

TRACK Program Documentation
- 19921016 -----
For version: 1.67

An up-to-date version of this document can be found in the VLBA Information System as item ARRY,OPS,CH12.

General =====

The Tape Management and Tracking System is a menu driven program that maintains a database capable showing the movement of tapes between observatories and correlator facilities worldwide. In addition it will also manage shelf space for the VLBA Correlator facility at the AOC (Array Operations Center), and keep track of the number of tapes in the different "pools" of released tapes at all correlator facilities.

The database contains enough information to track tapes and detect when shipments, or parts of shipments, have been "lost".

For tapes to be tracked they must be "entered into the system". Once the tapes have been entered they may be shipped and received by everyone. This allows everyone to come to the same place to determine the status of individual tapes and shipments that they have made and/or check for tapes that have been shipped to them.

The program expects to be run from a regular VT100 terminal (132 column mode is useful but not necessary for antenna locations).

Remote Operations =====

Currently the Track system is only being run at the AOC (but is being used by locations other than just the VLBA antennas and the AOC). There are two independent systems. One is set up on ZIA, and the other is set up on VLBACC. The database on ZIA is considered the "master" or server database. Every even Universal Time (UT) hour a program on ZIA copies the Track database on VLBACC to ZIA and updates the database on ZIA. On the odd UT hours a program on VLBACC gets a copy of the ZIA database and brings the VLBACC database up to date. This method of operating is designed to be extended beyond the two computers in the AOC to any number of "remote sites" (Haystack, Bonn, etc., for example).

Security =====

Everyone will be allowed to perform searches and generate reports. Your account must be on an "access list" to be allowed to ship and receive tapes. There is a second list which designates which accounts are considered to be correlator accounts and where tapes must be (as tracked by the program) for them to be "released". Additionally the account must be on a "shelf permission list" to be allowed to use the shelf functions. The program currently only understands the shelf arrangement proposed for the AOC. The Track Program System Manager (currently bgreschk@nrao.edu) should be contacted if access to the secured functions are required.

The menu selections will change according to your level of access.

Printing =====

Because of the number of remote users printing is not performed in the "normal" manner. If a printer is connected to your terminal individual screen fulls of information should be printed using the terminal's "print screen" function. In various places the question "Do you want to print this" will come up. Answering YES to this will cause the program (at the appropriate time) to send the commands necessary to cause a VT100 terminal to "dump" the output to a printer connected to the terminal. A form feed is performed at the end of the printout. When printing is turned on, the pauses every screen full are turned off, with the exception of the "All tapes report" (see below).

The program does not know anything about the equipment setup. Depending on the general lengths of reports you may generate it may be a good idea to have some sort of hardware buffer between the terminal and the printer. This will help prevent overrunning the memory buffer in the printer.

For those of you in the AOC entering FILE at the "Do you want to print this" question will allow you to enter a filename. The report or list of information that normally would be displayed on the screen will be sent to this file instead. After answering the "filename" question you will be asked if the new data should OVERWRITE the data in the file that you specified, or if the data should be APPENDED to the end of some old data that is already in the file. Appended data will be separated from the old data by a form feed character.

Help!

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Help is available at any of the prompts. Just enter "help". The whole word must be entered.

Color and Attributes

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The status codes of the tapes will be displayed in different colors, or different video attributes depending on their status, their location, if the color option has been turned on (see the "Operation" section), and the list being generated.

	Tape lists	Shelf list
	-----	-----
Released tapes	Yellow or highlighted	Yellow or highlighted
Received at a correlator	Red or reverse video	Red or normal video
Received at an antenna	Green or normal video	--
Shipping to a correlator	Red or reverse video	--
Shipping to an antenna	Green or normal video	--
Unknown status	Cyan or reverse/ highlighted video	Cyan or reverse/ highlighted video

The colors generally match the "dot convention" used to identify the status of the tapes: Green-ready for recording, Red-contains data, Yellow-waiting to be degaussed and released.

User Interface Stuff

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To Shift, or Not to Shift

All entries may be made in upper or lower case (everything is converted to upper case by the program).

Prompt Operations

There are two types of prompts.

Default prompts:

These prompts contain a default input surrounded by brackets somewhere in the prompt:

Location [AOC]: _

If the information in the brackets is good enough then just pressing the Return Key will make the program think that the default information (in this case "AOC") was entered. Entering anything else, and then pressing the Return Key will override the default information.

