device Status
          4 — Station Statistics
          5 — Device Options
          6 — Remote Loopback Test
          7 — Response Time Monitor




     Enter menu # for desired function here — then depress ENTER

     Depress CLEAR to exit CONFIG mode, ALT-C to re-display Menu

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```

All station and many device options are selected from a 5548 or 5549 display that is plugged into the 5544 or 5546 cluster-controller and designated as the "master" display. Initially the master display must be plugged into port 1 on the controller and is designated as LU2, but either of these facts can be subsequently changed.

To choose options, the master display is put into the CONFIG mode by depressing the ALT key with the C key. This causes the menu shown above to be displayed, along with instructions for displaying a menu selection, as shown.

Options can be entered by displaying menu items 1, 2 & 5. As options are entered on these screens, a printed copy of any screen can be made by depressing PRINT LOCAL or PRINT LCL if a printer has been assigned to the master display per the screen associated with menu item 2. If invalid entries are made on an options screen, the screen will remain even though ENTER is depressed, all invalid entries will be highlighted, and the cursor will move to the first invalid entry.

There can be up to 12 or 32 LUs (Logical Units) numbered 02 to 33, for the 5546 or 5544 respectively, each of which must be assigned to a different controller port, numbered 01 to 12 or 01 to 32, via the Stored Station Configuration display screen (menu item 1), shown below. If the 5546 or 5544 controller only accommodates up to 6 or 16 devices, respectively, instead of 12 or 32, then only up to 6 or 16 LUs, each with any unique number between 02 & 33, can be assigned to up to 6 or 16 ports, using only the port numbers 01 to 06 or 01 to 16. Also, not more than 4 printer devices can be assigned to ports 01 to 16 or to ports 17 to 32 on a 32-device 5544.

As shown on the Stored Station Configuration screen, a device type must be specified for each LU, by entering one of the following designations:

16

D1 — 5548 or 5549 (cabinet-style) display with a T5, INC5 or ENC5 keyboard

D2 — 4503 (round-base) display with a T (16" std) or narrow (19") ENC keyboard

D3 — 4503 (round-base) display with a wide (25") ENC keyboard

D4 — 4503 (round-base) display with a TU (19" std) keyboard

P1 — Belt (line) or high-speed matrix character printer

P2 — Standard-speed matrix character printer

P3 — Daisy-wheel (letter-quality) printer

At the top of the Stored Station Configuration screen, the controller station address (any 2-character hex value from 01 to FE) must be entered, the LU number of the master display must be entered if different than 02, and options must be elected for NRZI and between-bracket printer-sharing. Elect option Y for NRZI only in cases where it is required by the communications facilities. (See under Interface in Technical Facts for description of NRZI.) Elect option Y for between-bracket printer-sharing for most applications. When a printer is shared, per the Printer Authorization Matrix, this option permits equal contention between the computer and the displays sharing it; otherwise, if option N is elected, the contention is biased in favor of the computer.

As shown below for the Printer Authorization Matrix screen (menu item 2), the LU number for each printer must be entered and followed by its mode, class and source device(s). As stated on the screen, the B, H or L mode entered for each printer determines whether it can be used by the host computer and/or the displays whose LU numbers are assigned to it as source devices. Then, when the same display is assigned to several printers, the printer class number(s) assigned to each printer permits the display user to restrict each printout to a different class of printers, via the IDENT key on the display.

For this purpose, each printer can be assigned up to 16 class numbers (from 70 to 85). (For example, if printer LUs 04, 05 & 06 are assigned to display LU 03, a user-requested print-out from the display would occur only on printer LUs 05 and 06 if only they were assigned to class 74 and the display user entered 74 for IDENT before depressing PRINT LOCAL or PRINT LCL.)

As shown below for the Device Options screen (menu item 5), certain options must be elected for each LU device. Not all options apply to all devices, however options that an LU device cannot perform are ignored for that device. If the numeric-lock option is elected for a display LU, it restricts the entry of data in a numeric field to the characters 0 to 9, —, . and DUP, unless an INC5 keyboard is being used and the NUMERIC or ALPHA key is depressed during entry. If the character insert option is elected for a 5548 or 5549 display LU, depression of the INS (insert) key moves data on the screen to create a space at the cursor location, instead of putting the display into the insert mode wherein the space is created as the characters to be inserted are entered. If the display-only option is elected for a 5548 or 5549 display LU, it can only display received data, which permits the keyboard to be removed. If the FF (Form Feed) on end of message option is elected, it causes the same result as if an FF device order had been received at the end of each message. Elect the selector pen option for those 5548 or 5549 display LUs so equipped. Elect monocase display for those 5548 or 5549 display LUs where it is desired. Elect the ENC option for 5548 & 5549 display LUs with (20") ENC5 keyboards. Elect the PF13-24 Primary option for displays with T5, ENC5 or TU keyboards equipped with the modification kit to replace the PF keys with keys having PF1-12 on the front of the keys and PF13-24 on the top. Elect the NL option for belt & high-speed matrix printers that are optioned (per Additional Printer Options, described below) for up to 132 char/line at 10 char/in, and for daisy-wheel printers optioned both for automatic new-line at right-hand margin and for up to 132 char/line at 10 char/in, to cause the printer to perform 2 new-lines instead of 1 on receipt of a 132-characater line following by NL.

STORED STATION CONFIGURATION

Station Address (Hex): 01
Master Display LU #: 02
NRZI Coding (Y or N): N
Between-Bkt Printer Sharing (Y or N): Y
Device:

LU#	Port#	Type		LU#	Port#	Type
02	01	D1		03		
04				05		
06				07		
08				09		
10				11		
12				13		
14				15		
16				17		
18				19		
20				21		
22				23		
24				25		
26				27		
28				29		
30				31		
32				33		

Valid display types:
Cabinet-style display with
D1 — Any keyboard
Round-base display with
D2 — 16" std or 19" ENC keyboard
D3 — 25" ENC keyboard
D4 — 19" std keyboard

Valid printer device types:
P1 — Line or hi-speed char matrix
P2 — Low-speed char matrix
P3 — Daisy-wheel char

Depress:
CLEAR to exit CONFIG mode
ALT-C to re-display Menu
ENTER to store data
Power Station controller
OFF & ON to load data

PRINTER AUTHORIZATION MATRIX

LU #	Mode	Class (Read # vertically)				Source Device LU# (Read # vertically)							
		7777 0123	7777 4567	7788 8901	8888 2345	0000 2345	0000 6789	1111 0123	1111 4567	1122 8901	2222 2345	2222 6789	3333 0123
--	-	----	----	----	----	----	----	----	----	----	----	----	----
--	-	----	----	----	----	----	----	----	----	----	----	----	----
--	-	----	----	----	----	----	----	----	----	----	----	----	----
--	-	----	----	----	----	----	----	----	----	----	----	----	----
--	-	----	----	----	----	----	----	----	----	----	----	----	----
--	-	----	----	----	----	----	----	----	----	----	----	----	----
--	-	----	----	----	----	----	----	----	----	----	----	----	----

Enter each printer LU # and mode,
then enter x beneath the desired class #s and source display device LU #s

Valid Modes:
B — Both host & local printing
H — Host printing only
L — Local printing only

Depress:
ENTER to load data
CLEAR to exit CONFIG mode
ALT-C to re-display Menu

```
                          ***DEVICE OPTIONS***
                         LU # (Read # vertically)
                0000 0000 1111 1111 1122 2222 2222 3333
    Option      2345 6789 0123 4567 8901 2345 6789 0123

    Numeric Lock      ----  ----  ----  ----  ----  ----  ----  ----
    Character Insert  ----  ----  ----  ----  ----  ----  ----  ----
    PF13-24 Primary   ----  ----  ----  ----  ----  ----  ----  ----
    20" ENC Keyboard  ----  ----  ----  ----  ----  ----  ----  ----
    Display Only      ----  ----  ----  ----  ----  ----  ----  ----
    Monocase Display  ----  ----  ----  ----  ----  ----  ----  ----
    Selector Pen      ----  ----  ----  ----  ----  ----  ----  ----
    FF on End of Message  ----  ----  ----  ----  ----  ----  ----  ----
    NL if 133rd Char = NL  ----  ----  ----  ----  ----  ----  ----  ----


    To elect option, enter x beneath desired LU #, adjacent to option name
    Options that do not apply to a device are ignored for that device

    Depress ENTER to load data, CLEAR to exit CONFIG mode, ALT-C to re-display Menu
```

ADDITIONAL PRINTER OPTIONS

In addition to the printer options previously described, there are options that are selected by means of miniature switches located on circuit cards inside each printer device. The following tables list these options and the option numbers that relate to the required settings.

Since these printers are also used in other product lines, some of the options shown do not apply, but must be chosen so as to not conflict with standard or desired system operation.

Options relating to receipt of on-line controls (e.g. FF) state only what the printer does when it receives the control, not what was received from the computer that caused the control to be sent from the cluster-controller to the printer.

Belt Printer Options

Printer Speed (bps)	
75	59a
150	59b
300	59c
600	59d
1200	59e
2400	59f^F
4800	59g
9600	59h

Does not apply. Elect option 59f for all applications.

Printer Character Set	
95 char	19d
	23b^F
	55a^F
64 char	19e^F
	23b^F
	55a^F
More than 95 char	19f
	23a
	55b
Less than 64 char	19g
	23b^F
	55a^F

Elect 19d, 23b & 55a where 95-character (up-low) print-outs are required, but 19e, 23b & 55a for 64-character (monocase) print-outs. (Also be sure that the printer is equipped with the proper typecarrier.)

SSI Printer Interface	
yes	57a^F
no	57b

Elect 57a for all applications

Printer	Paper Alarm Caused By	
Tractor Feed	paper out	48a
	paper out when start of form reached	48b^F

Elect 48a for most applications, to put the printer in unavailable status immediately after paper alarm. This allows present print-out to continue but prevents next one until paper re-filled.

Paper Alarm Turns Off Printer Motor	
yes	56b
no	56a^F

Elect 56a for friction feed printers & 56b for tractor feed

Printer Auxiliary Alarm	
yes	60a
no	60b

Elect 60b for all applications

Printer	On receipt of Lower Case, Print	
64 character	upper case	22b^F
	≢	22a
95 character	lower case	21a^F
	upper case	21b

will cause the upper case equivalent to be printed on receipt of lower case.

Options 21a and b are used when an up-low printer is being added to a monocase system which will eventually become up-low. Option 21b permits the printer to be introduced into the system as monocase, and option 21a then permits it to be switched to up-low when the system becomes up-low.

