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# Andrew APC300 Utility Program User's Guide

*(AE03B-A0015)*

*Version 1.01*  
*Andrew Corporation*

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## 1 Overview

The APC300 Setup and Control program provides for complete setup and control of an Andrew APC300 antenna controller. The program is designed to work with APC300 software versions 2.8 or later; however, it will work with Version 2.7 except that disabling of Polarization is not supported. Versions 2.6 and older do not support the GMT date. Features of the program include the following:

1. APC300 setup wizard to define all parameters needed for efficient and accurate control of all Andrew antennas.
2. Up to four APC300 antenna controllers may be defined.
3. Real time display and updating of current APC300 status and the GMT date and time.
4. Uploading and downloading of satellite positions, setup parameters and SMARTRACK tables.
5. Five copies of uploaded satellite positions, setup parameters and SMARTRACK tables are kept for each APC300.
6. Five copies of operator defined satellite positions, setup parameters and SMARTRACK tables are kept for each APC300.
7. Satellite positions, setup parameters and SMARTRACK tables may be displayed and edited.
8. Satellite coordinate calculations using standard two-line orbital element sets or IESS-412 ephemeris parameters. Calculated coordinates may be downloaded to the APC300 SMARTRACK tables or viewed on the screen or printed.
9. Current status, satellite positions, setup parameters and SMARTRACK tables may be printed by operator request.
10. Operator logon security is provided to prevent unauthorized users from moving the antenna or downloading data to the APC300.
11. An online manual and context sensitive help is available.

The program allows for defining up to four APC300 antenna controllers; however, it will only communicate with one of them each time the program is executed. If more than one APC300 is defined, then the APC300 Selection dialog is activated when the program starts forcing the operator to select one APC300 controller for the current execution of the program. The satellite positions, setup parameters and SMARTRACK tables are maintained separately for each APC300. By default, the program uses the same serial port to communicate with all APC300s; however, it is possible to define multiple serial ports and assign each APC300 to a different port. The program will still only communicate with one APC300

per execution even if each APC300 is assigned to a different serial port. The program provides for saving up to five sets of uploaded satellite positions and setup parameters and SMARTRACK tables for each APC300 and provides for downloading any of them.

The program's default baud rate for communications with APC300s is 1200; however, if the APC300 does not respond at 1200, the program will try all valid baud rates in order to establish communications.

## 1.1 Startup Procedure

The APC300 Setup and Control program performs a fixed sequence of actions every time that it starts running. The startup sequence may be ended at any time by entry of **Ctrl-F8** or with the **Stop Startup Procedure** item in the Commands menu. The startup sequence is defined as follows:

1. The first time that the program is run, the dialog shown in figure 1 will be activated allowing for operator entry of the device name for the serial port used to communicate with the APC300 and for entry of a descriptive name for the antenna. The device name of the serial port and the antenna name may be changed later through the Configuration Property Sheet.

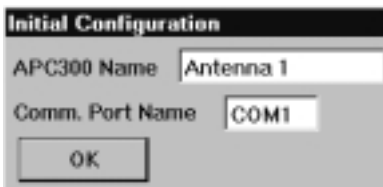


Figure 1.

2. If there are more than one APC300s defined, the dialog shown in figure 2 will be displayed. The program will only attempt to communicate with one APC300; therefore, this dialog lists the names of the APC300 Antennas present and forces the operator to select one before the program will continue. The satellite positions, setup parameters and SMARTRACK tables are maintained separately for each APC300.



Figure 2.

3. If the APC300 Setup Wizard has not been completed for the selected APC300, it will be automatically started and the rest of the startup procedure will be skipped. The APC300 Setup Wizard is described in another section. You may cancel the Setup Wizard before continuing to the next page if the APC300 has already been setup. If the Setup Wizard is canceled on the first page, then the normal startup procedure will continue.
4. The program attempts to establish communications with the APC300 by reading the GMT date and time. If the APC300 does not respond, the program will try all valid baud rates before ending the startup sequence and enabling all program functions.
5. If the GMT date and time are received, they are displayed in the upper left corner of the screen and the operator is asked to verify that they are correct.
6. If the GMT date or time are not correct click on the “No” box to activate the dialog shown in figure 3 to change the date or time. Set the correct date and time and download them to the APC300.



Figure 3.

7. After the GMT date and time is accepted or corrected, the satellite positions, setup parameters and SMARTRACK tables are uploaded and saved.
8. If no changes are detected in the satellite positions or setup parameters since the last time that they were uploaded, the startup sequence is ended.
9. If changes are detected in the satellite positions or setup parameters since the last time that they were uploaded, then all data is displayed on the screen with changed fields underlined and vertical scrolling enabled. An example is shown in figure 4. The operator is asked whether he wants to display only changed fields with current and previous values. If the operator clicks the “Yes” box then changed fields are displayed with current values on the left side and their previous values on the right side of the screen as shown in figure 5. The operator is then asked whether he wants to download the previous satellite positions and setup parameters to the APC300. If the answer is “Yes”, then the previous satellite positions and setup parameters are downloaded to the APC300 and the startup sequence is ended. If the answer is “No”, the start up procedure is ended.

# APC300 Utility Program

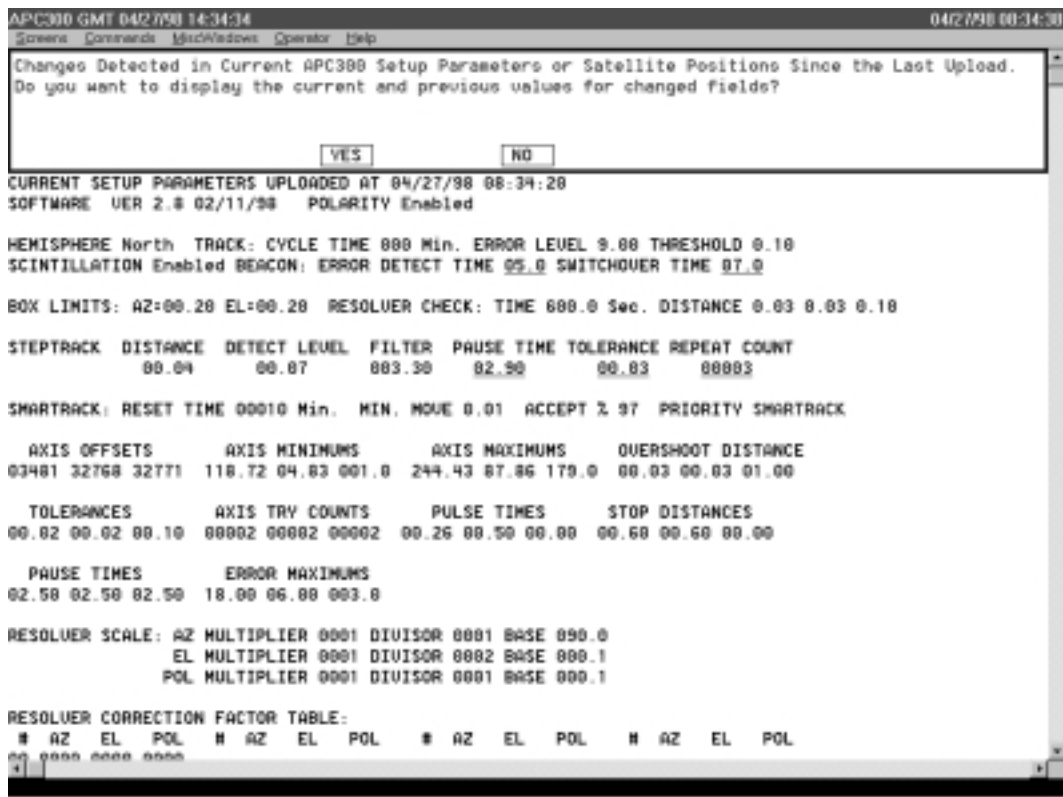


Figure 4.

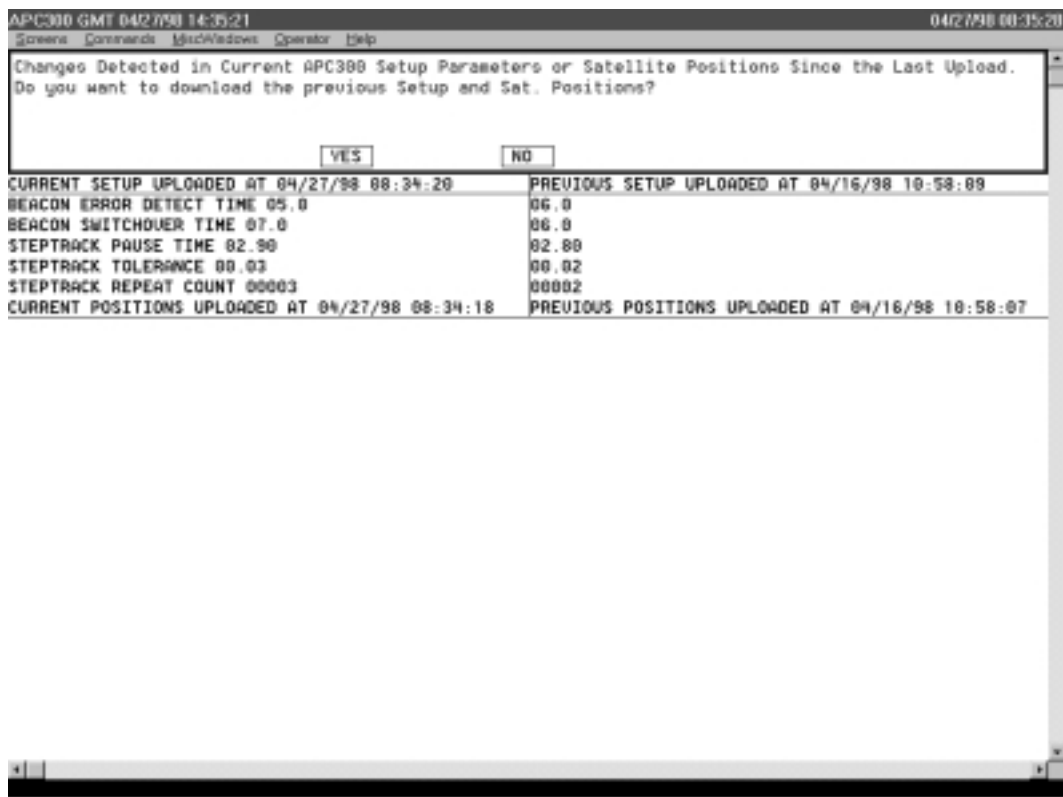




Figure 5.

## 1.2 Screen Layout

The top line of the screen is always reserved for the GMT date and time received from the APC300 and the current date and time set in the PC. Immediately below the date and time window is the Menu Bar. The bottom of the screen is reserved for displaying informational or warning messages. Error conditions will always be displayed in a message box which requires acknowledgment by clicking on the OK button or pressing the Enter key. The area of the screen between the menu bar at the top of the screen and the message window at the bottom of the screen is the "Screen" display area used for displaying data and for windows and dialog boxes. The right side of the screen contains a vertical scroll bar which will vertically scroll information on the screen when there is more information than can be displayed all at once. There is a horizontal scroll bar at the bottom of the screen area, which will scroll the screen horizontally if the data displayed is wider than the screen. The scroll bars are disabled for screens which cannot be scrolled. The operator interfaces with the system through the keyboard and the mouse.