Non-default prompts:

These are regular prompts where something must be entered; there is no default input.

Quit/Return

At most prompts the word "QUIT" may be entered to stop a current line of questioning or to stop the current operation and return to the menus. At most Non-default prompts, just pressing the Return Key will have the same effect as entering "QUIT". The whole word "QUIT" does not need to be entered. "Q", "QU", or "QUI" will suffice.

One thing to note: When the Return Key is pressed the action is performed immediately. No "Are you sure?" questions will be asked. Along the same lines, to keep the interface as simple to use as possible, if you make a mistake in a series of questions and fail to see it before you press the Return Key, you

must start over, you can't go back and "fix" the error.

Prompt Input Lengths

The allowed length of input to the various system prompts is listed below:

Origin/Destination/Location: 5 characters (See location codes)
Date/Time: See below
Control No: 18 characters
Shipper: 5 characters (See shipper codes)
Project/Pool: 12 characters
Remark: 60 characters

Characters entered beyond the above limits will be ignored.

Date/Time

All dates and times for events in the system are kept in Universal Time.

When entering the date/time the date may be entered alone. The time will default to "00:00". If the time is to be changed the date must precede the time.

Date shortcuts

The date 1992JUN27 may be entered in any of the following ways:

1992JUN27
19920627
92JUN27
920627

Time shortcuts

The time 04:27 may be entered in any of the following ways:

04:27
4:27
0427
04:00 may be entered as:
04:00
0400
04
4

Control Number Prompts

When searching for shipments, adding tapes to shipments, and recreating items using the control number, the number may be entered with 3 preceding periods. This will tell the system to attempt a match using the input following the periods, and the end of a control number in the database. For example if there are tapes being shipped with the control number "471041634001", the shipment may be checked on using "...4001". If there is a shipment "4001" it will be "found" too; likewise for other shipments ending in "4001". If the input does not have the 3 periods then a "regular" exact match is attempted.

Menu Operations

Entering the letter "Z" at any menu prompt will return you to the next higher level menu. When in the Main Menu entering "Z" will quit the program. At all of the menu prompts ("Command:") just pressing the Return Key will have the same effect as entering "Z".

If you are at the Main Menu prompt, and you know which selection you want to make in one of the sub-menus, both the main and the sub-menu item can be entered at the same time. For instance, If you want to add tapes to the system you can enter "da" at the Main Menu "Command:" prompt. This is the same as entering the "d", pressing return, then entering the "a" and pressing the return.

The menu selections will change according to your level of access.

Tape Numbers

The program accepts the input from the "standard" VSN/CRCC bar coded labels that are currently on all MkIII/VLBA tapes. The first 8 character number is

the Volume Serial Number (VSN), and the 4 digit number is the Cyclic Redundancy Check Code (CRCC). The bar code "protocol" is Code 3 of 9, or 39.

When entering the tape number from a keyboard the VSN may be entered at the "Enter VSN:" prompt. If the Return Key is pressed the "CRCC:" prompt will come up. When the CRCC has been entered the program will check to make sure that the CRCC can be calculated using the VSN. If this test fails an error message will be issued and the "Enter VSN:" prompt will return.

An alternate keyboard entry method is to enter the VSN, a single space, and the CRCC (as in: mpir0155 171a). Again the VSN and CRCC will be checked against each other to verify the input.

To use a bar code reader the reader should be set to generate the Code 39 checksum character. This character will be checked to verify the VSN, and to verify proper operation of the bar code reader.

The Standard Information Line

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Most requests for information will result in a line of data for each tape. This is called the Standard Information Line. For example

```
TEST0150 Sh BONN AOC 92JUN19 20:13 Yes C123 FEDEX AB234
```

contains the following information:

- "TEST0150" is the Volume Serial Number (VSN) of the tape.
 - "Sh" is the status of the tape. Possible states that the tape may be in are "Sh"-Shipping, "Rc"-Received, "Rl"-Released, and "Uk"-Unknown.
 - "BONN" is the first location code (see below).
 - "AOC" is the second location code (see below).
 - "92JUN19 20:13" is the UT date and time that the system was informed that this tape was going to be shipped (or received, or released, etc.).
 - "Yes" indicates that the tape is assigned to a shelf location (at the AOC).
 - "C123" is a control number (internal to the organization shipping the tape, or the actual shipper waybill number) that could be used to track the tape if it were lost during shipping.
 - "FEDEX" is the shipper used to transport the tape.
 - "AB234" is the project code associated with the data on the tape.
- When a tape is in the Released state this field will contain the tape "pool" that the tape is assigned to.

