AT&T EXPANSION MODULE OVERVIEW

CAUTIONS

NONE

REFERENCE DOCUMENTS

SELECT CODE	DESCRIPTION
305-327	AT&T/XM MANUAL
305-466	CARTRIDGE TAPE UTILITIES GUIDE
305-354	SOFTWARE INFORMATION BULLETIN - AT&T/XM ADMINISTRATION
305-374	SOFTWARE INFORMATION BULLETIN - CARTRIDGE TAPE UTILITIES GUIDE

MATERIAL REQUIRED

Same as Reference Documents

OBJECTIVES

At the end of this work assignment you will be able to:

1. List the factory configurations of the AT&T/XM

2. List the AT&T/XM customer installed packages

3. List the features of the AT&T/XM

OVERVIEW

- INTRODUCTION

- DESCRIPTION

- FACTORY CONFIGURATIONS

- CUSTOMER INSTALLED PACKAGES

OVERVIEW

This work assignment is divided into four major sections each discussing several subjects. The major sections and subjects include:

I INTRODUCTION

II DESCRIPTION

    (A) Specifications

    (B) Features

    (C) Documentation
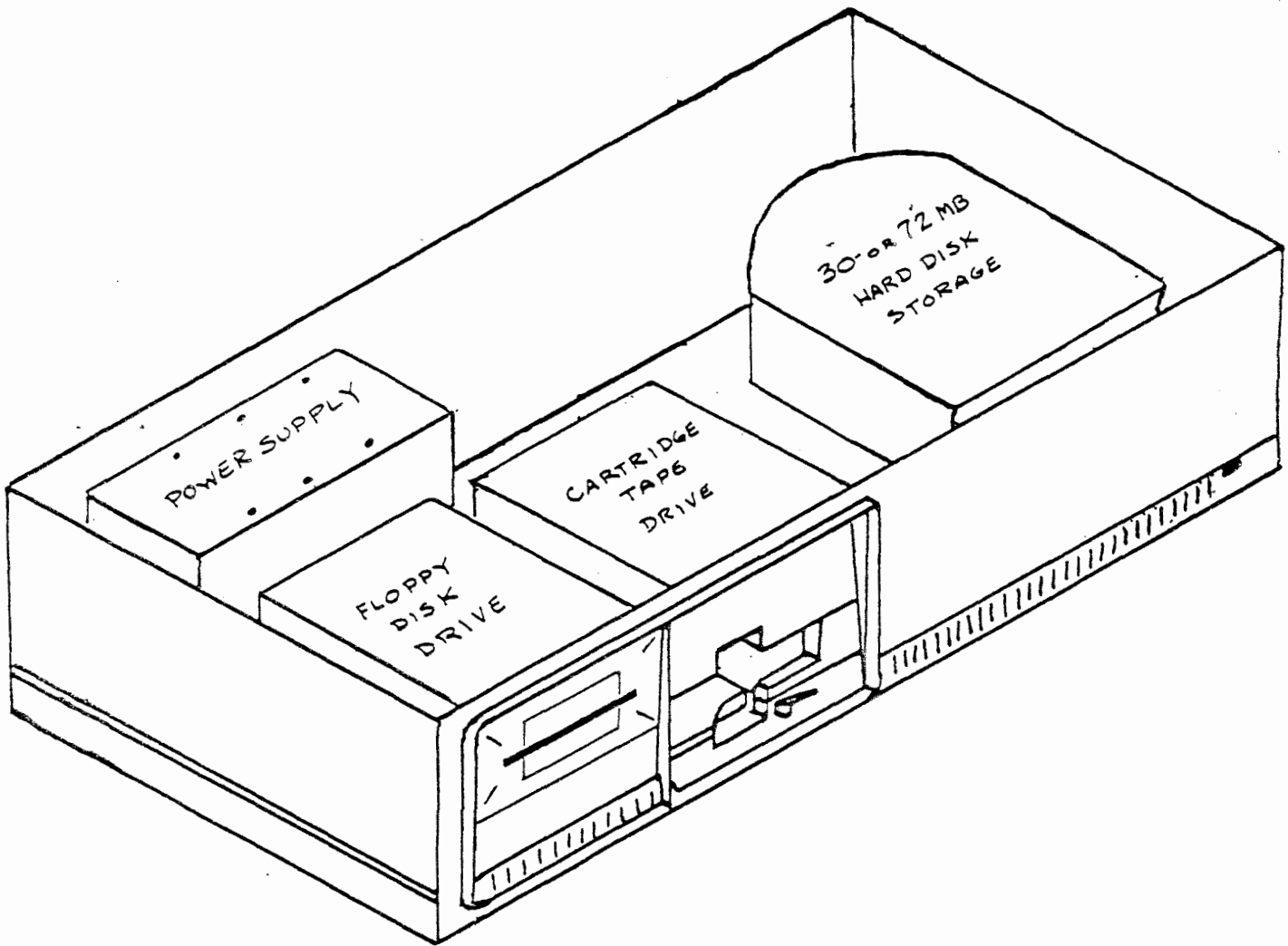
III FACTORY CONFIGURATIONS

    (A) Factory Installed

IV CUSTOMER INSTALLED PACKAGES

    (A) Customer Installed

INTRODUCTION

POWER SUPPLY

FLOPPY DISK DRIVE

CARTRIDGE TAPE DRIVE

30-OR 72 MB HARD DISK STORAGE

AT&T/XM

INTRODUCTION

The AT&T 3B2 Computer Expansion Module, designated AT&T/XM, is an external unit that increases the data storage capacity of the AT&T 3B2 Computer. A 3B2 with the Expansion Module offers the flexibility to use various combinations of:

          ⍣ STORAGE DEVICES

             - Cartridge Tape Drive

             - Floppy Disk Drive

             - Hard Disk Drives

                * 30-MB Hard Disk Storage

                      OR

                * 72-MB Hard Disk Storage

With these devices, the AT&T/XM can be configured to meet your specific requirements. The figure on the the opposite page shows a AT&T/XM with the cover removed and a floppy disk, cartridge tape drive and hard disk storage device installed. For clarity, the power supply is shown, but the connectors on the back panel have been eliminated. Both of these will be shown and discussed, in detail, later in the work assignment.

MISCELLANEOUS HARDWARE

In addition to major storage devices, there is some miscellaneous hardware, includes a Catridge Tape Controller (CTC) board that installs in your 3B2 Computer and cables for connecting the two units together.

SPECIFICATIONS

 PHYSICAL CHARACTERISTICS

- 22 inches wide, 17 inches deep, 4.6 inches high

- Supports 60 pounds

 POWER REQUIREMENTS

- 115 Volts, 5 Amperes, 50/60 hertz AC.

- 298 Watts Maximum Power Consumption

 TEMPERATURE and HUMIDITY LIMITS

- 40 to 100 degrees Fahrenheit

- 20 through 80% Humidity

DESCRIPTION

SPECIFICATIONS

Physical Characteristics

The AT&T/XM cabinet is approximately 22 inches wide, 17 inches deep, and 4.6 inches high. The empty AT&T/XM cabinet weighs less than five pounds. Different weights can be expected for different configurations, e.g..floppy and hard disks.

Power Requirements

The AT&T/XM operates on standard 115 volts, 50/60 hertz Alternating Current (AC). The supply circuit should have a capacity of 5 amperes. The maximum surge power consumption of 298 watts may be experienced immediately after the power is applied. The normal operating power consumption is 243 watts.

Temperature and Humidity Limits

The AT&T/XM will operate within the range of 40 to 100 degrees Fahrenheit (5 to 38 degrees Celsius). The allowable humidity is 20 through 80 percent; the unit does not require a controlled environment.

DOCUMENTATION

SELECT CODE	DESCRIPTION
305-327	AT&T/XM MANUAL
305-466	CARTRIDGE TAPE UTILITIES GUIDE
305-354	SOFTWARE INFORMATION BULLETIN - AT&T/XM ADMINISTRATION
305-374	SOFTWARE INFORMATION BULLETIN - CARTRIDGE TAPE UTILITIES GUIDE

DESCRIPTION

DOCUMENTATION

When you receive your AT&T/XM, the documentation required to install the equipment is included. Below is a list of the documentation.

SELECT CODE   DESCRIPTION

305-327   AT&T/XM MANUAL

305-466   CARTRIDGE TAPE UTILITIES GUIDE

305-354   SOFTWARE INFORMATION BULLETIN -
               AT&T/XM ADMINISTRATION

305-374   SOFTWARE INFORMATION BULLETIN -
               CARTRIDGE TAPE UTILITIES GUIDE

In addition to the paper documentation, you will receive two sets of diskettes for:

    ♦ Cartridge Tape Utilities

    ♦ AT&T/XM Administration

These diskettes contain the software needed to tell your 3B2 about the AT&T/XM.
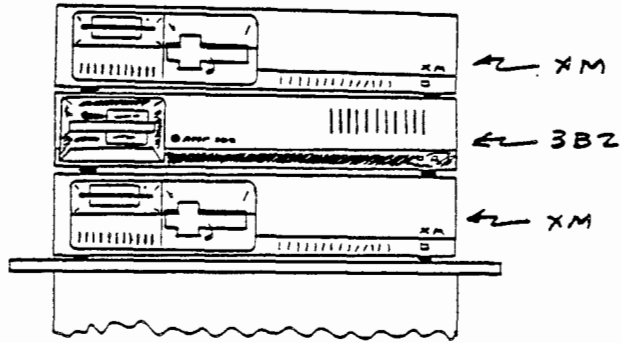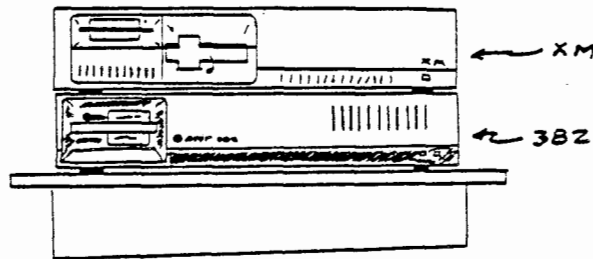
FEATURES
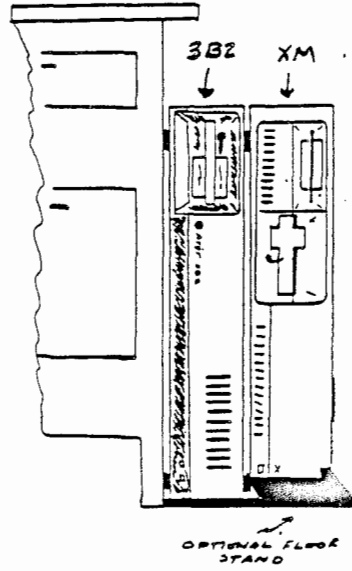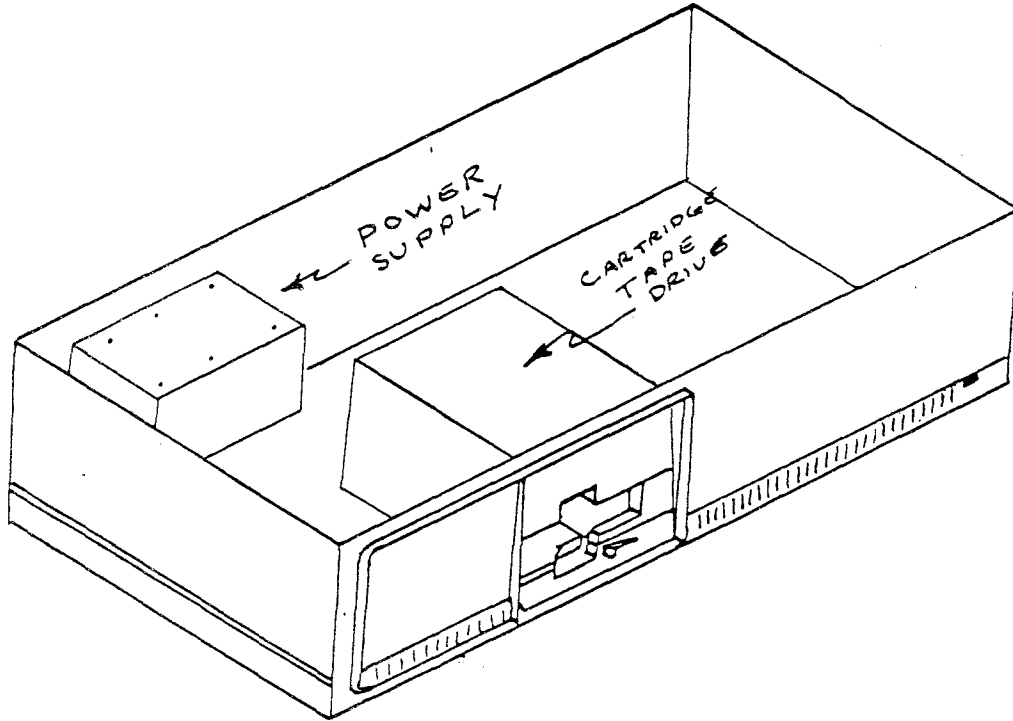
FIGURE A

FIGURE B

FIGURE C

DESCRIPTION

FEATURES

The AT&T/XM cabinet is compact and lightweight enough to be easily placed where you want it. The cabinet top will support the weight of one 3B2/300 Computer and an additional AT&T/XM (FIG A). Of course, your AT&T/XM can be placed on top of your 3B2/300 Computer (FIG B), under it, beside it, or mounted in an optional vertical stand (FIG C). Placement of your AT&T/XM is really a matter of personal preference and available workspace, as shown in the figures on the opposite page.

In addition to flexible placement, the unit has several factory-installed configurations and four user-installed packages. The configurations and packages are described on the following pages.

FACTORY CONFIGURATIONS

STORAGE DEVICES	FACTORY CONFIGURATIONS		
	A	B	C
Cartridge Tape Drive	X	X	X
30-Megabyte Hard Disk Drive		X	
72-Megabyte Hard Disk Drive			X

FACTORY CONFIGURATIONS

Previously we said the AT&T/XM was flexible in its configuration possibilities. A configuration is simply a AT&T/XM cabinet with one or more storage devices installed. The unit can be configured at the factory TO YOUR REQUIREMENTS.

In the discussion that follows, we'll examine the various factory configurations.

The AT&T/XM is available with three different factory-installed configurations. The chart on the opposite page lists the three possible configurations of factory-installed storage devices, designated A, B and C. Factory-installed configurations save you time and effort that would be required to completely assemble the AT&T/XM yourself. The cabinet, power supply, and internal cabling are all put together at the factory. The storage device(s) are installed and connected inside the AT&T/XM cabinet, depending on your configuration requirements.

Configuration A

This configuration is the basic AT&T/XM that includes only a cartridge tape drive. The cartridge tape drive allows you to store data from and restore data to your 3B2 Computer.

FACTORY CONFIGURATIONS
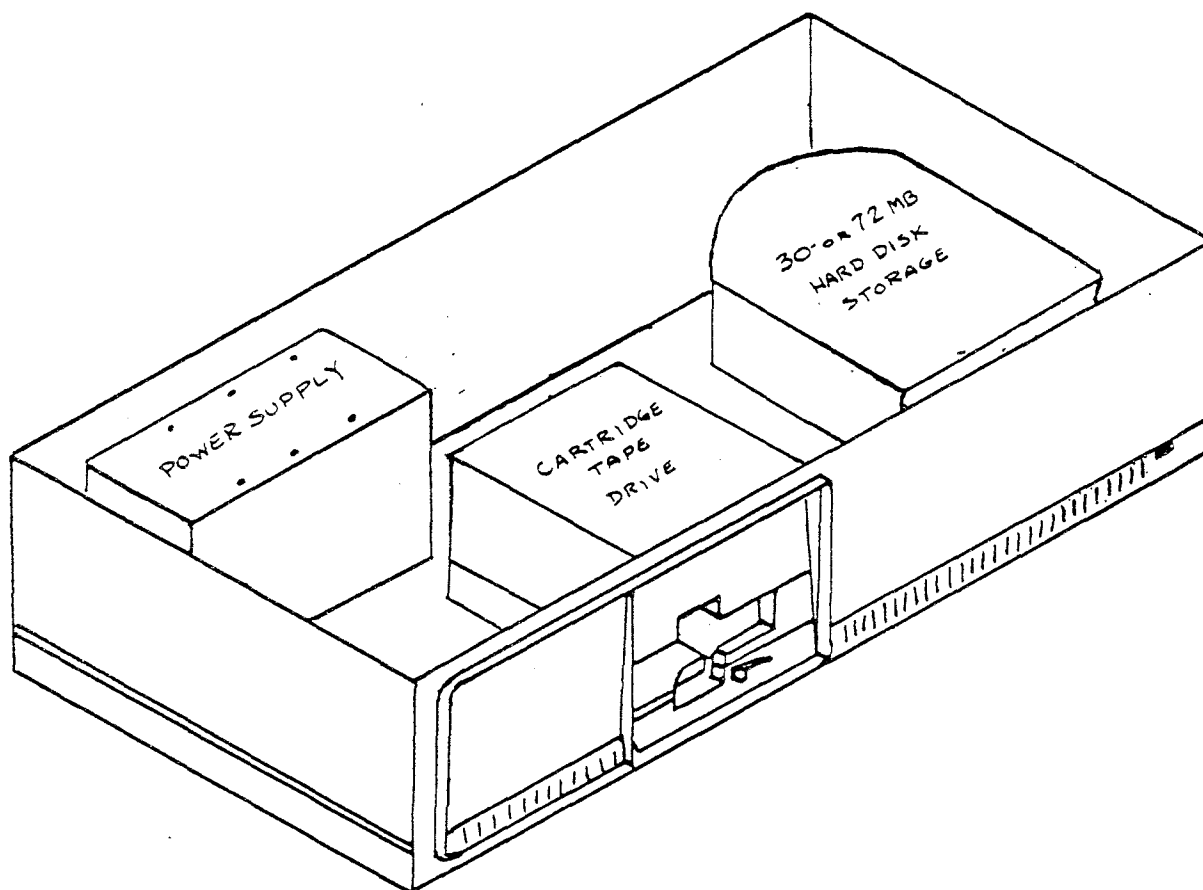
FACTORY CONFIGURATIONS

The remaining two configurations, B and C, are a combination of the Cartridge Tape Drive and either the 30- or 72-Megabyte Hard Disk Drive. The primary difference between the 30- and 72-Megabyte Hard Disk Storage is the amount of data stored. The 30-Megabyte Hard Disk Drive stores 30 Million - 8 bit words, called bytes. The 72-Megabyte Hard Disk Drive stores 72 Million bytes.

Configuration B

Factory configuration B is a 30-Megabyte Hard Disk Drive and Cartridge Tape Drive.

STORAGE DEVICES	FACTORY CONFIGURATIONS		
	A	B	C
Cartridge Tape Drive	X	X	X
30-Megabyte Hard Disk Drive		X	
72-Megabyte Hard Disk Drive			X

Configuration C

The final configuration is C. This configuration combines a 72-Megabyte Hard Disk Drive with the Cartridge Tape Drive and is the last of the three factory configurations.

STORAGE DEVICES	FACTORY CONFIGURATIONS		
	A	B	C
Cartridge Tape Drive	X	X	X
30-Megabyte Hard Disk Drive		X	
72-Megabyte Hard Disk Drive			X

STORAGE DEVICES

● Floppy Drive Package

● Cartridge Tape Drive Package

● 30-Megabyte Hard Disk Drive Package

● 72-Megabyte Hard Disk Drive Package
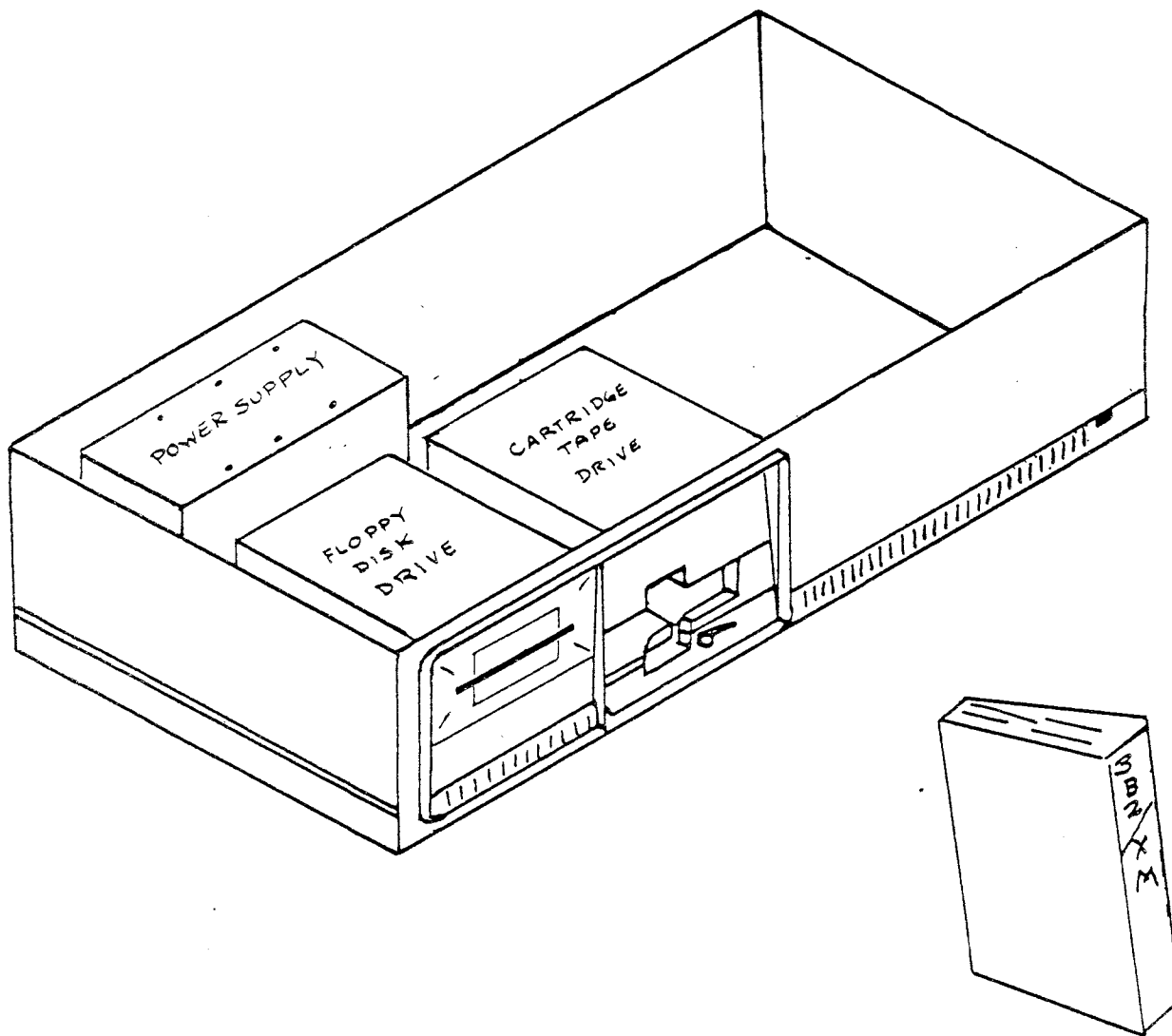
CUSTOMER-INSTALLED PACKAGES

STORAGE DEVICES

In addition to the three factory configurations, there are four customer installed packages you can order and install on your AT&T/XM. They are:

- Floppy Drive Package

- Cartridge Tape Drive Package

- 30-Megabyte Hard Disk Drive Package

- 72-Megabyte Hard Disk Drive Package

These packages allow you to add more storage devices to your AT&T/XM whenever you wish. Each package includes the storage device and all the necessary materials, allowing you to install the device.

FLOPPY DRIVE PACKAGE

CUSTOMER-INSTALLED PACKAGES

FLOPPY DRIVE PACKAGE

Earlier we said the basic AT&T/XM consisted of a Cartridge Tape Drive and the Cartridge Tape storage media. The basic AT&T/XM can be modified with a customer-installed Floppy Disk Drive. The Floppy Disk Drive uses "floppy disks" as the storage media.

Floppy disks, also referred to as flexible disks, floppy diskettes, flexible diskettes, or just plain "floppies", are a removable media for saving and retrieving programs and data. Reading and writing of floppy disks is done on the FLOPPY DISK DRIVE.

The FLOPPY DRIVE PACKAGE consists of the following items:

- FLOPPY DISK DRIVE

- MOUNTING HARDWARE

- AT&T/XM MANUAL

One floppy disk drive can be mounted in each AT&T/XM. The floppy disk drive is located to the right of the Cartridge Tape Drive. A maximum of two AT&T/XMs can be connected to your 3B2 Computer. Therefore, it is possible to add up to "two" external floppy disk drives in addition to the floppy disk drive internal to the 3B2 Computer.