## 1.3 Menu Bar

The Menu Bar is the second line from the top of the screen. It contains five drop down menus which are described below. The easiest way to access the menus is to click one of the menu titles with the mouse and then click on the desired menu item. The menus are also accessible with the keyboard. The **Alt** key will select the Menu Bar. Change the selected drop down menu with the **side arrow** keys and display the menu with the **Enter** key or simply enter the underlined letter. Move up and down the selected menu with the **up/down arrow** keys and select the highlighted menu entry with the **Enter** key or simply enter the underlined letter for the menu item. The Menu Bar is shown below. Most of the menu items have accelerator keys which provide for selection of the menu item without using the menu. Menu items which have accelerator keys have the keys identified on the right margin of the menu item. All of the accelerator keys are also defined in the section below on using the keyboard.



Figure 6.

The Screens menu is shown in figure 7. Items in the menu are as follows.

<b>Antenna Status</b>	Displays Current APC300 Status
<b>Satellite Positions</b>	Displays Satellite Lists Uploaded and Defined by the Operator
<b>Setup Parameters</b>	Displays Setup Parameters Uploaded and Defined by the Operator
<b>SMARTRACK Tables</b>	Displays SMARTRACK Tables Uploaded from the Controller and Defined by the Operator
<b>Reports</b>	Prints a report for the currently selected screen
<b>Operator ID</b>	Displays the Operator ID definition screen
<b>File Directory</b>	Displays the File Directory screen

- ACULOG Screen**            Displays the ACULOG Data Collection Plot screen
- ACULOG Replay Screen**    Display the ACULOG Data Replay screen
- Program Exit**            The Program Exit menu item will terminate the program.

<u>S</u> creens	<u>C</u> ommands	<u>M</u> isc'Windows
<u>A</u> ntenna Status		F2
<u>S</u> atellite Positions		F3
Setup <u>P</u> arameters		F4
SMARTRACK <u>I</u> ables		F5
<u>R</u> eports		F6
<u>O</u> perator ID		F7
<u>F</u> ile Directory		F8
AC <u>U</u> LOG Screen		F9
AC <u>U</u> LOG Replay Screen		F10
Program <u>E</u> xit		

Figure 7.

The Commands menu contains commands that you use to activate dialog boxes for sending commands to the APC300. The command dialog boxes can be activated by "Hot Key" and by selecting the device with the mouse. The Commands menu is shown in figure 8.

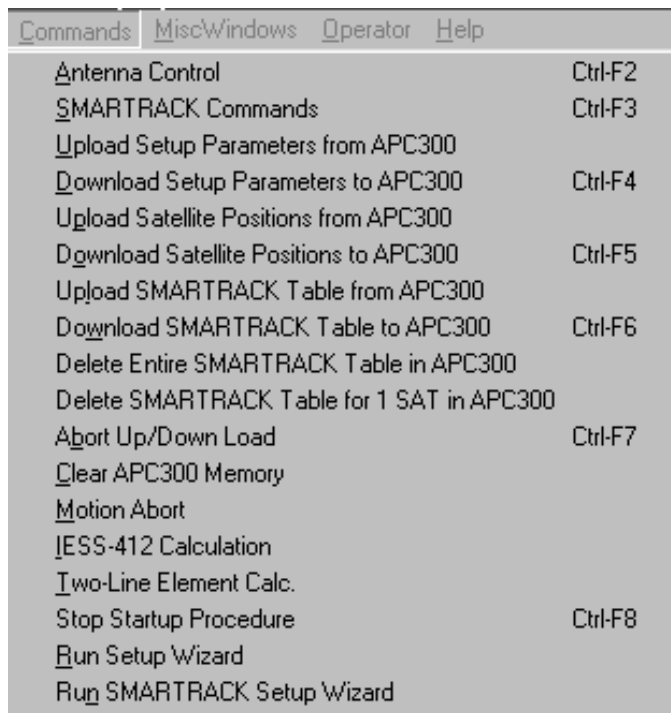


Figure 8.

The following commands appear in the Commands menu:

**Antenna Control** Activates dialog for antenna related commands other than SMARTRACK commands

**SMARTRACK Commands** Activates dialog for SMARTRACK related commands including setting the GMT date and time.

**Upload Setup Parameters** Initiates uploading of setup parameters. The new data is saved in the “Current Parameters” entry in the SETUP.DAT file and previously uploaded data is moved back one entry. The oldest set of uploaded data is discarded.

**Download Setup Parameters** Activates a dialog for choosing a set of uploaded or operator defined setup parameters to download to the APC300.

**Upload Satellite Positions** Initiates uploading of satellite positions. The new data is saved in the “Current Satellite Positions” entry in the SETUP.DAT file and previously uploaded data is moved back one entry. The oldest set of uploaded data is discarded.

**Download Satellite Positions** Activates a dialog for choosing a set of uploaded or operator defined satellite positions to download to the APC300.

**Upload SMARTRACK Table** Initiates uploading of SMARTRACK tables from the APC300. The new table

entries are saved in the “Current SMARTRACK Table” entry in the SMRTRK.DAT file and previously uploaded table entries are moved back one entry. The oldest set of uploaded table entries is discarded.

**Download SMARTRACK Table**

Activates a dialog for choosing a set of uploaded or operator entered SMARTRACK Table entries to download to the APC300.

**Delete Entire SMARTRACK Table in APC300**

Deletes the entire SMARTRACK table in the APC300 and then uploads the empty table and stores it in the Current Entry position of the SMARTRACK Table file.

**Delete SMARTRACK Table for 1 SAT in APC300**

Activate a dialog to delete all SMARTRACK table entries for one satellite. The remaining table entries are uploaded following the deletion.

**Abort Up/Down Load**

Abort upload or download of satellite positions and setup or SMARTRACK Table entries currently in progress.

**Clear APC300 Memory**

Sends a command to the APC300 which initializes satellite positions and setup parameters to default values and clears the SMARTRACK table. The operator must verify this request before it is actually sent to prevent it from being executed by accident.

**Motion Abort**

Sends a command to the APC300 to stop all axis motion.

**IESS-412 Calculation** Activates a dialog for calculation of INTELSAT satellite pointing angles.

**Two Line Element Calc.**

Activates a dialog for calculation of pointing angles for satellites using standard two-line orbital element sets and the NORAD SPD4 algorithm.

**Run Setup Wizard** Activates the APC300 Setup Parameter Definition wizard.

**Run SMARTRACK Setup Wizard**

Activates the APC300 SMARTRACK Parameter Setup wizard.

The MiscWindows menu contains commands that you use to activate windows to display information gathered or monitored by the system. These windows may be dynamically updated when information displayed is changed or updated. Some of these windows can be activated by Hot Key or in some cases by selecting the device with the mouse and clicking the right button. There are also some dialog windows for adding or changing system data. The MiscWindows menu is shown in figure 9.

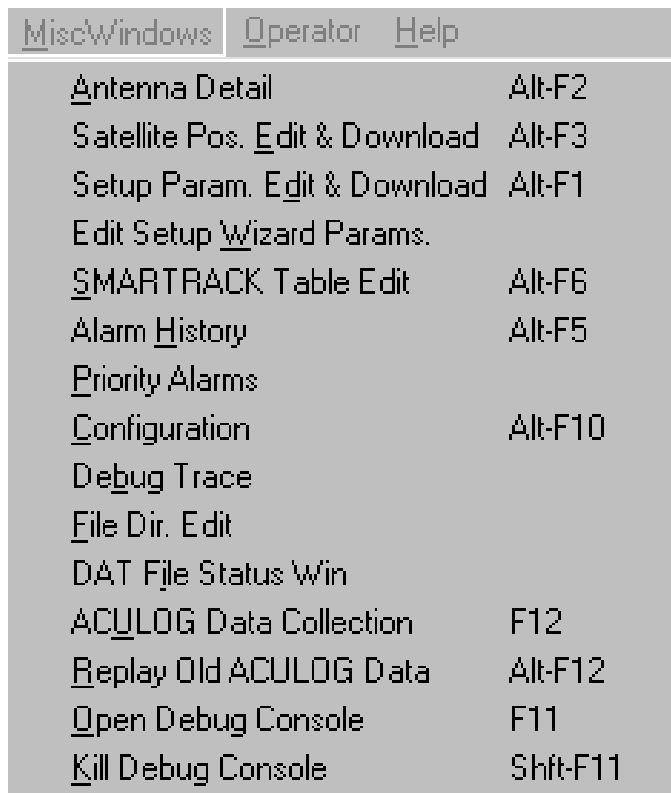


Figure 9.

The following commands appear in the MiscWindows menu:

**Antenna Detail** Activates a window to display antenna detail status.

**Satellite Pos Edit & Download**

Activates a dialog for editing antenna satellite positions and downloading them to the APC300

**Setup Param Edit & Download**

Activates a dialog for editing APC300 setup parameters and downloading them to the APC300

**SMARTRACK Table Edit**

Activates a dialog for editing SMARTRACK Table elements and Downloading them to the APC300.

**Alarm History** Activates a window to display the system alarm history

**Priority Alarms** Activates a window to display the priority alarm history

**Configuration** Activates the System Configuration Property Sheet

**Debug Trace** Activates a window to display debug trace information

**File Dir. Edit** Activates a dialog for editing file directory entries

**DAT File Status Win**

Activates a window to display information about files defined in the file directory

**ACULOG Data Collection**

Activates a dialog for controlling ACULOG satellite position.

**Replay Old ACULOG Data**

Activates a dialog for replaying previously collected ACULOG data from a file.

**Open Debug Console**

Activates a DOS window for display of communications debugging information

**Kill Debug Console**

Terminates the debug console window

The Operator menu contains commands that you use to log on, log off and activate the operator define dialog box. The Operator menu is shown in figure 10.

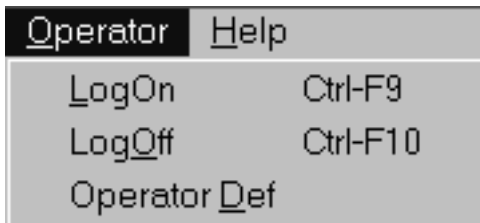


Figure 10.

The following commands appear in the Operator menu:

**LogOn** Activates a window for logging on to the system.

**LogOff** Logs Off the current operator.

**Operator Def** Activates a dialog for defining operators

### 1.4 Using the Keyboard

The easiest way to navigate through the system is with the mouse; however, most features of the system can be accessed through the keyboard. Keys which have special functions include the following:

**F1** Displays context sensitive help window.

**Alt** Activates the menu bar when pressed and released.

**Esc** Removes the currently selected window or dialog box.

**Tab** Changes the selected data entry control or button, etc in a dialog box moving in the forward direction.

**Shift-Tab** Changes the selected data entry control or button, etc in a dialog box moving in the backward direction.

**Enter** Activates a selected menu item or dialog box push button. It also completes entry into data entry fields and moves to the next field just like a Tab.