When in the 132 column mode a standard information line will be basically the same but with a line number added (where appropriate), the CRCC displayed, the tape status spelled out, the tape thickness shown, and the actual shelf location displayed.

Location codes

Which location code is which depends on the status of the tape:

Shipping: The first code will be the destination, the second code will be where the tape was shipped from.

Received: The first code will be where the tape was received, the second will be where the tape was last shipped from.

Unknown: The first code will be the location where the tape was tagged as being in an unknown state.

Released: The first code is where the tape is sitting, waiting to be shipped.

In most cases changing the status of a tape (by shipping it, or receiving it, etc.) only changes the information that is necessary. This means that things like shipping information will still show up when a tape is received, and so on.

The Main Menu

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The Main Menu is the top level menu. From here you may enter any of the sub-menus.

A. Shipping/Receiving

This area is used for generating lists of tapes to ship, entering information that identifies tapes that have been received, and checking on the status of shipments.

B. Reports

This area is where you may have the system generate various lists of information about the status of groups of tapes.

C. Group Reports

The reports in this area are some of the same reports that are in the Reports menu except that these functions produce information for "groups" of locations (VLBA, EVN, CORR... See "List of accepted group codes" in the Miscellaneous Menu). The default group that the menu will display information for is set by the default location code for the account you logged into (or entered when you started the program). If the program is started from an account that does not have access privileges the group will be set to "???". You will have to give the program a group code the first time that you enter the menu.

D. Tape/Shelf Control

Items in this area are used to handle a the "dirty little details" involved with managing the information in the database. Normally most of these functions will not be used if the "regular functions" (Make a shipment, Receive a shipment, etc.) are used. In fact using them can be hazardous since many of them bypass the normal checks.

E. Tape History

This area can be used to track the movement of individual tapes of the life of the tape in the tracking system.

F. Miscellaneous

Used to obtain data of a general nature and to set some program parameters.

The Shipping/Receiving Menu

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This menu is used to conduct all of the shipping and receiving functions.

A. Check on a shipment

This function will search the database for all tapes belonging to a shipment with a particular control number which have not been received. The "... " input may be used.

B. Check on shipments to

This allows you to check for all of the tapes that are in the process of being shipped to a particular location. The origin of the shipments may be selected. An "*" may be entered for the origin. This will cause the tapes from all origins to be listed.

C. Check on shipments from

This will show all of the tapes shipped from a location that have not yet been received at their destinations. The destination of the shipments may be selected. An "*" may be entered for the destination. This will cause the tapes to all destinations to be listed.

D. Check on all tapes in shipment

This will list all tapes with a Shipping status.

E. Make a shipment

This selection is used to enter a shipment of tapes into the system. Depending on your location this function will also generate shipping requests and shipping labels.

F. Add tapes to a shipment

Allows tapes to be added to a preexisting shipment using the control number.

G. Receive a shipment of tapes

This function allows a destination to acknowledge the receipt of a shipment of tapes by VSN.

H. Receive a shipment/check project

This function is the same as the one above except that the current project code for the tape is displayed and you are allowed to change it.

I. Receive a whole shipment

This function allows all of the tapes for a shipment to be received using the control number. Assigning of the tapes to the shelves (at the AOC) is not allowed so the function "Receive a shipment of tapes" above should be

used for receiving tapes at the AOC.

- J. Receive and release tapes to a pool
This function allows you to receive a shipment of tapes and then immediately (as you enter each one) release the tapes and assign them to a tape pool.
- K. Release some tapes
This allows the status of tapes to be changed to Released. Optionally the function can also remove the same tapes from the shelves (at the AOC). This function will also ask correlator facilities into which tape "pool" the tapes being released should be placed.
- L. Change control numbers
If at the time a tape shipment is entered the control number is not known, a "unique" number may be used (one is "made up" by the program using the date/time and your location) and then changed at a later time to the "real" control number using this function.
- M. Change a shipment origin/destination
This function allows either or both of the location codes for all of the tapes in a particular shipment to be changed.
- N. Recreate a shipping record
Recreates the display that is shown following "Make a shipment" and "Add tapes to a shipment" using the control number.
- O. Recreate a shipping request
Recreates the display that is generated following the shipping record when using "Make a shipment" or "Add tapes to a shipment". The request will only be honored if the program knows how to generate a shipping request for your location. The control number must be supplied.
- P. Generate shipping labels
Generates the shipping labels for whole projects, or for selected locations.