Print Character Following ESC	
yes	54a^F
no	54b

Elect 54b for most applications

Turn Printer Motor Off if Data Transfer Stops 40 sec	
yes	58b
no	58a^F

Elect 58b for most applications

Elect option 22a if a monocase printer is being added to a monocase system. It will cause receipt of any character other than monocase to print ≢ , indicating an error.

If the monocase printer is being added to a full (upper and lower case) system, elect instead option 22b. This

Print Substitute Character On Parity Error		
yes	Even	19a^F
	Odd	19b
No		19c

The controller sends even parity to all belt and high-speed matrix printer devices. Elect 19a or c according to whether it is desired to indicate characters received with even parity errors or not.

19   20

Perform Form Feed	
on RM loss	18b
on RM loss or on rec'g ETX	18c
neither	18a

Elect 18a for all applications, because if an automatic form feed at the end of each received message is desired it can be provided by electing that option on the Device Options screen described above.

Receipt of FF or Depression of FORM ADVANCE key Causes Tractor Feed Printers to	
Form Feed	39a
New Line or Paper Advance, respectively	39b

Elect 39a for most applications. With 39b FF would cause new line (carriage return + line feed) to occur, & depression of the FORM ADVANCE key would cause paper to be fed for as long as the key is held depressed.

Printer Left-Hand Margin Setting at Column	
1	17a^F
2	17b2
3	17b3
4	17b4
5	17b5
6	17b6
7	17b7
8	17b8
9	17b9
10	17b10
11	17b11
12	17b12
13	17b13

Printer Right-Hand Margin Setting at Column	
80	17c^F
79	17d79
78	17d78
77	17d77
76	17d76
to	to
25	17d25
132	17e
131	17f131
130	17f130
129	17f129
128	17f128
to	to
73	17f73

The options above are used to determine the maximum print-out line length and location. Actual line length may vary per received commands and orders. Printer performs automatic new line (carriage return + line feed) at right-hand margin unless next character is NL.

Double Line Feed	
yes	20b
no	20a

Elect 20a for most applications. 20b causes a blank line between every printed line.

High-Speed (340 cps) Matrix Printer Options

On receipt of	printer performs	
FF or ETX	form feed	501a
	new line	501c
FF	form feed	501b
ETX	carriage return	501b
FF	new line	501d
ETX	carriage return	501d
FF or ETX or on RM loss	form feed	501e
	new line	501g
FF or on RM loss	form feed	501f
ETX	carriage return	501f
FF or on RM loss	new line	501h
ETX	carriage return	501h

Elect option 501a for most applications. The printer will never receive ETX from the cluster-controller, consequently this option causes form feed on receipt of FF and carriage return on receipt of CR as would be expected in most systems. (New line is carriage return + line feed, should an option for it be elected.)

Interface	Speed (bps)		
EIA		9600	500a
		4800	500b
		2400	500c
		1200	500d
		600	500e
		300	500f
		150	500g
		110	500h
SSI	Erase†	yes	500i
		no	500j^F

†Erase data to be printed from printer's 2-line buffer if paper out, cover or bail up or if printer interface (SSI) turns off.

Does not apply. Elect 500j for all applications.

Form Perforation Skip-Over	
0-lines	507a^F
3-lines	507b
4-lines	507c
6-lines	507d

Elect this option according to form design considerations

Print Character following ESC	
yes	504b
no	504a^F

Elect 504a for most applications

Perform New Line		
after adjacent number of char's have been printed on line not ending in NL or VT	218	502a
	132	502b^F
	66	502c
on CR*		502e
neither		502d

*prevents underlining

Power	
VAC	Hz
115	50
230	60

Specify 115 or 230 VAC and 50 or 60 Hz according to power requirements

Elect 502b for most applications. It will cause the print head to move to the beginning of the next line after 132 characters have been printed on the same line, unless the 132nd character is followed by NL (New Line) or VT (Vertical Tabulation). Elect 502d if underlining will be performed — i.e. if a line of characters followed by CR (Carriage Return) followed by a line of underlines will sometimes be received.

Expand Characters on line containing SO (Shift Out)	
yes	505a
no	505b^F

Contract Characters on line containing DC2 (Device Control 2)	
yes	506a
no	506b^F

Elect 505b and 506b for most applications because the computer is not normally prepared to distinguish between printers having this capability and those not having it.

If option 505a is elected, a line of characters containing SO anywhere in line causes the characters in that line to be printed at 5 or 10 cpi, according to whether the PITCH control is set at 10 or 16 respectively.

If option 506a is elected, a line of characters containing DC2 anywhere in that line causes the characters in that line to be printed at 16.7 cpi if the PITCH control is set at 10 (or continue to be printed at 16.7 if set at 16).

Character Set	Print Substitute Character on Parity Error		
ASCII	Yes	Even	503a
		Odd	503b
	No		503c^F
EBCDIC	Yes	Even	503d
		Odd	503e
	No		503f
Neither	No		503g

The controller generates even parity to all belt or high-speed matrix printer devices. Consequently elect option 503d or f according to whether it is desired to indicate characters received from the station controller with even parity errors or not.

Standard-Speed (30 cps) Matrix-Printer Options

Character Font			
Standard, except	slash on zero	& print ↑ & ← instead of ∧ & ─	431b
	slash on oh		431c
	slash on oh		431d
	zero narrower than oh		431a
Optional	zero narrower than oh or per opt'l ROM, via SO-SI		431e 473a
	per optional ROM		431e[F] 437b

Elect 431a for most applications, to print the standard font with zero printed narrower than oh

Maximum Line Length	
80	472a
100	472b
132	472c
132 but no bell	472d[F]

Elect 472d for most applications to permit up to 132 char/line to be printed, without ringing the end of line bell when that many characters are printed.

Provide Top-Of-Form Signal	
yes	470a[F]
no	470b

Provide Form Feed Signal	
yes	471a[F]
no	471b

Elect 470b and 471b for all applications.

Daisy-Wheel Printer Options

Bi-Directional Printing	
yes	519a[F]
no	519b

Elect 519a on for most applications.

Stop Printer on Paper Out	
yes	520a[F]
no	520b

Elect 520a on for most applications to stop the printer when the paper supply is gone

FF on ETX	
yes	524a
no	524b[F]

Elect 524b for most applications

Perform New Line		
at right-margin	yes	522a[F]
	no	522b
on NL	yes	523a[F]
	no	523b
on CR	yes	521a[F]
	no	521b

Elect options 522a, 523a & 521b for most applications. Option 522a causes the printer to perform new line (carriage return + line feed) after it has printed
132 char at 10 char/in,
158 char at 12 char/in or
198 char at 15 char/in.
It also permits the NL device option (described earlier under Station & Device Options) to cause 2 new-lines instead of 1 on receipt of a 132-char line followed by NL. If otion 522b is elected instead of 522a, it causes only 1 new-line if the NL device option is elected, & prevents new-line if the NL device option is not elected, if a 132-char line is received & followed by an NL.

OPTIONS CHECK LIST

In order to select options for an entire system in advance of installation, make one copy of the table on the next page for each station in the system and one copy of the tables below for each printer in the system. Then, when selecting options from the previous tables uses these tables to be sure that all required choices have been made by entering or circling the option choice character or number or by crossing out the option choice if it does not apply.

Additional Belt Printer Options for Printer Device No._____ at Station No._____
17 a b__
17 c d__
17 e f
18 a b c
19 a b c
19 d e f g
20 a b
21 a b
22 a b
23 a b
39 a b
48 a b
54 a b
55 a b
56 a b
57 a b
58 a b
59 a b c d e f g h
60 a b

Additional Std-Speed Matrix Printer Options for Device No._____ Station No._____
431 a b c d e
470 a b
471 a b
472 a b c d
473 a b

Additional High-Speed Matrix Printer Options for Device No._____ at Station No._____
115 230
50   60
500 a b c d e f g h i j
501 a b c d e f g h
502 a b c d e
503 a b c d e f g
504 a b
505 a b
506 a b
507 a b c d

Additional Daisy-Wheel Printer Options for Device No._____ Station No._____
519 a b
520 a b
521 a b
522 a b
523 a b
524 a b

Station Address _____   **Master Display LU #** _____   **NRZI Coding** Y N   **Between-Bkt Printer Sharing** Y N

LU#	Port#	Type	Mode	Class #s / Source LU#s	Numeric Lock	Character Insert	Display Only	FF on End Of Msg	Selector Pen	Monocase Display	20" ENC Keyboard	PF13-24 Primary
02												
03												
04												
05												
06												
07												
08												
09												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												

Station Address __07__   **Master Display LU #** __02__   **NRZI Coding** Y (N)   **Between-Bkt Printer Sharing** Y (N)

SAMPLE

LU#	Port#	Type	Mode	Class #s / Source LU#s	Numeric Lock	Character Insert	Display Only	FF on End Of Msg	Selector Pen	Monocase Display	20" ENC Keyboard	PF13-24 Primary
02	01	D1			X							
03	04	D2			X	X						
04	03	P1	B	70, 72 /04								
05	02	P2	L	78 /02, 09				X				
06												
07												

DEVICE DESCRIPTION
General

Each device at each 5540 station can be either a display or a printer, with the limitations stated under Station Description.

Each display at each 5540 station can be a 1-color 5548 or a 4-color 5549 cabinet-style display, or can be a 1-color 4503 round-base style display. Each 5548 & 5549 display can have a high or low-profile typewriter (T5) style keyboard, or can have a low-profile external numeric cluster (ENC5) or internal numeric cluster (INC5) style keyboard. Each 4503 display can have one of 2 typewriter (T or TU) style keyboards, or one of 2 external numeric cluster (narrow or wide ENC) style keyboards. All 5548 & 5549 displays have a keylock and may have selector pen. 4503 displays may have keylock.

All displays have feet that permit them to be easily slid around on any flat surface, plus brake pads that prevent further sliding should one of their feet go over the edge of the surface. Cabinet-style 5548 & 49 and round-base 4503 displays can be up to 4-1/2 and 6 ft, respectively, from their attached keyboards.

Each printer at each 5540 station can be a friction or tractor-feed belt printer, a standard or high-speed dot-matrix printer, or a daisy-wheel printer. Friction and tractor-feed printers are for printing, respectively, on continuous rolled or fan-folded forms. Both dot-matrix and daisy-wheel printers are tractor-feed printers. The belt tractor-feed printer is available in a floor-model cabinet large enough to accommodate both the paper supply and the print-out, with windows to view each; and is available in a forms-access version which permits the print-out to be torn off just below the last line printed.