**F2** Displays the Antenna Status screen

**F3** Displays the Antenna Satellite Position screen

**F4** Displays the Antenna Setup Parameters screen

**F5** Displays the Antenna SMARTRACK Table screen

**F6** Prints a report if the current screen is not the Status, Devices or Graphic screen

**F7** Displays the Operator ID screen.

<b>F8</b>	Displays the File Directory screen.
<b>F9</b>	Displays the Aculog screen
<b>F10</b>	Displays the Aculog Replay screen
<b>F12</b>	Activates the Aculog Control Dialog
<b>Ctrl-F2</b>	Activates the Antenna command dialog box.
<b>Ctrl-F3</b>	Activates the Antenna SMARTRACK command dialog box.
<b>Ctrl-F4</b>	Activates the Setup Parameter Download dialog box.
<b>Ctrl-F5</b>	Activates the Satellite Position Download dialog box.
<b>Ctrl-F6</b>	Activates the SMARTRACK Table Download dialog box.
<b>Ctrl-F7</b>	Stops Uploading or Downloading of Satellite Positions and Setup Parameters or SMARTRACK Table Entries
<b>Ctrl-F8</b>	Stops the program startup procedure which automatically establishes communications with the APC300 and uploads all data when the program starts running.
<b>Ctrl-F9</b>	Activates the Operator LogOn dialog box.
<b>Ctrl-F10</b>	Logs off the current operator.
<b>Alt-F1</b>	Activates the Setup Parameter Edit and Download Dialog
<b>Alt-F2</b>	Activates the Antenna detail status window.
<b>Alt-F3</b>	Activates the Satellite Position Edit and Download Dialog
<b>Alt-F5</b>	Activates the Alarm History window.
<b>Alt-F6</b>	Activates the SMARTRACK Table Element Edit and Download Dialog.
<b>Alt-F10</b>	Activates the Configuration Property Sheet.
<b>Alt-F12</b>	Activates the Aculog Replay Control Dialog.

## 1.5 Using the Mouse

The mouse may be used to access the menus and to activate dialog boxes and detailed status windows. When the mouse pointer is moved around on the screen areas touched by the pointer, which may be selected to activate a dialog box or window, will be displayed in reverse video. When the APC300 position status line is selected on the Status screen, the APC300 command dialog may be activated by clicking the left mouse button and the detailed status window may be activated by clicking the right button. Dialog push buttons or check boxes are activated by clicking with the left button. The drop down menus are activated by holding down the left button and a menu item is selected by releasing the button.

## 1.6 Help Screens

The **F1** key may be activated at any time to display online help for the current context which may be a menu, dialog box or the main screen. In addition each dialog box has a help push button which will display the help window for the dialog. An example of a help window is shown in figure 11.

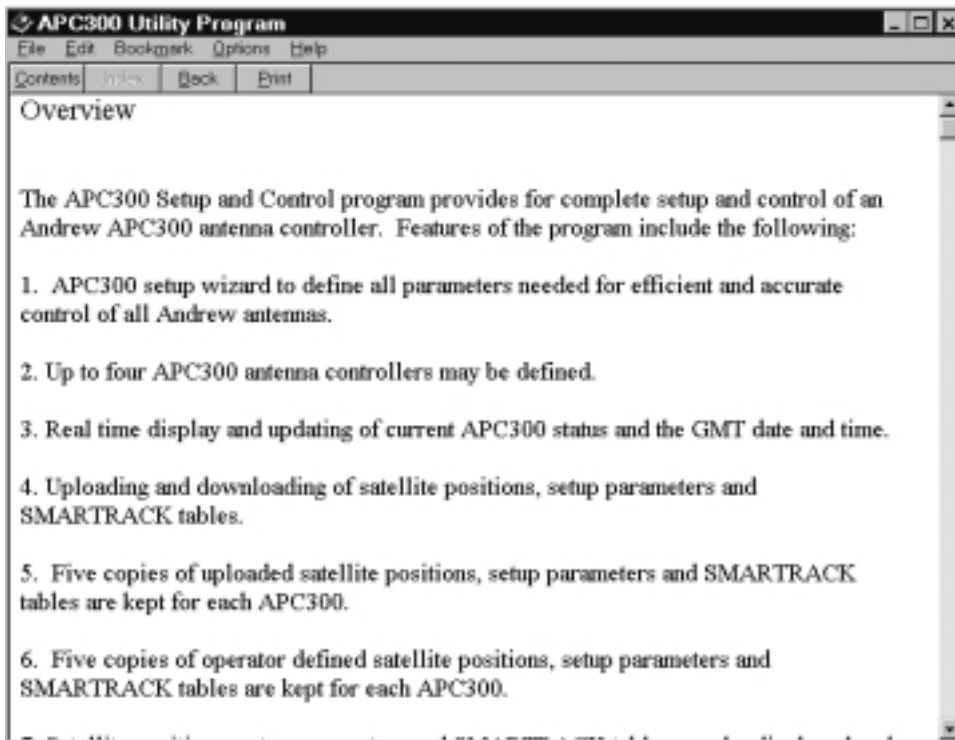


Figure 11.

## 2 APC300 Status Screen

Select the Screens menu and choose the Antenna Status menu item or enter **F2** to activate the Antenna Status screen. This screen is a tabular display of the current APC300 status. The Antenna Command dialog and detail status window may be activated by selecting text for the current satellite position with the mouse pointer and clicking the left or right mouse buttons respectively. The first line of the display contains the antenna name, the current satellite position and the current AZ, EL and POL angles. The second line contains the position error for each axis if the antenna is currently on a satellite.

An example of the screen is shown in figure 12. Other fields are as follows:

- |                             |   |
|-----------------------------|---|
| <b>Local/Remote Status</b>  | State of the Local/Remote switch on the APC300 front panel.   |
| <b>Local Jog Mode</b>       | Indicates whether the APC300 is in local jog mode.  |
| <b>Travel Limit/Count</b>   | A fault indicates that one or more axes have exceeded the software limit. The count indicates the number of times that this fault has occurred since the counts were cleared.   |
| <b>Position Error/Count</b> | A fault indicates that the current coordinates are not within tolerance limits of the coordinates for the current satellite position. The count indicates the number of times that this fault has occurred since the counts were cleared. |



<b>Lo Tracking Signal</b>	A fault indicates that the beacon receiver DC signal is below a preset error level. No steptracking occurs when this fault is present.
<b>Summary Fault/Count</b>	A fault indicates that one or more of the following conditions exist. The count indicates the number of times that this fault has occurred since the counts were cleared. Battery Backed RAM Data Invalid. Resolver is immobile. RDC Hardware failure. Drive Hardware failure.
<b>SMARTRACK</b>	Indicates whether SMARTRACK is enabled if the current satellite is one through ten.
<b>PRIORITY</b>	Indicates whether SMARTRACKing or Steptracking has priority.
<b>Box Limit</b>	Indicates whether Box Limits is enabled or disabled.
<b>Steptrack</b>	Indicates whether steptracking is enabled or disabled. If a steptrack cycle is currently in progress, then <b>“/INP”</b> will be displayed.
<b>Steptrack Beacon</b>	Indicates whether the steptrack beacon receiver is primary, secondary or auto-primary or auto-secondary.
<b>Beacon Signal</b>	Indicates the current beacon receiver(P or S) and the current signal level in volts.

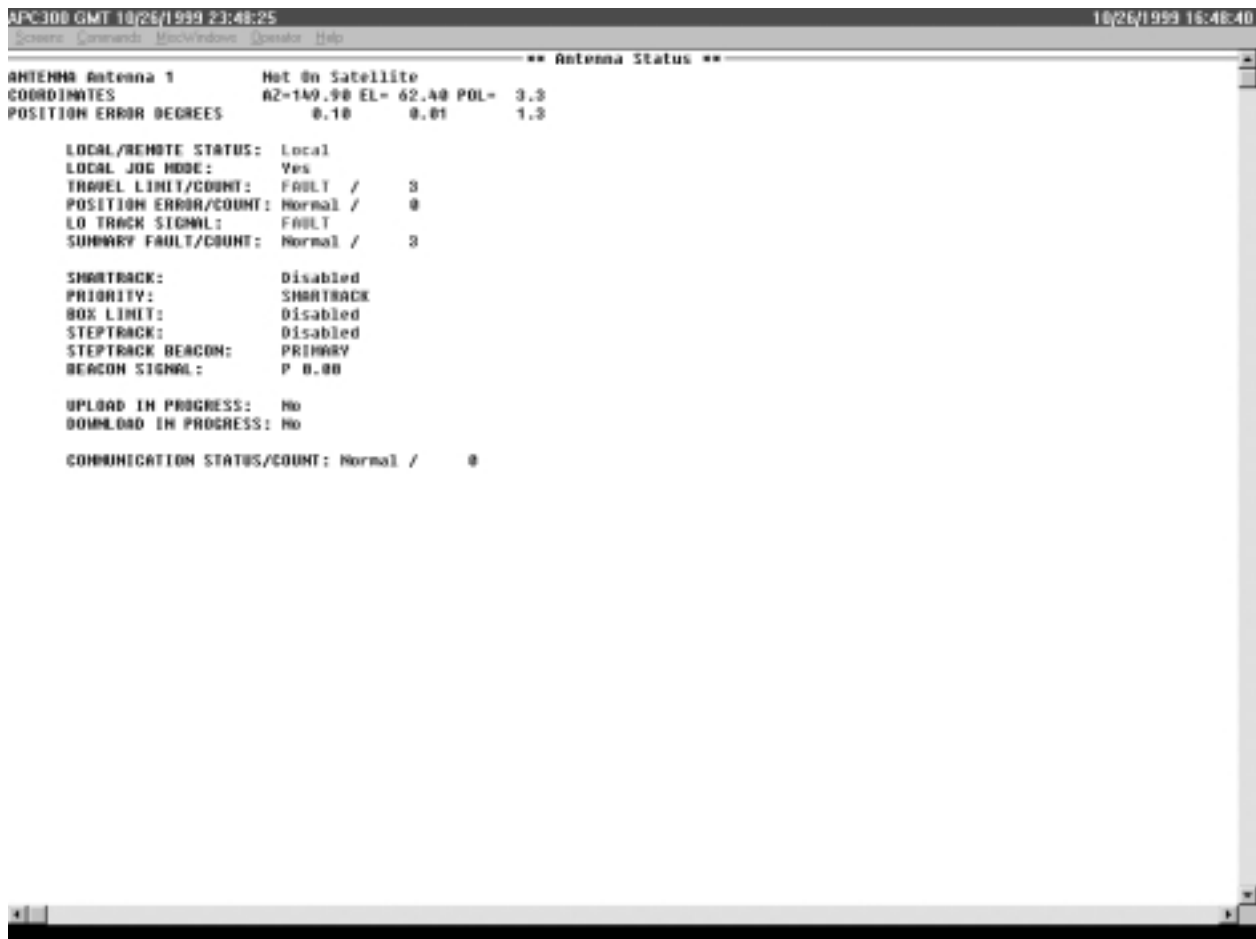


Figure 12.

**Upload In Progress** Indicates whether a Satellite Position and Setup Parameter or SMARTRACK Table upload is currently in progress.

**Download In Progress** Indicates whether a Satellite Position and Setup Parameter or SMARTRACK Table download is currently in progress.

**Communication Status/Count** Indicates whether the software is currently able to communicate with the APC300. The count indicates the number of times that this fault has occurred since the counts were cleared.

## 2.1 APC300 Detailed Status Window

The detailed status window contains the same information as the Antenna Status screen. It is activated from the MiscWindows menu or with **Alt-F2**. The window is included to allow display of current status while screens other than the Antenna Status screen are selected. An example of the window is shown in figure 13.