Reports Menu

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- A. All tapes at
This will list all of the tapes with the status of Received, Unknown, and Released at a particular location.
- B. Idle tapes at
This will list all of the tapes that have been in the state of Received or Unknown for more than a given period of days at a particular location. A report showing the tapes for all of the locations listed on the "Accepted locations list" (See Miscellaneous Menu items) can be obtained by entering an "*" for the location.
- C. Search for tapes by partial VSN
This function allows all of the tapes in the database to be searched looking for matches to a partial VSN. If you are looking for information on a tape with a VSN of "mpir01-something" you could enter "mpir" and all of the tapes beginning with "MPIR" would be displayed. The tape could also be searched for using the partial VSN "ir01". The whole VSN may also be entered when looking for a specific tape.
- D. List released tapes at
This function will generate a list of tapes that are in the Released state at a particular location (only the correlators may have released tapes).
- E. Check for lost tapes to
Will list the tapes that have been in the Shipping state to a particular location for more than a particular number of days.
- F. Check for lost tapes from
Will list the tapes that have been in the Shipping state from a particular location for more than a particular number of days.
- G. Check for lost tapes
Will list all of the tapes that have been in the Shipping state for more than a particular number of days.
- H. Search for tapes by project

This function allows you to search for tapes that are for a particular project. Partial matches with the given project code are attempted.

- I. Tape count summary for
This function lists the number of tapes Received, Shipped (to and from), Released, and in an Unknown state for a given location. A report showing tapes for all of the locations listed on the "Accepted locations list" (See Miscellaneous Menu items) can be obtained by entering an "*" for the location. Both the number of thick ("T") and thin ("t") tapes are listed. The location names will be listed when in the 132 column mode. For correlator facilities this function will also display the number of released tapes in each of the tape pool categories. If there are any tapes that are being shipped from a location, the date and time of the oldest shipment will be displayed in the "OldestShip" column.
- J. Shelf list
This will generate a list of all of the shelf locations that have tapes assigned to them (at the AOC). Optionally the list can be made to include empty shelf locations. Tapes that have a status of other than received will be indicated (see status states in the "Standard Information Line" section above).
- K. Shelf list with project codes
This function is the same as the one above except that it shows the project code assigned to each tape in parenthesis following the VSN.
- L. All tapes report
This function will list a Standard Information Line for ALL of the tapes (theoretically thousands!) in the database. This item will always pause each screen full!

Group Reports Menu

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Replace "???" with any of the group codes.

- A. All tapes at ??? locations
This will list all of the tapes with the status of Received, Unknown, and Released at all of the locations in the selected group.
- B. Idle tapes at ??? locations
This will list all of the tapes that have been in the state of Received, Unknown, or Released for more than a given period of days at all of the locations in the selected group.
- C. Check for lost tapes to ??? locations
Will list the tapes that have been in the Shipping state for more than a particular number of days to any of the locations in the selected group.
- D. Check for lost tapes from ??? locations
Will list the tapes that have been in the Shipping state for more than a particular number of days from any of the locations in the selected group.
- E. Search for tapes by project from ??? locations
This function allows you to search for tapes that are for a particular project from any of the locations in the selected group. Partial matches with the given project code are attempted.
- F. Tape count summary for ??? locations
Will list the number of tapes Received, Shipped (to and from), Released, and in an Unknown state at all of the locations in the selected group. Both the number of thick ("T") and thin ("t") tapes are listed. If there are any tapes that are being shipped from a location, the date and time of the oldest shipment will be displayed in the "OldestShip" column.
- G. Check on shipments to
- H. Check on shipments from
- I. Search for tapes by partial VSN
These functions are the same as the ones in the Shipping/Receiving and the Reports Menu. They are included here for convenience.
- J. Change current group code
This function allows you to switch to a different group.