Both the large 5544 and small 5546 cluster-controller operate on diskette-loaded protocol, which permits the 5540 station to be changed from SNA protocol, described in this document, to BSC protocol, described in another Technical Reference.
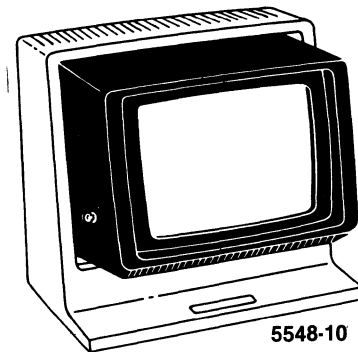
Additional device features are summarized on the following pages. Consult the 5540 Features & Selection Guide document to determine which features are currently available and in what combinations they are available.
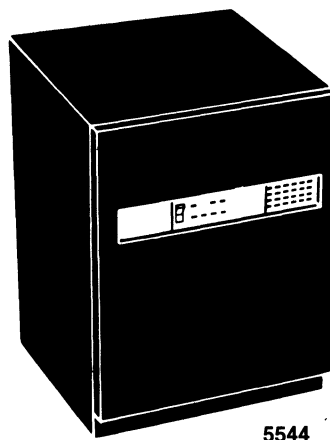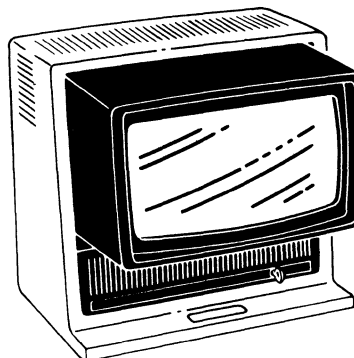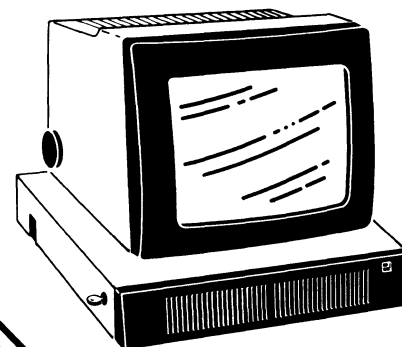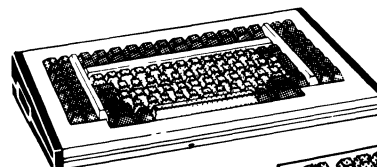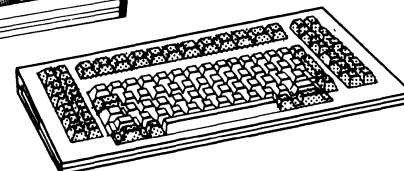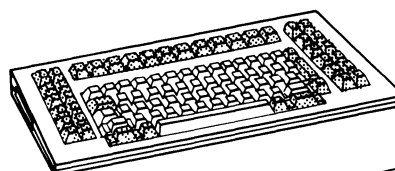
5546
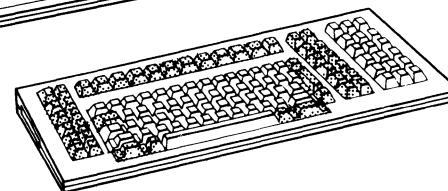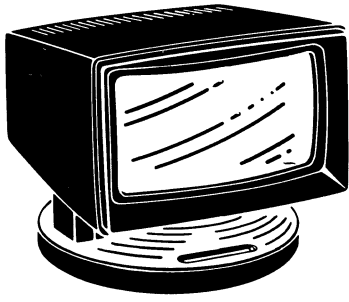
5544
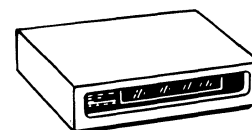
5548-10

5548-20

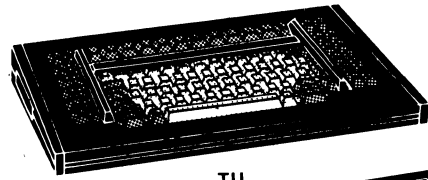5549-40

T5, high-profile

T5, low-profile

INC5, low-profile

ENC5, low-profile

26

4503

T
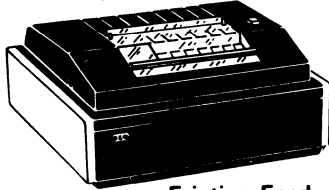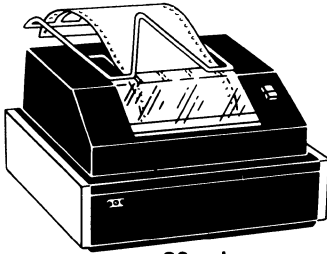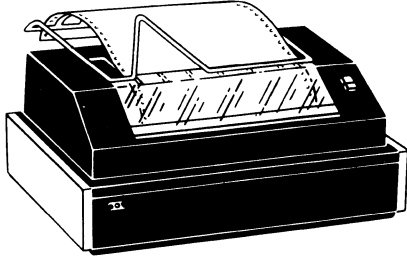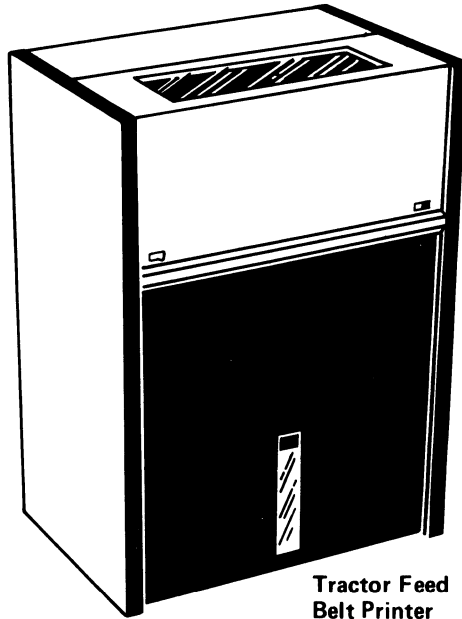

TU

ENC, Narrow

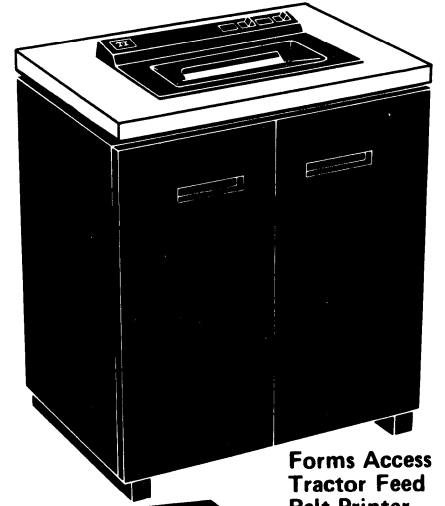ENC, Wide

Friction Feed
Belt Printer
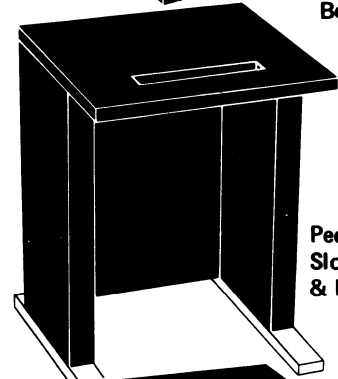

80-column
Tractor Feed
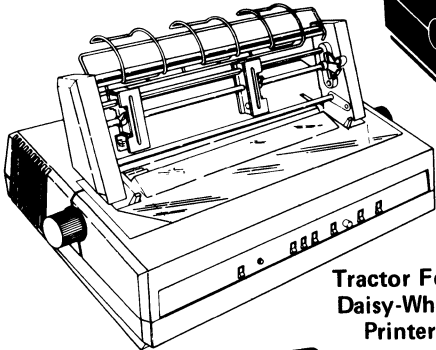Belt Printer

132-column
Tractor Feed
Belt Printer

Tractor Feed
Belt Printer

Forms Access
Tractor Feed
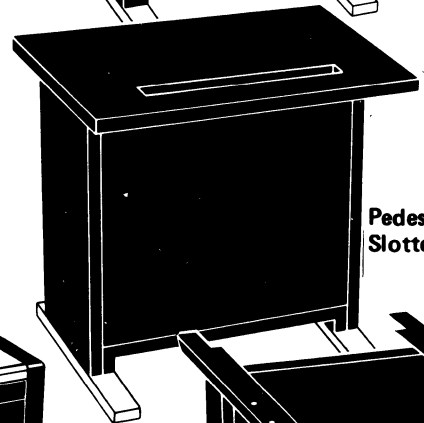Belt Printer
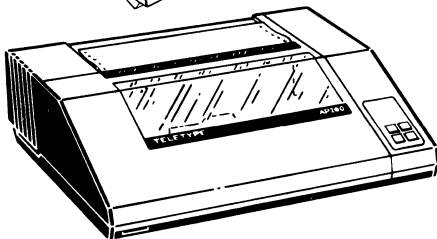

Pedestal with
Slotted Top
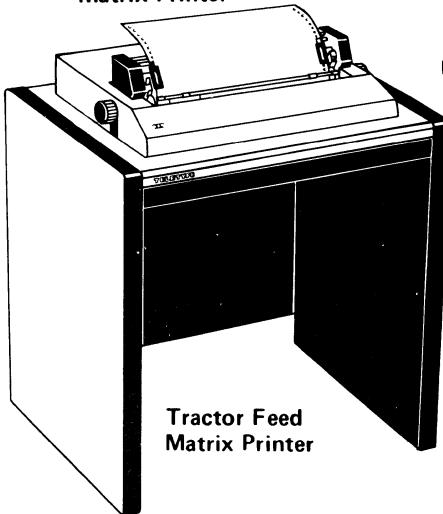& No Door

Pedestal with
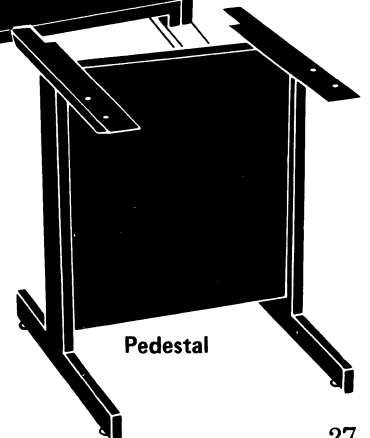Slotted Top

Pedestal

Tractor Feed
Daisy-Wheel
Printer

Tractor Feed
Matrix Printer

High-Speed
Tractor Feed
Matrix Printer

Tractor Feed
Matrix Printer

27

Features Summary

GENERAL

Remote SNA protocol: FID2, PU2, LU1, 2&3.
SSCP-PU & SSCP-LU: FMP0, TSP1.
LU-LU: FMP3, TSP3

Compatibility: 3274 C-type, 3178, 3278-2&5,
3279-2A,3A,S2A&3Xbasic, 3287-1&2 & 3289

Non-simultaneous send-receive
via 4-wire multi-point private line
or digital service using SDLC

Bit encoding: Direct (NRZ) or NRZI

Code & Error Check: EBCDIC & CRC

Speed: 2400, 4800, 7200 or 9600 bps, sync.