CARTRIDGE DRIVE PACKAGE

POWER SUPPLY

(ADDITIONAL) CARTRIDGE TAPE DRIVE

CARTRIDGE TAPE DRIVE

CARTRIDGE UTILITIES
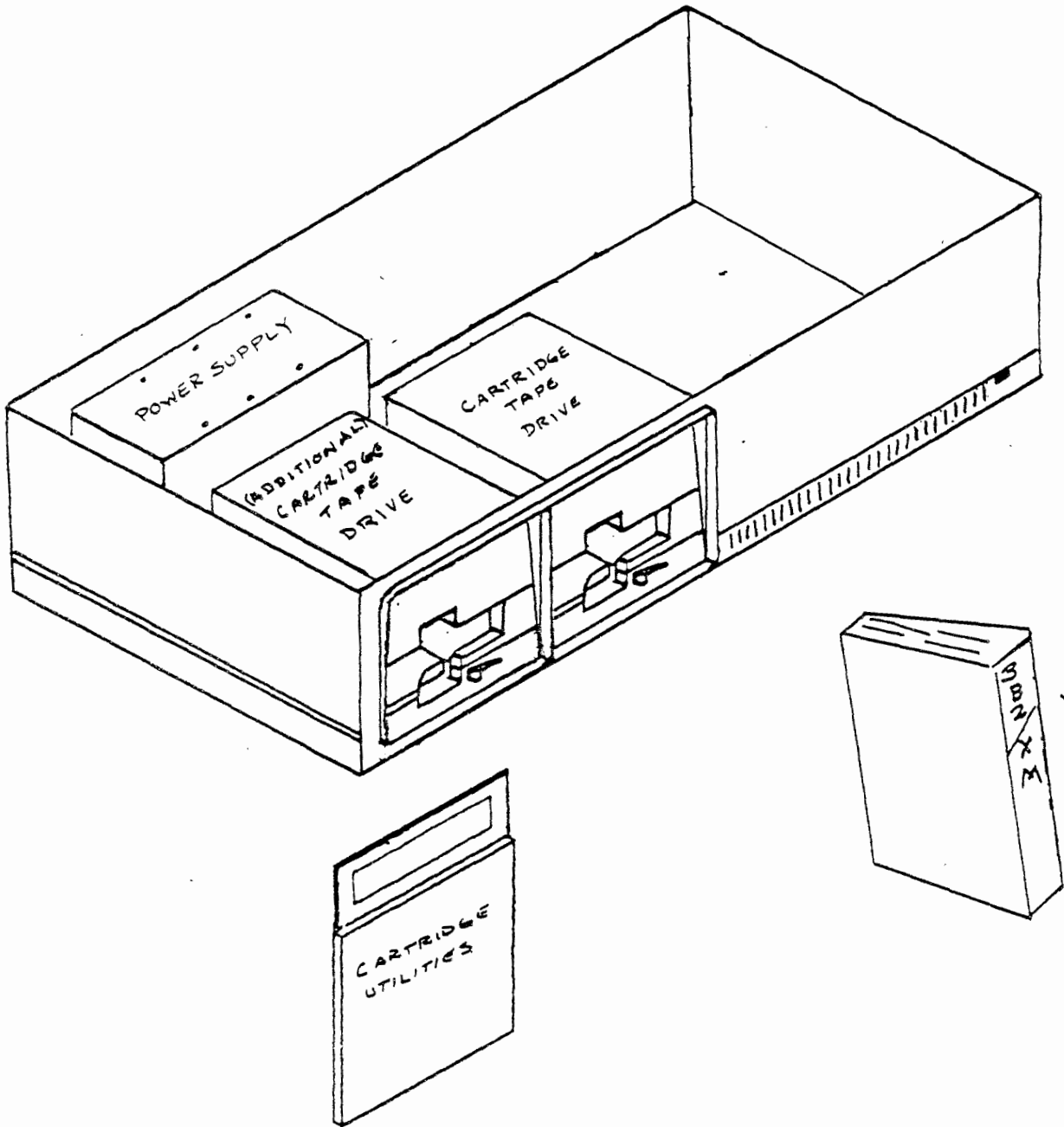
CUSTOMER INSTALLED PACKAGES

CARTRIDGE DRIVE PACKAGE

Recall, each of the three factory configurations of the AT&T/XM
had a **Cartridge Tape Drive** installed. However, an additional
cartridge tape drive can be added. The cartridge tape drive is an
external storage device of your 3B2 Computerthat uses removable
tape cartridges. The cartridge tapes store data from and restore
data to your 3B2 Computer. Each AT&T/XM can have two cartridge
tape drives installed, and each 3B2 Computer can support two XMs.

The **Cartridge Drive Package** consist of the following hardware,
documentation and software.

           ❖ HARDWARE

               - Cartridge Tape Drive

               - Mounting Hardware

           ❖ DOCUMENTATION

               - Software Information Bulletin –
                 Cartridge Tape Utilities Guide

               - Cartridge Tape Utilities Guide

           ❖ SOFTWARE

               - Cartridge Tape Utilities Floppy Disk

Using the items in the package and following installation
procedures, discussed later in the work assignment, you can add an
additional Cartridge Tape Drive. The actual installation of the
Cartridge Drive Package will be discussed in work assignment
entitled "AT&T/XM Cartridge Tape System".

30- or 72-MEGABYTE HARD DISK DRIVE PACKAGE

POWER SUPPLY

CARTRIDGE TAPE DRIVE

30- or 72 MB HARD DISK STORAGE

3B2/XM
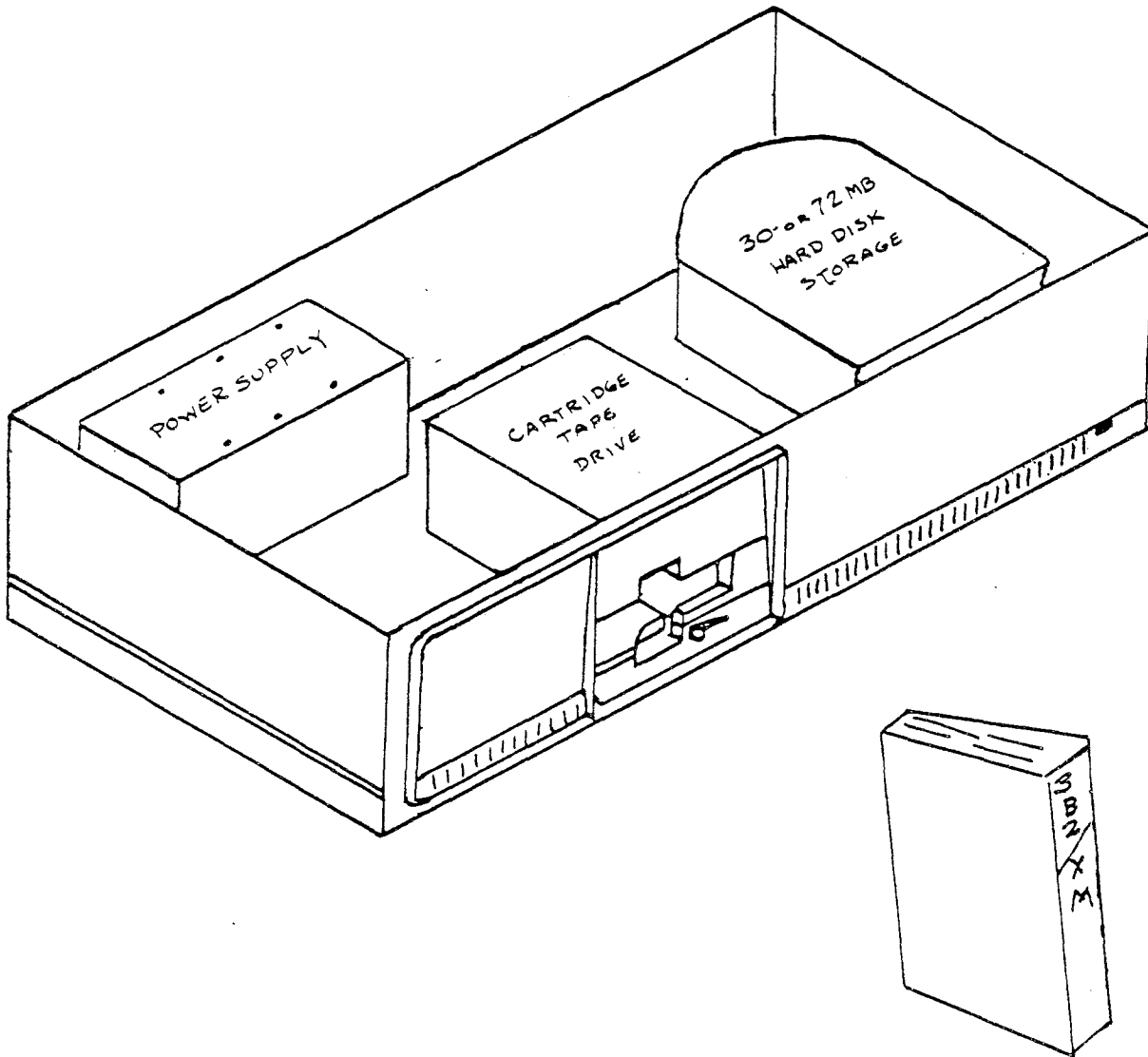
CONFIGURATIONS and PACKAGES

30- or 72-MEGABYTE HARD DISK DRIVE PACKAGE

You may futher modify the basic AT&T/XM by adding a hard disk.
The hard disk used in the AT&T/XM is used to store large amounts
of data that's required to be readily accessible to the 3B2
Computer. These disk drives are viewed as external by the 3B2
Computer and provide either 30- or 72-megabytes of additional data
storage. Two AT&T/XM configurations are available, one of which is
factory-installed. However, a disk drive can be easily installed
in a AT&T/XM not containing a hard disk drive. The 3B2/300
Computer system will only support two hard-disk drives.

     .● 30-Megabyte Hard Disk Drive

           OR

     ● 72-Megabyte Hard Disk Drive

     ● Mounting Hardware

     ● Internal Cabling

     ● External Cabling

If you find one AT&T/XM is not sufficient to meet your storage
needs, a second AT&T/XMmay be added to your 3B2 Computer whenever
you wish.

NOTES

APPLICATION

Answer the following questions using your student guide and any available documentation.

1. You have been assigned to order a AT&T/XM for your office. You want maximum hard disk storage capacity. Which factory configuration would you select?

    _____

2. How many AT&T/XMs can be added to the 3B2 Computer?

    _____

3. Your have ordered factory configuration A. Which device packages would you order to give you maximum disk storage and another choice of removable media?

    _____

    _____

4. Most powerful computers require a controlled environment. Does your powerful AT&T/XM require a controlled environment?

    _____

5. It would be convenient to have the ability to make tapes and floppy disks. Is this possible? YES/NO
    Which device package would you order to give you this added flexibility? (Assume you have factory configuration B).

    _____

INSTALLING AT&T/XM TO EXISTING 3B2 COMPUTER

REQUIREMENTS

A 3B2 Computer configured for UNIX System V Release 2.0 or later and 1
megabyte of Random Access Memory.

CAUTIONS

Familiarize yourself with the 3B2 Computer Owner/Operator Manual
BEFORE installing the AT&T/XM.

After powering down your 3B2 Computer, always unplug it from the wall
outlet before removing the cover.

Follow instructions carefully to avoid personal injury or equipment
damage.

Do not disturb the 3B2 Computer internal components unless you are
explicitly told how and when to do it.

REFERENCE DOCUMENTS

SELECT CODE	DESCRIPTION
305-327	AT&T/XM MANUAL
305-466	CARTRIDGE TAPE UTILITIES GUIDE
305-354	SOFTWARE INFORMATION BULLETIN – AT&T/XM ADMINISTRATION
305-374	SOFTWARE INFORMATION BULLETIN – CARTRIDGE TAPE UTILITIES GUIDE

MATERIAL REQUIRED

3B2 MODEL 300 COMPUTER and TERMINAL
AT&T/XM
The documentation listed in Reference Documents
Screwdriver
Ribbon cables and soft power cord
Cartridge Tape Controller Card
Wrist Strap

NOTES

OBJECTIVES

At the end of this work assignment you will be able to:

1. Identify from external examination an upgraded 3B2 Computer, operating on UNIX System V Release 2.0 or later.

2. Locate and move the hard disk terminating resistor to the out of circuit position.

3. Install the cartridge tape controller card.

4. Connect the AT&T/XM to the 3B2 Computer.

IS YOUR 3B2 COMPUTER READY?

FIGURE A

DISK ACCESS PANEL
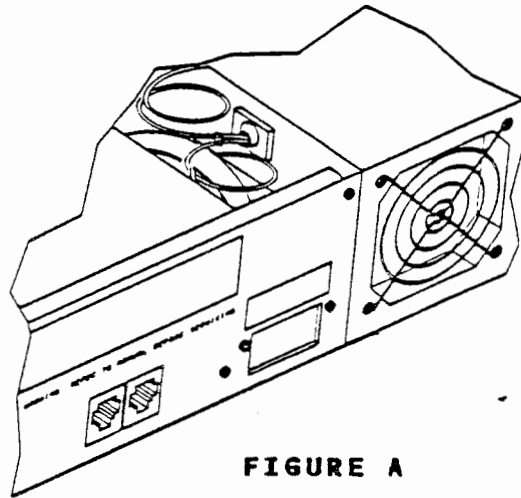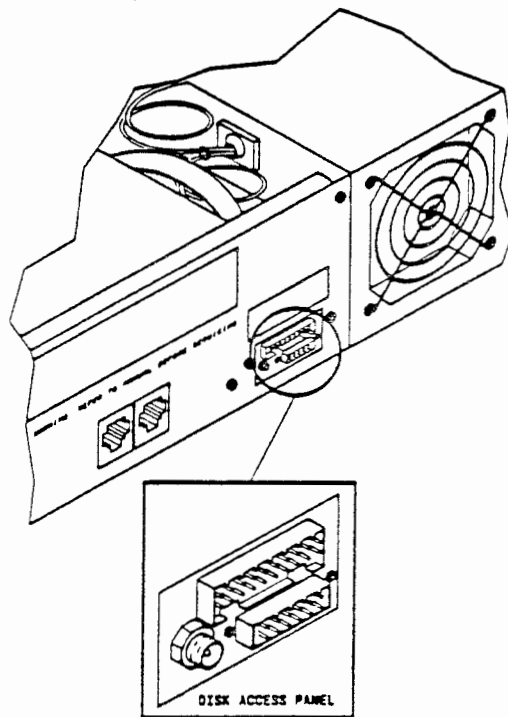
FIGURE B

IS YOUR 3B2 COMPUTER READY?

Before you attempt to install a AT&T/XM, take a moment to verify your
3B2 Computer has been updated to UNIX System V Release 2.0 or later.
The update required changes to both software and hardware. Figure A,
on the opposite page shows the back of a 3B2 Computer that has not
been updated.

The easiest way to determine if you 3B2 Computer has been updated, is
to look at the back panel. Your unit has been updated if there are two
square connectors and a small round jack located in the center of the
back panel. This location is now called the disk access panel.

Take a moment and look at the back panel of your 3B2 Computer. Has it
been updated? If not, consult your instructor.

REMOVING THE COMPUTER COVER

LEFT SIDE

POWER SWITCH

TOP COVER SCREW

TOP COVER SCREW

OFF ON

RIGHT SIDE

TOP COVER SCREW

CABLE ACCESS DOOR

① RELEASE LATCH

TOP COVER SCREW

③ PULL DOOR UP

② ROTATE CABLE ACCESS DOOR UP
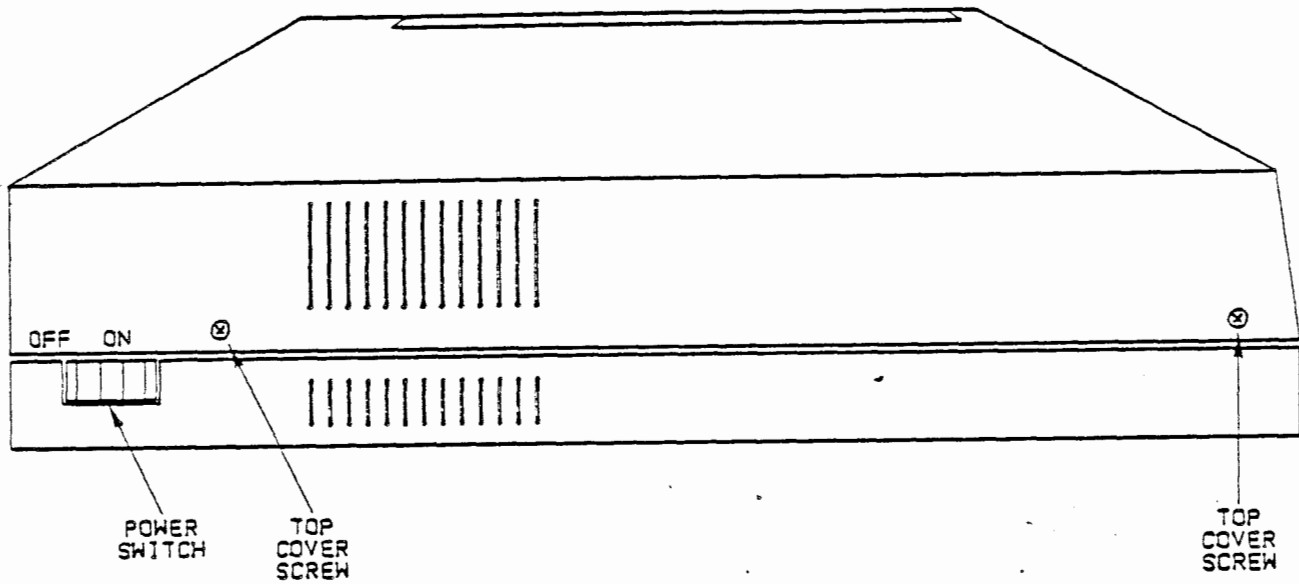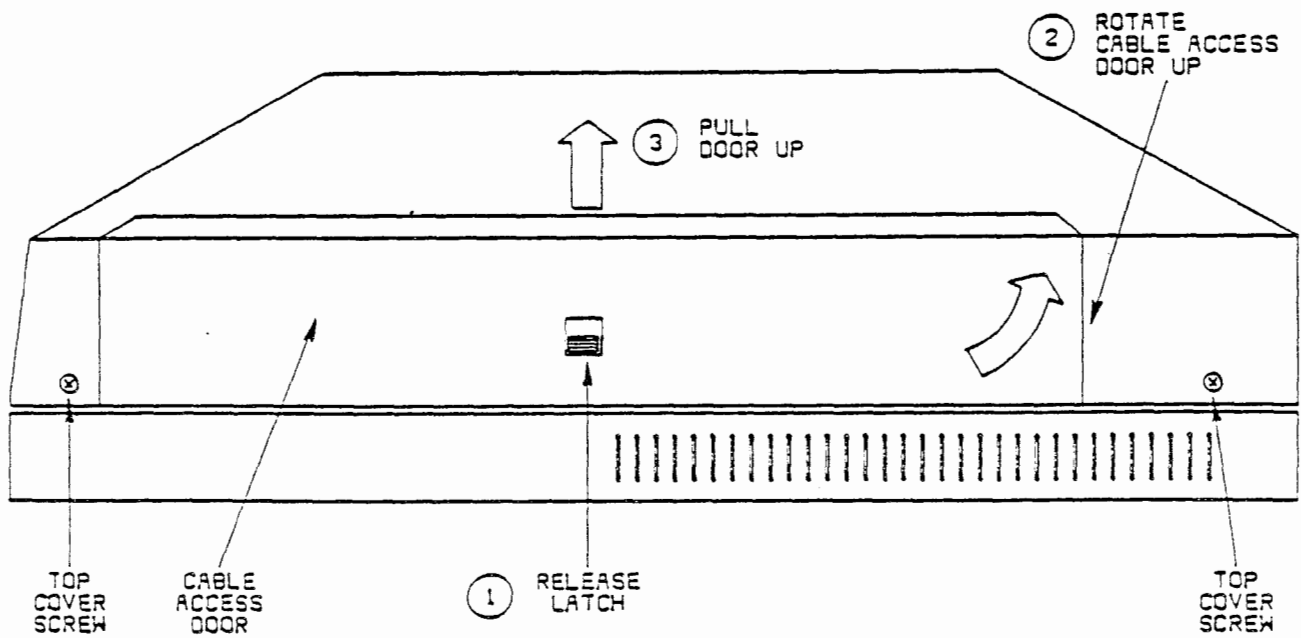
REMOVING THE COMPUTER COVER

Now that you have determined your 3B2 Computer has been updated, there
are a few simple changes required inside the unit. First, make sure
the unit is powered down and unplugged from the wall outlet. If it
isn't powered down, use either the shutdown command

                    shutdown -y -i0

or power-down via the Simple Administration Machine Management Menu".
This menu was discussed in the work assignment titled Simple
Administration. The subcommand of that menu is:

                        powerdown.

Just a reminder, "never pull the power plug or externally remove power
until the 3B2 Computer has completed its powerdown procedure."

Removing the Computer Cover

After the power has been removed, it is safe to remove the computer
cover.

   1. On the right side of the computer is a cable access door. To
       open the door, 1) release the "latch", 2) swing up the cable
       access door, and 3) pull up and out.

   2. Remove the four screws holding the cover (two on the left side
       and two on the right side).

   3. Carefully remove the top cover and set aside.

LOOKING AROUND

TWO
WIRE
CONNECTOR

34-PIN
CABLE
CONNECTOR

CABLE

TERMINATING
RESISTOR

POWER
SUPPLY
CAGE

FLOPPY
DISK
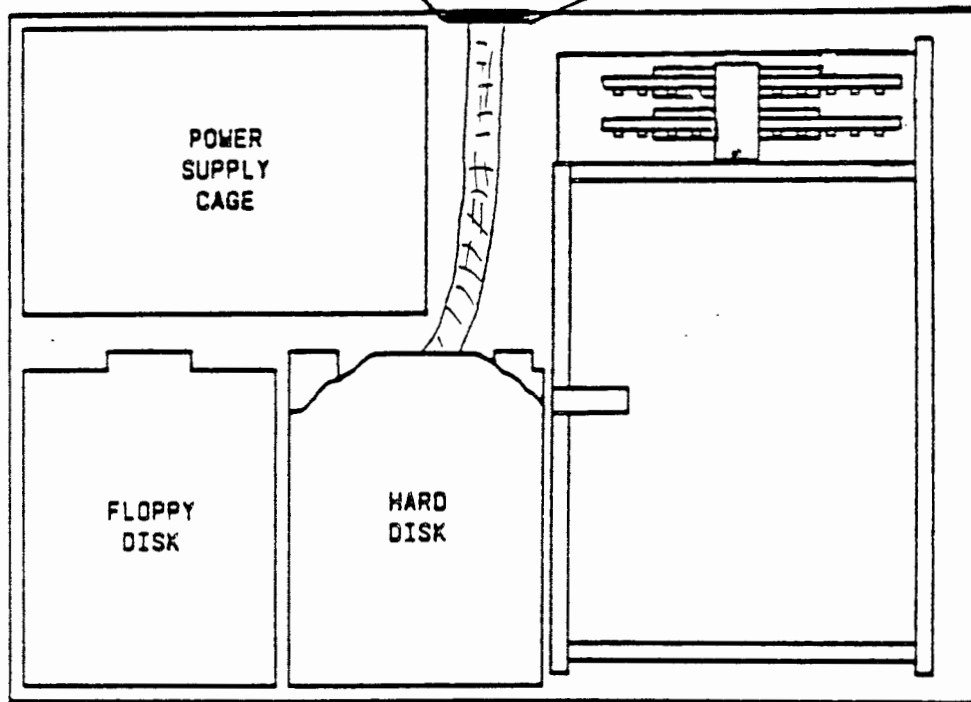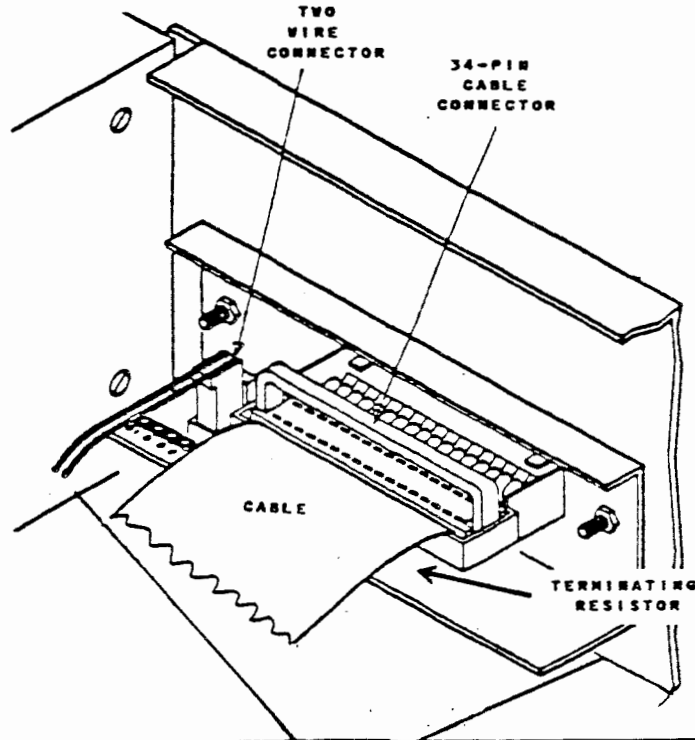
HARD
DISK

LOOKING AROUND

Before you can add the AT&T/XM, there are two hardware changes that must be done in your 3B2 Computer:

        1. Move a "Terminating Resistor"
        2. Add a "Cartridge Tape Controller Card"

Locating the 3B2 "Terminating Resistor"

As you view the 3B2 Computer from the top is a two-wire connector and the two square connectors mentioned earlier. It may be difficult to see both square connectors, but by referring to the figure on the opposite page, you see the general location. Of particular interest is the large 34-pin cable connector and the two wire connector, located to its left. In front of the large connector is a "terminating resistor". Again, its difficult to see, but it is under the cable! The resistor terminates the cable from the hard disk drive in the 3B2 Computer.