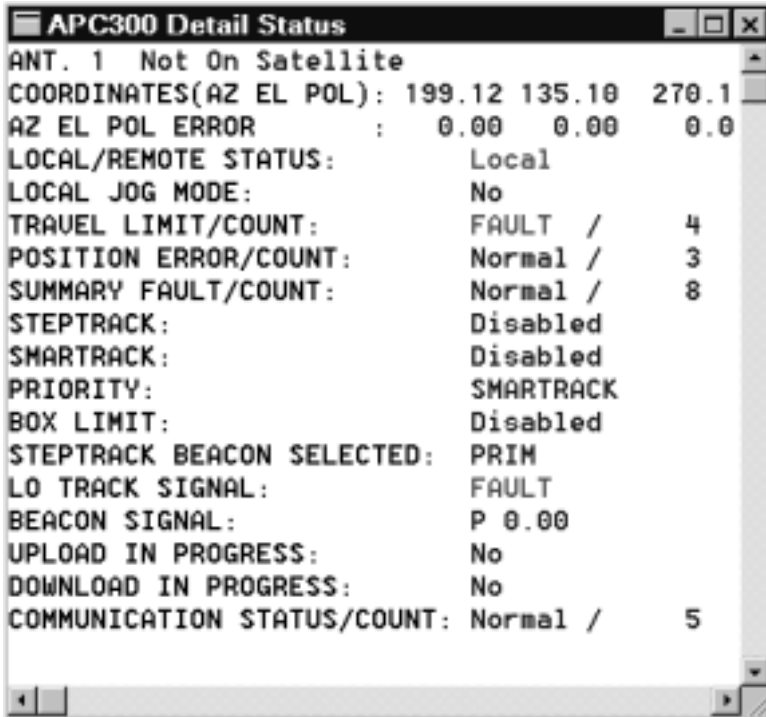


Figure 13.

### 3 APC300 Command Dialogs

#### 3.1 APC300 Antenna Control Dialog

You can activate the APC300 Antenna Control dialog with the Antenna Control menu item in the Commands menu, with the **Ctrl-F2** Hot Key or by selecting the antenna position line on the APC300 Status screen and clicking the left mouse button.

The APC300 Antenna Control dialog window provides for moving the antenna to a satellite, jogging the antenna or moving it to a set of coordinates. An example of the dialog is shown in figure 14.

The commands to move the antenna are defined as follows:

- Move to Satellite**     Select the desired satellite from the list box with the arrow keys or the mouse and then select this button to send the command to the antenna controller.
- Move to Coord**        Enter the desired coordinates for Az, El and Pol and then select this button to send a command to the antenna controller. The current coordinates are displayed when the dialog is activated.
- Jog Ant**                Select one of the jog buttons to jog the antenna in the direction labeled on the button. The amount that the antenna is moved in degrees is determined by jog parameters defined in the Antenna page of the System Configuration Property Sheet.

The **Beacon Rcvr Select** box contains push buttons for selecting the Primary beacon receiver, Secondary beacon receiver or setting the Auto mode which allows the APC300 to automatically switch between the Primary and Secondary beacon receiver.

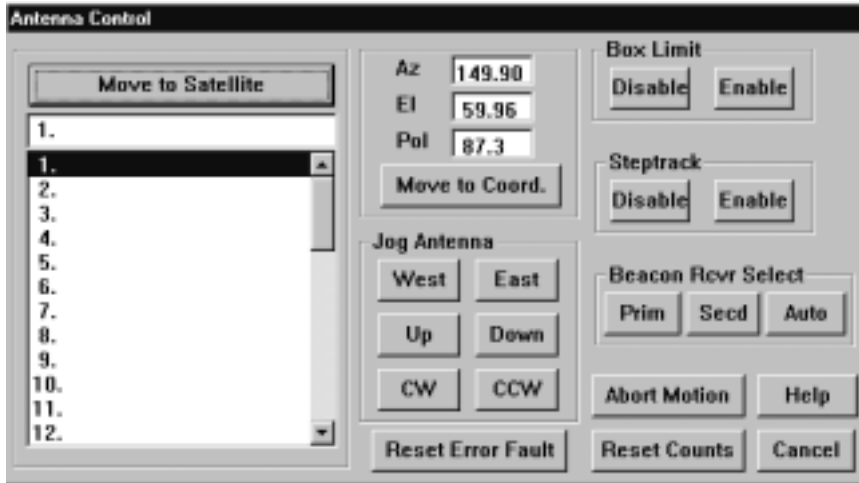


Figure 14.

### 3.2 SMARTRACK Command Dialog

This dialog window provides for sending commands related to the APC300's SMARTRACK features. It is activated from the Commands menu or with **Ctrl-F3**. An example of the dialog is shown in figure 15.

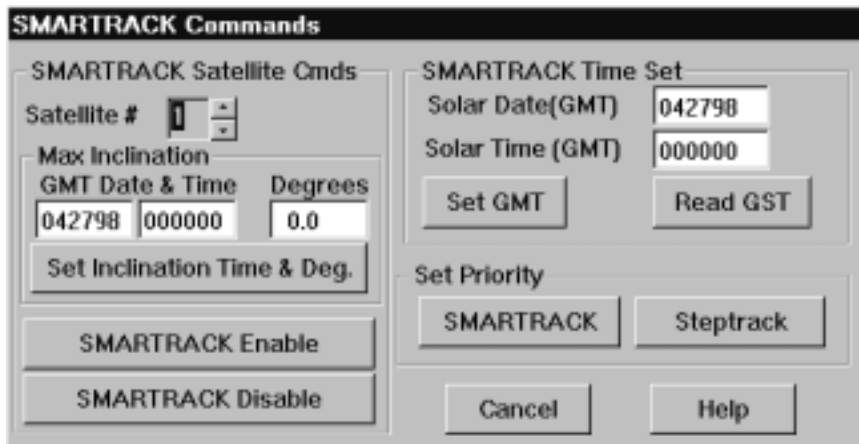


Figure 15.

Fields in the window are defined as follows:

#### SMARTRACK Satellite Cmds

This box contains SMARTRACK commands for the selected satellite number. Controls in this box include the following:

**Satellite #** Valid satellite numbers for SMARTRACK commands are 1 through 10. The commands activated by the push buttons use the selected satellite number.

**Max Inclination Time**

This is the GMT date and time for maximum inclination for the satellite. It must be entered in the form mmddy for the date and hhmss for the time. Trailing zeros may be left off of the time.

**Max Inclination Deg**

This is the maximum inclination in degrees which corresponds to the maximum inclination time. It should be entered in tenths of degrees.

**Set Inclination Time and Deg**

This push button sends a command to set the maximum inclination time and degrees, which must be entered in the fields above, for the selected satellite.

**SMARTRACK Enable**

This push button sends a command to enable SMARTRACK for the selected satellite.

**SMARTRACK Disable**

This push button sends a command to disable SMARTRACK for the selected satellite. If the APC300 is SMARTRACKing on a satellite, then SMARTRACK must be disabled before the antenna can be moved to another satellite or to a set of coordinates.

**SMARTRACK Time Set**

This box contains commands to set the Solar(GMT) date and time in the APC300 and to read and display the current times. The date must be entered in the form mmddy and the time in the form hhmss. This feature is not supported in APC300 software version 2.6 and older.

**Set Priority** This box contains push buttons to select the current priority of SMARTRACK or Steptrack.

## 4 Satellite Positions Screen

Select the Screens menu and choose the Satellite Positions item or enter **F3** to activate the Antenna Satellite Positions screen. The antenna positions may be printed when this screen is displayed by activating **F6** or by selecting Reports from the Screens menu.

There are five sets of uploaded satellite positions and five sets of operator defined satellite positions. The uploaded satellite position sets contain the most recent or "Current" satellite positions and the four

previously uploaded satellite positions. When an upload is performed, the satellite positions are stored in the “Current Positions” entry. Positions previously in the “Current” entry and previous entries are moved back and the oldest entry is discarded. Any of the ten sets of satellite positions can be downloaded. Satellite positions are stored in the APCPOS.DAT file. An example of the screen is shown in figure 16.

NOTE: When this program is started it automatically uploads satellite positions storing them as defined above.

** Satellite Positions (C-Display changes)**						
PREVIOUS POSITIONS # 2		UPLOADED AT 04/16/98 10:51:22			MAX INCLINATION	
SATELLITE NAME & LONGITUDE	AZ	EL	POL	SMRTRACK	GMT DATE & TIME	DEGREES
1 EUTELSAT 2F1 / HOT.	163.48	29.78	63.8	Disabled	04/27/98 09:39:07	000.0
2 EUTELSAT 2F2	167.20	30.29	63.8	Disabled	04/27/98 09:39:07	000.0
3 EUTELSAT 2F3	159.88	29.18	63.8	Disabled	04/27/98 09:39:07	000.0
4 EUTELSAT 2F4	178.93	30.57	63.8	Disabled	04/27/98 09:39:07	000.0
5 E1F5	153.54	26.74	61.2	Enabled	04/27/98 09:39:07	000.0
6 ASTRA	155.98	28.55	63.8	Disabled	04/27/98 09:39:07	000.0
7 (Free)	0.00	0.00	0.0	Disabled	04/27/98 09:39:07	000.0
8 TURKSAT 1C	138.98	19.18	133.0	Disabled	04/27/98 09:39:07	000.0
9 GALILEO 2	137.18	22.20	118.0	Disabled	04/27/98 09:39:07	000.0
10 TURKSAT 1B	142.18	24.18	108.0	Enabled	04/27/98 16:35:32	018.0
11 ARABSAT 2B	142.98	24.50	98.0			
12 DFS 2	145.18	25.20	63.8			
13 ARABSAT 2A	148.08	26.88	63.8			
14 EUTELSAT 1F4	148.58	26.38	63.8			
15 DFS 3	151.15	27.86	63.8			
16 TELE-X	173.58	30.95	95.0			
17 TELECOM 2C	176.08	30.98	47.0			
18 TU SAT 2	188.58	31.88	63.8			
19 THOR	188.98	31.88	63.8			
20 INTELSAT 707	181.18	31.88	63.8			
21 AMOS 1	184.84	30.68	95.0			
22 TELECOM 2D/2B	186.38	30.57	63.8			
23 TELECOM 2A	189.98	30.68	63.8			
24 HORIZONT 26	193.98	30.18	63.8			
25 EXPRESS 1	197.78	29.68	63.8			
26 INTELSAT 705	202.48	28.78	63.8			
27 INTELSAT 515	206.68	27.55	87.0			
28 INTELSAT K	206.58	27.59	91.2			
29 INTELSAT 605	218.18	26.78	98.0			
30 INTELSAT 601	213.58	25.78	98.0			
31 HISPASAT	216.32	24.71	98.0			

Figure 16.

If satellite positions have been uploaded from the controller or defined by the operator, they will be displayed on the screen. The **Up and Down Arrow** keys or **PageUp** or **PageDn** will scroll the antenna positions. They may also be scrolled with the mouse using the vertical scroll bar. The horizontal scroll bar or the **Left or Right Arrow** keys will change the set of satellite positions displayed. For the uploaded entries, the date and time that the positions were uploaded will be displayed at the top of the screen. For operator defined entries the entry number and name given for the set of positions will be displayed.

When uploaded satellite positions are displayed, information that changed from the previous upload is underlined. Entry of the ‘C’ key will change the display to show only fields that have changed with the

previous values on the right side of the screen. An example of this screen is shown in figure 17.