EIA (RS232) Interface: Matches 201, 208, 209,
2024, 2048 or 2096 modems or 500A DSUs,
or equivalent

Keyboard-selectable diskette-stored options

Modular design with built-in
station & device diagnostics

115 VAC at 60 Hz

CONTROLLER

Protocol, options & other firmware
loaded from 5¼" diskette, included
Spare diskette furnished for back-up

5544: Accommodates up to 16 or 32 devices;
4 or 8 printers max, 1 display min.
5546: Accommodates up to 6 or 12 devices;
4 printers max, 1 display min.

Displays & matrix & daisy-wheel printers
can be up to 5000 cable ft,
belt printers can be up to 2000 cable ft,
& modems can be up to 50 cable ft from controller

Device connection via:
2-twisted-pair cable,
coaxial cable (via adapters),
&/or under-carpet cable (via adapters)

Performs following SNA commands:
ActPU, DActPU, ActLU, DActLU, Bind, UnBind,
SDT, Clear, ShutD, Sig, Bid, Cancel, Chase
& ReqMS

Provides responses to above SNA commands;
plus following: ShutC, RecFMS, Sig, RTR,
Cancel, LUStat & Notify

Contains & maintains printer buffers

Has space for modem in cabinet

Includes 9-ft modem cable & 10-ft power cord

Diskette loading & loaded indicators

Send & receive status indicators

DISPLAY

5548: Displays characters in light-blue

5549: Displays characters in white or green,
in 1-color mode, if char's in field that is
highlighted or not, respectively;
or in white, red, blue or green,
in 4-color mode, if char's in field that is
p & h (protected & highlighted), h but not p,
p but not h, or neither p nor h, respectively.

5548-12
Displays 95 up-low or 64 monocase
characters on 12"-diagonal screen

5548-22 & 25:
Displays 95 up-low or 64 monocase
characters on 7" x 13" screen

5549-42 & 43:
Displays 95 up-low or 64 monocase
characters on 13"-diagonal screen

5548-12:
Displays char's via 7x9 within 9x11
dot-matrix, with 24x80 format
plus
User/Status info on line 26

5548-22:
Displays char's via 7x9 within 9x14
dot-matrix, with 24x80 format
plus
User/Status info on line 26

5548-25:
Displays char's via 7x9 within 9x14
or 5x7 within 7x10 dot-matrix,
with 24x80 or 27x132 format, respectively,
plus
User/Status info on line 26 or 29

5549-42:
Displays char's via 7x9 within 9x12
dot-matrix, with 24x80 format
plus
User/Status info on line 26

5549-43:
Displays char's via 7x9 within 9x12
dot-matrix, with 24x80 or 32x80 format
plus
User/Status info on line 26 or 34

5548 & 5549:
Display response-time data on line above
User Status info line on request from keyboard

28

4503: Displays characters in light-blue

4503: Displays 95 up-low or 64 monocase
characters on 7"x13" screen

4503: Displays char's via 7x9 within 9x14
dot-matrix, with 24x80 format
plus
User/Status info on line 25

User/Status Info Line
includes cursor row & column number

Display refreshed 60 times/sec

Display can be formatted into fields
by receipt of attribute characters.
Each can be:
Protected (from user entry)
Highlighted (intensified)
Selectable (by user)
Numeric
Modified (by user entry)
Hidden (not displayed or printed)

Performs following LU2 Commands:
Read All, Read Modified, Read Modified All,
Write, Erase-Write, Erase-Write Alternate &
Erase All Unprotected

Performs following LU2 Orders:
Start Field, Set Buffer Address, Insert Cursor,
Program Tab, Repeat to Address, &
Erase Unprotected to Address

Send all data or only modified fields*

Erase all data or only unprotected fields*

Erase unprotected data
between specifiable screen addresses*

Display data at specifiable screen address*

Move cursor to specifiable screen address*

Repeat specifiable character
between specifiable screen addresses*

Erase unprotected data
from specifiable screen address to end of field
& tab to start of next unprotected field*

Data wraps during character insert
& cursor wraps during data entry
4503: Data wraps during character delete

Performs auto-skip

Selectable fields selected via
Cursor Select key or
(if 5548 or 9) optional selector pen

Numeric lock option restricts data entry
in numeric fields to 0 to 9, -, ., & DUP

Cursor Up, Dn, L (Back Space), R, Tab,
Back Tab, Home & New Line (NL) keys

Erase EOF key erases to end of field.

Erase & Tab key (Tab on T & ENC keyboards)
erases to end of field & tabs

Char Delete & Insert keys.
Character Insert causes mode in which char's
inserted as entered or causes space for insert

Erase Input (unprotected data) & Clear (all data) keys

T & ENC keyboards: Local, Send/Receive,
Shift, Control & Caps Lock keys
TU, T5 & ENC5 keyboards: Reset, Enter,
Shift, Alt & Caps Lock keys
INC5 keyboard: Reset, Enter,
Numeric, Alt & Num Lock keys

Local Test key

Duplicate & Field Mark keys

T & ENC repeatable keys:
Cursor Up, Dn, L, R, ., -, _, Space, > , Del & Ins
TU, T5, INC5 & ENC5 repeatable keys:
All except Clear
& any that do not cause cursor motion
ENC also has Repeat key

24 PF & 2 (3 on INC5) PA keys

Keyboard error tone.
Also can be sounded*

Attention & System Request keys

T5, INC5 & ENC5: Keyboard selectable key-click

Ident key to identify printer
or class of printers to perform Print Local

5548 & 5549: Keyboard selectable
block or underline cursor, with optional blink

4503: Block cursor
5549 in 4-color mode:
Block cursor is field color,
underline cursor is white

5548 & 5549: Keylock, on display. 2 keys included.
Prevents all display operation
& turns off screen except for User/Status Line
4503: Optional Keylock with 2 keys, on keyboard.
Prevents all display operation
& turns off screen

Screen tilt & brightness controls.

Keyboard can be up to 4½ ft from display

5548 & 9: Includes 7½ ft power cord
4503: Includes 9½ ft power cord

5548 & 5549:
Keyboard not req'd if display used as monitor

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*under computer control

PRINTER

Prints protected & unprotected data from display determined by keyboard-selectable printer authorization matrix (PAM), via Print Local key or*

Performs following LU3 Commands:
Write, Erase-Write, Erase-Write Alternate & Erase All Unprotected

Performs following LU3 Orders:
Start Field, Set Buffer Address, Insert Cursor, Program Tab, Repeat to Address, Erase Unprotected to Address, New Line, Form Feed & End of Media

Performs following LU1 Orders:
Back Space, Carriage Return, Form Feed, Horiz Tab, Interexchange Record Separator, Line Feed, New Line, Set Horiz Format, Set Vert Format, & Vert Tab

Belt Printer

300 or 220 lpm† at 80 or 132 char/line, respectively

Full-character impact-printing via 80 or 132 print-hammers striking multiple-character-set typecarrier belt

Prints 95 up-low or 64 monocase characters, by changing typecarrier belts

Prints 10 char/in & 6 line/in, adjustable for double line feed

Friction Feed: Prints on standard 8½-in single-ply rolled paper

Tractor Feed: Prints up to 6-part fan-folded forms. Adjustable for forms 4 to 9½ or 15-in wide; 3-2/3, 5½ or 11-in long (See Physical Facts for other lengths)

Forms Access: Prints up to 6-part fan-folded forms. Adjustable for forms 4 to 9-1/8-in wide; 3-2/3, 5½ or 11-in long (See Physical Facts for other lengths)

Feeds multiple lines at 8 in/sec

Feedout 2, 16 or 35 lines to tear off last printed line on forms access, friction or tractor feed printer, respectively

Left-margin adjustable from col 1 to 13; right-margin from 25 to 80 or 73 to 132

Automatic new line at right-margin unless next character is NL

Bottom paper-loading

Spool-loaded print-ribbon

Low-paper/paper-out indicator

Form feed-out key

Includes 6-ft power cord

Paper-jam indicator on floor-model printer

Ribbon re-inker on floor-model printer

Standard-Speed Matrix Printer

30 cps: 15, 25 or 45 lpm† at 132, 72 or 49 char/line, respectively

Impact-prints 4x7 dot-matrix characters with 7x9 definition via 9-wire print-head

Prints 95 up-low characters

Print wires spring-driven, magnetically-held & electrically-released for low power usage

Prints 10 char/in & 6 line/in

Tractor feed

Prints up to 6-part fan-folded forms. Adjustable for forms 3 to 15-in wide; 11-in long (See Physical Facts for other lengths)

Feeds multiple lines 5 in/sec

Rear paper loading

Cartridge-loaded print-ribbon with re-inker

Includes 6-ft power cord

High-Speed Matrix Printer

340 cps: 125, 200 or 300 lpm† at 132, 72 or 40 char/line, respectively

Impact-prints 4x7 dot-matrix characters with 7x7 definition via 2-col, 14-wire print-head

Prints 95 up-low characters

Bi-directional printing option

Prints 5, 10 or 16.7 char/in at 6 or 8 line/in

Tractor feed

Prints up to 6-part fan-folded forms. Adjustable for forms 3 to 16-in wide; 3, 3½, 4, 5½, 6, 7, 8, 8½, 11, 12 or 14-in long

Feeds multiple lines at 10 in/sec

Performs 0, 3, 4 or 6-line form perforation skip-over

Cartridge-loaded print-ribbon

Front or bottom paper loading

2-digit status read-out to indicate printer ready, paper out, cover open bail up & several maintenance conditions

Form feed-out key

Includes 6-ft power cord

Automatic new line after printing 66, 132 or 218 characters on line not ending in NL

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*under computer control

†if not limited by operational or system characteristics

Daisy-Wheel Printer

55 cps: 20, 40, or 70 lpm†
at 132, 72 or 40 char/line, respectively

Full-character impact-printing via
solenoid-driven print-hammer
striking multi-element daisy-wheel