MOVING THE TERMINATING RESISTOR

TERMINATING RESISTOR
"IN-CIRCUIT POSITION"

FIGURE A

TERMINATING RESISTOR
"OUT OF CIRCIUT POSITION"
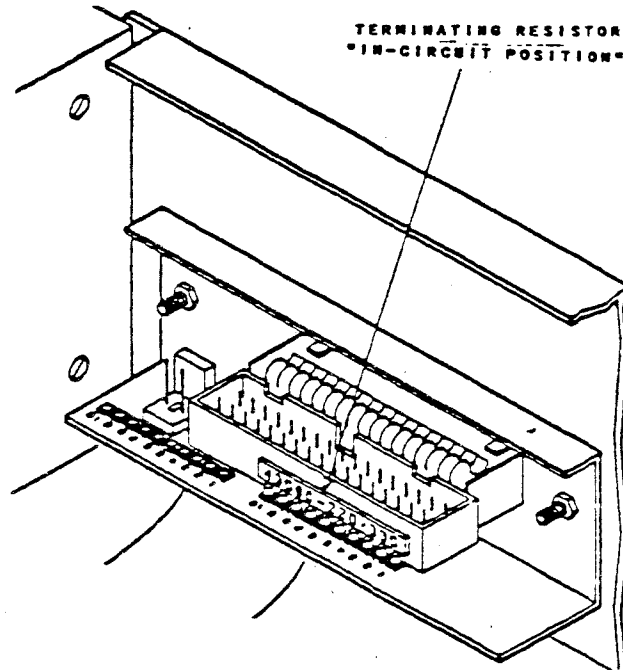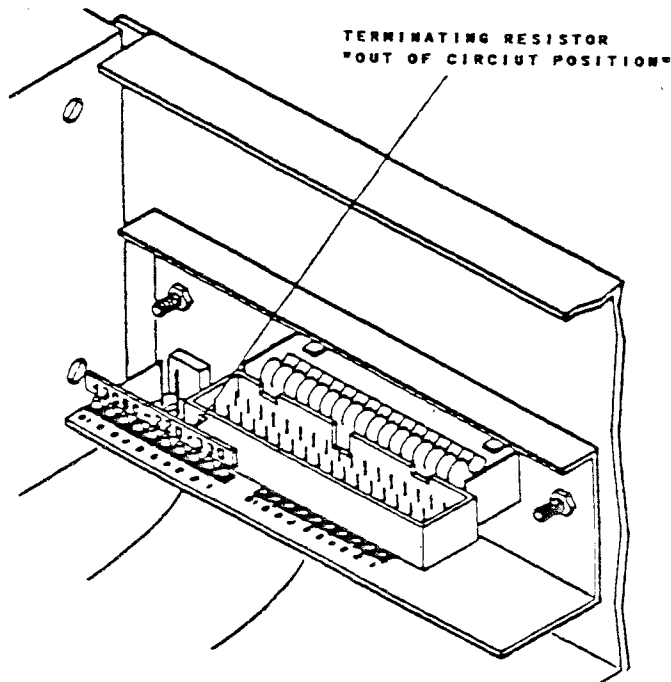
FIGURE B

MOVING THE TERMINATING RESISTOR

Prior to connecting the AT&T/XM to your 3B2 Computer, the "terminating resistor" in the 3B2 Computer must be moved.

The correct procedure is:

1. Remove the 34-pin cable connector using the cable connector pull tab. "DO NOT PULL THE CONNECTOR OUT BY THE RIBBON CABLE"

2. Remove the two-wire connector

    Refer to figure A.

    The "terminating resistor" is now visible in the in circuit position.

3. CAREFULLY remove the "terminating resistor" from the in circuit position and move it to the out of circuit position, figure B. The out of circuit position is really just a storage place.

NOTE: If you remove your AT&T/XM from this 3B2 Computer the "terminating resistor" must be restored to the in circuit position.

RECONNECT

TERMINATING
RESISTOR

TWO
WIRE
CONNECTOR

34-PIN
CABLE
CONNECTOR
AND
PULL-TAB

POWER
SUPPLY
CAGE

FLOPPY
DISK

HARD
DISK
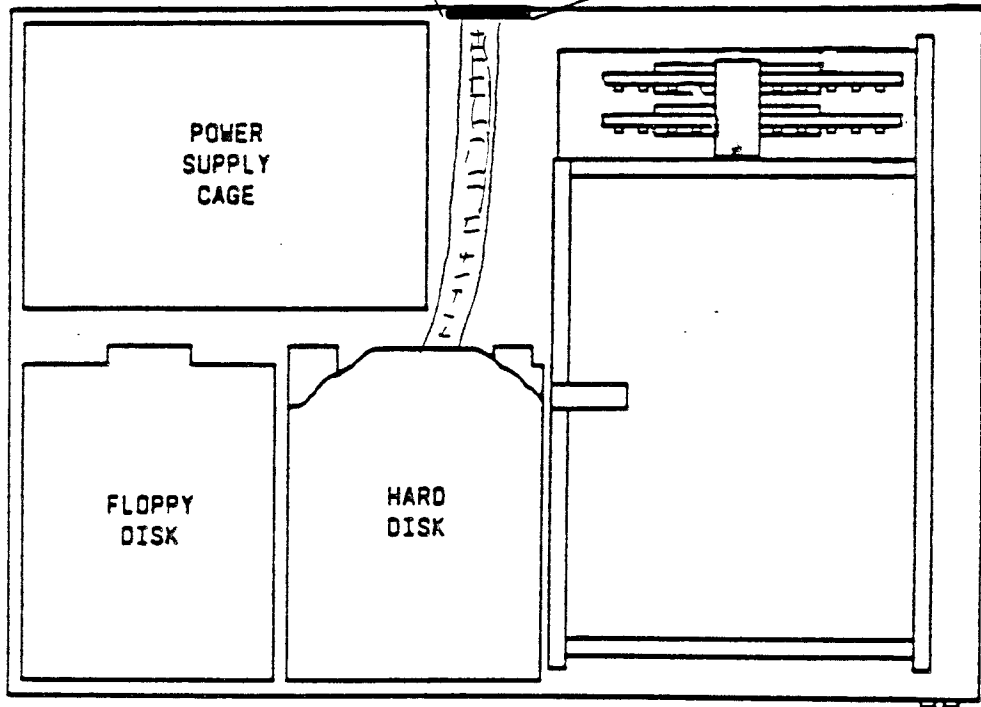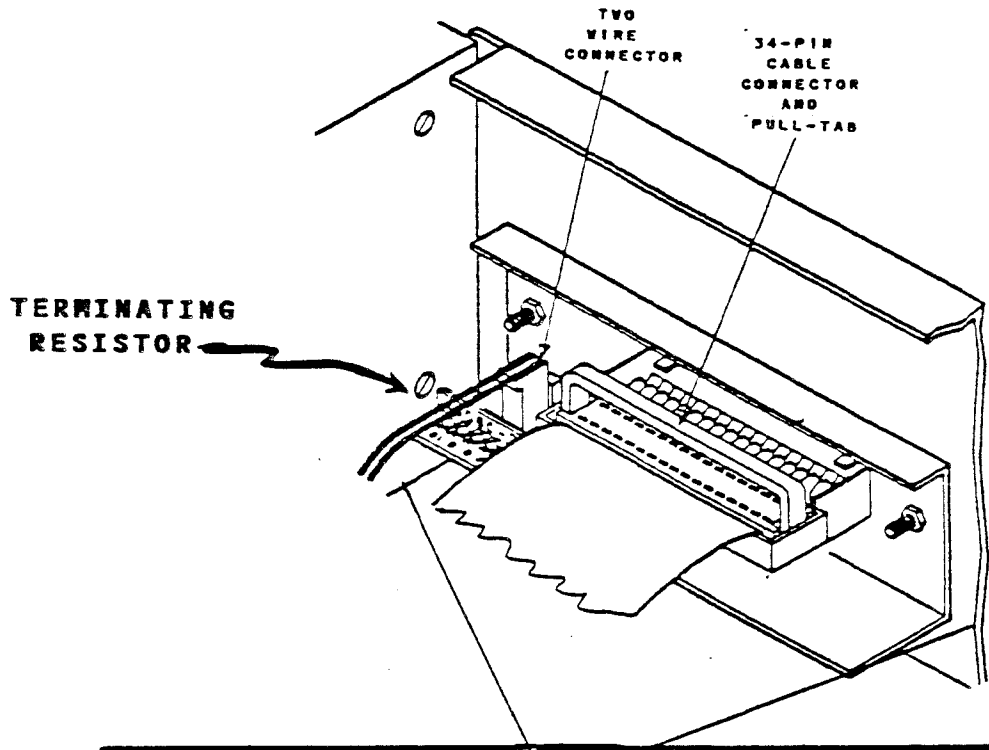
RECONNECT

The next step is to **CAREFULLY** reconnect the 34-pin ribbon cable and
two-wire connectors on the disk access panel.

Verify the connectors are firmly seated.

To briefly review:

When a AT&T/XM is added to your 3B2 Computer the "terminating
resistor", on the disk access panel, must be moved to the out of
circuit position. If the AT&T/XM is removed from your 3B2 Computer the
"terminating resistor" must be moved to the in circuit. postiion. If
this resistor is not in the proper location, the operation of your
unit may be erratic.

After the terminating resistor has been relocated, a Cartridge Tape
Controller (CTC) card must be installed. The card installs in a slot
on the left side of your 3B2 Computer. A discussion of this operation
follows on the next few pages.

ADDING THE CARTRIDGE TAPE CONTROLLER CARD
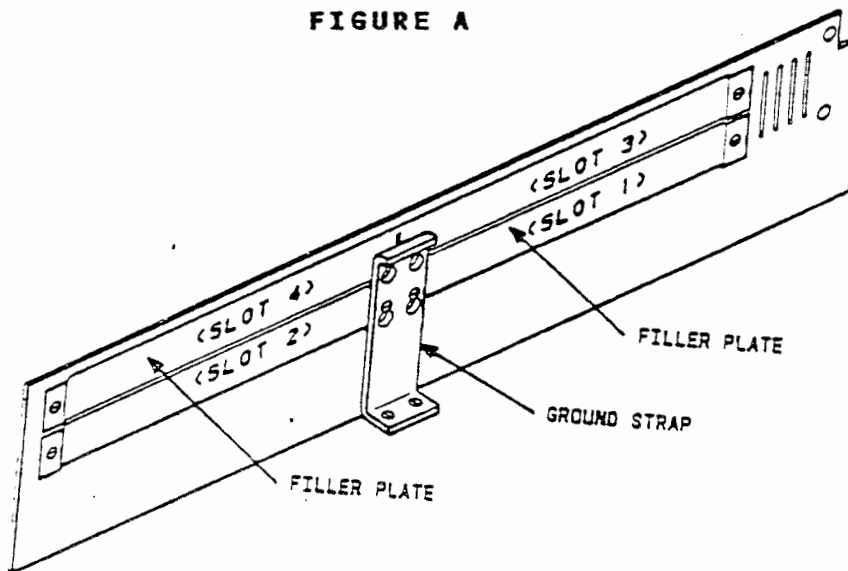
FIGURE A

FIGURE B

ADDING THE CARTRIDGE TAPE CONTROLLER CARD

The left side of the 3B2 Computer has four slots used for the addition
of feature cards to your 3B2 Computer. The slots are numbered one to
four. One rule needs to be restated, ALWAYS FILL THE SLOTS IN NUMERIC
ORDER. For example, figure A on the opposite page shows the four slots
unoccupied. Since the CTC is the first feature card added to your 3B2
Computer, and keeping with our rule, it will be installed in slot one.
If, for example, there had been cards in slots one and two, then the
CTC card would have been installed in slot three.

Before the card can added, the filler plate (figure B) for slot one
must be removed. To remove the filler plate, first remove the ground
strap, then remove the filler plate over slot one. It will be
necessary to "break" in the center. Save the filler plate in-case the
slot becomes vacant. Remember, the slots must either have a filler
plate or a card installed, else the air flow (cooling) will be
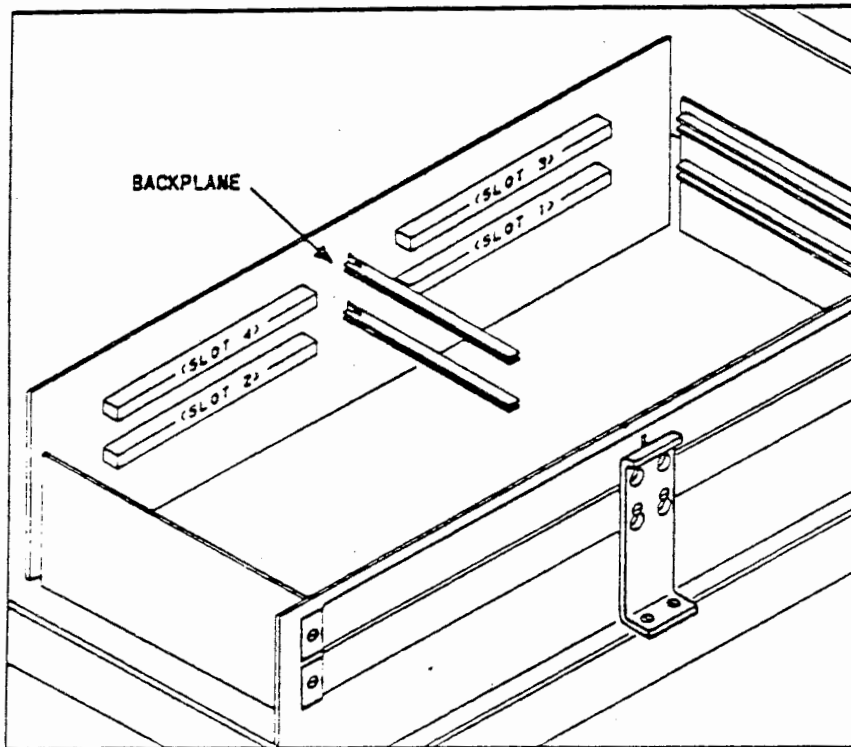impaired.

ADDING THE CARTRIDGE TAPE CONTROLLER CARD
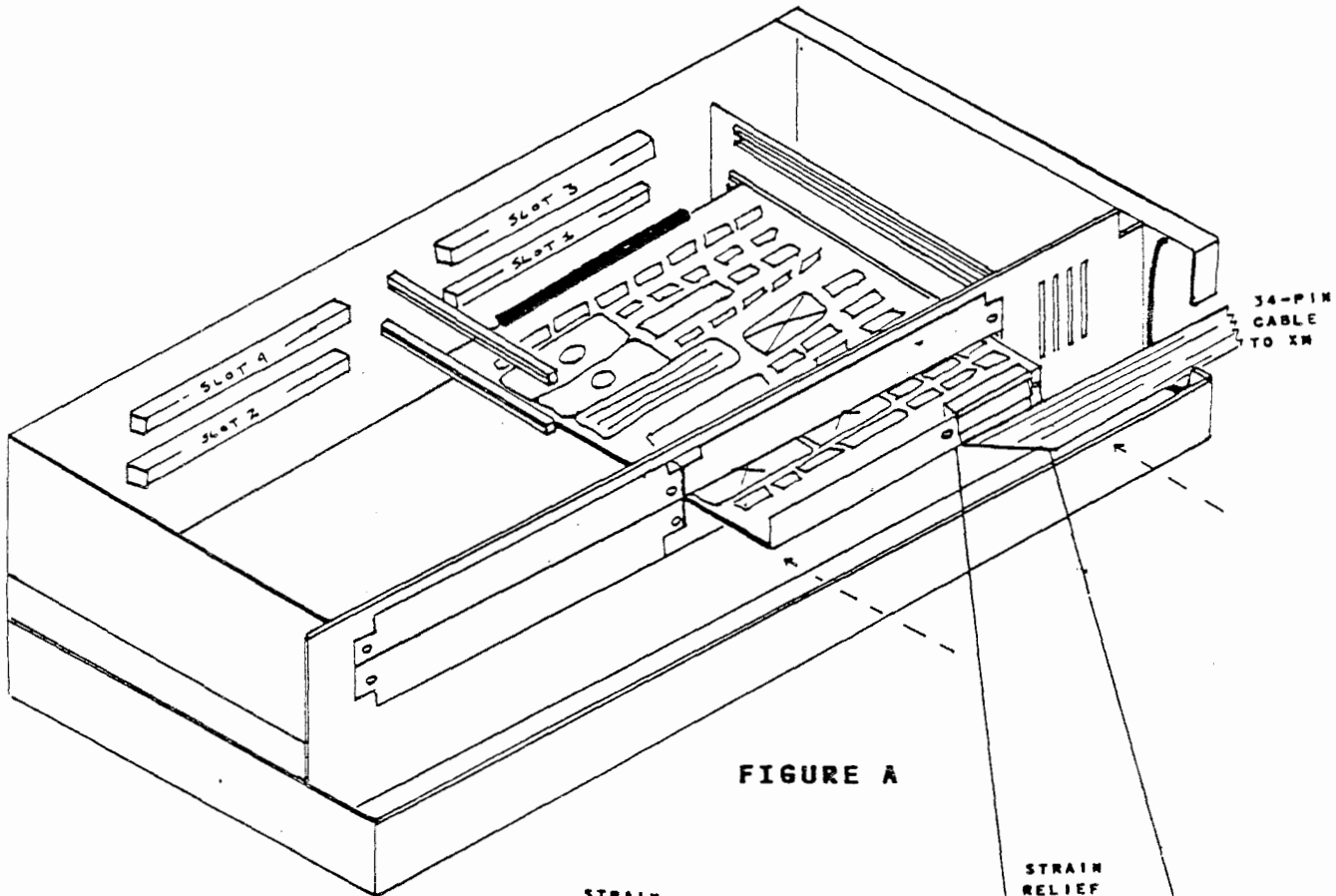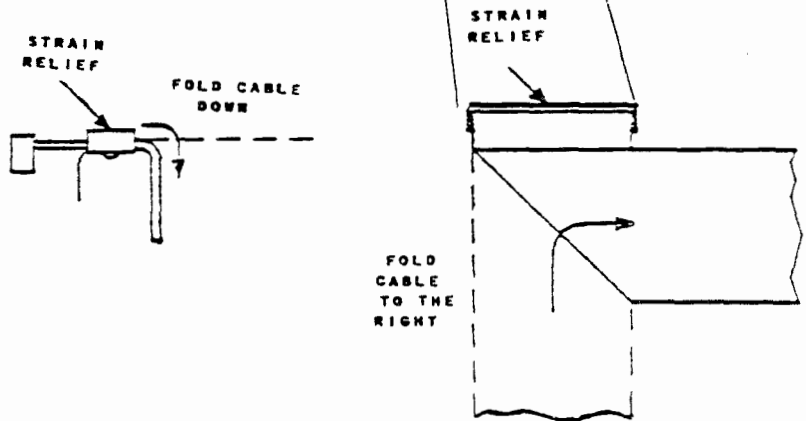
FIGURE A

FIGURE B

ADDING THE CARTRIDGE TAPE CONTROLLER CARD

Now that the filler plate has been removed, the CTC card can finally
be installed. I recommend you use the wrist strap and handle the CTC
card by the edges. Using the wrist strap is always a good procedure
when working inside your 3B2 Computer. Holding the CTC card by the
edges, like a record, put the card part of the way into slot one.

Before the installation of the CTC card is complete, the 34-pin ribbon
cable must be connected to the card and then folded as shown in figure
B. Folding the ribbon cable prevents stressing the connector or the
card. Fold the cable straight down at the strain relief and then to
the right as shown in figure B. Plug the cable into the CTC card
connector. Attach the strain relief to the front of the CTC card.

The other end of this 34-pin cable connects the cartridge tape drive
in the AT&T/XM. The actual interconnection of the units will be
discussed later in this work assignment; for now we'll connect just
the CTC end.

COMPLETING THE ADDITION

GROUND CLIP

34-PIN
CABLE
TO XM

SLOT 3

SLOT 4

SLOT 2

GROUND STRAP
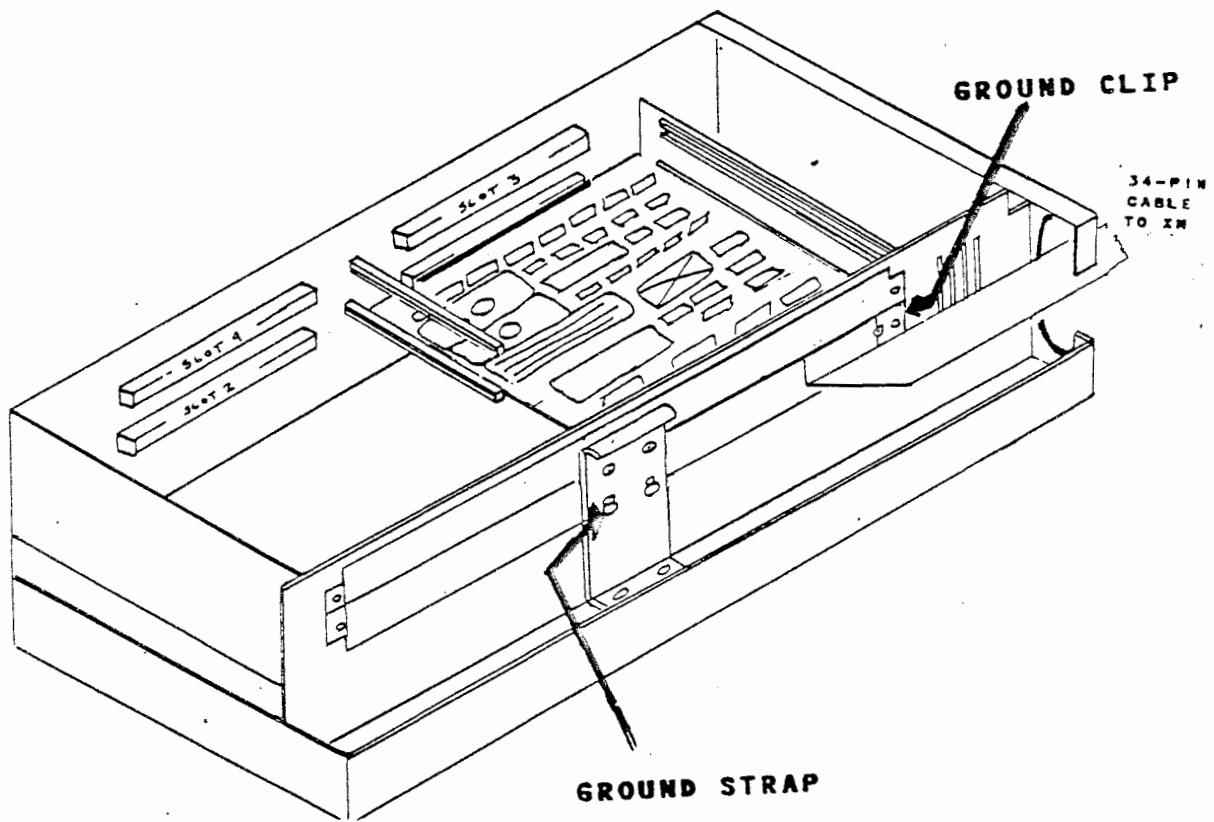
COMPLETING THE ADDITION

Now that the cable has been connected to the CTC card, you can
complete the addition of the card. Use caution when working near the
grounding fingers around the top of the feature card enclosure. These
fingers are sharp and you could accidentally cut yourself while trying
to push the CTC card into its connector.

Continue sliding the CTC card into slot one. Remember, this is the
slot we use in this example. You would use the next available slot in
your 3B2 Computer.

Route the ribbon cable out through the opening on the rear of the
computer cabinet. Leave the cable loose for the time being. We'll
connect it to the AT&T/XM later.

Add the ground clip on the front-right of the CTC card and re-install
the ground strap.

This completes the installation of the CTC card.