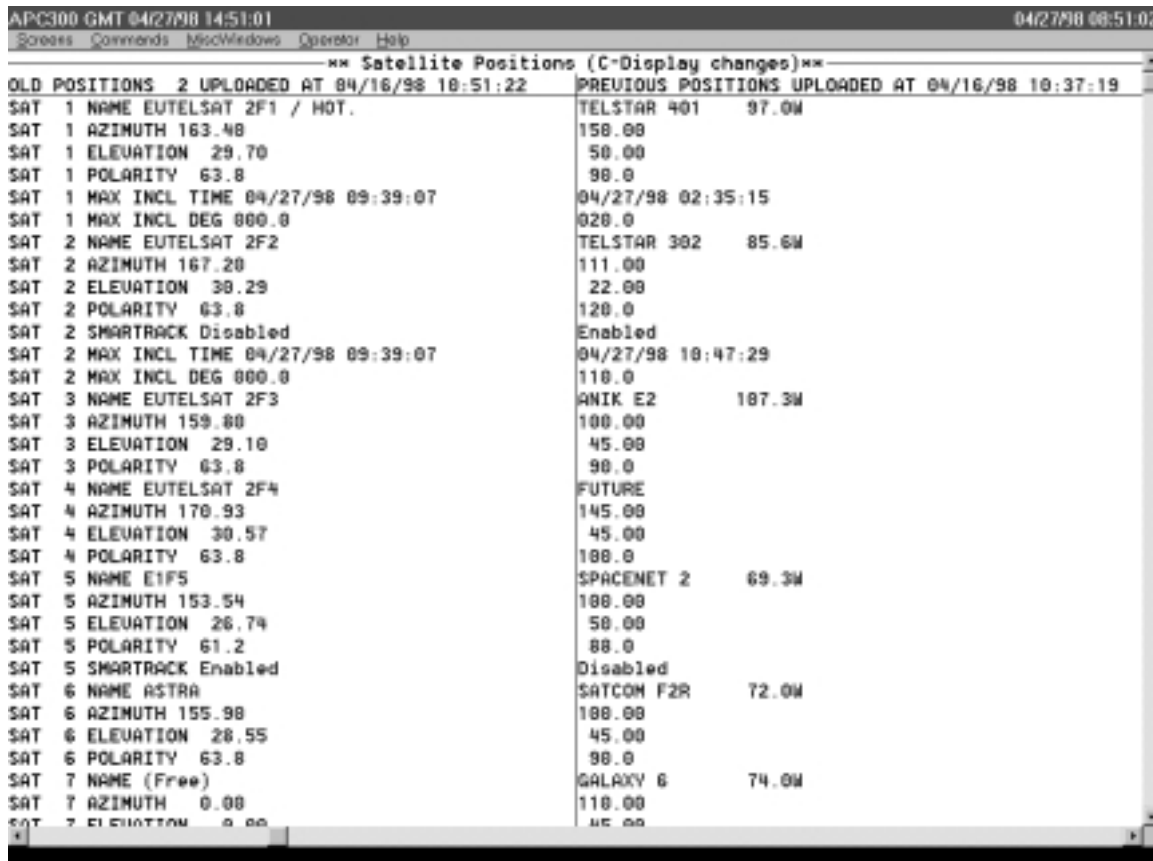


Figure 17.

#### 4.1 Satellite Position Editing Property Sheet

This property sheet allows the operator to change satellite positions which have been uploaded from the APC300 or to add or edit operator defined satellite positions. After the positions have been edited, they may be downloaded to the APC300. Changes to uploaded positions are not saved in the satellite positions file. The dialog cannot be activated unless the Satellite Position screen is selected. There is one page in the property sheet for each satellite position. An example of the property sheet for uploaded satellite positions is shown in figure 18 and an example for operator defined satellite positions is shown in figure 19.

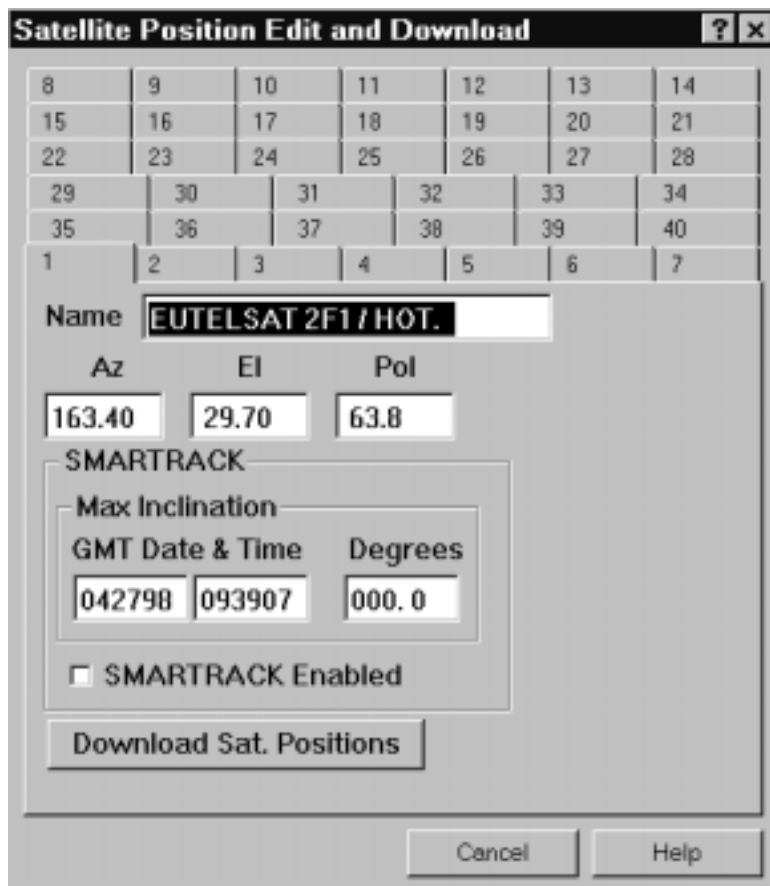


Figure 18.

Fields in each page are defined as follows:

**Name**            The name is 20 characters long and it is only used to identify the satellite on the APC300 front panel and in other windows in this program. The longitude may be included with the name.

**Az, El, Pol**        These fields are the coordinates of the satellite. Normally these fields are set through the APC300 front panel; however, they can be modified here if necessary.

**SMARTRACK**

This box is active for satellite positions one through 10. It contains fields for the Maximum Inclination GMT date and time and the degrees. There is also a check box to enable SMARTRACKing for the satellite.

**Download Sat. Positions**

This button is for downloading all forty satellite positions from the property sheet, which means that any changes that have been made will be downloaded.



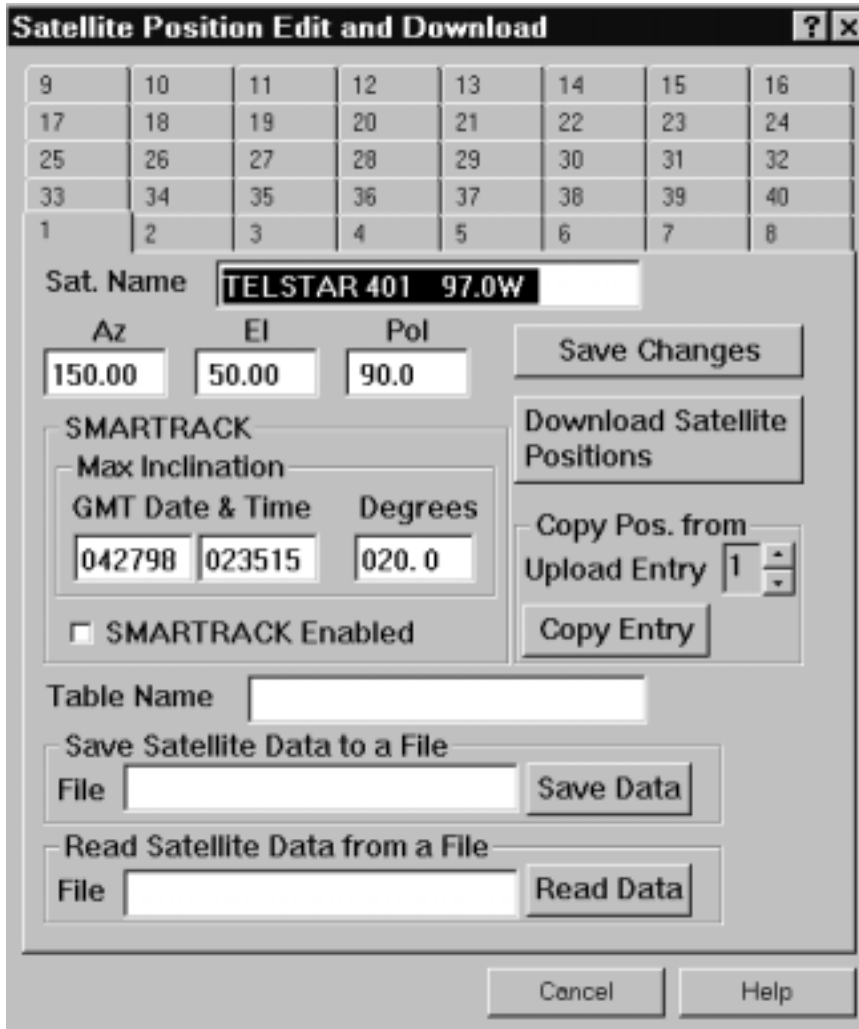


Figure 19.

**Save Changes**

This push button is used to save changes to all of the satellite positions in the APCPOS.DAT file. This button only appears when an operator defined satellite position entry is displayed on the screen.

**Copy Pos. From**

This box provides for loading a set of uploaded satellite positions into the property sheet so that they can be saved in the operator defined satellite entry displayed on the screen.

**Table Name** This fields is used to give the set of operator defined satellite positions an identifying name.

**Save Satellite Data to a File**

This box is for copying the satellite positions from the property sheet to a file named in the **File** field. The file can be read into the property sheet from the **Read Satellite Data**

from a **File** box.

### Read Satellite Data from a File

This box is for loading the satellite positions into the property sheet from a file named in the **File** field. The file must have been created by the **Save Satellite Data to a File** box.

## 4.2 Satellite Position Download Dialog

This dialog is activated from the Commands menu or with **Ctrl-F5**. It displays the date and time when each satellite positions entry was uploaded or the name for operator defined satellite positions. One of the entries must be selected and then the **Download Satellite Positions** button must be activated to start the download. An example of the dialog is shown in figure 20.

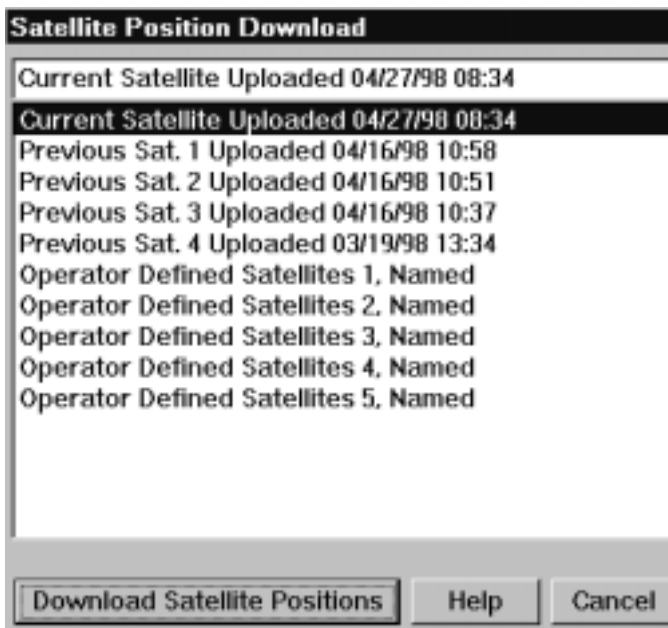


Figure 20.