Tape/Shelf Control Menu

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- A. Add new tapes to the system
Newly purchased (or discovered) tapes are entered into the system with this function. If the tape is already in the system a message will be displayed. In these cases the data for these tapes will still be updated.
- B. Change the status of some tapes
This can be used to change the status of a group of tapes perhaps from Received to Unknown. If the tapes are being released the program will prompt for the pool code (if you are a correlator account).
- C. Assign tapes to the shelves
This function is used to assign tapes to the shelves (at the AOC) that were not assigned at the time they were received.
- D. Remove tapes from the shelves
This function is used to remove tapes from the shelves (at the AOC) that were not removed when they were released. The status of the tapes after removal may be selected.
- E. Change the shelf location of some tapes
Used to move tapes around among the shelves (at the AOC).
- F. Check for shelf location occupation
This allows you to see if a tape is assigned to a particular shelf location (at the AOC).
- G. Search for tapes by partial VSN
This is the same as the item in the Reports Menu.
- H. Edit all data for a tape
This function will allow you to go back and "fix" any problem with the data for a particular tape. (All item double checks are bypassed when using this function -- so be careful).
- I. Change the project code of some tapes
Allows the project code to be changed for individual tapes.
- J. Change the pool code of some tapes
Allows the pool code to be changed for individual tapes.

Tape History

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- A. List all tapes received at
This function will list all of the tapes that have been received at a location between two dates.
- B. Count all tapes received at
This function will count all of the tapes that have been received at a location between two dates.
- C. Show the history of a tape
This function will list all of the places a particular tape has been received between two dates.

Miscellaneous Menu

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- A. List of authorized users
This will display the "access list" of user accounts that have permission to alter tape information in the database.
- B. List of accepted locations
The list of observatories and correlator facilities and their corresponding codes that will be recognized by the system.
- C. List of accepted shippers
The list of shippers and their corresponding codes that will be recognized by the system.
- D. List of shipping addresses

Displays a list of addresses for various facilities. This are used for shipping requests and shipping labels.

- E. List of accepted tape pool codes
Displays a list of the accepted tape pool codes that are used by the correlators when releasing tapes. The first column is the codes accepted by the program. The location codes in the brackets list which correlator(s) each pool code may be used by.
- F. List of accepted group codes
This function lists the accepted group codes and the location codes for the locations assigned to each group.
- G. Set the number of display lines
When the system is generating a long list of information it will pause when a certain number of items have been printed. The correct number of items is 20 for a standard 24 line terminal. This can be altered using this function to, for example, get the display to not stop scrolling. This could be done by setting the number of display lines to a large number.
- H. Set the display width
The program can be made to command a VT100 terminal to display information in either the 80 or 132 column mode. When in the 132 column mode the data in a Standard Information Line is expanded.
- I. Toggle the color mode
This function allows the color mode of the program to be turned on and off.
- J. Known bugs/Features being worked on
Displays a list of the known system bugs and new features that are being added to the system.
- K. Database statistics
This function displays the number of tapes in each status category and the total number of tapes in the database. It also counts the number of tapes assigned to the shelves at the AOC, the number of records in the database, and it displays the last time the database was reconciled with the "master" database (for remote database locations). Just for fun.
- L. Generate a CRCC
This function will generate the CRCC for a given tape VSN. This could be used to change data for a tape that is not in your hands.

Internal Checks

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AOC only:

You cannot remove a tape from the shelves unless it has been Released.
You cannot ship a tape that has not been removed from the shelves.

All correlators:

You cannot release tapes that are not "at" your correlator.

Everywhere:

If you attempt to receive a tape that the system does not think was sent to your location a message to that effect will be printed. At that point you will have the option of either going ahead with the operation or stopping and not marking the tape as Received. In either case the sender should be contacted to ensure that the tapes have arrived at the intended destination.

In addition, when tapes are shipped, the system checks to see that they have been received at the location doing the shipping.

Operation

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To start the program, log into an account on VLBACC or ZIA (at the AOC) or whichever local machine is running Track, and enter

track

The screen will clear and the Main Menu will appear. Starting the program from certain accounts will set a default location for that session. The default location is specified in the "access list" (See item "A" in the Miscellaneous

Menu). The default location can be altered when the program is started by entering

```
track <location>
```

where <location> is one of the location codes accepted by the system (See item "B" in the Miscellaneous Menu).