REPLACE THE COVER

OFF ON

POWER
SWITCH

TOP
COVER
SCREW

LEFT SIDE

TOP
COVER
SCREW

TOP
COVER
SCREW

CABLE
ACCESS
DOOR

RELEASE
LATCH

TOP
COVER
SCREW
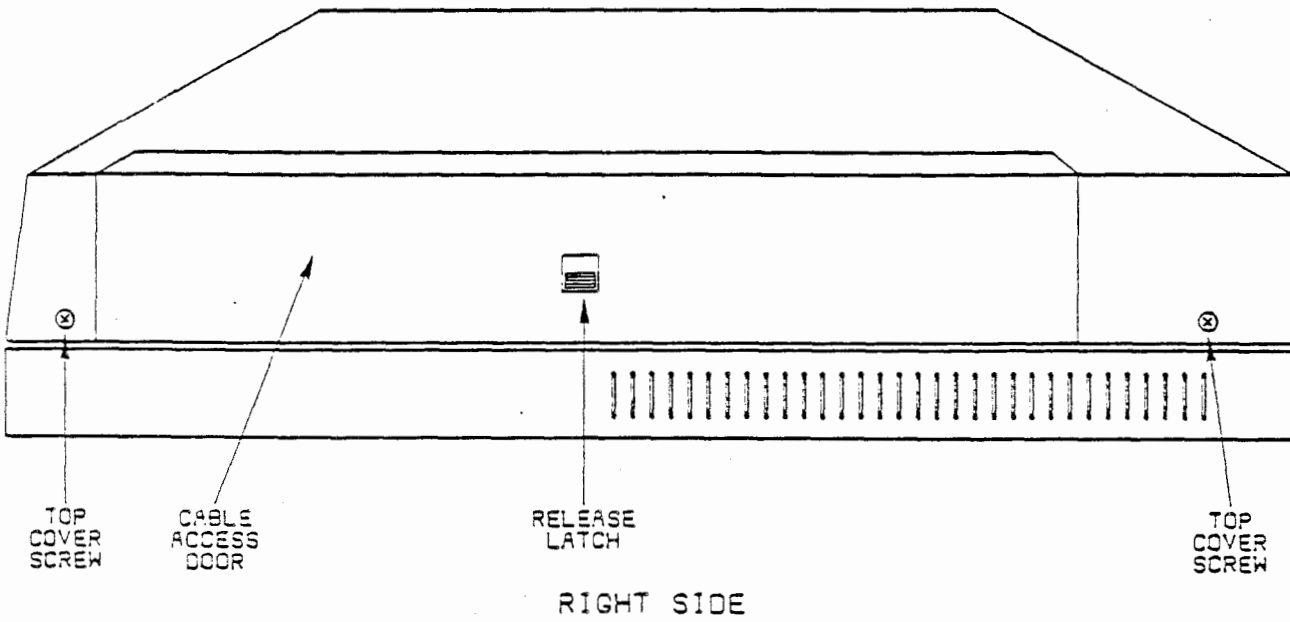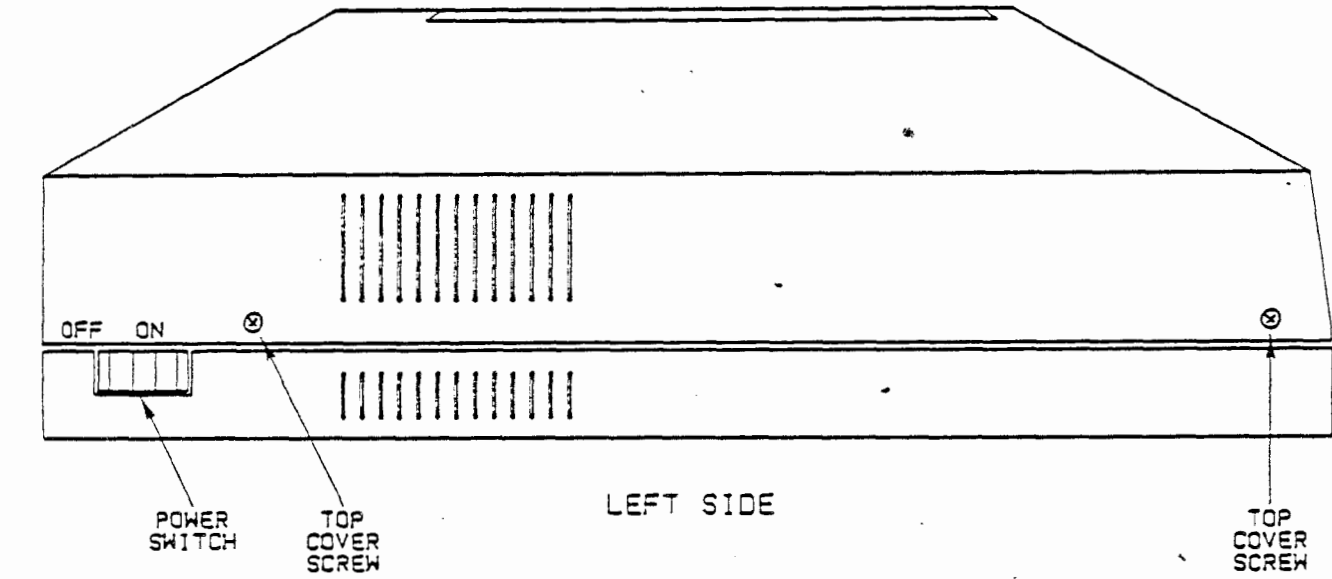
RIGHT SIDE

REPLACE THE COVER

After the CTC card and ground clip have been added and the ground strap installed, the computer cover may be placed back on the computer.

   1.   Install the four screws holding the cover (two on the left side
        and two on the right side).

Congratulations! The installation of your CTC card is now complete.

The next part of the work assignment will attach the cables.

THE RIBBON CABLES
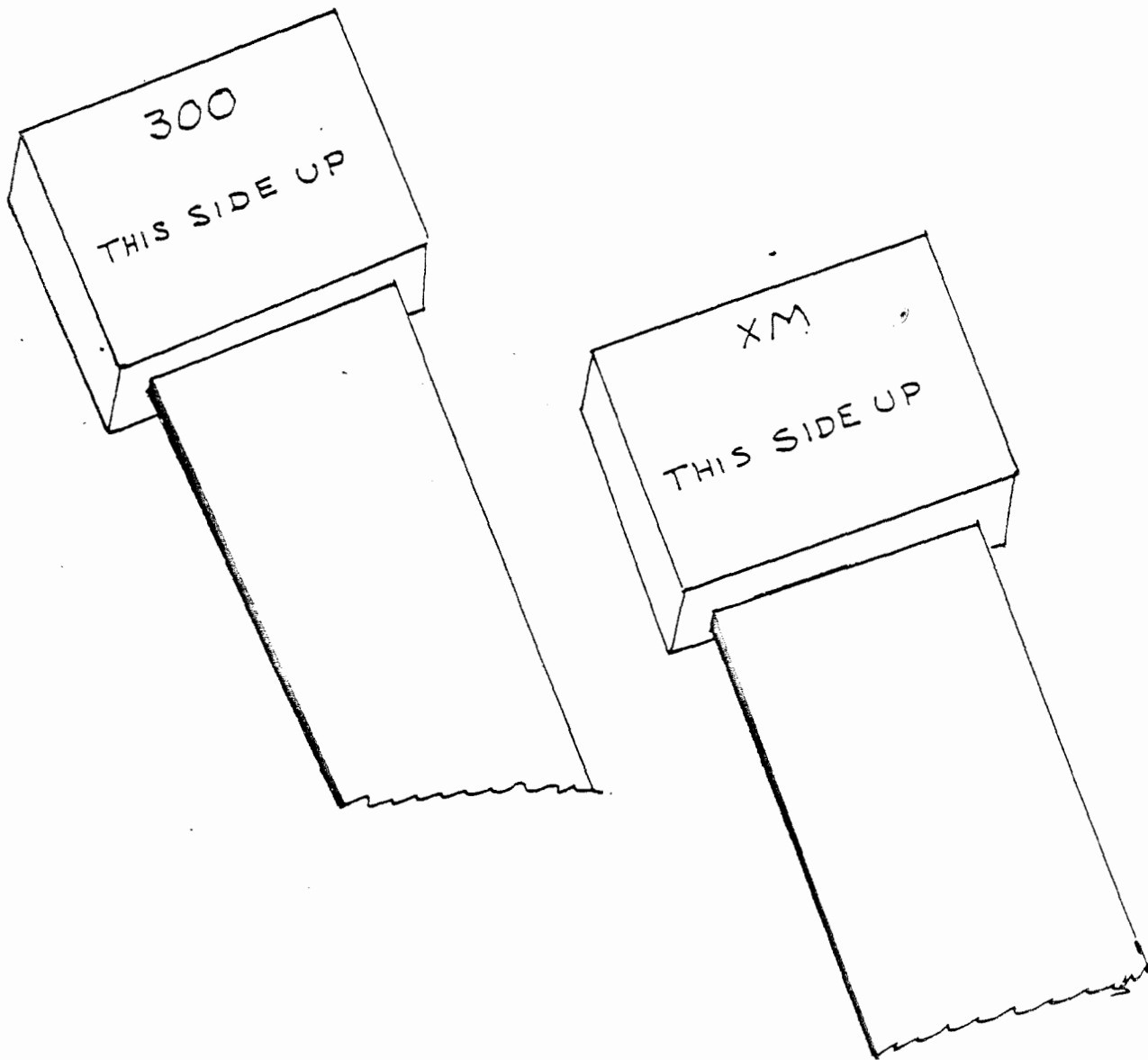
THE RIBBON CABLES

There are four cables connecting the AT&T/XM and 3B2 Computer together. Two of the cables are for the hard disk, one from the cartridge tape controller and the forth for soft power control.

Before we begin the final connections, lets take a moment and discuss how the cables are designated. It is very important the cables be connected correctly. While impossible to interchange the 20 and 34-pin connectors, it is possible to install them upside down, and even reversed.

The cables are designated XM or 300. Obviously, the XM connects to the AT&T/XM and so on. The other designation THIS SIDE UP means just what it says.

In summary: If the cables are turned over or reversed, serious equipment damage could result.

ATTACHING THE RIBBON CABLES

20-PIN
HARD DISK
CONNECTOR
OUTLET

34-PIN
HARD DISK
CONNECTOR
OUTLET

FIGURE A

CLAMP
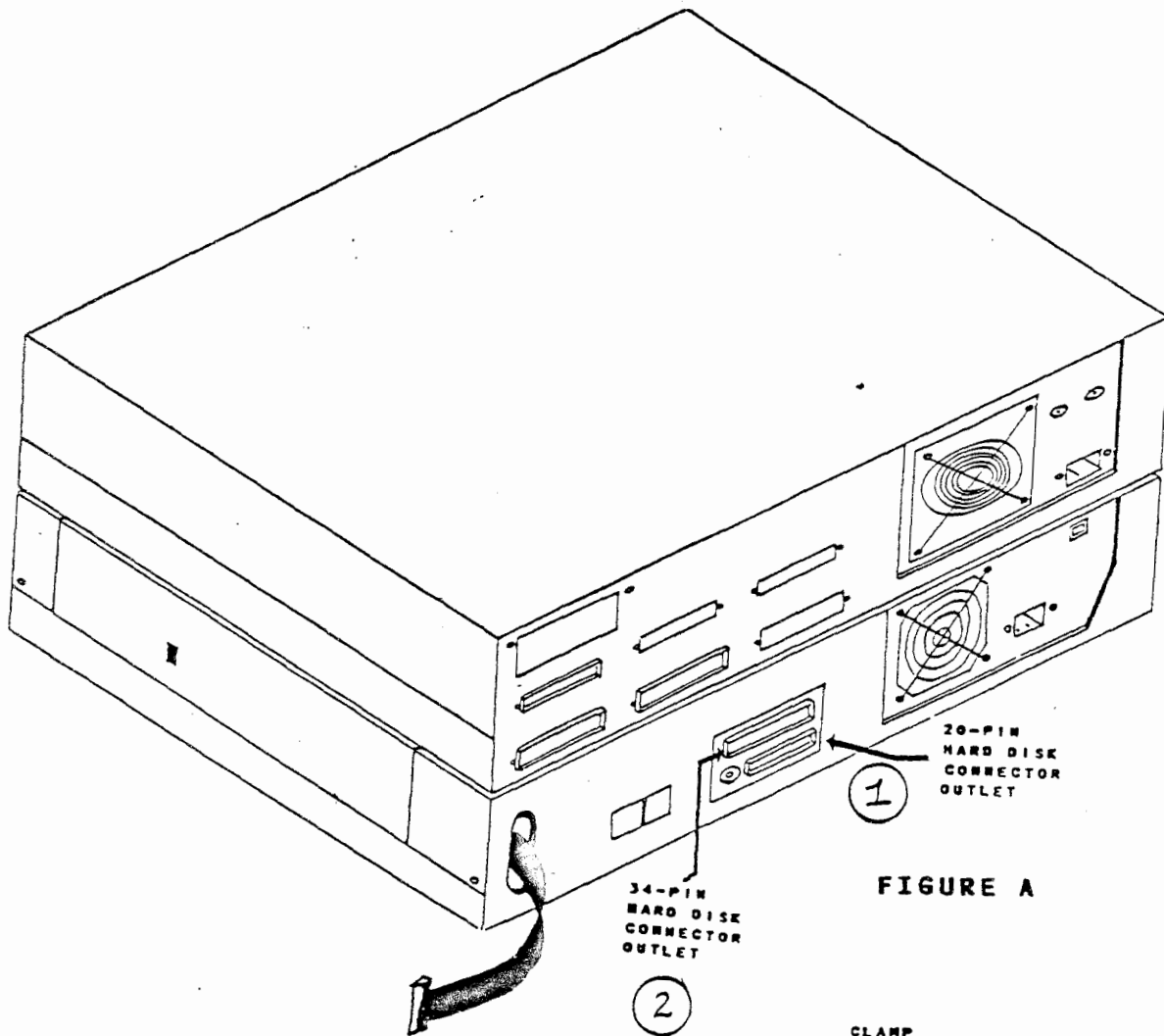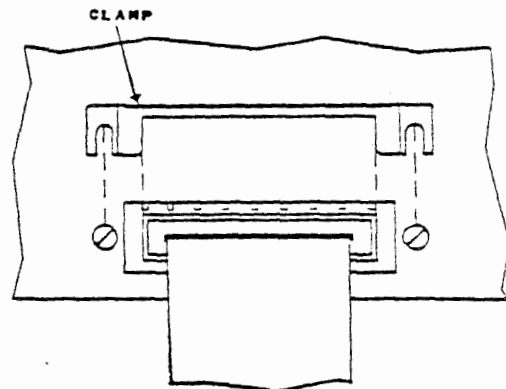
FIGURE B

ATTACHING THE RIBBON CABLES

Finally, we are ready to connect the two units together. Find a flat surface, where the units will be located, to work. For this example the units are going to be stacked: the AT&T/XM on-top of the 3B2 Computer.

Three ribbon cables need to be connected. The two of the three ribbon cables, 20- and 34-pins, connect the hard disk in the AT&T/XM to the 3B2 Computer hard disk: the third connects the CTC card in the 3B2 Computer to the cartridge tape drive in the AT&T/XM.

Refer to figure A.

1. <u>Connect</u> one end of the 20-pin ribbon cable, the smaller one, and designated 300 to the hard disk connector outlet on the disk access panel of the 3B2 Computer.

   Refer to figure B.

   A. <u>Loosen</u> the two screws holding the 20-pin hard disk connector outlet to the back panel. (Figure B)

   B. <u>Insert</u> the clamp between the screw and the back panel. Make sure the clamp holds the 20-pin ribbon cable to the connector.

   C. <u>Tighten</u>. the screws.

2. <u>Connect</u> one end of the 34-pin ribbon cable, designated 300, to the hard disk connector outlet on the disk access panel of the 3B2 Computer.

   A. <u>Lossen</u> the two screws holding the cable connector to the back panel.

   B. <u>Insert</u> the clamp between the screw and the back panel. Make sure the clamp holds the 34-pin ribbon cable to the connector.

   C. <u>Tighten</u> the screws.

ATTACHING THE RIBBON CABLES

③
26-PIN
HARD DISK
CONNECTOR
OUTLET

③
34-PIN
HARD DISK
CONNECTOR
OUTLET

FROM
CTC
CARD

FIGURE A

CLAMP
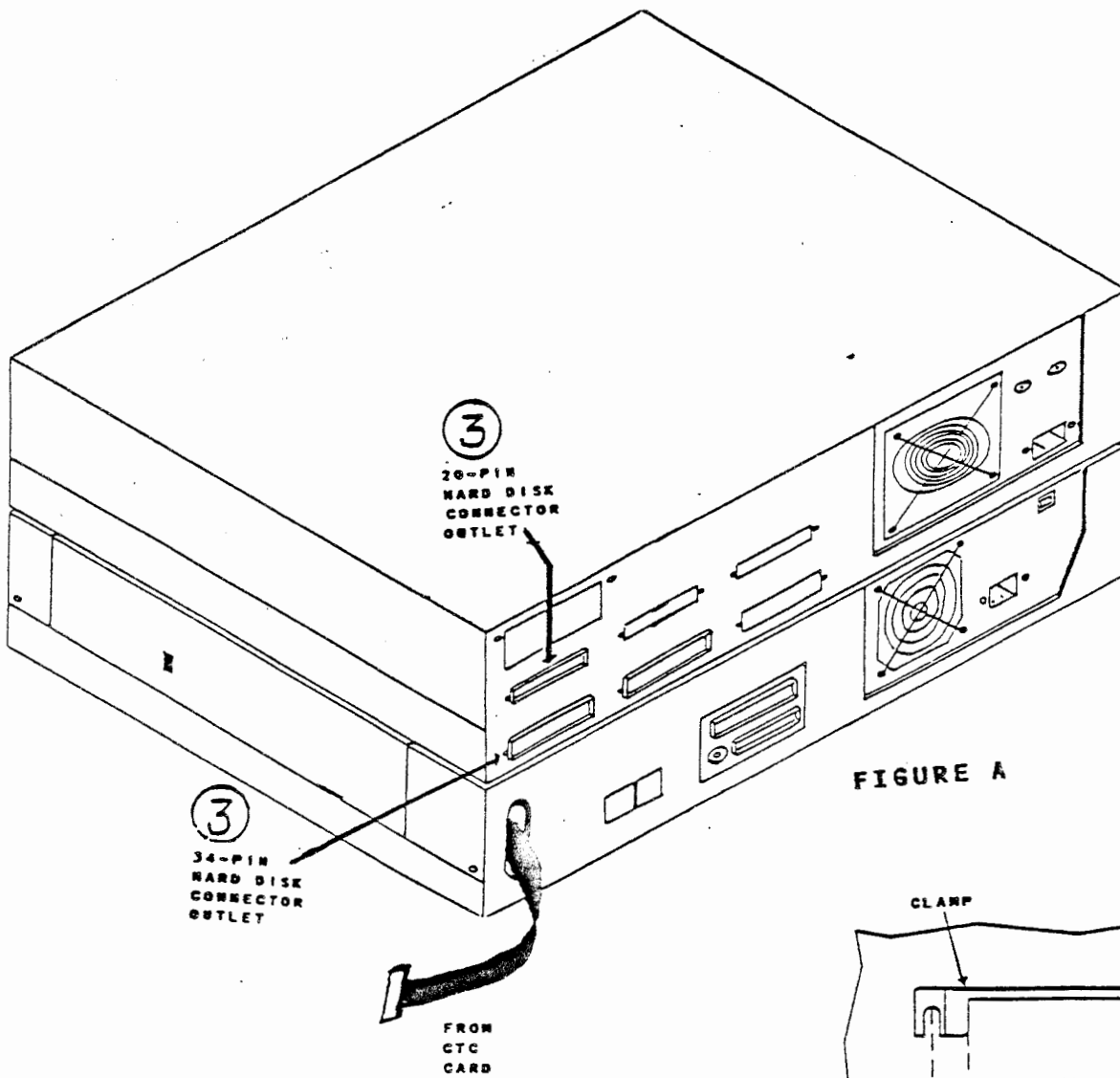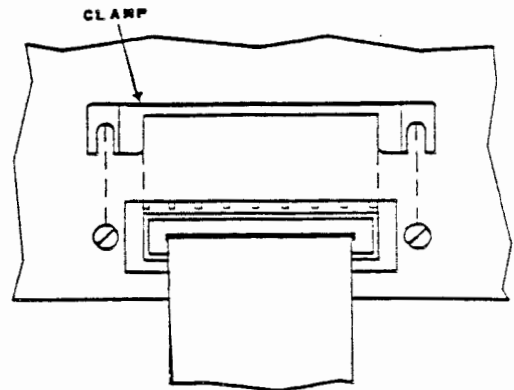
FIGURE B

ATTACHING THE RIBBON CABLES

Refer to figure A.

3. <u>Connect</u> the free ends of the 20- and 34-pin ribbon cables coming from the 3B2 Computer, and designated XM, to the hard disk connector outlets on your AT&T/XM.

    Refer to figure B.

    A. <u>Loosen</u> the two screws holding the cable connector to the back panel.

    B. <u>Insert</u> the clamp between the screw and the back panel. Make sure the clamps hold the 20-and 34-pin ribbon cables to the connectors.

    C. <u>Tighten</u> the screws.

ATTACHING THE RIBBON CABLES

④

34-PIN
CARTRIDGE
TAPE CONNECTOR
OUTLET

FIGURE A

CLAMP
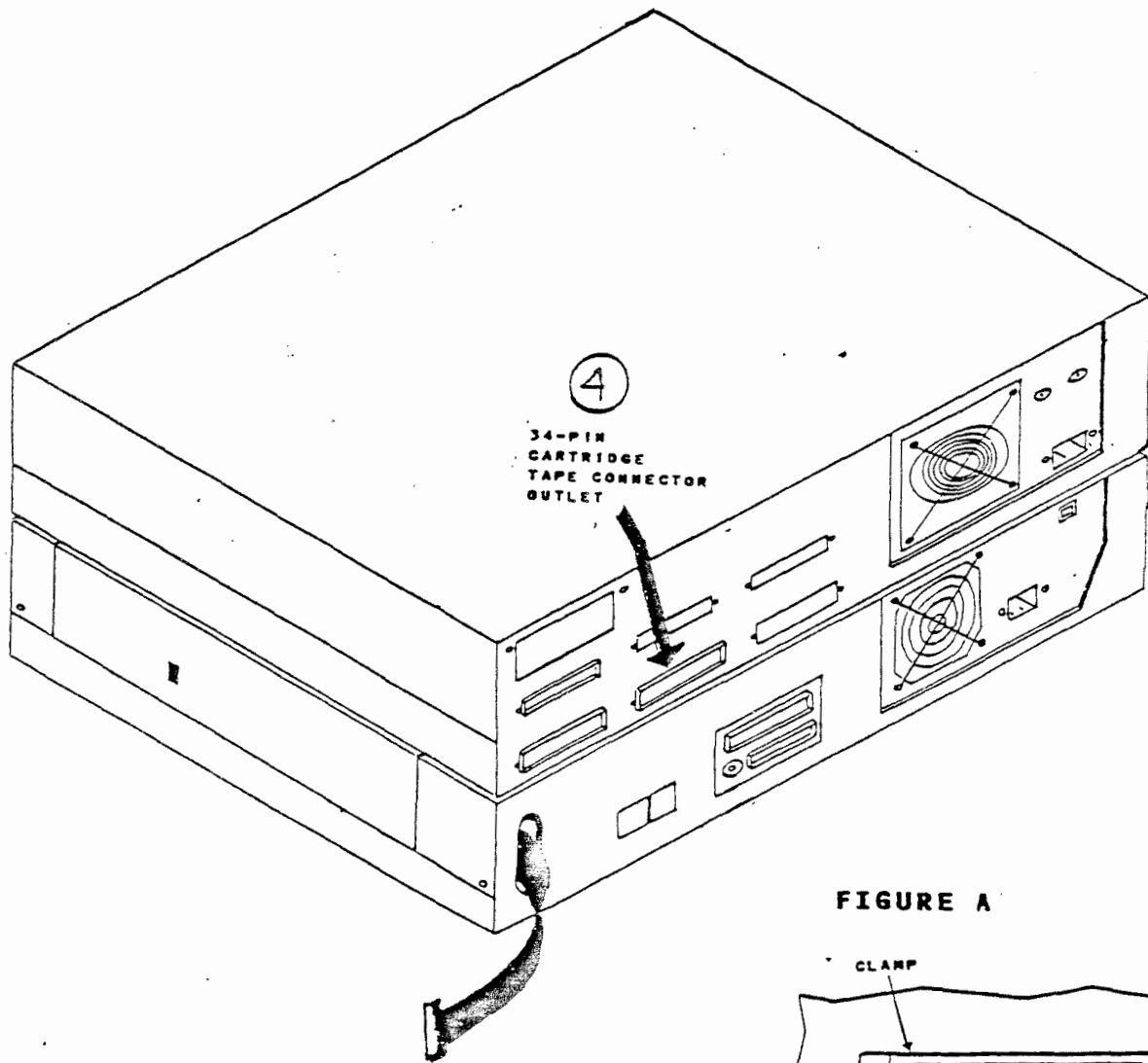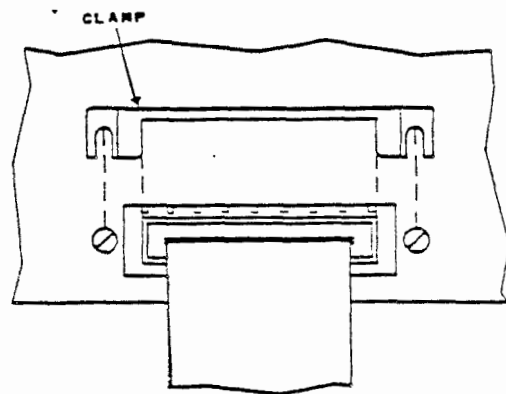
FIGURE B

ATTACHING THE RIBBON CABLES

There is one cable remaining to be connected.

4. Locate the 34-pin ribbon cable coming from the CTC card
   previously installed inside your 3B2 Computer.

   Plug the free end of the cable into the Cartridge Tape connector
   outlet, which is located on the back panel of the AT&T/XM.

   A. Loosen the two screws holding the cable connector to the
      back panel.

   B. Insert the clamp between the screw and the back panel.
      Make sure the clamp holds the 20-pin ribbon cable to the
      connector.