## 5 Setup Parameters Screen

Select the Screens menu and choose the Setup Parameters item or enter **F4** to activate the Antenna Setup Parameters screen. The antenna setup data may be printed when this screen is displayed by activating **F6** or by selecting Reports from the Screens menu.

There are five sets of uploaded setup parameters and five sets of operator defined setup parameters. The uploaded setup parameters contain the most recent or "Current" setup parameters and the four previously uploaded setup parameters. When an upload is performed, the setup parameters are stored in the "Current Positions" entry. Parameters previously in the "Current" entry and previous entries are moved back and the oldest entry is discarded. Any of the ten sets of setup parameters can be downloaded. Setup parameters are stored in the SETUP.DAT file. An example of the screen is shown in figure 21.

## APC300 Utility Program

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NOTE: When this program is started it automatically uploads setup parameters storing them as defined above.

```
APC300 GMT 04/27/98 14:36:50 04/27/98 08:36:51
Screens Commands MiscWindows Operator Help
** APC300 Setup Parameters (C-Display changes)**
CURRENT SETUP PARAMETERS UPLOADED AT 04/27/98 08:34:20
SOFTWARE VER 2.8 02/11/98 POLARITY Enabled

HEMISPHERE North TRACK: CYCLE TIME 000 Min. ERROR LEVEL 9.00 THRESHOLD 0.10
SCINTILLATION Enabled BEACON: ERROR DETECT TIME 05.0 SWITCHOVER TIME 07.0

BOX LIMITS: AZ=00.20 EL=00.20 RESOLVER CHECK: TIME 600.0 Sec. DISTANCE 0.03 0.03 0.10

STEPTRACK DISTANCE DETECT LEVEL FILTER PAUSE TIME TOLERANCE REPEAT COUNT
00.04 00.07 003.30 02.90 00.03 00003

SMARTACK: RESET TIME 00010 Min. MIN. MOVE 0.01 ACCEPT % 97 PRIORITY SMARTACK

  AXIS OFFSETS      AXIS MINIMUMS      AXIS MAXIMUMS      OVERSHOOT DISTANCE
03481 32768 32771  118.72 04.83 001.0  244.43 87.86 179.0  00.03 00.03 01.00

  TOLERANCES      AXIS TRY COUNTS      PULSE TIMES      STOP DISTANCES
00.02 00.02 00.10  00002 00002 00002  00.26 00.50 00.00  00.60 00.60 00.00

  PAUSE TIMES      ERROR MAXIMUMS
02.50 02.50 02.50  18.00 06.00 003.0

RESOLVER SCALE: AZ MULTIPLIER 0001 DIVISOR 0001 BASE 000.0
                EL MULTIPLIER 0001 DIVISOR 0002 BASE 000.1
                POL MULTIPLIER 0001 DIVISOR 0001 BASE 000.1

RESOLVER CORRECTION FACTOR TABLE:
# AZ EL POL # AZ EL POL # AZ EL POL # AZ EL POL
00 0000 0000 0000
```

Figure 21.

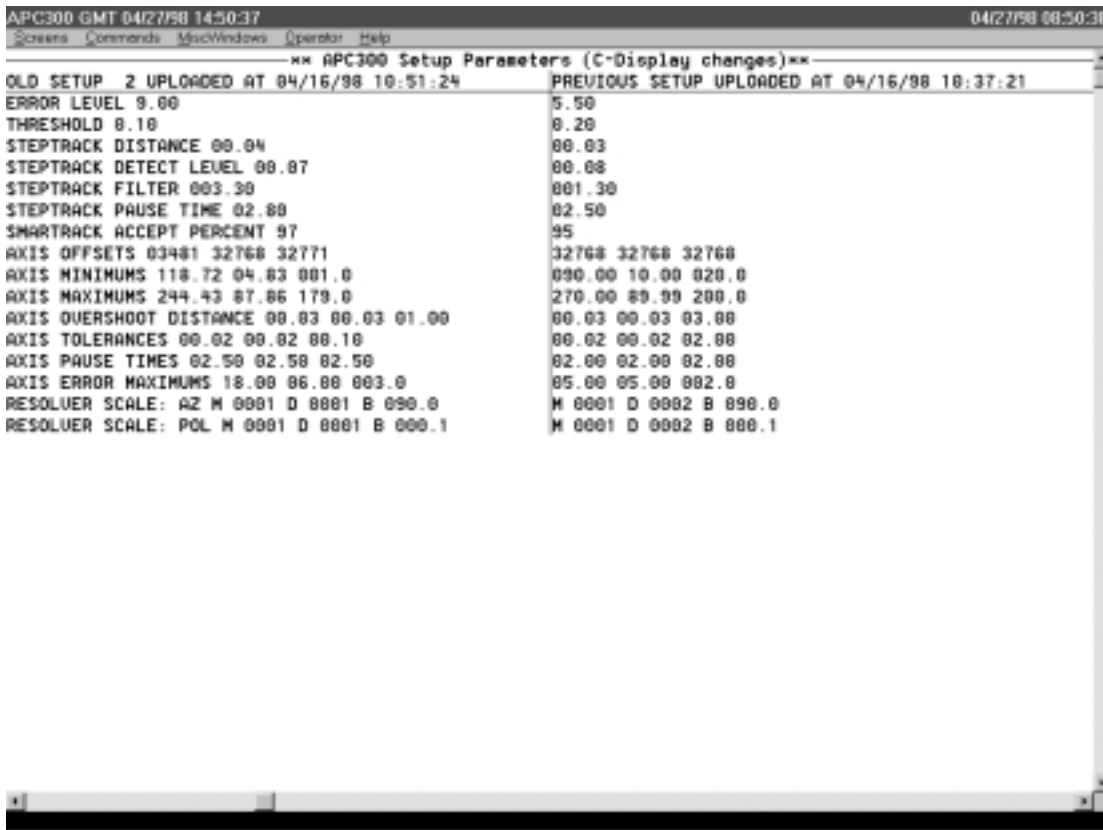


Figure 22.

If setup parameters have been uploaded from the controller or defined by the operator, they will be displayed on the screen. The **Up and Down Arrow** keys or **PageUp** or **PageDn** will scroll the setup parameters if they will not fit on the screen. They may also be scrolled with the mouse using the vertical scroll bar. The horizontal scroll bar or the **Left or Right Arrow** keys will change the set of setup parameters displayed. For the uploaded entries, the date and time that the parameters were uploaded will be displayed at the top of the screen. For operator defined entries the entry number and name given for the set of parameters will be displayed.

When uploaded setup parameters are displayed, information that changed from the previous upload is underlined. Entry of the 'C' key will change the display to show only fields that have changed with the previous values on the right side of the screen. An example of this screen is shown in figure 22.

### 5.1 Setup Parameters Property Sheet Page 1

This property sheet allows the operator to change setup parameters which have been uploaded from the APC300 or entered by the operator. After the parameters have been edited, they may be downloaded to the APC300. Changes to uploaded parameters are not saved in the setup data file. The dialog cannot be activated unless the Setup Parameter screen is selected. An example of the property sheet page for uploaded setup parameters is shown in figure 23 and an example for operator defined parameters is shown in figure 24.

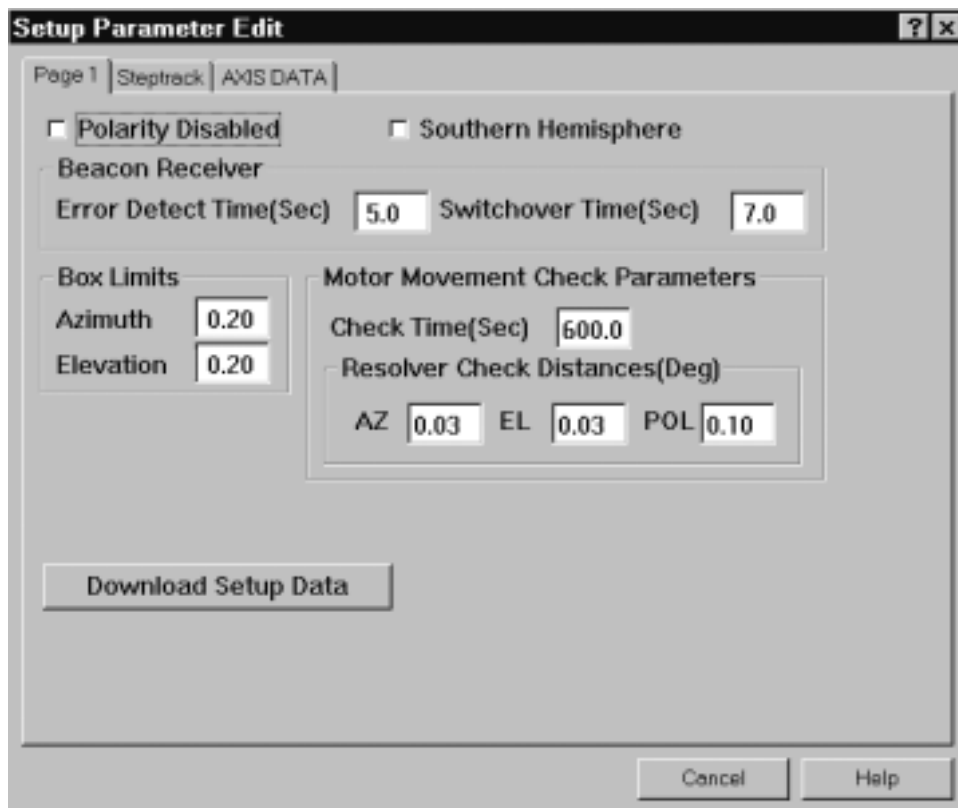


Figure 23.

Fields in this page are defined as follows:

**Polarity Disabled** This check box indicates that polarity is fixed and not controlled or monitored by the APC300. If polarity is disabled, all polarity related parameters are ignored by the controller.

**Southern Hemisphere** This check box indicates that the antenna is located in the southern hemisphere. If not checked, the northern hemisphere is assumed.

**Beacon Receiver Error Detect Time** This time in tenths of seconds defines the delay time increment after the beacon receiver is switched to the alternate. It is called BEDLY from the front panel.

**Beacon Receiver Switchover Time** This field defines the delay in tenths of seconds that the APC300 waits after detecting a low signal condition before switching to the alternate beacon. It is called BS DLY from the front panel.

**Box Limits** Sets change limits for Az and El when the box limit option is enabled. This feature prevents satellite signals from being lost due to equipment or operator error.

Status display indicates “BOXLIM” and summary alarm is activated when limits are exceeded.

### Motor Movement Check Parameters

**Check Time** This is the time limit in tenths of seconds for detecting axis movement failure. If an axis fails to move by an amount greater than the resolver check distance for the time given by this field, then an axis “Resolver Immobile” fault is set and all axis movement is stopped. This is known as the MINSPD check time from the front panel.