The program may be started in the 132 column mode by using the "-w" switch.

```
track -w
```

If your terminal supports the ANSI color standard escape sequences the program can be told this by starting it with

```
track -c
```

If you are running the program on a workstation and you have a bar code reader attached to one of the serial ports (ttya or b for example) you can tell the program to read the input for the VSNs from the serial port using

```
track -b/dev/ttya
```

The program will read input from the serial port or the keyboard (not both at the same time). This will require that you have a bar code that contains the word "QUIT" in order to get out of a VSN series. The prompt will be "Scan VSN:" when the program expects you to use the bar code reader, and "Enter VSN:" when it expects you to use the keyboard (entering VSNs with the bar code reader is not always appropriate).

Multiple command line switches may be used, but they must be kept separate.

```
track -c -w hay
```

is OK, but

```
track -cw hay
```

is not.

Procedure Notes

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Making shipments and adding tapes to shipments

To make the most efficient use of the program for making shipments and for adding tapes to shipments, the tapes should be grouped such that all of the tapes for a given project are entered together (if applicable). When the "Project [???]:" prompt appears the project code for the first batch of tapes should be entered. When all of the tapes for that project have been entered the word "PROJECT" may be entered at the "Enter VSN:" prompt. This triggers the program to ask for another project code. Enter the project code for the next batch of tapes and then continue entering the VSNs for the tapes belonging to that project, and so on.

Shelf Functions

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The Tape Management and Tracking System is set up to track the whereabouts of tapes in the VLBA Correlator Tape Library. When tapes are received, or placed on the shelves at the AOC (using the applicable menu functions) the question "Use which shelf selection mode" will come up. There are 4 possible modes.

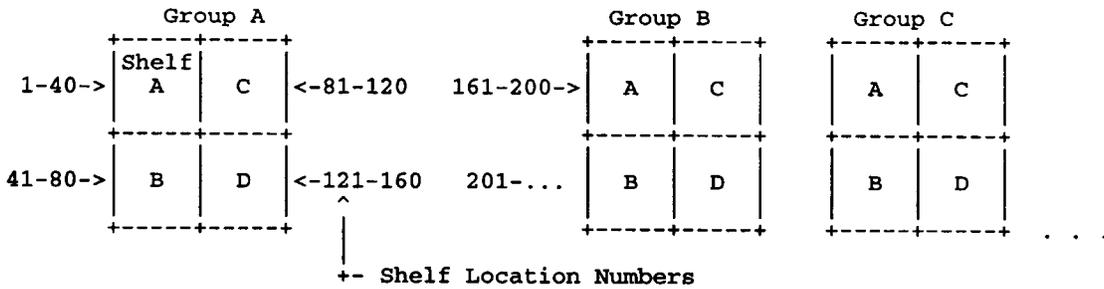
- AUTOMATIC - The shelves will be searched from shelf location #1 on. The tape will be assigned to the first empty shelf location found.
- FIRST - This mode allows you to select the first shelf location. The system then selects subsequent locations from that point on. Shelves that are occupied will be skipped over.
- MANUAL - This mode will prompt you to enter a shelf location for each tape.
- NONE - This will stop the system from making any shelf assignments.

The above words should be used to select the mode at the "Use which shelf selection mode" prompt. Only the first character of each word needs to be

entered.

Shelf Locations

The system is currently set up to keep the shelf locations of the tapes using the following scheme:



First the shelf locations are numbered from 1 through to the number of shelf locations (ultimately around 1000). Each shelf unit holds 40 tapes. Shelf units are arranged into groups of 4. Each group is given a letter designation (A-?). Each shelf unit in a group is given a letter designation (A-D). A shelf location (where individual tapes reside) is designated using the letter of the group, then the letter of the shelf unit, then the shelf location number as in AA34.

To clarify the nomenclature:

- Shelf location designation - this is the whole code: AA34
- Shelf location number - this would be the 34 part.
- Shelf location - this is used to refer collectively to the above two items. We have no "slots" or "bins" or "pookas". We have shelf locations.

When entering the shelf location into the system for shelf location BA161 you may enter: B - the first location in the B Group (which is shelf location number 161)
 BA - the first shelf location of the A Shelf Unit in the B Group
 161 - the shelf location number
 or BA161 - the whole shelf location designation

For shelf location 162 you would have to enter 162 or BA162.