   C. Tighten the screws.

CONNECT SOFT POWER CORD

SOFT POWER
CONTROL JACKS

AC POWER
CORD
CONNECTORS

SOFT POWER
CONTROL JACK
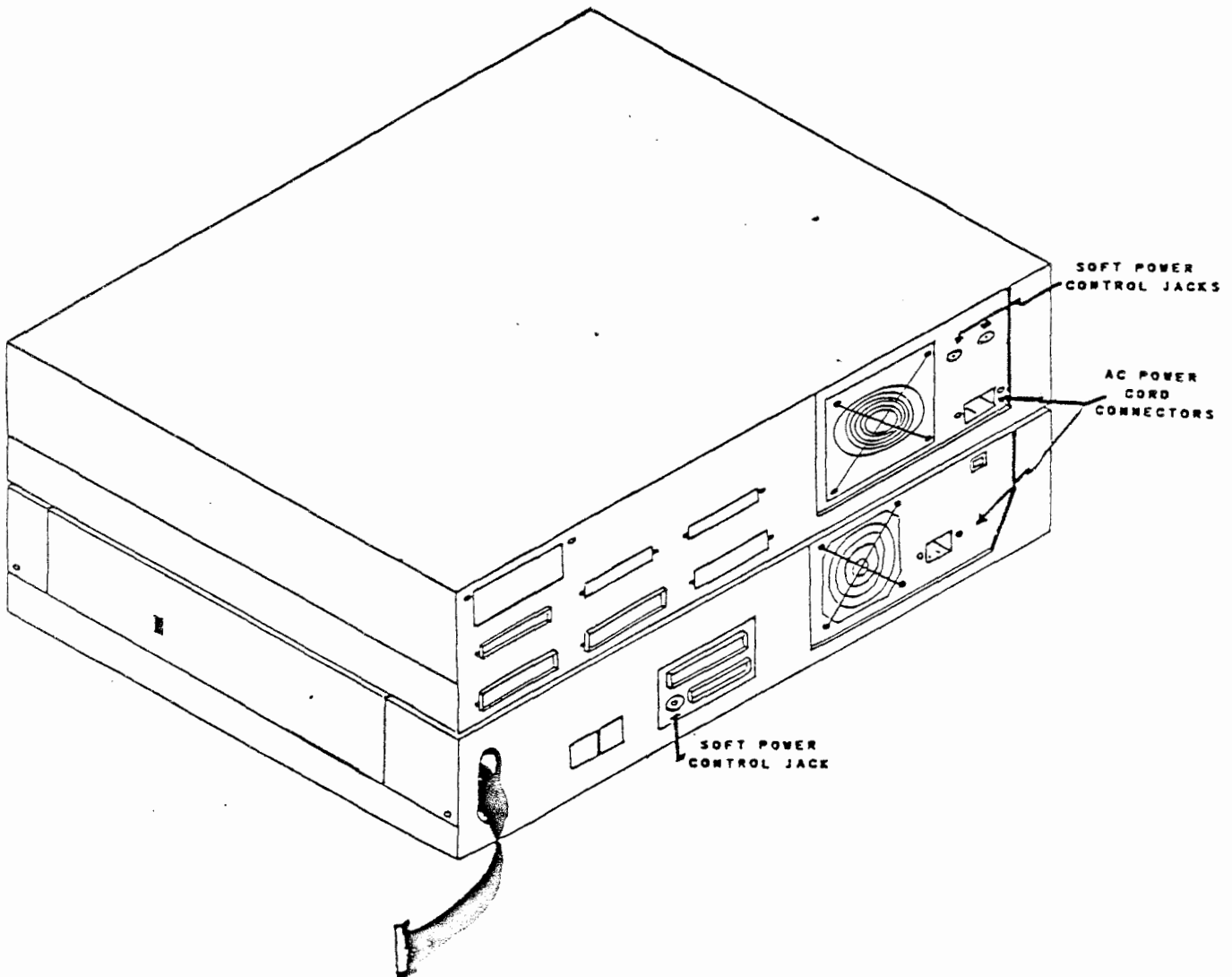
CONNECT SOFT POWER CORD

The soft power cord allows the 3B2 Computer to control the power-up
and down of the AT&T/XM. The soft power cord must now be connected.
This cord has one female plug connector on each end. Unlike the ribbon
cable, either end of the cord can be used. Refer to the figure on the
opposite page. Plug one end of the cord into the soft power control
jack on the back of the 3B2 Computer cabinet.

Plug the other end of the cord into one of the soft power control
jacks on the back of the XM cabinet.

Note: The two power control jacks on·the XM may me mounted
horizontally (side-by-side) or vertically (one above the other). You
can plug the soft power cord into either of these two jacks and obtain
the same results.

Plug the AC power cord of the XM into the AC power cord connector on
the back of the XM cabinet.

This completes the connection of your AT&T/XM to the 3B2 Computer.

POWER UP
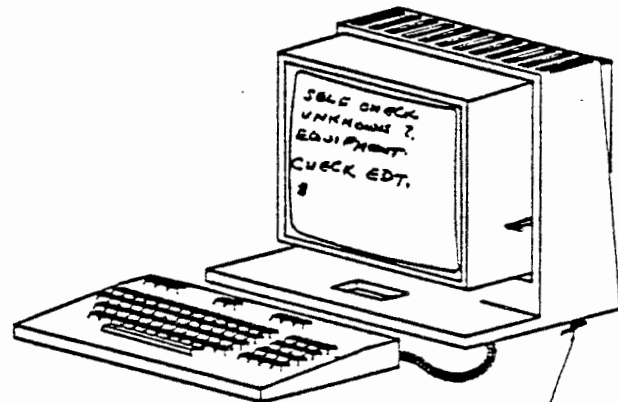
USER TERMINAL
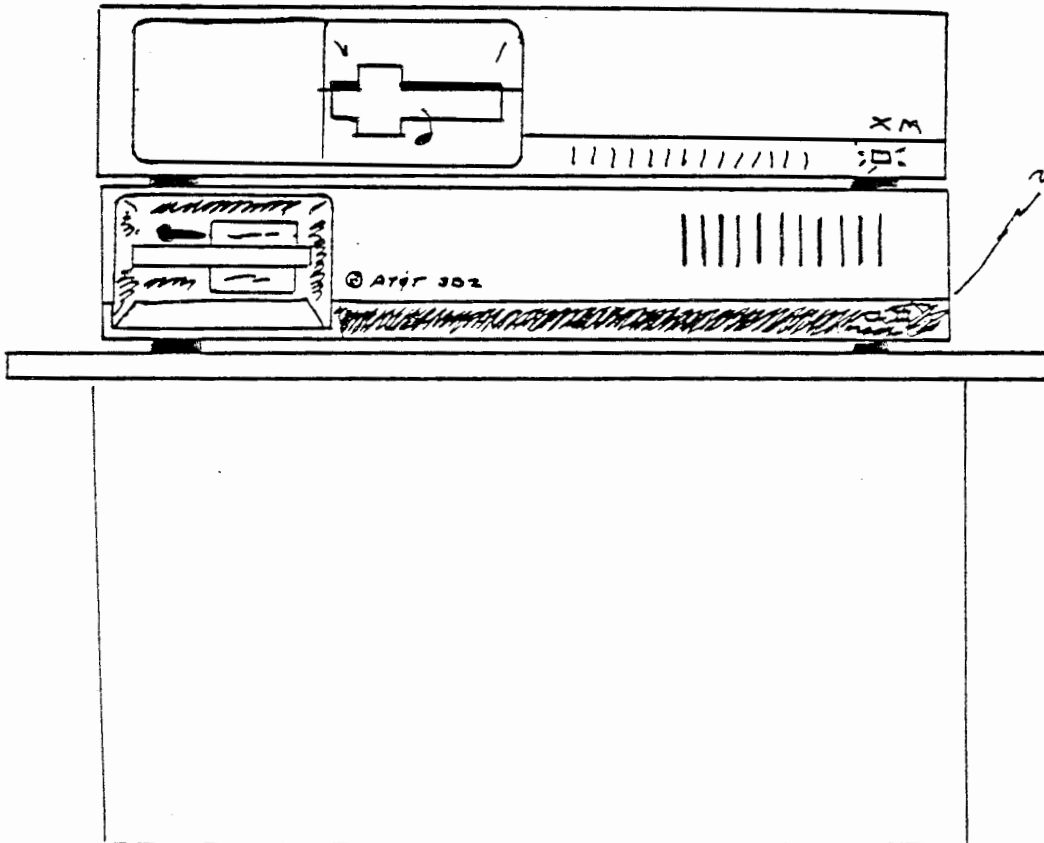
POWER UP

Take a moment to ensure all cables are properly connected and completely seated.

The last step is to power up your 3B2 Computer and AT&T/XM. As the 3B2 Computer proceeds through its self-check, you will receive the following message:

        SELF-CHECK
        UNKNOWN ID CODE (0x5) IN SLOT 1
        EQUIPMENT DEVICE TABLE COMPLETION WILL CONTINUE
        CHECK EDT.

This message is because the software required for your 3B2 Computer to recognize the CTC card has not been installed. The software required by the 3B2 Computer will be discussed and installed in the next work assignment, along with a complete discussion of the message.

NOTES

APPLICATION

Using your student guide and all available doucmentation, answer the
following questions. For item 7, divide yourselves into groups of two
and follow the instructions.

1. What release of UNIX will allow the addition of the AT&T/XM?
    _____

2. You have been instructed to add an AT&T/XM to a 3B2 Computer.
    How will you determine if the 3B2 Computer has been updated?
    _____

3. Your 3B2 Computer and AT&T/XM are operating erratically. Which
    procedure may have been skipped during the addition of the
    AT&T/XM?
    _____

4. If you reverse one of a ribbon cables, what results can be
    expected?
    _____

5. Your 3B2 Computer has one feature card installed. Where will the
    next feature card be installed?
    _____

6. Another person wants to use your AT&T/XM. In addition to
    disconnecting cables, what MUST be done inside your 3B2
    Computer?
    _____

NOTES

APPLICATION

7. Prior to connecting the AT&T/XM and 3B2 Computer together, let
    review a few items.

    - Do not disturb the 3B2 Computer internal components unles
      you are explicitly told how and when.

    - Use caution when working near the grounding fingers around
      the top of the feature card enclosure. These fingers are
      sharp and you could accidentally cut yourself while trying
      to push the CTC card into its connector.

    - The CTC card and Terminating Resistors are very fragile.
      Please handle these items with extreme care.

    Obtain the necessary equipment from your instructor and connect
    the 3B2 Computer and AT&T/XM together.

Have you instructor verify the connection, before applying the power.
If you have any questions to this point, revolve them with your
instructor.

AT&T/XM OPERATION

REQUIREMENTS

A 3B2 Computer and attached AT&T/XM configured for UNIX System V Release 2.0 or later and 1 megabyte of Random Access Memory.

CAUTIONS

Familiarize yourself with the 3B2 Computer Owner/Operator Manual.

Follow instructions carefully to avoid personal injury or equipment damage.

Handle diskettes by the edges only, like a record.

REFERENCE DOCUMENTS

SELECT CODE	DESCRIPTION
305-327	AT&T/XM MANUAL
305-466	CARTRIDGE TAPE UTILITIES GUIDE
305-354	SOFTWARE INFORMATION BULLETIN - AT&T/XM ADMINISTRATION
305-374	SOFTWARE INFORMATION BULLETIN - CARTRIDGE TAPE UTILITIES GUIDE

MATERIAL REQUIRED

3B2 MODEL 300 COMPUTER and TERMINAL
AT&T/XM
The documentation listed in Reference Documents
AT&T/XM Administration Utilities
AT&T/XM Cartridge Tape Utilities

NOTES

OBJECTIVES

At the end of this work assignment you will be able to:

1. Load AT&T/XM Administration Utilities

2. Load Cartridge Tape Utilities

3. Partition the Hard Disk in the AT&T/XM

4. Repartition the hard disk in the AT&T/XM

NOTES

SYNOPSIS

Up to this point, you have connected the AT&T/XM and you 3B2 Computer
together and restored the power. We left the previous work
assignment with a warning message from computer saying;

        SELF-CHECK
        UNKNOWN ID CODE 0x5 FOR DEVICE IN SLOT 1
        EQUIPT DEVICE TABLE COMPLETION WILL CONTINUE.
        CHECK EDT.

This message, loosely translated says, there in some piece of
equipment in slot 1, but the computer does not know about it. We We
are about to tell the 3B2 Computer this known piece of equipment, by
installing the AT&T/XM Administration Utilities and the Cartridge Tape
Utilities, sometimes called Tape Utilities.

In this work assignment we will load the AT&T/XM Administration
Utilities and the Cartridge Tape Utilities onto the hard disk in the
3B2 Computer. After the successful load of the Utilities, we'll
prepare the hard disk in the AT&T/XM for use, by partitioning it.

There will be several Applications where you can try out your new
knowledge.

SINGLE USER MODE

RUN LEVEL	DESCRIPTION
0	Power-down state
1,s, or S	Single-user mode is used to install/remove software utilities, run file system backups/restorals, and to check file systems. Only the root file system is mounted on entering the single-user mode. It is necessary to mount the /usr file system when doing a software installation/remove or file system backup/restoral.
2	Multi-user mode in the normal operating mode for the file system. The root (/) and (/usr) file systems are mounted in this mode. When the the system is powered-up it is put in this mode.
3	User defined run state.
4	User defined run state.
5	Firmware mode is used to run diagnostics (dgmon), make a floppy key (newkey), change the firmware password (passwd), dump the system image to floppy disk (sysdump), and display the system generic version (version).
6	Return to firmware and reboot the operating system. The system comes up in multi-user mode (run-level 2).
a, b, or c	Pseudo run-states that are normally processed by the telinit command. These entries in initab are not run-levels; init cannot enter run-level a, b, or c. A process started by an a, b or c continues to run when init changes states. A request to start the execution of a process associated with a, b. or c does not change the current run-level.

SINGLE USER MODE

To get the system in the single user mode, you need to be logged in as
root and the current directory must be / before the shutdown command
can be executed.

The shutdown command, without any options, takes the system to the
single user state or state 1. This is the state or "RUN LEVEL" the
system must be in to add or remove utilities. The chart on the
opposite page list the various "RUN LEVELS" (states). For now lets
time a moment and review the shutdown command and see where the "RUN
LEVEL" information fits into the command.

Command Format

The general format of the shutdown command is as follows:

shutdown [-y] [-ggrace] [-i**state]**

The various arguments (options) of the shutdown command are discussed
below:

-y   Specifies a "yes" response for shutdown continuation.

-ggrace   Specifies the number of seconds before all user processes
              or jobs are terminated. The default grace period is 60
              seconds. (360 seconds maximum)

-istate   Specifies the system run-level or state to initialize to.
              The figure on the opposite page list the various "RUN
              LEVELS" or states. The default states is the single-user
              mode (1,s,or S).

Since we are in the just powered-up state, we need to get to "RUN
LEVEL" 1. For this example we will disregard the -g and -p arguments.
The message would be:

shutdown -y -i1<CR>

A short time after this message is entered, you will receive the
following message:

INIT: SINGLE USER MODE

At this point we can begin to install the AT&T/XM Administration
Utilities and the Tape Utilities.

SYSTEM ADMINISTRATION MENU

SYSTEM ADMINISTRATION

1	diagnostics	system diagnostics menu
2	diskmgmt	disk management menu
3	filemgmt	file management menu
4	machinemgmt	machine management menu
5	packagemgmt	package management
6	softwaremgmt	software management menu
7	syssetup	system setup menu
8	ttymgmt	tty management menu
9	usermgmt	user management menu

SYSTEM ADMINISTRATION MENU

As fundamental as it may seem, the best place to begin the
installation of the AT&T/XM Utilities is by accessing the System
Administration Menu by entering the command:

                            sysadm

The menu is shown on the opposite page. To briefly review the nine
items on the menu:

1 diagnostics   Enable you to get a report on built-in disk errors and
                  provides advice on how to repair these errors.

2 diskmgmt   Enables you to format and copy floppy disks and
                  partition hard disks.

3 filemgmt   Allows you to copy data from hard disks to floppy disk
                  and vice versa.

4 machinemgmt   Covers such tasks as changing operating states,
                  turning off the computer, and making a floppy key.

5 packagemgmt   Manages the software and hardware you add to your 3B2
                  Computer.

6 softwaremgmt   Allows you to install new software, remove old
                  software and run software directly from a floppy disk.

7 syssetup   Tells your computer about its environment. For
                  example, time zone, what peripheral devices are
                  connected to it, etc.

8 ttymgmt   Allows you to change the characteristics of the port-
                  connected devices, such as terminals and printers or
                  modems.

9 usermgmt   This menu allows you to add, delete or modify users or
                  groups.

Now that we have briefly reviewed the menu options, which would you
select to install new software? _____

I'm sure you choose number 6, software management. This is the menu
item allowing you to add new software.

SOFTWARE MGMT

SYSTEM ADMINISTRATION

```
1   diagnostics      system diagnostics menu
2   diskmgmt         disk management menu
3   filemgmt         file management menu
4   machinemgmt      machine management menu
5   packagemgmt      package management
6   softwaremgmt     software management menu
7   syssetup         system setup menu
8   ttymgmt          tty management menu
9   usermgmt         user management menu


Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 6
```

FIGURE A

SOFTWARE MANAGEMENT

```
1   installpkg    install new software package onto built-in disk
2   removepkg     remove previously installed package from built-in disk
3   runpkg        run software package without installing it


Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 1

Insert the removable medium for the package you want to install
into diskette1 drive.
Press <RETURN> when ready. Type q to quit.
```

FIGURE B

SOFTWAREMGMT

From the previous page, we selected menu option 6 softwaremgmt to install utility packages. The SYSTEM ADMINISTRATION MENU is shown in Figure A, along with the instructions from the computer to "Enter a number ....". By entering number 6, the software management menu is displayed (Figure B). The softwaremgmt menu has three items. Of particular interest is item 1 installpkg.

The installpkg option is used to install new software packages onto the 3B2 Computer's built-in disk.

After we enter the number1 the computer instructs us to:

Insert the removable medium for the package you want to install into the diskette1 drive.

The first utility to be loaded will be the AT&T/XM Administration Utilities, followed by the Cartridge Tape Utilities.

Press <RETURN> when ready. Type q to quit.

The loading of the AT&T/XM Administration Utilities begins, you must wait until the installation is complete or aborted by the computer.

A discussion of the utilities installation is the subject of the next few pages, but for now lets take a moment to review a couple of terms from the messages:

                            REMOVABLE MEDIUM
                            DISKETTE1 DRIVE

REMOVABLE MEDIUM - This refers to the floppy disk containing the utilities.

DISKETTE1 DRIVE - This is the floppy disk drive in your 3B2 Computer. Remember, at this point your computer still doesn't know about the XM.

INSTALLING AT&T/XM ADMINISTRATION UTILITIES

Installing the 3B2/XM Administration Utilities
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All Rights reserved

```
//etc/busched
//etc/ckbusched

    .
    .
//usr/admin/menu/diskmgmt/checkfsys
//usr/admin/menu/diskmgmt/cpdisk
//usr/admin/menu/diskmgmt/cpdisk.d/diskette
//usr/admin/menu/diskmgmt/erase
//usr/admin/menu/diskmgmt/erase.d/diskette
//usr/admin/menu/diskmgmt/format
//usr/admin/menu/diskmgmt/format.d/diskette
//usr/admin/menu/diskmgmt/harddisk/display
//usr/admin/menu/diskmgmt/harddisk/display.d/disk
//usr/admin/menu/diskmgmt/harddisk/makehdfsys
//usr/admin/menu/diskmgmt/harddisk/partitioning
//usr/admin/menu/diskmgmt/harddisk/partitioning.d/disk
//usr/admin/menu/diskmgmt/harddisk/rmdisk
//usr/admin/menu/diskmgmt/harddisk/rmdisk.d/disk
//usr/admin/menu/diskmgmt/makefsys
//usr/admin/menu/diskmgmt/mountfsys
//usr/admin/menu/diskmgmt/unmountfsys
//usr/admin/menu/filemgmt/backup
//usr/admin/menu/filemgmt/backup.d/diskette
//usr/admin/menu/filemgmt/bupsched/DESC
//usr/admin/menu/filemgmt/bupsched/schedcheck
//usr/admin/menu/filemgmt/bupsched/schedmsg
//usr/admin/menu/filemgmt/restore
//usr/admin/menu/filemgmt/restore.d/diskette
//usr/admin/menu/filemgmt/store
//usr/admin/menu/filemgmt/store.d./diskette
//usr/admin/menu/softwaremgmt/installpkg
//usr/admin/menu/softwaremgmt/installpkg.d/diskette
//usr/admin/menu/softwaremgmt/removepkg
//usr/admin/menu/softwaremgmt/removepkg.d/diskette
//usr/admin/menu/softwaremgmt/runpkg
//usr/admin/menu/softwaremgmt/runpkg.d/diskette

    .
    .
363 blocks

    .
    .
```

Installation of the 3B2/XM Administration Utilities is complete
You may remove the medium from the diskette drive.

INSTALLING AT&T/XM ADMINISTRATION UTILITIES

Once the actual installation of the utilities has begun, you will receive a listing of the directories and files created or changed. Refer to thepartial listing on the opposite page.

Briefly reviewing changes made to the system, you see the some changes were to the etc directory. The etc directory contains programs and data files used by the system.

The majority of the changes occurred to the usr directory. The usr directory holds directories and files of importance to you, the user.

A closer look at the listing on the opposite page reveals extensive changes to /usr/admin/menu, the administration menu. These are the menus which help you perform tasks on your 3B2 Computer. Changes occurred to:

              diskmgmt   disk management menu
              filemgmt   file management menu
              softwaremgmt software management menu

We are not going to spend time examining the changes to the menu, I just wanted to point out where some were made.

A word or two about names, sometimes called the naming convention. Although some of the directory and file names are cryptic, most are decipherable, such as cpdisk (copy diskette) and describe a task. You don't need to know this information to do your job, its sometimes nice to have an idea what the file is doing.

Find the file installpkg (part of softwaremgmt). What do you think is happening here? It seems the install package software had to be updated to include information about the AT&T/XM features, such as the second hard disk. Lets finish up the installation of the AT&T/XM Administrative Utilities.

Several messages will continue to appear end with:

Installation of the AT&T/XM Administration Utilities is complete.
You may now remove the medium from the diskette1 drive.

one last thought about the AT&T/XM Administrative Utilities,

ONCE THEY ARE INSTALLED, THEY CAN NOT BE REMOVED

They can only be removed by completely reloading the system.

The next step is to install the Cartridge Tape Utilities.

INSTALLING the TAPE UTILITIES

Insert the removable medium for the package you want to install
into the diskete1 drive.
Press <RETURN> when ready. Type q to quit: <CR>
Installing the Tape Utilities.
The following files are being installed:
//boot/ctc.o
//etc/ff
//etc/finc
//etc/frec
//etc/tar
//etc/ctcfmt
//etc/ctcinfo
//etc/ctccpio
//etc/tsavecpio
//etc/cmpress
//etc/master.d/ctc
//etc/rc.d/ctc
//etc/vtoc/ctc1dft
//etc/vtoc/ctc2dft
//dgn/CTC
//dgn/X.CTC
//lib/pump/ctc
//usr/include/sys/ct.h
//usr/include/sys/ct_dep.h
//usr/include/sys/ct_lla.h
//usr/options/ctc.name
//usr/admin/makefsys.d/ctape
//usr/admin/checkfsys.d/ctape
//usr/admin/mountfsys.d/ctape
//usr/admin/umountfsys.d/ctape
//usr/admin/menu/filemgmt/backup.d/ctape
//usr/admin/menu/filemgmt/restore.d/ctape
//usr/admin/menu/filemgmt/store.d/ctape
//usr/admin/menu/tapemgmt/checkfsys
//usr/admin/menu/tapemgmt/compress
//usr/admin/menu/tapemgmt/compress.d/ctape
//usr/admin/menu/tapemgmt/format
//usr/admin/menu/tapemgmt/format.d/ctape
//usr/admin/menu/tapemgmt/info
//usr/admin/menu/tapemgmt/info.d/ctape
//usr/admin/menu/tapemgmt/makefsys
//usr/admin/menu/tapemgmt/mountfsys
//usr/admin/menu/tapemgmt/resetusage
//usr/admin/menu/tapemgmt/resetusage.d/ctape
//usr/admin/menu/tapemgmt/unmountfsys
//usr/admin/menu/tapemgmt/DESC
694 blocks

INSTALLING the TAPE UTILITIES

Now that the AT&T/XM Administration Utilities have been installed the
next step is to load the Tape Utilities. We don't need to go back to
the System Administration Menu and select software management. The
last message from your 3B2 Computer was:

Insert the removable medium for the package you want to install into
diskette1 drive, in this case Tape Utilities, and Press the <RETURN>
when ready.

As with the AT&T/XM Administration Utilities, you will receive a
listing of the directories and files added or changed. The listing on
the opposite page shows again etc and usr/admin/menu were extensively
changed.

Some of the changes were for the system, such as describing the
Cartridge Tape Drive to software. Others, were required to build files
and diagnose the Cartridge Tape Controller and added new commands.
Still others created a new category to the System Administration Menu,
being tapemgmt. A discussion of CTC diagnostics and three of the eight
new commands occur in two other work assignments — AT&T/XM
Diagnostics and Cartridge Tape Drive.

INSTALLING the TAPE UTILITIES

1>>>>   Does your 1st cartridge tape package include a floppy disk
        drive? y = yes, n = no: n

2>>>>   Does your 1st cartridge tape package include a tape drive? y =
        yes, n = no: y
        Creating /dev/rdsk/c2d0s0
        Creating /dev/dsk/c2d0s0
        Creating /dev/rdsk/c2d0s1
        Creating /dev/dsk/c2d0s1
        Creating /dev/rdsk/c2d0s2
        Creating /dev/dsk/c2d0s2
        Creating /dev/rdsk/c2d0s3
        Creating /dev/dsk/c2d0s3
        Creating /dev/rdsk/c2d0s4
        Creating /dev/dsk/c2d0s4
        Creating /dev/rdsk/c2d0s5
        Creating /dev/dsk/c2d0s5
        Creating /dev/rdsk/c2d0s6
        Creating /dev/dsk/c2d0s6
        Creating /dev/rdsk/c2d0s7
        Creating /dev/dsk/c2d0s7
        Creating /dev/rdsk/c2d0s8
        Creating /dev/dsk/c2d0s8
        Creating /dev/rdsk/c2d0s9
        Creating /dev/dsk/c2d0s9
        Creating /dev/rdsk/c2d0sa
        Creating /dev/dsk/c2d0sa
        Creating /dev/rdsk/c2d0sb
        Creating /dev/dsk/c2d0sb
        Creating /dev/rdsk/c2d0sc
        Creating /dev/dsk/c2d0sc
        Creating /dev/rdsk/c2d0sd
        Creating /dev/dsk/c2d0sd
        Creating /dev/rdsk/c2d0se
        Creating /dev/dsk/c2d0se
        Creating /dev/rdsk/c2d0sf
        Creating /dev/dsk/c2d0sf
        Creating /dev/SA/ctape1
        Creating /dev/rSA/ctape1

3>>>>   Installation of Tape Utilities is completed.