Prints 95 up-low characters

Bi-directional printing option

Prints 10, 12 or 15 char/in
at 3, 6 or 8 line/in

User-removable tractor feed

Prints up to 6-part fan-folded forms.
Adjustable for forms 3 to 15-in wide;
3, 3½, 4, 5½, 6, 7, 8, 8½ or 11-in long

Feeds multiple lines at 5 in/sec

Rear paper loading

Cartridge-loaded print-ribbon

Paper out, ribbon out &/or cover open indicator

Stop printer on paper-out option

Includes 6-ft power cord

Automatic new-line at right-margin unless
next character is NL

TECHNICAL FACTS

EBCDIC Code (Extended Binary Coded Decimal Interchange Code)

EBCDIC				Controls				Characters							
Bit 0				0								1			
Bit 1				0				1				0			1
Bit 2				0		1		0		1		0		1	
Bit 3 / HEX				0	1	0	1	0	1	0	1	0	1	0	1
4 5 6 7 / HEX				0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

4	5	6	7	HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0	NUL				SP	&	-						{	}	\	0
		0	1	1		SBA					/		a	j	~		A	J		1
		1	0	2		EUA							b	k	s		B	K	S	2
		1	1	3		IC							c	l	t		C	L	T	3
	1	0	0	4		ENP	INP						d	m	u		D	M	U	4
		0	1	5	PT/HT	NL	LF	TRN					e	n	v		E	N	V	5
		1	0	6		BS							f	o	w		F	O	W	6
		1	1	7									g	p	x		G	P	X	7
1	0	0	0	8	GE		SA						h	q	y		H	Q	Y	8
		0	1	9		EM						`	i	r	z		I	R	Z	9
		1	0	A					¢	!	¦	:								A
		1	1	B	VT				.	$	,	#								B
	1	0	0	C	FF	DUP		RA	<	*	%	@								C
		0	1	D	CR	SF			(	)	_	'								D
		1	0	E		FM/IRS			+	;	>	=								E
		1	1	F			BEL	SUB		¬	?	"								F

Key

ACK	- Acknowledge	FF	- Form Feed	SF	- Start Field
BEL	- Bell	FM	- Field Mark	SHF	- Set Horizontal Format (= 2BC1)
BS	- Backspace	FS	- File Separator		
CAN	- Cancel	GE	- Graphic Escape	SI	- Shift In
CR	- Carriage Return	GS	- Group Separator	SLD	- Set Line Density (= 2BC6)
DC1	- Device Control 1	HT	- Horizontal Tabulation		
DC2	- Device Control 2	IC	- Insert Cursor	SO	- Shift Out
DC3	- Device Control 3	INP	- Inhibit Presentation	SOH	- Start of Heading
DC4	- Device Control 4	IRS	- Interchange Record Separator	SP	- Space
DEL	- Delete	ITB	- End of Intermediate Transmission Block	STX	- Start of Text
DLE	- Data Link Escape			SUB	- Substitute
DUP	- Duplicate	LF	- Line Feed	SVF	- Set Vertical Format (= 2BC2)
EM	- End of Medium	NAK	- Negative Acknowledge		
ENP	- Enable Presentation	NL	- New Line	SYN	- Synchronous Idle
ENQ	- Enquiry	NUL	- Null	TRN	- Transparent
EOT	- End of Transmission	PT	- Program Tab	US	- Unit Separator
ESC	- Escape	RA	- Repeat to Address	VCS	- Vertical Channel Select (= 04XX)
ETB	- End of Transmission Block	RS	- Record Separator		
ETX	- End of Text	SA	- Set Attribute	VT	- Vertical Tabulation
EUA	- Erase Unprotected to Address	SBA	- Set Buffer Address		

Station Vocabulary

KEYBOARD

INC5 Style

65 of the 68 monocase characters shown in column 4-7 and C-F of the EBCDIC code chart can be entered on the keyboard. { } and ` are the exceptions. Also, the controls FM and DUP can be entered.

Any style except INC5

All 96 upper and lower case characters shown on the EBCDIC code chart except DEL can be entered on the keyboard. Also, the controls FM and DUP can be entered.
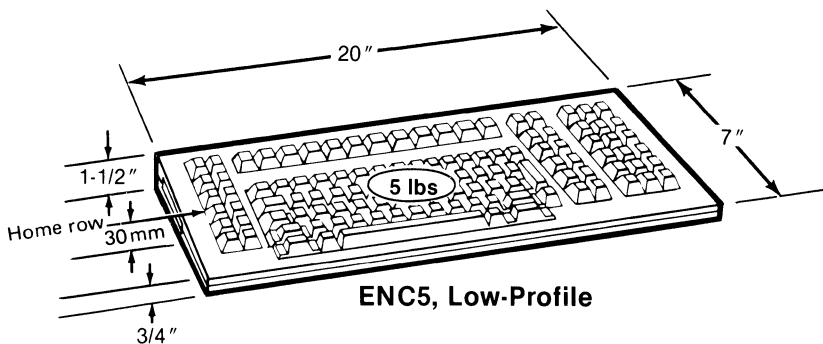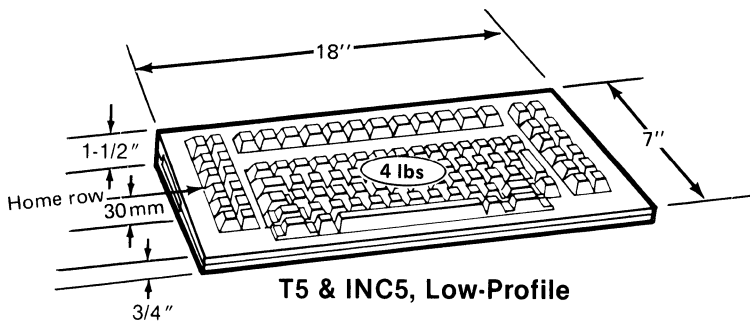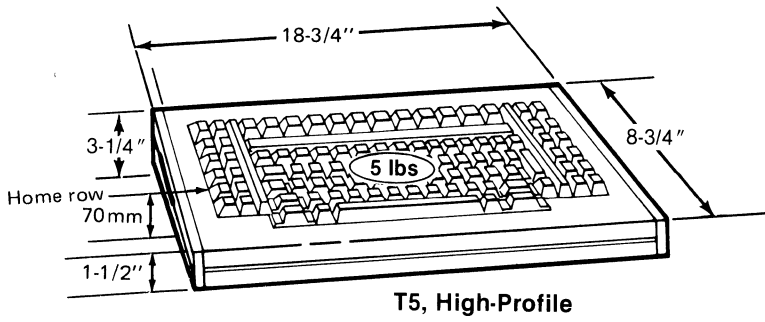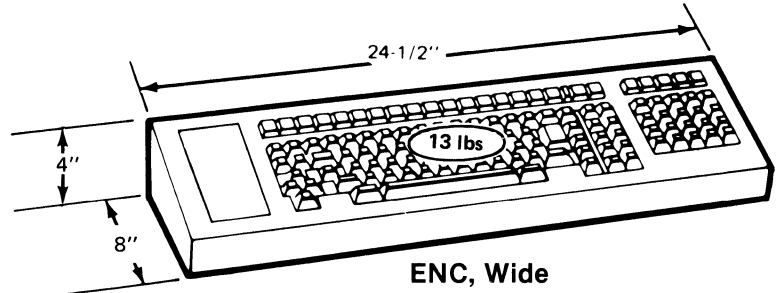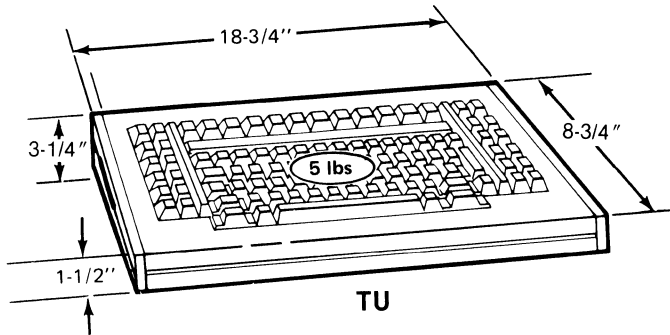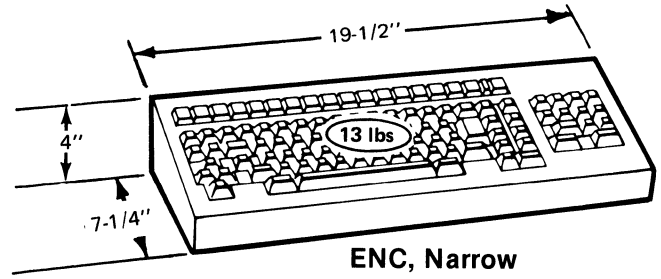
DISPLAY AND PRINTER

The display can display and the printer can print 64 of the 68 monocase characters shown in the EBCDIC code chart in columns 4 to 7 & C to F (the characters { , } , ¦ and ` are not displayed or printed); or optionally the 95 upper and lower case characters shown in columns 4 to F.

If only 64 monocase characters can be displayed or printed, the corresponding character 4 columns to the right is displayed or printed for the characters shown in columns 8 to A of the code chart.

Additionally, the symbol F_M and D_U is displayed for the control FM and DUP, respectively, and the character SP is printed for both of these controls.

Physical Facts

15-1/2"
4"
7-1/4"
11 lbs
T

19-1/2"
4"
7-1/4"
13 lbs
ENC, Narrow

18-3/4"
3-1/4"
1-1/2"
8-3/4"
5 lbs
TU

24-1/2"
4"
8"
13 lbs
ENC, Wide

18-3/4"
3-1/4"
Home row 70mm
1-1/2"
8-3/4"
5 lbs
T5, High-Profile

18"
1-1/2"
Home row 30mm
3/4"
7"
4 lbs
T5 & INC5, Low-Profile

20"
1-1/2"
Home row 30mm
3/4"
7"
5 lbs
ENC5, Low-Profile

DISPLAYS

17″
13-1/2″*
15-1/4″
25 lbs.
12″
9-1/2″
11-1/2″
4-1/2″
*15″ D if max.
tube tilt up

5548-12

15″
50 lbs.
14″
14″ DIA.
16″

4503

17″
16″*
16″*
30 lbs.
7″ 13″
8-1/2″
12-1/2″
2-2/2″
*18″ H & 16-1/2″ D
if max. tube tilt up

5548-22 & 25

15″
14-1/2″
13″*
16-1/2″
13″
12″
40 lbs.
16-1/2″
19-1/2″ 17″
3-1/2″
15 lbs.
17-1/2″
18-1/2″
*16″ if max tilt

5549-42 & 43

Physical Facts (cont'd)

CONTROLLERS

22″

18″

28.5″

125 lbs.