### Resolver Check Distance

These fields are the minimum movements for each axis in degrees required to prevent “Resolver Immobile” faults. They are known as the MINSPD check distances from the front panel.

### Download Setup Data

This button is for downloading all setup parameters from the property sheet, which means that any changes that have been made will be downloaded.

### Save Changes

This push button is used to save changes to all setup parameters in the SETUP.DAT file. This button only appears when an operator defined setup parameters entry is displayed on the screen.

### Copy Pos. From

This box provides for loading a set of setup parameters into the property sheet so that they can be saved in the operator defined parameters entry displayed on the screen.

### Table Name

This field is used to give the set of operator defined setup parameters an identifying name.

### Save Setup Data to a File

This box is for copying the setup parameters from the property sheet to a file named in the **File** field. The file can be read into the property sheet from the **Read Setup Data from a File** box.

### Read Setup Data from a File

This box is for loading the setup parameters into the property sheet from a file named in the **File** field. The file must have been created by the **Save Setup Data to a File** box.

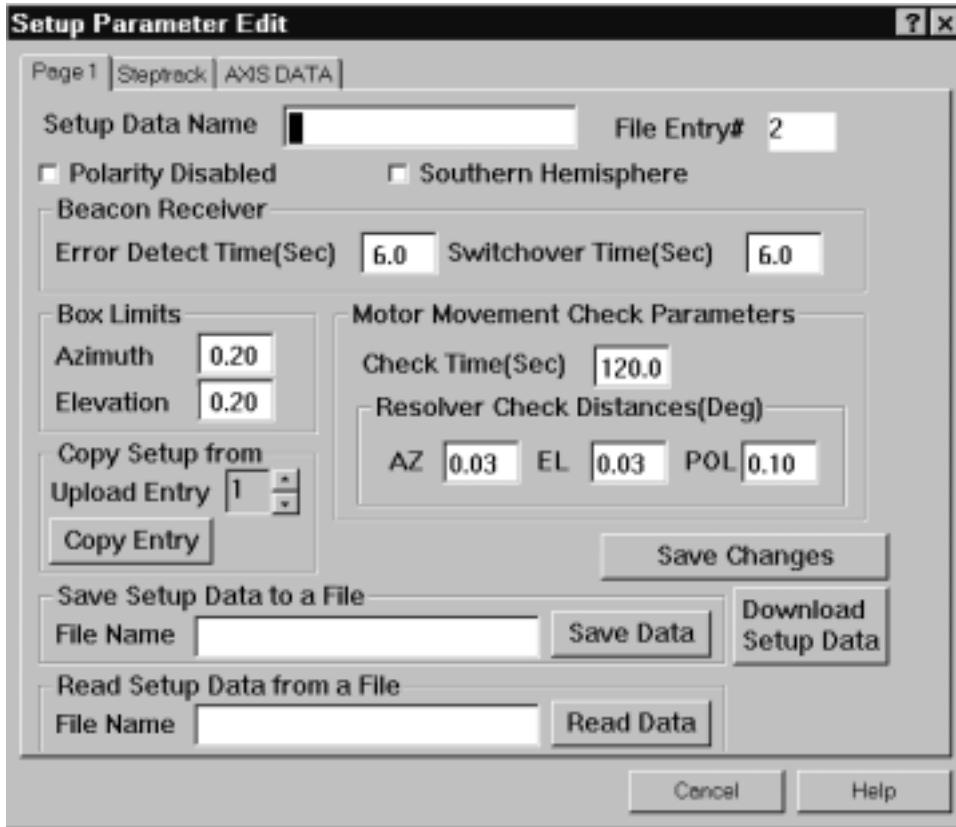


Figure 24.

## 5.2 Setup Parameters Property Sheet Steptrack Page

This page in the Setup Parameters property sheet is for Steptrack and SMARTRACK parameters. An example of the page is shown in figure 25. Fields in this page are defined as follows:

### Scintillation Disabled

This option toggles steptrack scintillation detection. When enabled, short error signals pause steptrack operation. Scintillation is primarily a problem in Ku band operation.

### Track Cycle Time

This is the automatic steptrack time period initialization. The time period may be set from 1 to 254 minutes. To disable the option, set the time to zero. When this option is in effect, the time remaining until the next time initiated steptrack function is displayed. The cycle counter is reset to the programmed timer period if steptrack is initiated by a threshold change or a new command position.

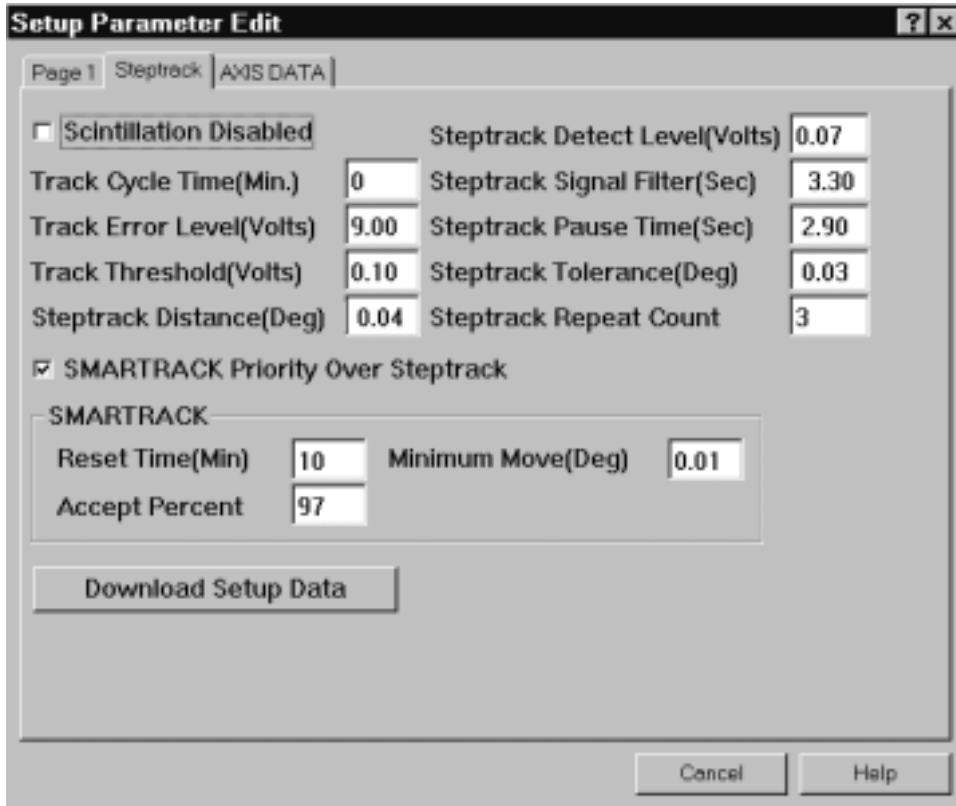


Figure 25.

**Track Error Level**

This is a voltage level below which the steptrack operation is canceled. If this error condition occurs, the status display indicates low signal (LO SIG) and the Summary Alarm is activated.

**Track Threshold**

This option sets the signal strength change that initiates a steptrack operation.

**Steptrack Distance**

This is the steptrack scan step size.

**Steptrack Detect Level**

Detectable change level in volts which determines scan distance or end point. Scan reverses direction when signal drops by this value. After second detect condition occurs, axis is positioned to angle with highest peak.

**Steptrack Signal Filter**

The adjust digital filter time constant.

**Steptrack Pause Time**

Time increment allowing filter to adjust to new signal level after each steptrack scan.



### **Steptrack Tolerance**

Tolerance is the difference between start position and final position. Steptrack cycle repeats until difference falls below tolerance.

### **Steptrack Repeat Count**

Defines the maximum number of steptrack cycles to be repeated in one operation.

### **SMARTRACK Priority Over Steptrack**

SMARTRACK and Steptrack each cause the antenna to be repositioned without operator commands. Different algorithms are used. In addition to leaving one feature or the other disabled, the steptrack algorithm may be disabled for SMARTRACK enabled satellites by selecting SMARTRACK priority. A combined algorithm may be selected by choosing steptrack priority. The combined algorithm causes SMARTRACK priority to “watch” Steptrack. When no steptracking is in progress, SMARTRACK makes its usual predictions and moves. When a low signal is detected, Steptrack hunts for a strong signal. Upon completion of the tracking process, SMARTRACK inserts the position and time for the newly peaked signal in its database for future predictions.

### **SMARTRACK Reset Time**

The delay before SMARTRACK initiates another steptrack operation after a steptrack scan does not obtain an acceptable signal.

### **SMARTRACK Accept Percent**

This option defines the percentage of the predicted signal voltage which SMARTRACK should consider acceptable before initiating a steptrack operation.

### **SMARTRACK Minimum Move**

This is the minimum move distance for SMARTRACK. Predictions which differ from the observed position by less than this value do not result in antenna repositioning.

### **Download Setup Data**

This button is for downloading all setup parameters from the property sheet, which means that any changes that have been made will be downloaded.

**Save Changes** This push button is used to save changes to all setup parameters in the SETUP.DAT file. This button only appears when an operator defined setup parameters entry is displayed on the screen.

## **5.3 Setup Parameters Property Sheet Axis Page**

This page in the Setup Parameters property sheet is for Axis related parameters. An example of the page is shown in figure 26. Fields in this page are defined as follows for each axis.

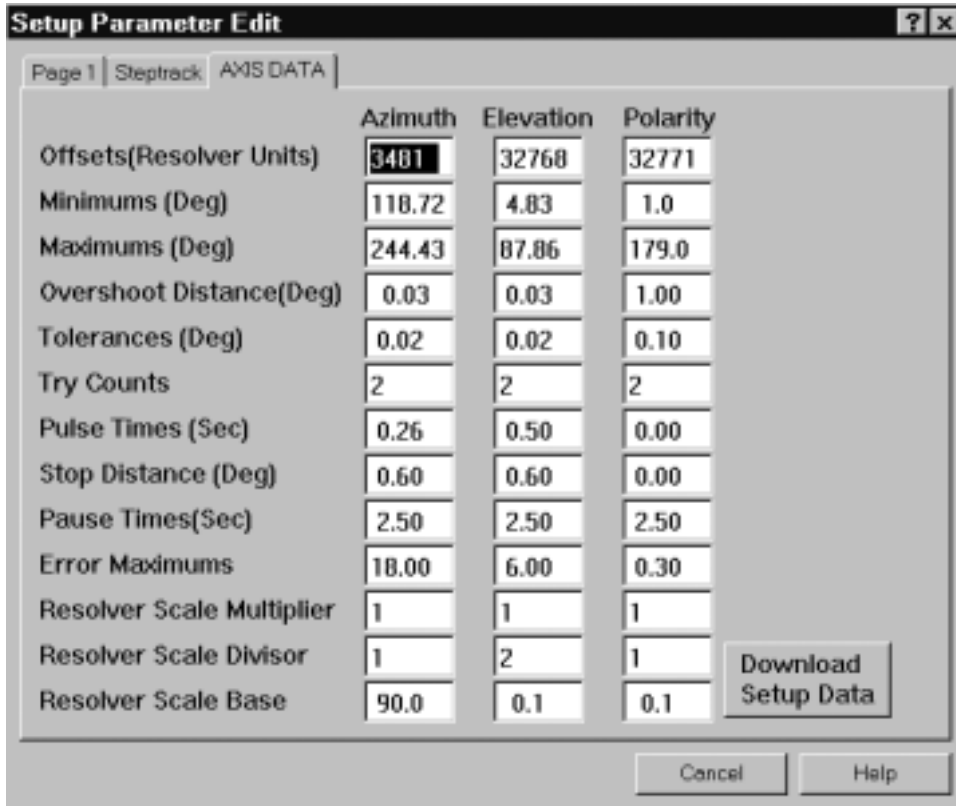


Figure 26.