4>>>>   Execute Standard shutdown and Reboot the system.

INSTALLING the TAPE UTILITIES

Even after the directories and files have been changed, work remains.
You are asked to supply information about whether there is a floppy
disk or tape drive installed.

For our example, the AT&T/XM has a Cartridge Tape Drive installed.
So, you would answer the first question

1. "Does your 1st cartridge tape package include a floppy disk
   drive?"
   y = yes, n = no: The answer is NO.
   The answer is NO, because our AT&T/XM does not

   have the Floppy Disk Drive installed.

The next question

2. "Does your 1st cartridge tape package include a tape drive?"
   y = yes, n = no: The answer is YES

The answer is YES, because our AT&T/XM has the Cartridge Tape Drive
installed.

After the questions are answered the system again begins listing some
information: Creating /dev/dsk/c2d0s0...

After the "creation", you will receive the message:

3. Installation of Tape Utilities is completed.

You are now instructed by the computer to:

4. Execute Standard shutdown and reboot the system.

This last message will be discussed in detail in a moment. For now
lets finish our analysis of the messages.

INSTALLING the TAPE UTILITIES

5>>>>   Once you have rebooted the system, execute "sysadm resetusage"
        to reset the cartridge tape controller time in use counter.
        if this package contains a cartridge tape device.

6>>>>   You may now remove the medium from the diskette1 drive.

        Insert the removable medium for the package you want to
        install.
        into the diskette1 drive.
        Press return when ready. Type q to quit: q

7>>>>   Press the <RETURN> key to see the softwaremgmt menu [?, ^, q] :
        q

INSTALLING the TAPE UTILITIES

The messages continue with:

   5.   Once you have rebooted the system, execute "sysadm resetusage"
        to reset the cartridge tape controller time in use counter if
        this package contains a cartridge tape device.

We need to keep this note in mind for later. We'll explain and reset
the usage counter in a later work assignment.

The messages continue:

   6.   You may remove the medium from the diskette1 drive.

        Insert the removable medium for the package you want to install
        into diskette1 drive.
        Press <RETURN> when ready. Type q to quit.

We are going to type q because the installation of the two utilities
is complete.

   7.   Press the RETURN key to see the softwaremgmt menu [?, ^, q]:

We once again type q. We want to get back to the system prompt and
begin a shutdown.

SHUTDOWN and REBOOT

RUN LEVEL	DESCRIPTION
6	Return to firmware and reboot the operating system. The system comes up in multi-user mode (run-level 2).

FIGURE A

```
# shutdown -y -i6 -g0

Shutdown started.   Mon Mar 3 15:25:24 EST 1985

Broadcast Message from root (console) Mon Mar 3 15:25:27...
THE SYSTEM IS BEING SHUT DOWN NOW ! ! !
Log off now or risk your files being damaged.


# INIT: New run level: 6
The system is coming down. Please wait.
System services are now being stopped.

The system is down.
```
Automatic Reboot

```
SELF-CHECK

Several messages will appear, ending with:
The system is ready.

Console Login:
```

FIGURE B

SHUTDOWN and REBOOT

To this point we have successfully loaded the AT&T/XM Administration Utilities and the Tape Utilities. Even though they are loaded, we cannot use them until the system is rebooted. Rebooting, takes the system to its most basic state, allowing you to bring it back to full operation, using the recently installed AT&T/XM Administration and Tape Utilities. One of the last instructions from the computer was:

Execute Standard shutdown and Reboot the system.

Shutdown

Since we have used the shutdown message before, lets not spend time reviewing the format. Instead, take a moment to look at a portion of the run level chart shown in figure A. The last message from the computer instructed us shutdown and reboot the system. A check of the chart indicates we should use RUN LEVEL 6. The complete chart is shown on page 6. This run level is used to reboot and bring the operating system up to multi-user mode. Keeping this in mind, the shutdown message format will be:

shutdown -y -i6 -g0

The computers response to this message is shown in Figure B on the opposite page. Several messages are generated, indicating the reboot is in progress.

The last two messages from the computer:

The system is ready.
Console Login:

are your notification that everything is alright, and to login as root.

BACKUP SCHEDULE REMINDER

SYSTEM ADMINISTRATION

1	diagnostics	system diagnostics menu
2	diskmgmt	disk management menu
3	filemgmt	file management menu
4	machinemgmt	machine management menu
5	packagemgmt	package management
6	softwaremgmt	software management menu
7	syssetup	system setup menu
8	tapemgmt	tape management menu
9	ttymgmt	tty management menu
10	usermgmt	user management menu

FIGURE A

FILE MANAGEMENT

1	backup	backup files from built-in disk to removable medium
2	bupsched	backup reminder scheduling menu
3	diskuse	display how much of the hard disk is being used
4	fileage	list files older than a particular date
5	filesize	list the largest files in a particular directory
6	restore	restore files from removable media to built-in disk
7	store	store files & directories of files onto removable media

FIGURE B

1	schedcheck	schedule backup reminder checks
2	schedmsg	schedule backup reminder message

FIGURE C

BACKUP SCHEDULE REMINDER

One of the new software features of the AT&T/XM Administrative
Utilities is the **BACKUP SCHEDULE REMINDER**. Simple Administration
provides the automatic backup schedule reminder service (**sysadm
bupsched**) as part of the File Management menu. Once YOU have
formulated the backup schedule, it can entered into the backup-
schedule reminder files. At the appropriate time, the system will
remind you of which file systems should be backed-up. Since your file
systems and backup requirements are different than mine, I'll give you
an example of how to set-up the schedule. You'll have to design your
own schedule.

The procedures are the same as before; start at the System
Administration Menu. This time select item #3 **filemgmt**. (Figure A).

Next select item #2 **bupsched** from the File Management menu. (Figure
B).

Finally we have the two items displayed from the backup reminder
scheduling menu, as shown in figure C.

The two submenu commands shown in figure C can be performed by
directly entering **sysadm <command>**. The **schedcheck** command will allow
you to manipulate the data which informs the system of the times to
display the reminder message. The **schedmsg** command will allow you to
manipulate the data which controls what type of file systems are
included in the reminder service display. Each command is interactive
and displays instructions according to the input received from you.

On the next few pages we will explore some of the options and uses of
the **schedcheck** and **schedmsg** commands.

BACKUP SCHEDULE REMINDER

```
$   sysadm schedcheck<CR>

Enter the command you wish to execute [p, r, a, m, w, q, ?]: p<CR>
# This file will be scheduled via the cron command
#        Format of lines:
#min hour daymo month daywk/etc/chbusched>/dev/console2>/dev/console
#        min   - time(s) of day
#        hour
#        daymo - day(s)s of the month (1,2, ... 31)
#        month - month(s) of the year (1,2, ... 12)
#        daywk - day(s) of week (0-6, 0=sun, 1=mon, ... 7=sat)
#
#        Example:
#00  17   *      *      1      /etc/chbupscd > /dev/console >/dev/console
#
#        At 5:00pm in the evening on mondays during any month of the
#        year, check to see if there are any file systems that need
#        to be backed up.
#
#==================================================================================
#
#        Default backup schedule calls for checks mon through friday
#        at 5:00pm.
#
#   1  00   17   *      *      1,2,3,4,5      /etc/ckbusched >/dev/console
```

FIGURE A

```
Enter the command you wish to execute [p, r, a, m, w, q, ?]: a<CR>

Enter the time at which you want to check to see if any backups
are scheduled [q, ? ]: 15:00<CR>
Enter the day of the week [0-6, *, q, ?]: 2<CR>
Enter the day of the month [ 1-31, *, q, ? ]: 8,9,10,11,12,13,14<CR>
Enter the month [ 1-12, *, q, ? ]: 2,4,6,8,10,12<CR>
```

FIGURE B

```
Enter the command you wish to execute [p, r, a, m, w, q, ?]:p<CR>
 file min hour     daymo                month       daywk
  |    |   |         |                    |           |
  2   00  15 8,9,10,11,12,13,14  2,4,6,8,10,12   2  (path.info)
```

FIGURE C

BACKUP SCHEDULE REMINDER

Schedule Check

The **sysadm schedcheck** command informs the system of the <u>times to display the reminder message</u> The time is specified by the following information:

- Time of day. (Military time for hours and minutes)

- Day of the week. (Sun-Sat is 0-6 respectively)

- Day of month. (1-31)

- Month. (1-12)

The **sysadm schedcheck** command has options which allow you to print, change, write (save) the information found in the reminder check file. Figure A displays the **sysadm schedcheck** command execution and the current backup reminder check file: the options are listed below. <u>Which option?</u>

There are six options available for use or editing the schedcheck file. They are:

```
                    p - Print lines for the file
                    r - Remove a line or group of lines
                    a - Add a line
                    m - Modify a command
                    w - Write the changes into a file
                    q - Quit - Leave busched
```

Figure B adds the information necessary to display a backup reminder at 3:00 pm(15:00) on the second Tuesday (2) of every other month (2,4,6,8,10,12). You probably noticed I skipped "Enter the day of the month (8,9,10,11,12,13,14)." This entry means, the second Tuesday that has a date of 8 through 14. If you check the calendar, you'll find the second Tuesday always falls between the 8th and 14th of the month.

In sum, we have instructed the reminder service to inform us to do a backup at 15:00 (3:00 pm), on the second Tuesday which has a date of 8 through 14, every other month, e.g.. the even months.

Figure C shows the output when you select the p option. The new entry will be incorporated into the cron command the next time the system is taken to multi-user mode, either on power-up or from the single-user mode.

BACKUP SCHEDULE REMINDER

```
$  sysadm schedcheck<CR>

Enter the command you wish to execute [p, r, a, m, w, q, ?]: p<CR>
# This file will be scheduled via the cron command
#         Format of lines:
#time     day      month      list
#
#         time  - time(s) of day
#         day   - day(s)s of week (mon, tue, etc)
#         day   - day(s)s of the month (1,2, ... first, last)
#         month - month(s) of the year (jan, feb ...)[
#         list  - list of filesystems to e backed up
#                 or command to be executed (!command line )
#
#         Example:
#10:00-18:00      mon     *        /usr
#         If ckbuscd is invoked between 4:00 and 6:00 in the
#         evening on mondays during any month of the year,
#         display /usr as the name of the file system that needs
#         to be backed up.
#
#=====================================================================================
#
#         Default backup schedule calls for daily backups of /usr
#         and monthly backups of root (/) on the 15th of each
#         month.
#
    1  00:00-08:00, 16:00-23:59 mon, tue, wed, thu, fri  *   /usr
    2  16:00-23:00        15          *              /
```

FIGURE A

```
Enter the command you wish to execute [p, r, a, m, w, q, ?]: a<CR>

Enter the time intervals in which backup reminder messages are
are to be printed  [q, ? ]: 15:30-19:00<CR>
```

FIGURE B

```
Enter the command you wish to execute [p, r, a, m, w, q, ?]:p<CR>
  file        hour              daymo         month       list
   |           |                 |             |           |
   3      15:30-19:00          15,30           *          /usr2
```

FIGURE C

BACKUP SCHEDULE REMINDER

Schedule Message

The sysadm schedmsg command controls what type of file systems are included in the reminder message. The message received from the reminder service is:

The following file systems are due for backup at this time:

<string of file systems>

The file systems included in the message are displayed according to WHEN the backup reminder check file displays the message. To control which file systems are included in the message, the following information must be entered in the backup reminder message file:

- Range of time. (Military time for hours and minutes)

- Day. (Sun - Sat is 0-6 respectively; 1-13 for the day of the month)

- Month. (1-12)

- List of file systems or command to execute.

The sysadm schedmsg comand allows you to print, change, and write (save) the information found in the reminder message file.

Figure A is a sample of schedmsg command execution. It displays the current backup reminder message file.

Figure B displays the schedmsg command which adds the information necessary to display a reminder to backup the /usr2 file system whenever there is a message displayed between 3:30 pm and 7:00 pm on the fifteenth and thirtieth day of each month.

If you had chosen to print the lines of the file again, you would have seen the information shown in figure C added to the bottom of the file.

The new entry will be incorporated into the cron command the next time the system is taken to the multi-user mode, either on power-up or from single-user mode.

THE NEW SYSTEM

SYSTEM ADMINISTRATION

1	diagnostics	system diagnostics menu
2	diskmgmt	disk management menu
3	filemgmt	file management menu
4	machinemgmt	machine management menu
5	packagemgmt	package management
6	softwaremgmt	software management menu
7	syssetup	system setup menu
8	ttymgmt	tty management menu
9	usermgmt	user management menu

FIGURE A

SYSTEM ADMINISTRATION

1	diagnostics	system diagnostics menu
2	diskmgmt	disk management menu
3	filemgmt	file management menu
4	machinemgmt	machine management menu
5	packagemgmt	package management
6	softwaremgmt	software management menu
7	syssetup	system setup menu
8	tapemgmt	tape management menu
9	ttymgmt	tty management menu
10	usermgmt	user management menu

FIGURE B

TAPE MANAGEMENT

1	checkfsys	check a removable medium file system for errors
2	compress	compress file system
3	format	format removable cartridge tapes
4	info	display tape drive information
5	makefsys	create a new file system on a removable medium
6	mountfsys	mount a removable medium file system
7	resetusage	reset tape cartridge usage count
8	unmountfsys	unmount a removable medium file system

FIGURE C

THE NEW SYSTEM

In sum, we loaded the AT&T/XM Administration Utilities and the Tape
Utilities, performed a shutdown and rebooted back to the multi-user
level.

While all the changes are not readily apparent, there is one we can
see immediately by accessing the SYSTEM ADMINISTRATION MENU.

The "menu" shown in Figure A is the the SYSTEM ADMINISTRATION MENU
prior to the installation of the two utilities. Figure B is menu after
the installation of the two utilities. The most apparent difference is
the addition of item 8 **tapemgmt**.

As the result of adding the **tapemgmt**, eight subcommands for tape
management were created, Figure C.

The use of these new subcommands will be discussed in the work
assignment titled **AT&T/XM CARTRIDGE TAPE SYSTEM**.

Another convenience provided with the AT&T/XM Administrative Utilities
is the **"BACKUP REMINDER SERVICE"**.

After we complete the APPLICATION, which is next, we will check the
hard disk in the AT&T/XM and prepare it for use.

NOTES

APPLICATION

Referring to your Student Guide and any available documentation,
complete the following questions and tasks. Generate a printout for
each item of this application.

1. You have been instructed to install the AT&T/XM Administration
    and Tape Utilities. Construct the proper message, that will
    inform system users "THE SYSTEM IS BEING SHUT DOWN". Allow them
    45 seconds to log-off.

    _____

2. Enter the message you constructed from question 1 into your 3B2
    Computer. After the computer completes the procedure, what is
    the current "RUN LEVEL"?   .

    _____

3. Install the AT&T/XM Administration and Tape Utilities into your
    3B2 Computer following the instructions in the .SYSTEM
    ADMINISTRATION MENUs and your Student Guide.

4. What label has been assigned to the hard disk drive in the
    AT&T/XM?

    _____

5. Which menu and subcommand would you to display tape drive
    information? Display the proper menu an answer the next
    question.

    _____

6. What label has been assigned to the tape drive in the AT&T/XM?

    _____

7. Using sysadmin, enter the information required to remind you to
    perform backups for /usr. The reminder should be displayed on
    the third Thursday of the odd months at 08:00 am. Enter the
    message into your computer.

    _____

8. Reset the clock to the time from the previous question. What was
    the message that was displayed?

    _____

Have your instructor check your answers before you proceed to the next
part. If you have any questions to this point, consult with your
instructor.

NOTES

SYNOPSIS

Let's take a moment and review where we are in the installation of the
AT&T/XM.

We have connected the AT&T/XM to the 3B2 Computer: loaded AT&T/XM
Administration and Tape Utilities onto the hard disk in the 3B2
Computer and rebooted the system. Things are progressing
satisfactorily, so that now we can start to prepare the hard disk for
service.

Question 4, of the last Application required the system to be
rebooted. Take a moment to review the printouts from that operation.
There is one particular part of the message, we are interested in,
that being:

**The new disk in hardware slot 0 drive 1 has been labeled "disk2".
Use "sysadm partitioning" to reconfigure it.**

We'll begin the next part of this work assignment with a discussion of
hard disk partitioning.

The APPLICATION will allow you to partition the hard disk in the
AT&T/XM. At the end of this work assignment, the hard disk in the
AT&T/XM will be operational.

INTRODUCTION

INTRODUCTION

In an earlier work assignment, we said the AT&T/XM can be equipped with a 30- or 72-megabyte hard disk drive. This hard disk is connected directly to the hard disk in the 3B2 Computer providing either 30- or 72-megabytes of additional disk space.

The AT&T/XM hard disk (we'll call it the "second disk") is treated almost identically to the hard disk located in the 3B2 Computer. All transfers and processes involving the second hard disk are totally transparent to the users of the system.

The mention of hard disk drives creates different images according to which side of the disk drive you look from; user or administrative. To the casual user, the hard disk is some magical place where all data is manipulated and stored for their convenience. To the administrator, the hard disk is a constantly changing storage device that must function properly at all times, for both the administrators sake and the sake of the data.

This part of the work assignment is intended to prepare you to add the second hard disk.

PARTITIONING

UNIX system V Release 2.0 3B2 Version 1
comp5
Copyright (c) 1984 AT&T Technologies, Inc.
All Rights Reserved

Several messages will appear ending with:

Use **"sysadm partitioning"** to configure it.
The system is ready.

PARTITIONING

In the previous section of this work assignment, I asked you to get a printout of all the messages from the computer as it rebooted. We are primarily interested in the message

        Use **"sysadm partitioning"** to configure it.

Before we actually begin to partition the "second disk", it is best to have a clear understanding of the term partition.

What is a partition?

Partition(s) is probably the most important term to understand when dealing with hard disk drives. Basically, a partition is a section of hard disk space. Data will be recorded in these partition (sections). The "second disk" must be partitioned before it can be used, much like a floppy disk must be formatted.

Partitioning electronically divides the hard disk space into smaller sections. The hard disks used in the 3B2 Computer and AT&T/XM have eight partitions, though each can have a maximum of 16.

The size of a partition is determined by the number of blocks (1 block = 512-bytes of memory) you assign. For example, you may assign 22000 blocks to one partition and the remaining blocks to another partition.

How many blocks to a hard disk?

The 10 Megabyte hard disk contains 21888 blocks, while the 32 Megabyte hard disk has 62460 blocks.

In sum, the total number of blocks assigned (all assigned partitions) must equal the number of blocks available on the hard disk.

DISPLAY VOLUME TABLE OF CONTENTS
SYSTEM ADMINISTRATION

```
     1 diagnostics      system diagnostics menu
>>>>>2 diskmgmt         disk file management
      .
    10 usermgmt         user management menu
Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 2
```

DISK MANAGEMENT

```
     1 checkfsys        check a removable medium file system
      .
>>>>>5 harddisk         hard disk management menu
      .
     8 unmountfsys      unmount a removable medium file system
Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 5
```

HARD DISK MANAGEMENT

```
>>>>>1 display          display hard disk partitioning
     2 partitioning     partition a hard disk
     3 rmdisk           remove hard disk
Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 1

Select the device to use:

>>>>1 disk1
    2 disk2
Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 1

Displaying disk1 drive partitioning (hardware slot 0 drive 0):
```

Partition	Tag	Flags	First Sector	Sector Count	Mount Directory
0	2	0	3600	8928	
1	3	1	100	3500	
2	4	0	12528	9360	/usr
6	0	1	0	21888	
7	0	1	0	100	

DISPLAY VOLUME TABLE OF CONTENTS

The volume table of contents, more commonly known as vtoc, is a file containing the partition description of a hard disk. The sysadm menus are used to display the information contained in the vtoc. The vtoc for hard disks includes the following information:

Partition

Identifies the disk partition (section) by number. A maximum of 16 (0 through 15) partitions can be identified. The example, on the opposite page lists the partitions on disk 1 (in the 3B2 Computer). Only the partitions in use will be listed.

Tag

The tag is a number code which identifies the use of the partition. That is, whether the partition is being used as root, user, or some other type of disk space. For example, the tag for partition 0 is 2, indicating this is a root file. The following table gives the uses and codes that are reserved as tag identifiers:

NAME	NUMBER
UNASSIGNED	0
BOOT	1
ROOT	2
SWAP	3
USR	4
BACKUP	5

Flags

The flag is a number code identifying the mounting access mode. The data in partition 0 may be read and written. The following table shows the access modes and the permissions they indentify:

NUMBER	NAME
00	MOUNTABLE (read and write)
01	NOT MOUNTABLE
10	MOUNTABLE (read only)

DISPLAY VOLUME TABLE OF CONTENTS

Partition	Tag	Flags	First Sector	Sector Count	Mount Directory
0	2	0	3600	8928	
1	3	1	100	3500	
2	4	0	12528	9360	/usr
6	0	1	0	21888	
7	0	1	0	100	

DISPLAY VOLUME TABLE OF CONTENTS

First Sector

This field identifies the first block of the partition. For example, partition 1 has a first sector of 100, meaning that block 100 is the first block of partition 1. Blocks are counted starting at 0 and going to the end of the disk.

Sector Count

Identifies the number of blocks (sectors) contained in the partition. For example, partition 1 has a sector count of 3500 blocks. Partition 1 would occupy blocks 100 through 3599. The next partition 0 would begin at block 3600 (first sector is 3600).

Mount Directory

Identifies the directory name for each mounted partition. This name is usually synonymous with the file system name.

PARTITIONING

```
# sysadm display<CR>

Running subcommand "display" from menu "harddisk",
HARD DISK MANAGEMENT

Select the device to use:

>>>>1 disk1
     2 disk2

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 1

Displaying disk1 drive partitioning (hardware slot 0 drive 0):
```

Partition	Tag	Flags	First Sector	Sector Count	Mount Directory
0	2	0	3600	8928	
1	3	1	100	3500	
2	4	0	12528	9360	/usr
6	0	1	0	21888	
7	0	1	0	100	

FIGURE A

```
# sysadm partitioning<CR>

Running subcommand "partitioning" from menu "harddisk",
HARD DISK MANAGEMENT

Select the device to use:

     1 disk1
>>>>2 disk2

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 2
```

FIGURE B

PARTITIONING

Now that we discussed some of the terms you will see as you partition
the "second disk", lets get down to the business of partitioning.

The commands used in partitioning a hard disk are located in the
"harddisk" submenu of the Disk Management menu. The procedure for
partitioning the hard disk follows in the discussion below.

1. The first step of the partitioning procedure is to display the
    vtoc of the hard disk in the 3B2 Computer. This will give you a
    idea of what to expect and how the first hard disk is
    configured.   The figure on the opposite page, shows the sysadm
    display command line and the associated vtoc for the hard disk
    in the 3B2 Computer.

2. The next step is to partition the second hard disk drive using
    the sysadm partitioning command. You should layout the size and
    name of each partition. I am not going to recommend a particular
    layout. Requirements vary from installation to installation. As
    a suggestion, for word processing applications as few as 1000
    blocks per login should prove sufficient. If your users are
    performing tasks requiring large amounts of memory, such as
    financial analysis (spreadsheets), consider 2000 or more blocks.
    The administration of memory is a science and beyond the scope
    of this work assignment.

The figure B, on the opposite page, shows the command line entry
sysadm partitioning.

PARTITIONING

```
# sysadm partitioning<CR>

Running subcommand "partitioning" from menu "harddisk",
HARD DISK MANAGEMENT

Select the device to use:

    1 disk1
>>>>2 disk2

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 2

There are 62460 blocks remaining on disk 2.

How many blocks for disk 2 partition 8?
[ (0 - 62640) again quit help ] (default 62640) 30000

Upon what directory should the file system within disk 2 partition 8
be mounted? [ (pathname) again quit help ] (default /usr2)<CR>

How many blocks for disk 2 partition 9?
[ (0 - 32400) again quit help ] (default 32400) 30000


    Note: The system rounds  up  block  numbers  to  the  next
    nearest  disk cylinder boundary. Therefore, the numbers do
    not add up correctly.


Upon what directory should the file system within disk 2 partition 9
be mounted? [ (pathname) again quit help ] (default /usr3)<CR>

How many blocks for disk 2 partition 10?
[ (0 - 2340) again quit help ] (default 2340) <CR>

Upon what directory should the file system within disk 2 partition 10
be mounted? [ (pathname) again quit help ] (default /usr4)<CR>

The disk2 drive is now partitioned.

#
```

PARTITIONING

The figure on the opposite page shows the command line entry sysadm
partitioning and the system responses.