5544

16″

13″

35 lbs.

6″

5546

MATRIX PRINTERS

9″

24″

72 lbs.

27″

High-Speed

10″

35 lbs.

13″

23″
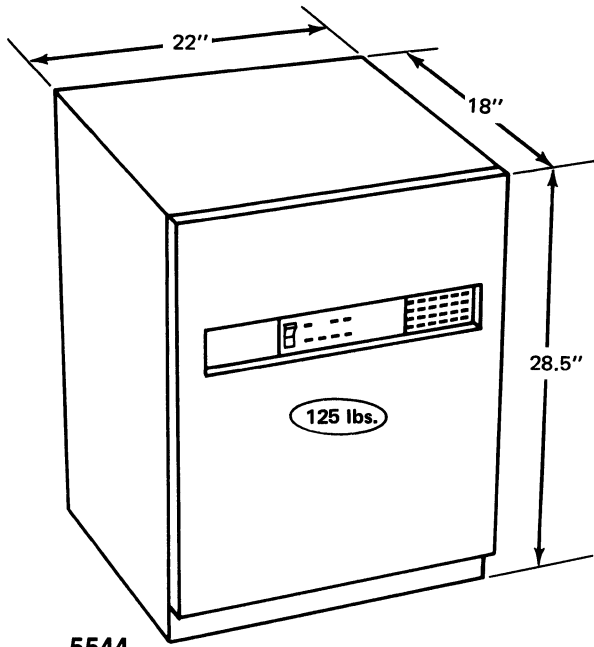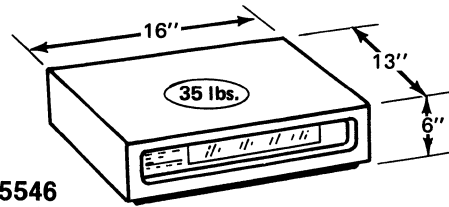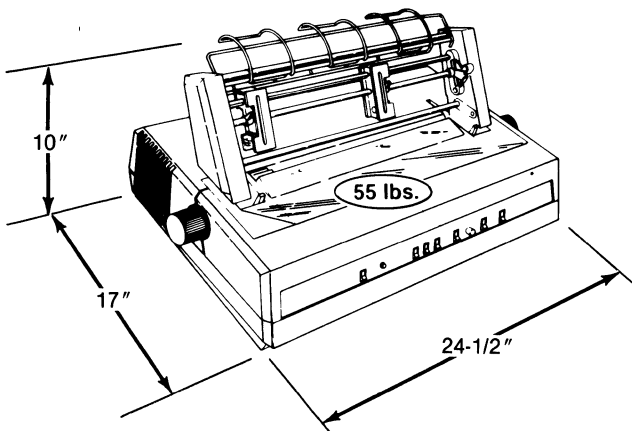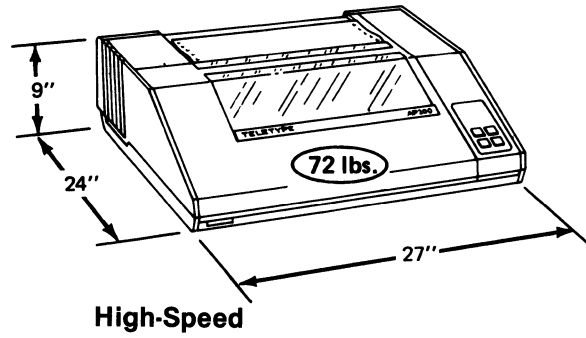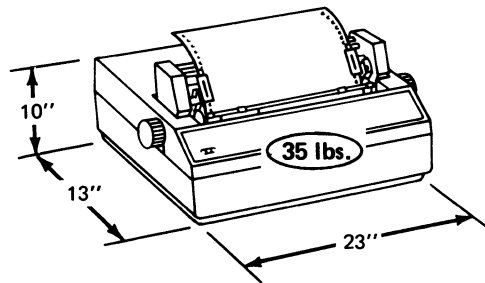
Standard-Speed, Table Model

6″

30″

105 lbs.

26″

28″

**Standard-Speed
Table Mounted**

DAISY-WHEEL PRINTER

10″

55 lbs.

17″

24-1/2″

BELT PRINTERS

145 lbs.

33.5"

20.5"

26"

**Forms Access
Tractor Feed**

80 lbs

8-1/2"

17-1/2"

20"

**Friction
Feed**

84 or 109 lbs

2"

11"

6-1/2"

17-1/2"

20" or 27-1/2"
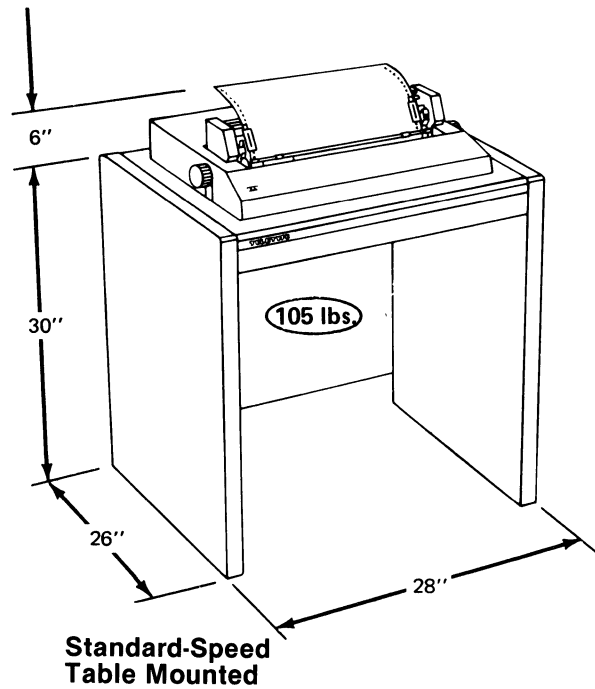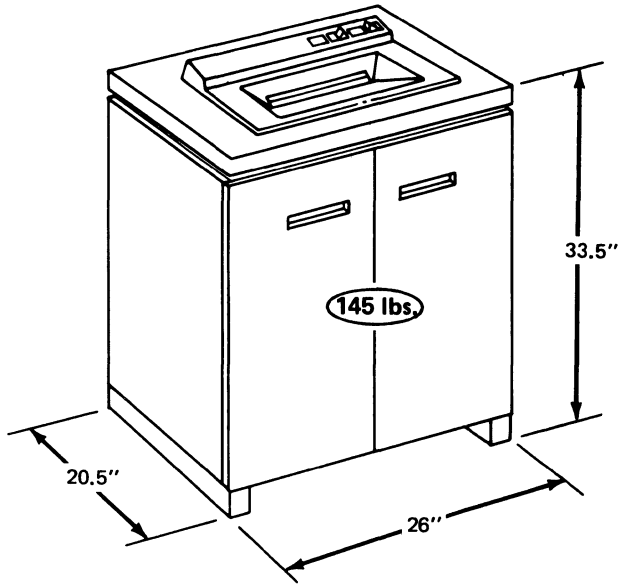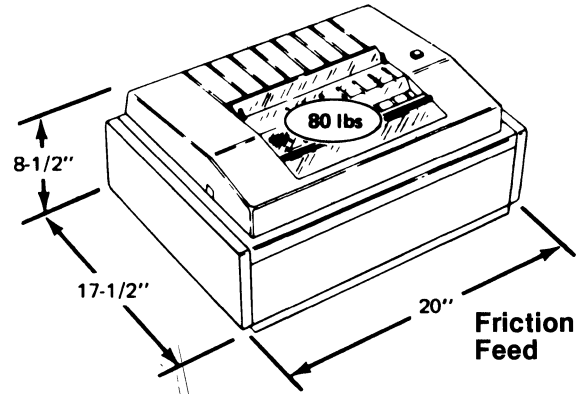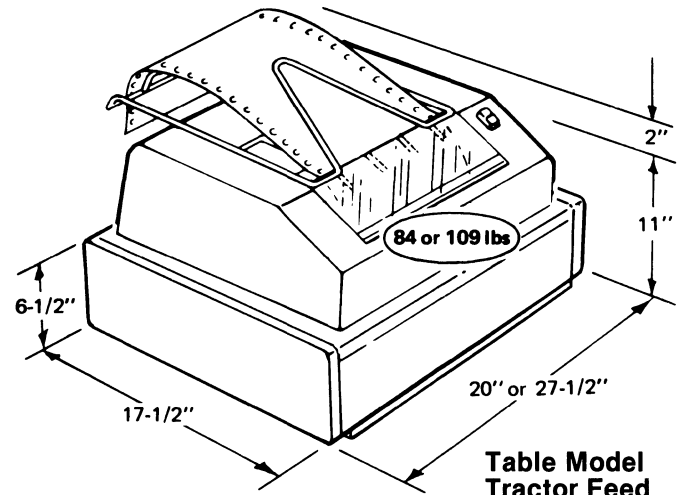
**Table Model
Tractor Feed**

30"

22"

42"

210 lbs.

**Floor Model
Tractor Feed**

20 or 27"

Top view of paper
slot in bottom of
tractor feed
printer cabinet

17-3/8"

2"

3-1/2"

4-1/2
or
5-1/2"

10-7/8
or
17"
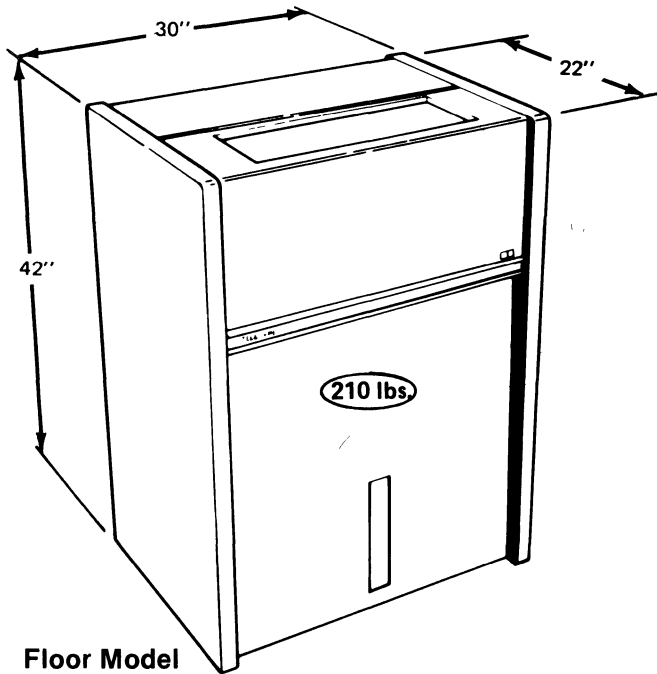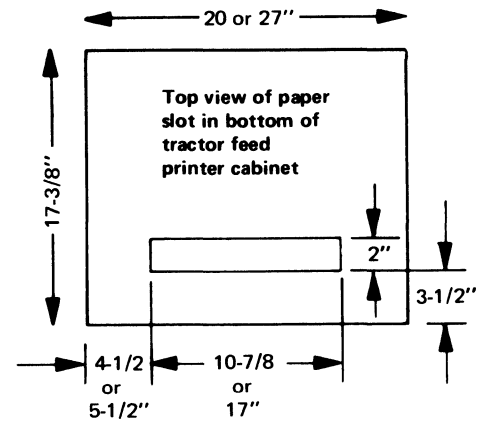
Physical Facts (cont'd)

PEDESTALS

2"

11" or 17"

3-1/2"

if slotted

17-3/8"

20 or 27-1/2"

25-1/4"

2-1/4"

44 or 57 lbs

12"

20 or 27-1/2"

17-3/8"

Recessed

29"

35 lbs.