DISCUSSION

After some header information, the system asks you to

Select which device to be use:

We are going to partition disk 2, the "second disk". We are then
informed

**There are 62460 blocks remaining on disks 2, and how many blocks for
disk 2 partition 8?**

Earlier I said there could be 16 partitions per hard disk.
Practically speaking, the number of partitions is limited by the
number of blocks you assign and a couple of other restrictions. For
example, there only can be 8 user partitions on the "second disk".
Partitions 0 through 5 cannot be accessed and partition 6 defines
(maps) the full user disk and partition 7 is reserved for boot blocks.
Partitions 8 through 15 can be assigned as you see fit.

At this point there are several decisions which must be made. Recall
I said you should decide how many blocks to assign to each partition.
If you don't give the system some response, it will go to the default
value of 62460 (blocks). For this example we will use 30000 (blocks).

Another decision to be made is the name to assign to the new
partition. The system again has a default value, in this case /usr2.
For this example we will allow default to be assigned.

The procedure continues until all of the available blocks are assigned
to a partition.

The last message from the system

The disk2 is now partitioned.

is your signal the "second disk" is ready for use.   partitioned. is
your signal the "second disk" is ready for use.

THE LAST STEP

```
# sysadm display<CR>

Running subcommand "display" from menu "harddisk",
HARD DISK MANAGEMENT

Select the device to use:

     1 disk1
 >>>>2 disk2

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 2
```

Partition	Tag	Flags	First Sector	Sector Count	Mount Directory
6	0	1	0	62550	
7	1	1	0	90	
8	0	0	90	30060	/usr2
9	0	0	30150	30060	/usr3
10	0	0	60120	2340	/usr4

THE LAST STEP

The last step of the partitioning procedure is to display the vtoc of the newly partitioned hard disk.

What message would you use to verify the "second disk" has been partitioned the way you want? Write the message below.

This message will show the "second disk" partitioning.

The example on the opposite page shows the sysadm display for displaying the vtoc of the "second hard disk".

Lets take a moment and review the disk layout. First, partition 6 lists the total number of blocks (sector count) available on the disk - 62550. Partition 7 has the hard disk boot information. The first sector is 0 and the last 89, for 90 blocks. Partition 8 begins at sector 90 and contains 30060 blocks..the last block being 30149. Remember, we said assigned 30000 blocks to this partition, but the system assigned 30060. The system.rounds up the block number to the next disk boundary. Partition 8 is assigned to use2.

Reading on down the vtoc we see the assignments, with only minor modification by the system, are indeed in place and the disk is ready for service. At this point you could begin to add users and user logins to the disk using the User Management Menu from System Administration.

If the "second disk" is not partitioned the way you really wanted it, it will necessary for it to be repartitioned.

REPARTITIONING A HARD DISK

```
# sysadm rmdisk

Running the subcommand rmdisk from menu "harddisk",
HARD DISK MENU

Select which device to use:

     1   disk1
>>>> 2   disk2

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT: 2

Removing disk2 drive from configuration (hardware slot 0 drive 1).

This will DESTROY the contents of the following file systems:

            /usr2 (/dev/dsk/c1d1s8)
            /usr3 (/dev/dsk/c1d1s9)
            /usr4 (/dev/dsk/c1d1sa)

Continue? [y, n, help] y<CR>
#
```

REPARTITIONING A HARD DISK

Repartitioning the "second hard disk" may be necessary for a number of
reasons. A particular partition may need more disk space (blocks)
added to it, the application or use of the hard disk may have changed,
or someone may have figured out a more efficient configuration.

>   NOTE: The repartitioning of a hard disk requires a
>   considerable amount of time due to the number of extended
>   procedures. Be sure to consider the downtime of the
>   computer.

For whatever the reason, the partitioning procedure is as follows:

1. Take the system to run level 2 using the following command:

                         shutdown -y -i2

2. Perform a backup of all file systems on the hard disk to be
    removed. This backup will be used to restore the data to the
    repartitioned hard disk if desired.

3. Remove current partitions from the hard disk using the rmdisk
    command of the "hard disk" submenu - Disk Management Menu.

The **sysadm rmdisk** command remove the specified hard disk from the
recognition of the 3B2 Computer. This command will not remove a hard
disk containing the root (/) file systems.

The figure on the opposite page shows the command lines and system
responses for removing the "second hard disk" (disk2). In this
example, the "second hard disk" contained the /usr2, /usr3, and /usr4
file systems.

The **rmdisk** command completely removes the existence of the specified
hard disk. As far as the computer is concerned, someone has removed
the "second hard disk" and shipped it to the factory. In order to
repartition the hard disk, the computer must know it exists.

REPARTITIONING A HARD DISK

```
# /etc/disks<CR>
```

The new disk in hardware slot 0 drive 1 has been labeled "disk2"
Use "system partitioning" to configure it.
```
#
```

You can execute disks if you are currently in the /etc directory.

REPARTITIONING A HARD DISK

/ect/disk

The /etc/disks command searches the equipped device table (EDT) and updates the device (/dev directory) files accordingly. This process informs the computer that the recently removed hard disk is still connected.

4. Execute **/etc/disks** to update the device files so the system recognizes the existence of the disk to be partitioned. The figure on the opposite page shows the command line and system responses associated with the **etc/disks** command.

5. Repartition the hard disk as desired. The processes for repartitioning the hard disk are the same as if it were a newly installed hard disk, as we previously discussed.

6. Restore data to the hard disk if desired.

NOTES

APPLICATION

Using the 3B2 Computer, AT&T/XM, your Student Guide and any available documentation, complete the following tasks. In the event you have problems with this application consult your instructor before proceeding.

1. Partition the "second disk" for five consecutive users. The first user of the "second disk" will be /usr3. Assign /usr7 22000 blocks, with the remainder divided among the other users.

2. Display the vtoc for the "second disk". How many blocks are assigned to /usr5?

    _____

3. Repartition the "second disk" for two users. Divide the available blocks between them. How many blocks are assigned to each user?

    _____

Notify your instructor you have completed this work assignment.

4
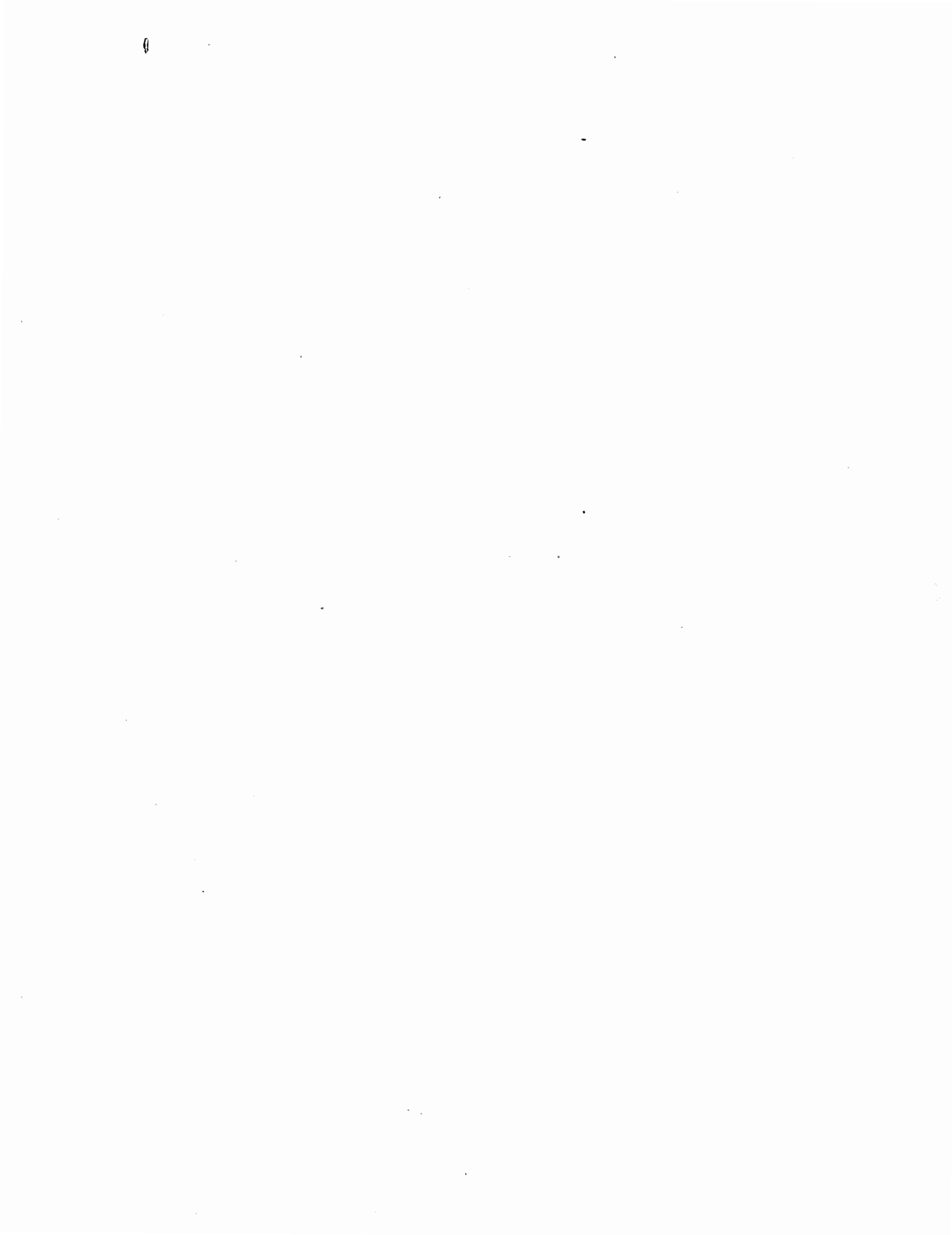
AT&T/XM CARTRIDGE TAPE SYSTEM

CAUTIONS

Never remove a cartridge tape when the power LED on the tape drive is
lighted.   The tape drive has a lock feature that prevents removing a
cartridge tape while the power LED is lighted. If you try to remove
the cartridge tape you may damage your tape drive.

Never expose cartridge tapes to magnetic fields or X-RAYS.

REFERENCE DOCUMENTS

SELECT CODE	DESCRIPTION
305-327	AT&T/XM Manual
305-466	CARTRIDGE TAPE UTILITIES GUIDE
305-354	SOFTWARE INFORMATION BULLETIN — AT&T/XM ADMINISTRATION UTILITIES
305-374	SOFTWARE INFORMATION BULLETIN — CARTRIDGE TAPE UTILITIES GUIDE

MATERIALS REQUIRED

3B2 Model 300 Computer and Terminal
AT&T/XM Unit
Data Cartridge

OBJECTIVES

Upon completion of this work assignment you will be able to:
- Describe the 3B2 Computer Cartridge Tape System
- Insert and remove tape cartridges
- Perform tape management using simple administration
- Format a cartridge tape
- Perform preventive maintenance procedures
  on the cartridge tape drive system

NOTES

SYNOPSIS

This work assignment is forth of five in the AT&T/XM series. To review happenings to this point:

1. The AT&T/XM and your 3B2 Computer have been physically linked by cables.

2. The AT&T/XM Administrative Utilities and Cartridge Tape Utilities, the software, have been loaded in your 3B2 Computer.

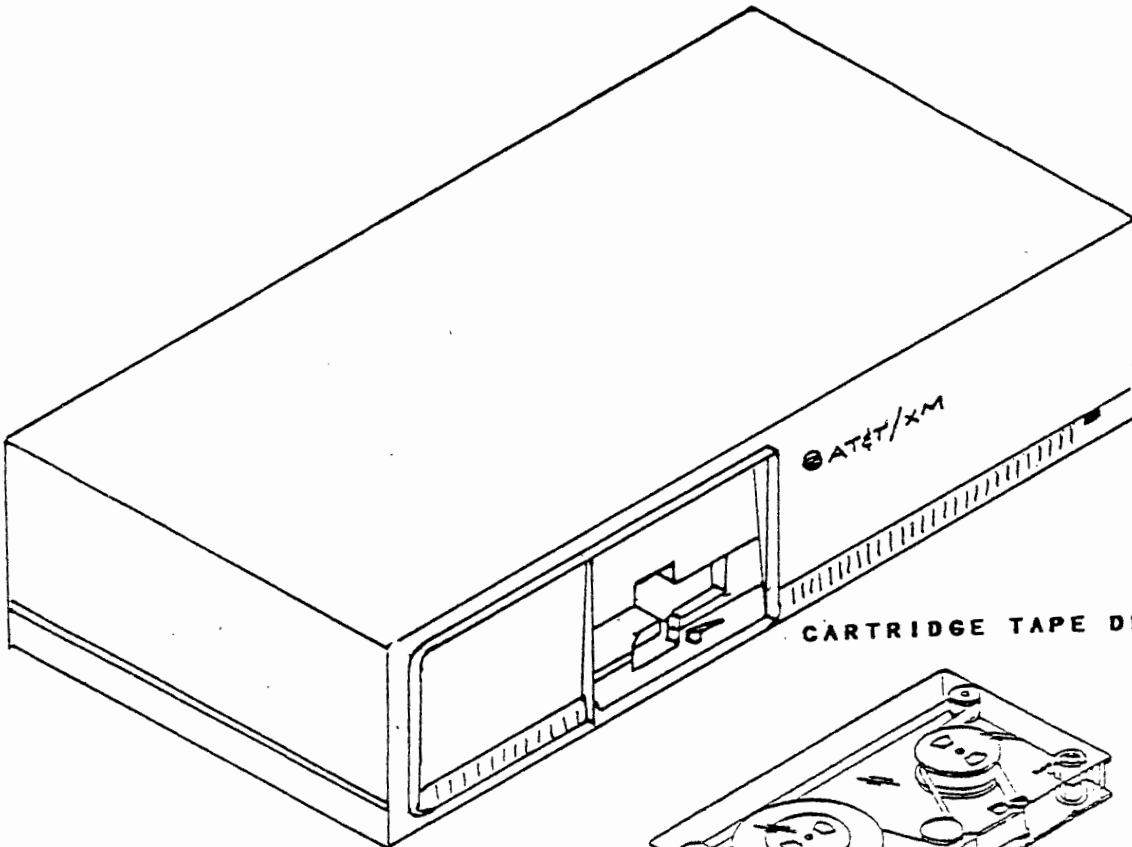3. The "second disk", in the AT&T/XM has been partitioned preparing it for users.

Of course, everything is operating as planned. In order to keep things that way, periodic maintenance of the cartridge tape system and the hard disks are required.

In this work assignment, you will learn the mechanics of using the cartridge tape and drive. Beyond the mechanics, we will discuss formatting the cartridge tape and using the tape system to efficiently manage your hard disk memory.
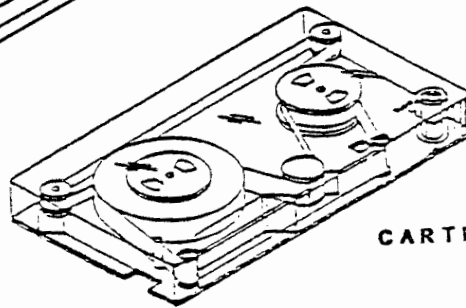
The final portion of this work assignment involves the cleaning and care of your cartridge tape drive.

As usual, there are several Applications throughout this assignment to help reinforce your new knowledge. If you have questions or are unsure, consult with your instructor.
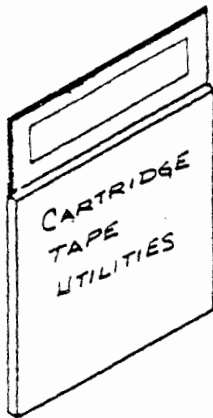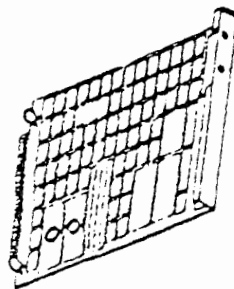
AT&T/XM CARTRIDGE TAPE SYSTEM

CARTRIDGE TAPE DRIVE

CARTRIDGE TAPE

CARTRIDGE TAPE
CONTROLLER CARD

FLOPPY DISKETTE

AT&T/XM CARTRIDGE TAPE SYSTEM

The AT&T/XM Computer Cartridge Tape System consists of:

- Cartridge Tape Drive

- Cartridge Tape

- Floppy Disk (Cartridge Tape Utilities)

- Cartridge Tape Controller Card

The Cartridge Tape Controller Card (CTC) plugs directly into the 3B2 Computer. Included in the package, but not shown in the figure are the interconnecting cables.

The tape drive is an external storage device of the 3B2 Computer, using removable tape cartridges for storing data. The software is on one floppy diskette labeled **"Cartridge Tape Utilities"**. The CTC card allows the 3B2 Computer to communicate with the cartridge tape system. Cabling connects the 3B2 Computer to the AT&T/XM.

The installation of the tape cartridge hardware was discussed in the "Installing AT&T/XM to Existing 3B2" work assignment. The installation of the software was discussed in "AT&T/XM Operation" work assignment.

AT&T/XM CARTRIDGE TAPE DRIVE

POWER
LED

LOADING LATCH
Normal Position
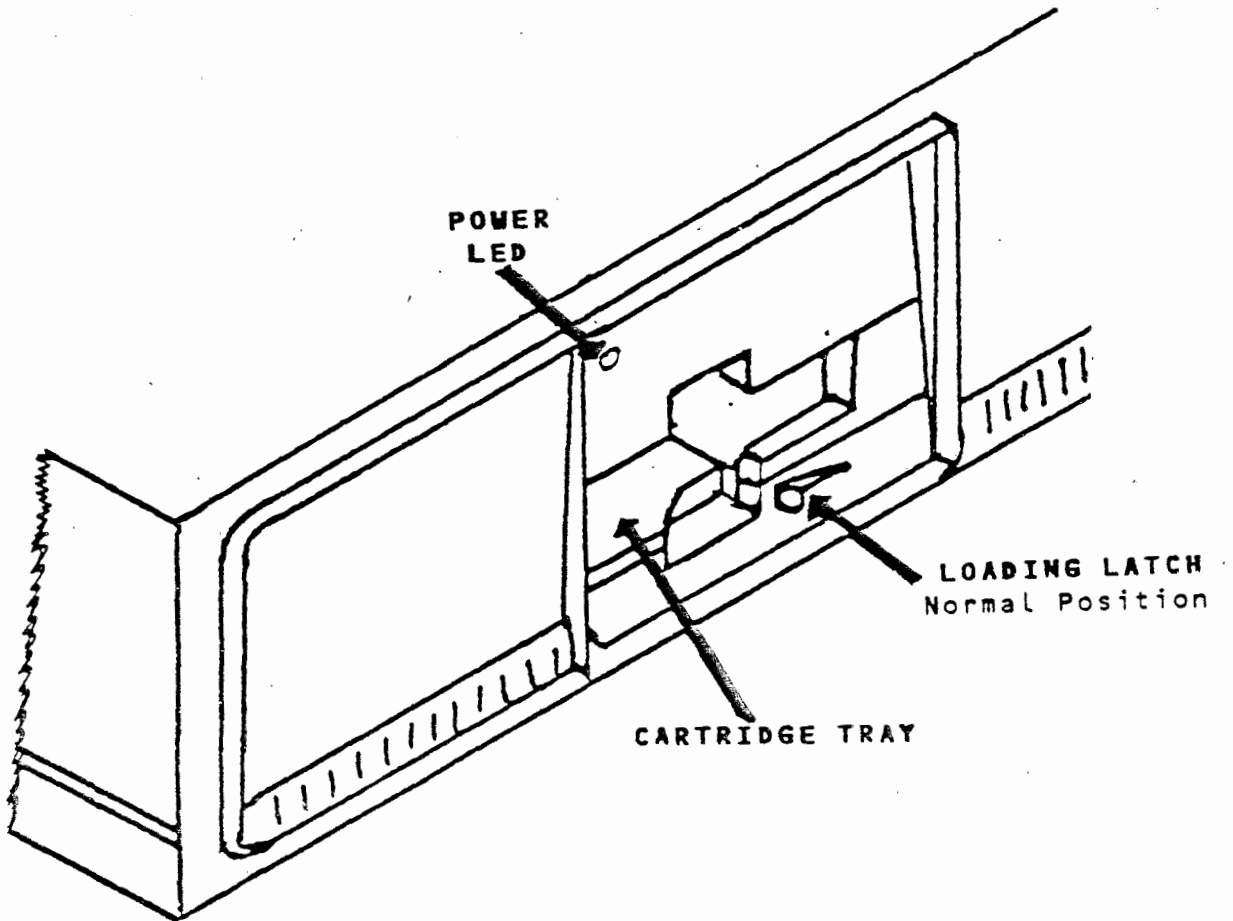
CARTRIDGE TRAY

FRONT OF AT&T/XM

AT&T/XM CARTRIDGE TAPE DRIVE

The AT&T/XM cartridge tape drive is manufactured by Cipher Data Products, Incorporated. The Model 525-CT Floppy Tape Cartridge Tape Drive* is a 1/4-inch streaming cartridge tape drive designed specifically for the backup of hard disks. The cartridge tape drive uses removable cartridge tapes. The usable (after formatting) data storage capacity of the cartridge tape is 23.3 megabytes. The cartridge tape drive has one head for both recording and reading data.

The figure on the opposite page shows the front view of the tape drive. In the upper left-hand corner of the front panel is a power LED that lights when the cartridge tape drive is working. The latch, lower middle of the front panel, is shown in its normal position e.g.. cartridge tape not inserted. The remaining part shown is the cartridge tray which pulls out for easy insertion of the cartridge.

---

* Trademark of Cipher Data Products, Incorporated

CARTRIDGE TAPE

WRITE
PROTECTION
TAB

SAFE — PREVENTS WRITING ON TAPE

SAFE — ALLOWS WRITING ON TAPE
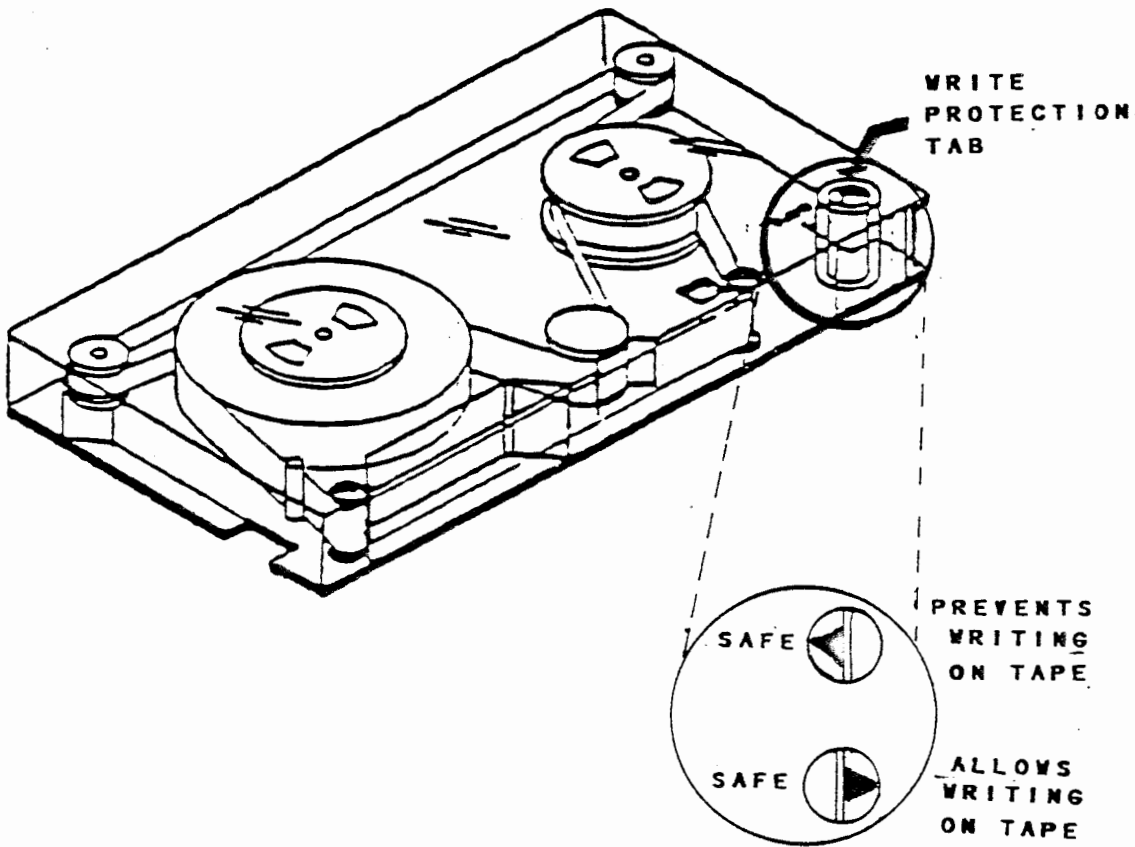
CARTRIDGE TAPE

The AT&T/XM tape drive is designed to operate with a certified cartridge tape, such as the 3M Scotch DC600A. The data storage capacity of the cartridge is 32 megabytes unformatted and 23.3 megabytes formatted. The tape drive records the data on 6 tracks, each containing a maximum of about 4 megabytes. Under normal operating conditions it takes about 17 minutes to record 23.3 megabytes of data on one tape.

The example on the opposite page shows a cartridge tape and indicates the location of the write protection tab. All certified cartridge tapes have the write protection feature. This feature prevents, accidentally writing over data on the tape. To prevent writing over data, turn the write protection tab until the arrow points to the SAFE position. If a cartridge tape is needed for recording data, turn the write protection tab until the arrow points away from the SAFE position.