22"*

26"
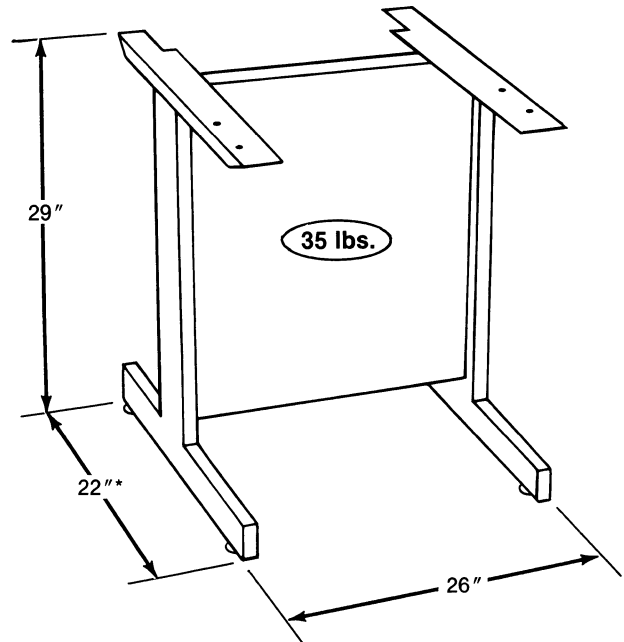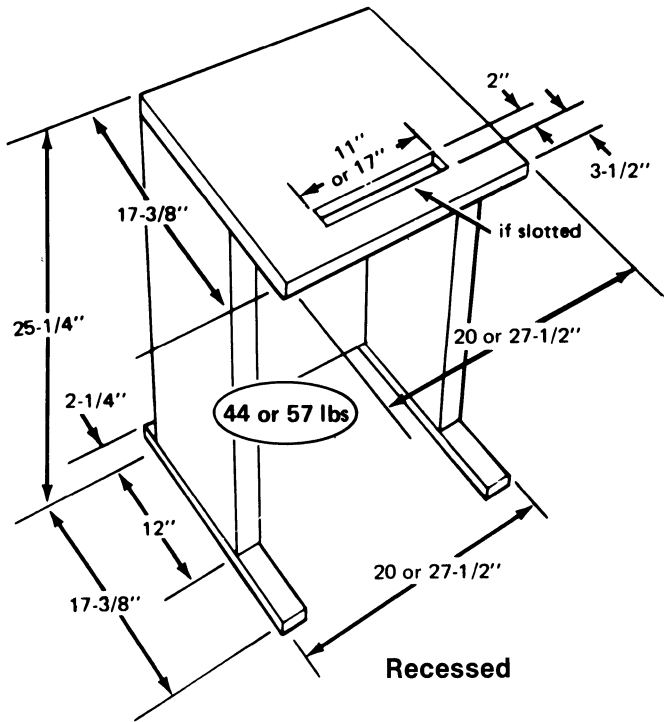
*Rear form accumulator shelf
adds 10" to depth, at 18" from floor

**High-Speed
Matrix-Printer**

2"

11" or 17"

3-1/2"

if slotted

17-3/8"

24-1/2" to 34"

25-1/4"

2-1/4"

55 lbs

12"

24-1/2"

17-3/8"

Standard

38
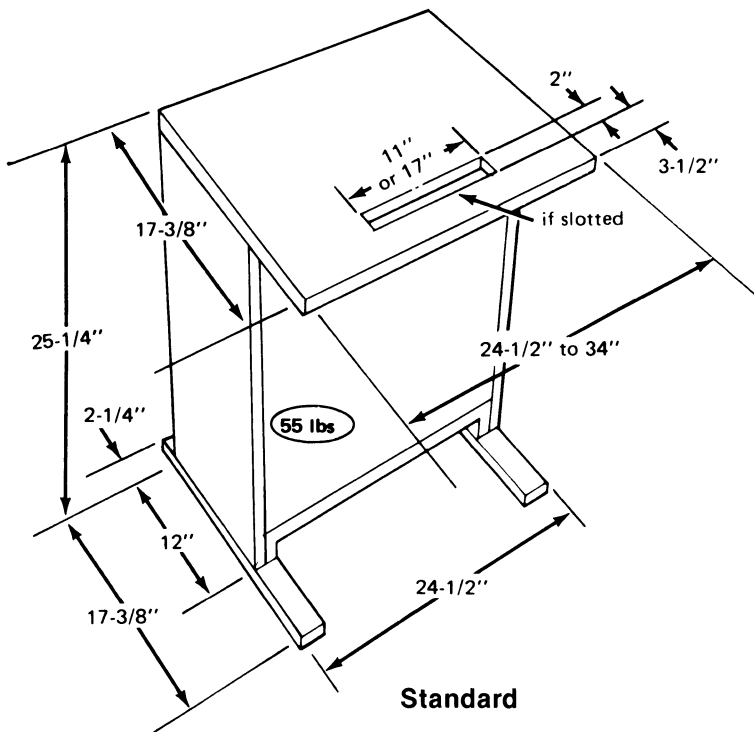
PAPER REQUIREMENTS

Rolled Paper

8-1/2" max.

1.025" ± .075

5"

approx length: 400 ft. (single ply)

Pin-Fed Forms

1/4"

1/2"

L

5/32"

W
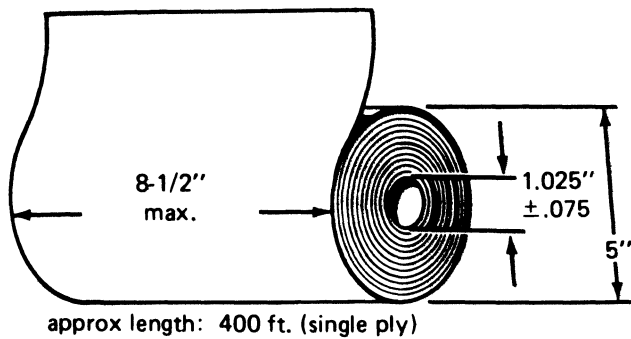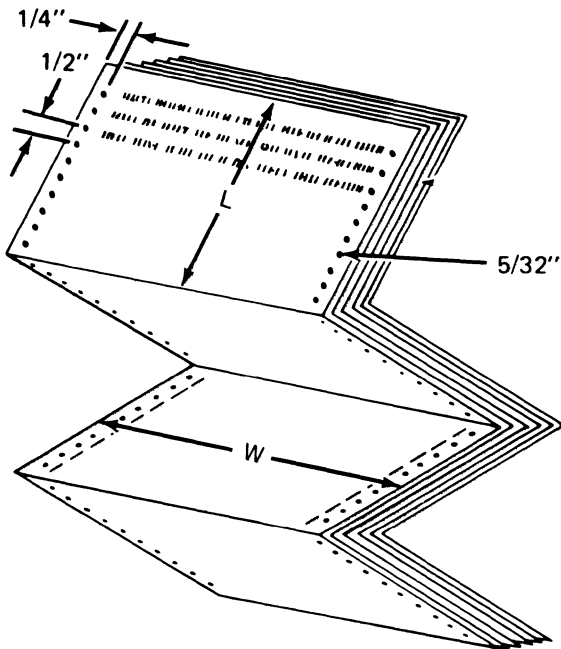
Belt printers: W = 4-1/4 to 9 or 15"
Matrix printers: W = 3 to 15 or 16"

High-speed matrix printers:
L = 3, 3-1/2, 4, 5-1/2, 6, 7, 8, 8-1/2, 11, 12 or 14"

Other printers:
L = Lengths on Optional Form Lengths table

Tractor Feed Optional Form Length	
Belts for Belt Printers	Tapes for AP100
2-1/2, 3-1/3, 5 & 10"	2-1/3"
2-3/4, 3-2/3, 5-1/2 & 11"	3"
3, 4, 6 & 12"	3-1/3"
3-1/4, 4-1/3, 6-1/2 & 13"	3-1/2"
3-1/2, 4-2/3, 7 & 14"	3-2/3"
3-3/4, 5, 7-1/2 & 15"	4"
4, 5-1/3, 8 & 16"	4-1/3"
4-1/4, 5-2/3, 8-1/2 & 17"	4-2/3"
4-1/2, 6, 9 & 18"	5"
5-1/2, 7-1/3, 11 & 22"	5-1/2"
	6"
	6-1/2"
	7"
	7-1/2"
	8"
	8-1/2"
	9"
	10"
	11"
	12"
	13"
	14"

NOTE: Form lengths ending in the fractions 1/4 or 3/4 inch are not compatible with line spacing of 3 to 6 lines/inch; those ending in the 1/2 inch are not compatible with 3 line/inch; and those ending in 1/3 or 2/3 inch are not compatible with 4 or 8 lines/inch.