The DC600A cartridge tape is shipped in a plastic storage case. Whenever the cartridge is not in use it should be stored in its original plastic case.
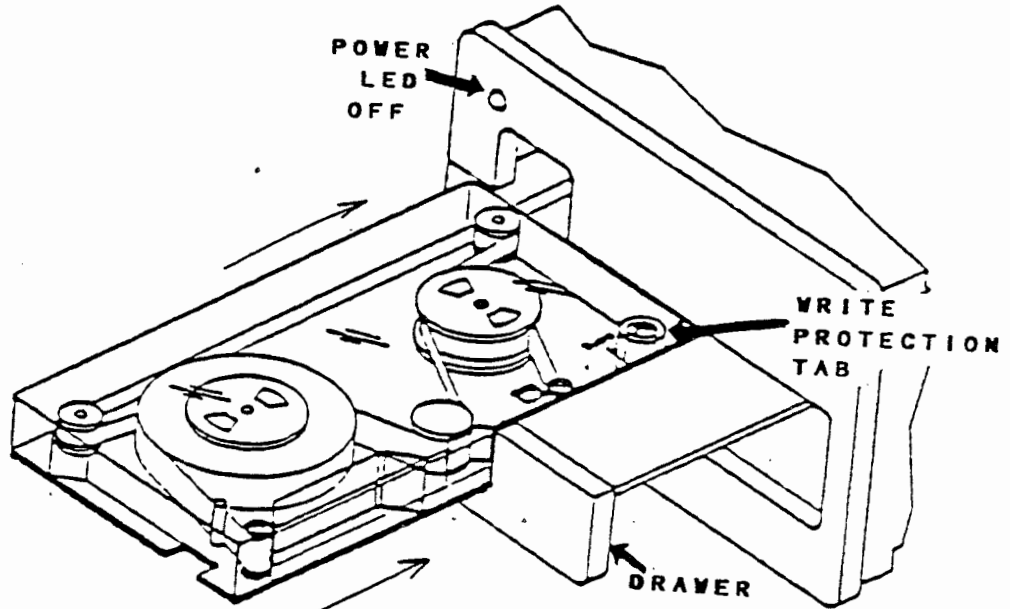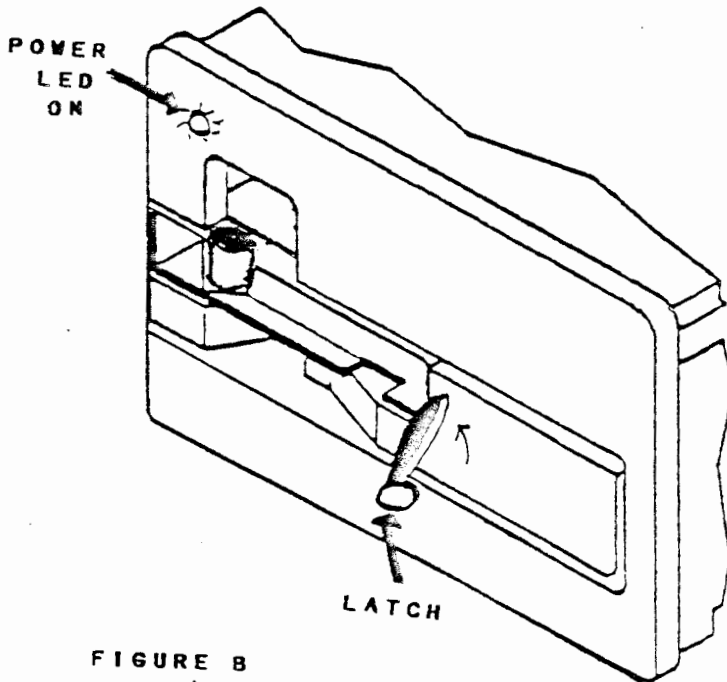
INSERTING AND REMOVING CARTRIDGE TAPE

FIGURE A

FIGURE B

INSERTING AND REMOVING CARTRIDGE TAPE

Inserting Cartridge Tape

The cartridge tape is inserted into the drive by **CAREFULLY** pulling out the drawer until it stops. Insert the cartridge so the side with the **write protection tab** is in the front right hand corner of the drawer. (Figure A) Push the drawer with the cartridge all the way into the tape drive until it stops. Rotate the loading latch, called the latch, to the vertical position. (Figure B)

When the latch is rotated to the vertical position the recording head engages with the cartridge. Micro-switches, inside the drive, indicate the presence of the cartridge, and the status of the write protection. The latch locks the cartridge in place. At this time the tape drive will automatically start a **re-tension pass**, which lasts about 3 minutes. Re-tensioning runs the tape forward and rewinds it, to ensure the tape is evenly tensioned across its length. This occurs every time a tape is inserted and the latch is turned to the vertical position. You should note, the drive LED will **not be lighted**, until re-tensioning is completed. Even though it is not lighted, you **cannot** remove the cartridge. When re-tensioning is complete the LED will light. The cartridge is now securely inserted in your tape drive and is ready to use.

INSERTING AND REMOVING CARTRIDGE TAPE

POWER
LED
OFF

FIGURE A

FIGURE B

DRAWER

INSERTING AND REMOVING CARTRIDGE TAPE

Removing Cartridge Tape

When removing the cartridge tape ensure the power LED on the tape drive is not lighted. If the power LED is lighted, wait until processes have stopped and the power LED is not.

Once the power LED is out, the tape cartridge can be removed by turning the latch to the horizontal position. (Figure A) Carefully pull out the drawer containing the cartridge. Do not exert excessive pressure on the drawer because it could damage the drawer. Take out the cartridge and place it in the plastic case. Store the tape cartridge in a safe place. Push the drawer all the way into the tape drive. The cartridge tape removal procedure is now complete.

NOTES

APPLICATION

Using your Student guide and any available documentation, answer the following questions.

1. If you wanted to know the proper procedure for inserting a tape cartridge what manual could you reference?

   _____

2. What components make up the 3B2 Cartridge Tape System?

   _____

   _____

3. The cartridge tape is used to load the operating system?
   TRUE or FALSE

4. The formatted capacity of the cartridge tape is _____ megabytes.

5. Using the information given in this work assignment and in the manual indicated in question number one, insert a cartridge into the 3B2 tape drive and allow the system to perform the re-tension pass.

Verify your answers with the instructor upon the completion of this application work assignment.

OPERATION

SYSTEM ADMINISTRATION

1	diagnostics	system diagnostics menu
2	diskmgmt	disk management menu
3	filemgmt	file management menu
4	machinemgmt	machine management menu
5	packagemgmt	package management
6	softwaremgmt	software management menu
7	syssetup	system setup menu
8	tapemgmt	tape management menu
9	ttymgmt	tty management menu
10	usermgmt	user management menu

TAPE MANAGEMENT

1	checkfsys	check a removable medium file system for errors
2	compress	compress file system
3	format	format removable cartridge tapes
4	info	display tape drive information
5	makefsys	create a new file system on a removable medium
6	mountfsys	mount a removable medium file system
7	resetusage	reset tape cartridge usage count
8	umountfsys	umount a removable medium file system

OPERATION

The cartridge tape drive provides for the following capabilities:

o   File Systems

o   File Backups

o   File Restorations

All basic operations of the tape system can be accomplished using the System Administration menus. The setup for the tape drive itself can be done with the **tapemgmt** menu selections and it's eight subcommands.

The same menu selection will allow you to accomplish the "File Systems" operations. To use the other tape system functions, File Backups and File Restorations, other System Administration menu selections will be necessary. The other selections necessary for tape system operations would be **diskmgmt**, **filemgmt**, and **usermgmt**. These selections were discussed in the System Administration work assignment.

Beyond the System Administration commands available for the tape system operation there are commands available for use by the sophisticated user. These additional commands are listed in the Cartridge Tape Utilities Guide. The commands listed in the guide will accomplish the same results as the menu commands, but each command has its advantage and disadvantage over the menu commands.

OPERATION

SYSTEM ADMINISTRATION

```
1  diagnostics      system diagnostics menu
2  diskmgmt         disk management menu
3  filemgmt         file management menu
4  machinemgmt      machine management menu
5  packagemgmt      package management
6  softwaremgmt     software management menu
7  syssetup         system setup menu
8  tapemgmt         tape management menu
9  ttymgmt          tty management menu
10 usermgmt         user management menu
```

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT:8

TAPE MANAGEMENT

```
1  checkfsys    check a removable medium file system for errors
2  compress     compress file system
3  format       format removable cartridge tapes
4  info         display tape drive information
5  makefsys     create a new file system on a removable medium
6  mountfsys    mount a removable medium file system
7  resetusage   reset tape cartridge usage count
8  umountfsys   umount a removable medium file system
```

OPERATION

The example on the opposite page shows the eight subcommands accessed in the System Administration menu by selecting menu #8 tapemgmt. The Tape Management menu subcommands are defined below:

checkfsys   This command checks a file system that has been created on tape for errors. If any errors are found, this procedure attempts to repair them.

compress   The compress subcommand is used to reorganize a file system in order to improve access efficiency in that file system. The reorganization is accomplished by first copying the file system from hard disk to tape. The hard disk is then restructured and the file system is copied from the tape back onto the hard disk. There are three requirements for compress to work, they are:

   ♣ The file system to be reorganized must be mounted on a hard disk

   ♣ The temporary storage device must be a cartridge tape

   ♣ The file system must fit on a blank cartridge tape

   You should backup the file system you want to compress before starting this procedure.

format   The format subcommand formats a blank cartridge tape. Before a blank tape can be used for storing information it must be formatted.

info   The info subcommand is used to display information about a tape that is mounted in the cartridge tape drive. Included in the display are items such as the number of available bytes and blocks, the number of allowed passes and the passes to date, and the Volume Table of Contents (VTOC).

OPERATION

SYSTEM ADMINISTRATION

```
1   diagnostics      system diagnostics menu
2   diskmgmt         disk management menu
3   filemgmt         file management menu
4   machinemgmt      machine management menu
5   packagemgmt      package management
6   softwaremgmt     software management menu
7   syssetup         system setup menu
8   tapemgmt         tape management menu
9   ttymgmt          tty management menu
10  usermgmt         user management menu
```

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, q to QUIT:8

TAPE MANAGEMENT

```
1   checkfsys        check a removable medium file system for errors
2   compress         compress file system
3   format           format removable cartridge tapes
4   info             display tape drive information
5   makefsys         create a new file system on removable medium
6   mountfsys        mount a removable medium file system
7   resetusage       reset tape cartridge usage count
8   umountfsys       unmount a removable medium file system
```

OPERATION

makefsys   This command creates a file system on a cartridge tape
                allowing you to store and access files on a storage medium
                other than a hard disk. When the file system is mounted it
                has the same characteristics as a file system on hard
                disk.

mountfsys   The mountfsys command mounts a tape file system and makes
                it available to use.

                **Do not remove the cartridge tape while the file system is
                still mounted.**

resetusage This subcommand is used to reset the counter that keeps
                track of the time that has elapsed since the tape drive
                was last cleaned and the time remaining until the next
                scheduled cleaning. After cleaning the tape drive counter
                has to be reset.

ummountfsys This subcommand unmounts a file system so that you can
                remove the tape cartridge.

On the next few pages we will examine the usage of two of the eight
TAPE MANAGEMENT subcommands, including:

                    ♠ Compress

                    ♠ Format

The commands associated with the file systems are not new to you and
do not require an expanded explanation beyond the previous pages. The
resetusage subcommand is explained where it is used, in the Cartridge
Tape Drive maintenance section of this work assignment. One last
command **info**, does not require any expansion, as it is completely
self-explanatory.

COMPRESS A FILE SYSTEM

TAPE MANAGEMENT

1	checkfsys	check a removable medium file system for errors
2	**compress**	**compress file system**
3	format	format removable cartridge tapes
4	info	display tape drive information
5	makefsys	create a new file system on a removable medium
6	mountfsys	mount a removable medium file system
7	resetusage	reset tape cartridge usage count
8	umountfsys	umount a removable medium file system

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, ^ to GO BACK, q to QUIT:2

    CAUTION: ONE OF THE INTERMEDIATE STEPS OF THIS COMMAND
    ERASES FILE SYSTEMS. ALWAYS MAKE SURE A BACKUP OF THE
    INVOLVED FILE SYSTEM IS AVAILABLE.

COMPRESS A FILE SYSTEM

The compress is used to reorganize a file system to improve access time and save memory space. The discussion of the compress command is divided into two parts:

- Using the Compress Command

- File System Compress Procedure

Using The Compress Command

The sysadm compress command is used to rid a hard disk system of fragmentation. Fragmentation is the name given to the pieces of disk space that are left after files and directories have been created and removed.

> Note: The sysadm compress command will not compress root (/) or /usr file systems.

The compress command copies all the existing files in a file system to the cartridge tape. Once the files are safe, the compress process erases the involved file system from hard disk. After the file system is erased, the process writes the saved files back onto the clean area of the hard disk. Since only the existing files are copied to the cartridge tape, only the existing files will be restored, thus eliminating the fragments.

The compress command is used to get the unused fragments of space back into the usable portion of the disk. This is helpful in those emergency situations to gain some free disk space. The amount of free disk space recovered depends on the number of files and directories that have been created and removed. The compress command should only be used when absolutely necessary, and is only a temporary fix to the disk space problem.

COMPRESS A FILE SYSTEM

```
# sysadm compress<CR>


Running subcommand 'compress' from menu 'tapemgmt',
TAPE MANAGEMENT



Does an up-to-date backup copy of the file system
you are about to compress? [y, n, ?] y<CR>
Mount file systems available for compression:
/usr /usr2


Enter the file system you want to compress [q]: /usr2<CR>
Insert tape into ctape1 drive, wait for re-tension pass to complete,
and press the <RETURN> key when ready [q]: <CR>


        As the compression process runs, it will  pose  several
        questions and display as series of messages.


761 blocks
File system copy from tape completed
#
```

COMPRESS A FILE SYSTEM

File System Compress Procedure

The procedure for compressing a file system is as follows:

1. Obtain a formatted cartridge tape.

2. Go to the single-user mode.

    shutdown<CR>

3. Mount the /usr file system and the file system that is to be
    compressed using the following commands:

        mount /dev/dsk/c1d0s2
        mount /dev/dsk/c1d1s2 /usr2

    Note: The /usr file system must be mounted to use
    the **sysadm** commands, but CANNOT be compressed using
    Bsysadm compress.

4. Execute the **sysadm compress** command and follow the interactive
    instructions.

5. Unmount the /usr file system and any other file system (other
    than root) and return the system to the normal operating
    condition using the following commands:

        unmountall
        init 2

The figure on the opposite page shows the command line entries and
system responses associated with the **sysadm compress** command. The
system is in the single-user mode with the /usr and /usr2 file systems
mounted.

FORMATTING A CARTRIDGE TAPE

TAPE MANAGEMENT

1	checkfsys	check a removable medium file system for errors
2	compress	compress file system
3	format	format removable cartridge tapes
4	info	display tape drive information
5	makefsys	create a new file system on a removable medium
6	mountfsys	mount a removable medium file system
7	resetusage	reset tape cartridge usage count
8	umountfsys	umount a removable medium file system

Enter a number, a name, the initial part of a name, or
? or <number>? for HELP, ^ to GO BACK, q to QUIT:3

FIGURE A

```
# sysadm format<CR>
More than one subcomand or submenu name matches 'format'.
        1    diskmgmt/format
        2    tapemgmt/format
Select one: [?, q] 2

Running subcommand 'format' from menu 'tapemgmt',
TAPE MANAGEMENT

Do you want the tape cartridge format verified?
[(default: y), n, q, ?,]: <CR>
Enter the maximum number of passes allowed for this tape cartridge
before it should be discarded (default is 4000): 3500<CR>

Insert tape, wait for re-tension pass to complete,
and press <RETURN> key when ready [q]: <CR>

        Insert the tape and wait for it to
        stop spinning. The hit <RETURN>.
        Formatting will begin.

Format completed successfully.

The cartridge tape in ctape1 drive
is now formatted and can be removed.
#
```

FORMATTING A CARTRIDGE TAPE

The time required to format a cartridge tape is approximately 20 minutes (not counting retensioning). The steps required to format a cartridge tape are as follows:

1. Determine the tape pass count you would like to place on the cartridge tape. The reason for setting the tape pass count is because cartridge tapes may only be used a limited number of times before the become unreliable. The more passes made, the more wear on the magnetic tape, thus the chances of data loss are increased. The cartridge tape drive keeps track of how many passes a tape makes by writing pass count information onto the tape. The recommended maximum cartridge tape pass count for cartridge tapes available through AT&T is 4000 passes.

    I should point out at this point a write-protected cartridge tape cannot have its pass count updated or written to. Therefore, it will seem ageless to your system.

    When it is close to the time to replace a cartridge tape, you will receive the following message:

    NOTICE: The cartridge tape in drive 1 is wearing out.
    Please replace it as soon as possible.
    It has an estimated life of (?) more backups.
    Failure to replace the tape cartridge will lead to data loss.

2. Select the **format** command from the Tape Management menu and follow the interactive instructions. If you use **sysadm format**, the system will ask which format to use. Formatting a cartridge tape requires the format option from the 'tapemgmt' menu.

3. Insert the cartridge tape into the cartridge tape drive.

4. Wait for formatting to complete and remove the cartridge tape.

Figure B shows the typical command line entries and system responses for formatting a cartridge tape. For this example, the maximum tape pass count was set to 3500.

CARTRIDGE TAPE DRIVE MAINTENANCE

NOTICE: Schedule preventative maintenance -- CLEAN TAPE
DRIVE. Failure to clean the tape drive will lead to
data loss.

CARTRIDGE TAPE DRIVE MAINTENANCE

The cartridge tape drive requires a minimal amount of maintenance.
Maintenance refers to cleaning the drive mechanisms and making sure
everything is working properly. The maintenance will be performed in
accordance to drive usage. On the next few pages we will discuss:

        ♠ Drive Usage Count

        ♠ Cleaning the Tape Drive

        ♠ Resetting the Drive Usage Count

Drive Usage Count

Your tape drive keeps track of how many 25-millisecond increments a
tape (any tape) has been in motion. This is referred to as the drive
usage count. The drive usage count is used to determine when your tape
drive needs preventative maintenance. When the drive usage count
reaches a certain limit, your system will give you the following
message:

> NOTICE: Schedule preventative maintenance -- CLEAN TAPE
> DRIVE. Failure to clean the tape drive will lead to data
> loss.

When you receive this message, you will need to clean the tape drive
and reset the usage count.

An additional thought about usage count. Two phases 15 and 16 do not
update the Cartridge Tape Pass Count. The tape you use for diagnostics
will seem ageless. To keep track of how many pass counts need to added
for running diagnostics, use the following information:

PHASE#	PASS COUNT
15	10
16	8

In sum, the pass count and tape usage information may not be
absolutley correct if you are performing excessive diagnostics. In
that case, you should consider and accelerated tape drive maintenance
schedule, the subject of the next few pages.

MAINTENANCE

CIRCUIT BOARD

CAPSTAN ROLLER

HEAD ASSEMBLY

TAPE PATH

LATCH
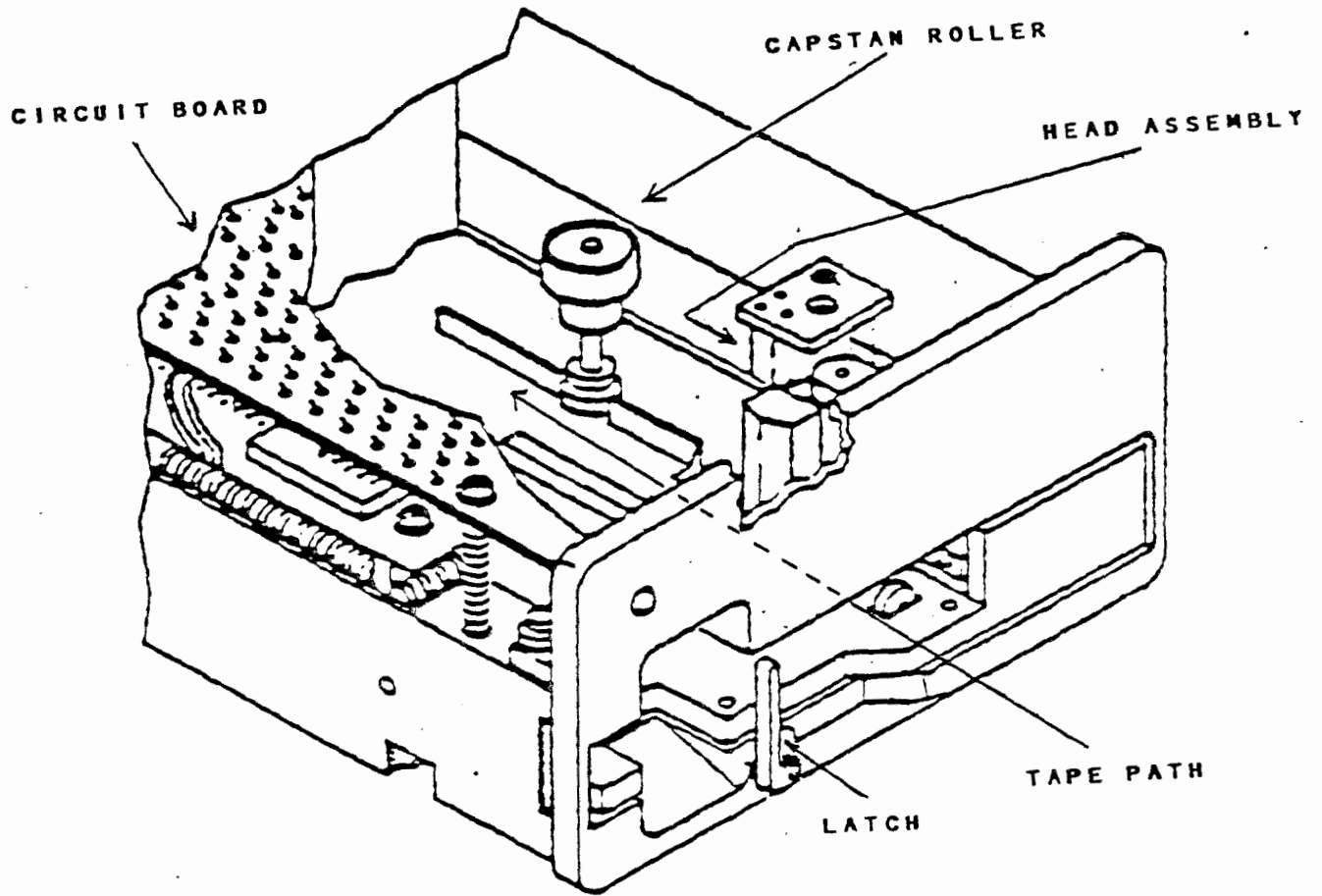
MAINTENANCE

Maintenance of the cartridge tape system consists of preventive
maintenance on the tape drive. The preventive maintenance required for
the tape drive involves cleaning the tape path, capstan roller, and
head assembly. The example on the opposite page shows these
components.

To clean the tape drive you must obtain the following two items:

  ♠ Approved cleaning swab - one that will not scratch the tape head
    or leave residue or fibers behind.

  ♠ Freon degreaser type TF.

To clean the tape drive, perform the following procedures:

  1. Power-down the 3B2 Computer with AT&T/XM.

  2. Slightly moisten the swab with the Freon degreaser.

  3. Carefully clean the head assembly with an approved cleaning
      swab. Replace the swab when it gets dirty.

  4. Use the swab to rotate and clean the capstan roller until the
      entire circumference of the capstan is cleaned.

  5. Clean any foreign debris in the tape pathway.

  6. Power up the 3B2 Computer with AT&T/XM and reset the usage count
      using system administration.

CARTRIDGE TAPE DRIVE MAINTENANCE

```
# sysadm resetusage<CR>

Running subcommand 'resetusage' from menu 'tapemgmt'
TAPE MANAGEMENT


Tape Drive Usage:       0 hours 0 minutes since last cleaning
    20 hours 0 minutes until next cleaning


#
```

CARTRIDGE TAPE DRIVE MAINTENANCE

Resetting the Drive Usage Count

Each time you clean the tape drive, you need to reset the drive usage
count.

> CAUTION: DO NOT reset the drive usage count unless you
> have actually cleaned the tape drive. If you continue to
> use a "dirty" tape head, data could be lost or damaged as
> it passes to the cartridge tape.

The drive usage count is reset with the **sysadm resetusage** command. The
figure on the opposite page, shows the command line and the system
responses for resetting the drive usage count.

NOTES

APPLICATION

Using your Student Guide and any other material, perform the following
tasks and answer the questions.

1. Format and verify the format of the cartridge tape installed in
    the drive using the default for the number of passes.

    THIS PROCEDURE TAKES APPROXIMATELY 20 MINUTES.

    TAKE THIS OPPORTUNITY TO REVIEW THE WORK ASSIGNMENT UP TO THIS
    POINT AND ASK YOUR INSTRUCTOR TO ANSWER ANY QUESTIONS YOU MAY
    HAVE.

2. Display the tape drive information and answer the following
    questions.

    What are the total number of bytes on tape?
    _____

    What is the tape pass count?
    _____

    What is the TAG# for partition 0 of the tape?
    _____

    Give the device name for the cartridge tape drive?
    _____

3. Using an approved swap and Freon degrease, clean the cartridge
    tape drive.

4. Reset the tape cartridge usage count.

Verify your answers with the instructor upon completion of the
application work assignment.

THIS COMPLETES THE WORK ASSIGNMENT, PLEASE   NOTIFY YOUR INSTRUCTOR
THAT YOU HAVE COMPLETED.