COAX CABLE ADAPTER

4"

5"

1-1/2"
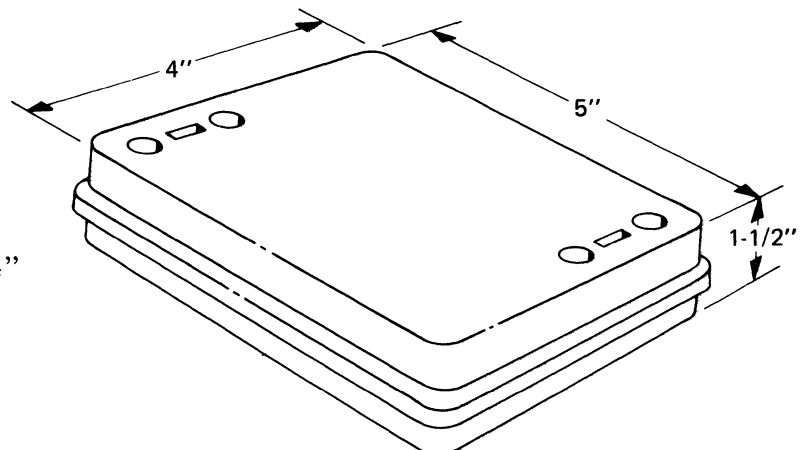
Environmental Requirements

TEMPERATURE

Storage: −40° to 150°F
(14 to 122°F if high-speed matrix printer)

Operating: 40 to 110°F
(50 to 100°F if high-speed matrix printer)

RELATIVE HUMIDITY

2 to 90% (non-condensing)
(10 to 90% if high-speed matrix printer)

ALTITUDE

Shipping: 0 to 50,000 ft
Operating: 0 to 10,000 ft

Electrical Requirements

SUPPLY VOLTAGE 115 VAC at 60 Hz

(115/230 VAC @ 50/60 Hz
 if high-speed matrix printer)

OPERATING POWER AND HEAT GENERATION

	Amps	Watts	BTU/hr
Keyboard & Display			
4503	1.2	106	362
5548-12	0.6	45	154
5548-22 & 25	1.5	80	275
5549-42 & 43	1.7	135	460
Belt Printer	1.4	160	547
Matrix-Printer	1.0	80	272
Hi-Speed Matrix	2	275	850
Cluster Controller			
5546	1.5	73	250
5544			
16-device	1.5	105	360
32-device	2	135	465

OPERATION	5544		COMMUNICATION FACILITIES	DEFINITION
	Lead		Circuit	
MESSAGE TRANSFER SENDING	4	RTS	(CA)	Request to Send
	5	CTS	(CB)	Clear to Send
	15	SSET	(DB)	Sender Signal Element Timing
	2	SD	(BA)	Sent Data
MESSAGE TRANSFER RECEIVING	8	RLSD	(CF)	Received Line Signal Detector †
	17	RSET	(DD)	Receiver Signal Element Timing
	3	RD	(BB)	Received Data
MAINTAIN CONNECTION	20	DTR	(CD)	Data Terminal Ready Data Set Ready
CIRCUIT GROUNDS	7	SG	(AB)	Signal Ground
	1	PG	(AA)	Protective Ground

†sometimes referred to as Carrier Detect (CD)

Station Interface

Interface circuits in accordance with EIA Standard RS232. Physical mating connector is Cinch or Cannon plug DB-19604-432.

Voltage	Control	Data
− 5 to − 25 VDC	Off	Binary 1 (Mark)
+ 5 to + 25 VDC	On	Binary 0 (Space)

Sent & Received Data

(Applies to SD & RD leads on interface)
(Shown is a perfect waveform for EBCDIC character H)

Direct (NRZ)

NRZI

To transmit a bit 0 in NRZ1 the waveform state is switched, from 0 to 1 or 1 to 0; to transmit a bit 1 the waveform is not switched

Documentation

System Generation Guide	622	

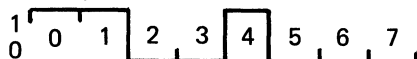| **How to Operate &/or Installation Information**	How to Operate	Installation
Station		
5544 w/4503		452
5544 w/5548 & 9		600
Display		
4503		
5548-12 & 15		597
5548-22 & 25		629
5549-42 & 43		601
Belt Printer		
Forms Access	417	426
Floor Model	433	426
Table Model	364	426
Matrix Printer		
Standard	501	502
High-Speed	509	510
Daisy-Wheel Printer	620	619
Device Cabling		602
Station Service Manual	603	

Coax Adapter Cable Requirements

Two 45LU101 Coax Adapters permit coax cable to be used as shown below:
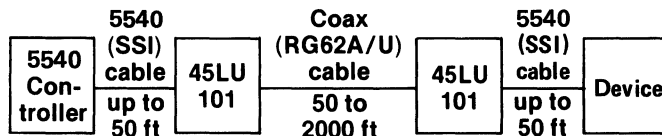
The coax cable used must conform to the specifications for RG62A/U coax cable.

The coax cable used must not have any connections between the center conductor and shield of less than 100K Ω and must not have any connections between ground and either the center conductor or shield. Also, shields of different coax cables must not be connected.

There must be fewer than 13 splices per coax cable. Also, each splice made with a BNC adapter must be protected with a plastic sleeve, and each splice made with a patch panel must be made on a non-conductive type panel.

The DC resistance of a prepared coax cable must be approximately 47 Ω per 1000 ft when the resistance of the center conductor is added to that of the shield.

Both 5540 and coax cable must be separated by at least 5 in from all light fixtures, must not be in the same conduit as a power cable, and must be separated from all power cables as listed in the table below.

Power Cable (< 440v)	Req'd Separation Between Power Cable & 5540 or Coax Cable		
	Cables in grounded conduit:		
	Neither	Either	Both
0 to 2KVA	5 in	2½ in	1½ in
2 to 5KVA	12 in	6 in	3 in
over 5KVA	24 in	12 in	6 in

SYSTEM & STATION DIAGNOSTICS

There are many diagnostics built into 5540 stations that permit system and station troubles to be isolated.

The simplest and easiest test that offers the least interference to system and station operation is the local test. It is initiated by depressing the L/TST key on any display. If any device, including the one under test, is selected for message reception by the computer, the cluster-controller will accept the message and forward it to the device if not forwarding the test message to the device under test. If the display passes the test an L/TST OK message is displayed. Also the display's LU number and cluster-controller port number is displayed—especially useful information during installation.

The same local test may be extended to include the station and/or computer modem, if the modems have an analog and digital loop-back test feature, respectively. Either test, however, requires system shutdown as well as switching of the modem(s) to a test mode. This test is initiated at the master display by depressing the ALT key with the C key, electing menu item 6, and obeying the displayed instructions, illustrated below. Results of the test are indicated via a message displayed on the bottom of the instruction screen.

Should a test isolate a trouble to the station, device status and station statistics can be displayed by depressing the ALT key with the C key and electing menu item 3 and 4, respectively. Beyond that, each device and the cluster-controller include self-testing diagnostics that permit trouble to be isolated to a particular circuit card or module.

Also of interest, response time for 5548 and 5549 displays can be obtained by depressing the ALT key with the X key at each display, as shown under display Controls & Indicators; or by electing menu item 7 after depressing the ALT key with the C key at the master display, as illustrated below. For each 5548 and 5549 display, this screen shows the response time for the last message sent from the display, shows a running total of the number of responses that were $< t_1$, between t_1 & t_2 and $> t_2$, where t_1 & t_2 are previously chosen values; and shows the number of characters sent and received since the counters were last reset.

```
                    ***STATION FUNCTION MENU***

          1 — Stored Station Configuration
          2 — Printer Authorization Matrix
          3 — Loaded Station Configuration & Device Status
          4 — Station Statistics
          5 — Device Options
          6 — Remote Loopback Test
          7 — Response Time Monitor


          Enter menu # for desired function here ___ then depress ENTER

          Depress CLEAR to exit CONFIG mode, ALT-C to re-display Menu

          58S401RLS200   Copyright Teletype Corporation 1983   All Rights Reserved
```

```
                      ***REMOTE LOOPBACK TEST***

          CAUTION — DO NOT Peform Loopback Test on ACTIVE SYSTEM

          To perform test — 1) set data channel to LOOPBACK mode
                             2) Depress ENTER and wait for response

          To return to Menu — depress ALT-C

          To exit CONFIG mode — depress CLEAR
```

LOADED STATION CONFIGURATION & DEVICE STATUS

Station Address (Hex): 01
Master Display LU #:   02
NRZI Coding (Y or N):   N
Between-Bkt Printer Sharing (Y or N): Y
Device:

LU#	Port#	Type	Status	LU#	Port#	Type	Status
02	01	D1	01	03			
04				05			
06				07			
08				09			
10				11			
12				13			
14				15			
16				17			
18				19			
20				21			
22				23			
24				25			
26				27			
28				29			
30				31			
32				33			

Valid display types:
Cabinet-style display with
D1 – Any keyboard
Round-base display with
D2 – 16" std or 19" ENC keyboard
D3 – 25" ENC keyboard
D4 – 19" std keyboard

Valid printer device types:
P1 – Line or hi-speed char matrix
P2 – Low-speed char matrix
P3 – Daisy-wheel char

All Devices have responded
For expanded status:
ENTER LU# here __ and depress ENTER

Depress:
CLEAR to exit CONFIG mode
ALT-C to re-display Menu

STATION STATISTICS

FLOPPY LOG

Watch__Dog__Timer	= 00000	Info__Queue__Overrun = 00000	Receive__Data__Overrun	= 00000
Idle__Line__Timeout	= 00000	Drive__Not__Ready = 00000	Frame__Check__Sequence	= 00000
Crc__Error__On__Read	= 00000	Data__Over/Underflow = 00000	Seek__Error	= 00000
Read__Error	= 00000	Write__Error = 00000	A – card Load Error	= 00000

SSL LOG / MSG SWITCHER LOG / FREE RAM

	Crc__Cnt	Overrun	Timeout	Buf__Ful	Not__Enb	Inv__Que	Inv__Dst	Ss1	Reg
A-card –	00000	00000	00000	00000	00000	00000	00000	52352	136256
C1-card –	00000	00000	00000	00000	00000	00000	00000	51312	012638
C2-card –	00000	00000	00000	00000	00000	00000	00000	00000	000000

SDLC LOG

Command__Reject	= 00000	Test__Response	= 00000	Test__Request	= 00000
Repeat__Transmit	= 00000	Transmit__Underrun	= 00000	Receiver__Overrun	= 00000
Primary__Abort	= 00000	Bad__FCS	= 00000	No__CTS	= 00000

Depress ENTER to load data, CLEAR to exit CONFIG mode, ALT-C to return to Menu

RESPONSE TIME MONITOR

LU#	Last Time	C1	C2	C3	Chars (100s) Recd	Sent	LU#	Last Time	C1	C2	C3	Chars (100s) Recd	Sent
02	000.0	0000	0000	0000	00000	00000							

Current values: t1 = 000.0 t2 = 000.0   New values: t1 =____ t2 =____
Depress ENTER to reset counters and load new t1, t2 values
Depress CLEAR to exit CONFIG mode, ALT-C to re-display Menu

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