**Offset** Offset angles are calculated from entries made in the ACTPOS mode. The displayed values are in resolver units.

**Minimums** The minimum angles beyond which antenna motion is not permitted.

**Maximums** The maximum angles beyond which antenna motion is not permitted.

**Overshoot Distance**

Used by the antenna control algorithm for positioning the axes. This is the axis travel after stopping a fast motor movement.

**Tolerances** This is the acceptable amount of error or “how far off” the antenna is from the target.

**Try Counts** The number of times that the controller will try a hunt operation to position the antenna within the tolerance limit of the target position.

**Pulse Times** Pulse time for hunting. If set to zero, the hunt phase lasts until the APC300 detects a change in axis position.

**Stop Distances**

Slow motor stop distance. Always set to zero for one-speed motors and SMARTRACK

operation.

**Pause Times** Motor pause time after each hunt.

**Error Maximums**

Position error limits for each axis. A fault occurs when one or more of the antenna axes positions changes beyond the limit without being commanded to move.

**Resolver Scale**

The **Multiplier** and **Divisor** define the gearing ratio for each axis. A 2:1 ratio would have a multiplier of 1 and a divisor of 2. The **Base** is the starting point for the resolver in degrees. The azimuth base for the northern hemisphere is usually 90.0 degrees and 270.0 degrees for the southern hemisphere.

**Download Setup Data**

This button is for downloading all setup parameters from the property sheet, which means that any changes that have been made will be downloaded.

**Save Changes** This push button is used to save changes to all setup parameters in the SETUP.DAT file. This button only appears when an operator defined setup parameters entry is displayed on the screen.

## 5.4 Setup Parameters Download Dialog

This dialog is activated from the Commands menu or with **Ctrl-F4**. It displays the date and time when each setup parameters entry was uploaded or the name for operator defined setup parameters. One of the entries must be selected and then the **Download Setup Parameters** button must be activated to start the download. An example of the dialog is shown in figure 27.

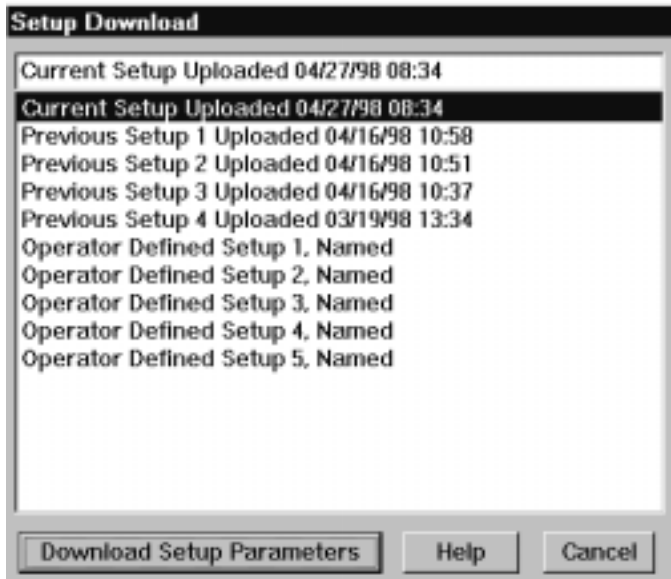


Figure 27.

## 6 SMARTRACK Tables Screen

Select the Screens menu and choose the SMARTRACK Tables item or enter **F5** to activate the Antenna SMARTRACK Tables screen. The SMARTRACK Tables may be printed when this screen is displayed by activating **F6** or by selecting Reports from the Screens menu.

There are ten sets of SMARTRACK Tables which are called entries. The first five entries are for SMARTRACK Tables uploaded from the APC300. The last five are for operator defined tables. When an upload is performed, the table elements are stored in entry one. The table previously in entry one is move to entry two, and table in entry two is moved to entry three, etc. The table in entry five is discarded. Any of the ten sets of table elements can be downloaded. SMARTRACK Tables are stored in the SMRTRK.DAT file.

If SMARTRACK Tables have been uploaded from the controller or defined by the operator, they will be displayed on the screen. The **Up and Down Arrow** keys or **PageUp** or **PageDn** will scroll the table elements if they will not fit on the screen. They may also be scrolled with the mouse using the vertical scroll bar. The horizontal scroll bar or the **Left or Right Arrow** keys will change the SMARTRACK Table displayed. The date and time that the parameters were uploaded will be displayed at the top of the screen for uploaded tables. An example of the screen is shown in figure 28.

APC300 GMT 04/27/98 14:37:00 04/27/98 08:37:01  
 Screen Commands MiscWindows Operator Help  
 \*\* SMARTTRACK Tables \*\*  
 CURRENT SMARTTRACK TABLE UPLOADED AT 04/27/98 08:34:09 NUMBER OF ELEMENTS= 175

N	POSH	ELEMENTN	NAME	AZ	EL	LEVEL	GMT DATE/TIME
1	1	1	EUTELSAT 2F1 / HOT.	236.84	25.53	5.5	04/27/98 09:27:05
2	1	2	EUTELSAT 2F1 / HOT.	236.84	25.53	5.5	04/27/98 08:57:05
3	1	3	EUTELSAT 2F1 / HOT.	236.84	25.53	5.5	04/27/98 08:42:04
4	1	4	EUTELSAT 2F1 / HOT.	236.84	25.53	5.5	04/27/98 08:27:06
5	1	5	EUTELSAT 2F1 / HOT.	236.84	25.53	5.5	04/27/98 08:12:04
6	1	6	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 07:57:04
7	1	7	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 07:42:05
8	1	8	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 07:27:05
9	1	9	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 07:12:05
10	1	10	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 06:57:04
11	1	11	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 06:42:05
12	1	12	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 06:27:04
13	1	13	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 06:12:05
14	1	14	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 05:57:04
15	1	15	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 05:42:05
16	1	16	EUTELSAT 2F1 / HOT.	236.83	25.53	5.5	04/27/98 05:27:04
17	1	17	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 05:12:05
18	1	18	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 04:57:04
19	1	19	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 04:42:06
20	1	20	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 04:27:05
21	1	21	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 03:57:05
22	1	22	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 03:42:05
23	1	23	EUTELSAT 2F1 / HOT.	236.82	25.53	5.5	04/27/98 03:27:05
24	1	24	EUTELSAT 2F1 / HOT.	236.81	25.53	5.5	04/27/98 03:12:04
25	1	25	EUTELSAT 2F1 / HOT.	236.81	25.53	5.5	04/27/98 02:57:05
26	1	26	EUTELSAT 2F1 / HOT.	236.81	25.53	5.5	04/27/98 02:42:04
27	1	27	EUTELSAT 2F1 / HOT.	236.81	25.54	5.5	04/27/98 02:27:05
28	1	28	EUTELSAT 2F1 / HOT.	236.81	25.54	5.5	04/27/98 02:12:04
29	1	29	EUTELSAT 2F1 / HOT.	236.81	25.54	5.5	04/27/98 01:57:05
30	1	30	EUTELSAT 2F1 / HOT.	236.81	25.54	5.5	04/27/98 01:42:04
31	1	31	EUTELSAT 2F1 / HOT.	236.81	25.54	5.5	04/27/98 01:27:06

Figure 28.

SMARTTRACK tables may also be created and downloaded through the IESS-412 and Two-line Element dialogs used for calculating pointing angles.

### 6.1 SMARTTRACK Element Edit Property Sheet Page

The SMARTTRACK Element Edit property sheet is activated from the MiscWindows menu or with **Alt-F6**. It may also be activated by selecting an element on the screen with the mouse and clicking the left button. The property sheet cannot be activated unless the SMARTTRACK Table screen is selected. The property sheet will only edit SMARTTRACK elements for the Table displayed on the screen. When the property sheet is activated, the table elements from the screen are stored in memory and changes to all elements are saved in memory as long as the property sheet is on the screen. An example of the property sheet page for uploaded tables is shown in figure 29 and an example for operator defined tables is shown figure 30.

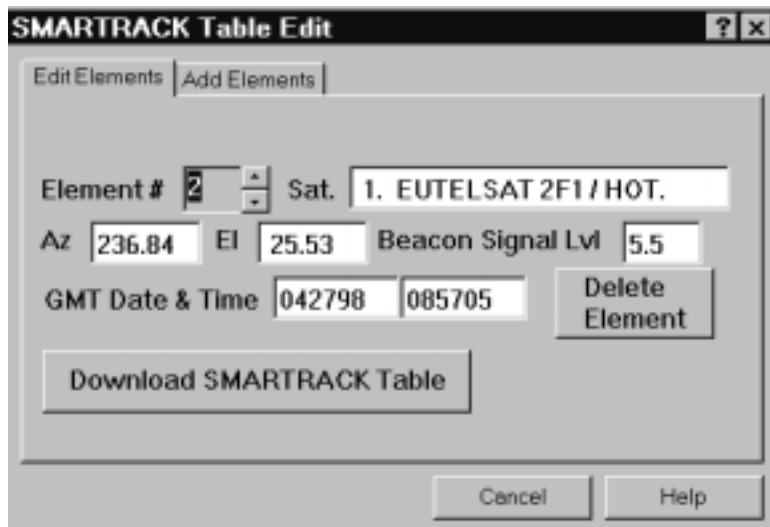


Figure 29.

Fields in the property sheet are defined as follows:

**Element #** This field selects the element to be edited. Where elements are numbered from one to the number of elements in the table.

**Satellite** This field displays the satellite position number and name for the element being edited.

**Az & El** The azimuth and elevation for the element.

**Beacon Signal Lvl**  
The expected beacon signal level in volts.

**GMT Date & Time**  
The GMT date and time for the table element. The GMT date and time is converted to Sidereal time when downloaded to the APC300. The date must be entered in the form mmddy and the time hhmmss.

**Delete Element**  
This button deletes the selected element number for the SMARTRACK table currently stored in memory.

**Download SMARTRACK Table**  
This button is for downloading the table stored in memory, which means that any changes that have been made will be downloaded.

**Save Changes** This push button is used to save changes to the SMARTRACK table elements in the SMRTRK.DAT file. This button only appears when an operator defined SMARTRACK Table is displayed on the screen.

**Copy Pos. From**

This box provides for loading an uploaded SMARTRACK Table into the property sheet so that it can be saved in the operator defined SMARTRACK Table entry displayed on the screen.

**Table Name** This field is used to give the SMARTRACK Table defined by the operator an identifying name.

**Save Table to a File**

This box is for copying the SMARTRACK Table from the property sheet to a file named in the **File** field. The file can be read into the property sheet from the **Read Table from a File** box.

**Read Table from a File**

This box is for loading the SMARTRACK Table into the property sheet from a file named in the **File** field. The file must have been created by the **Save Table to a File** box.

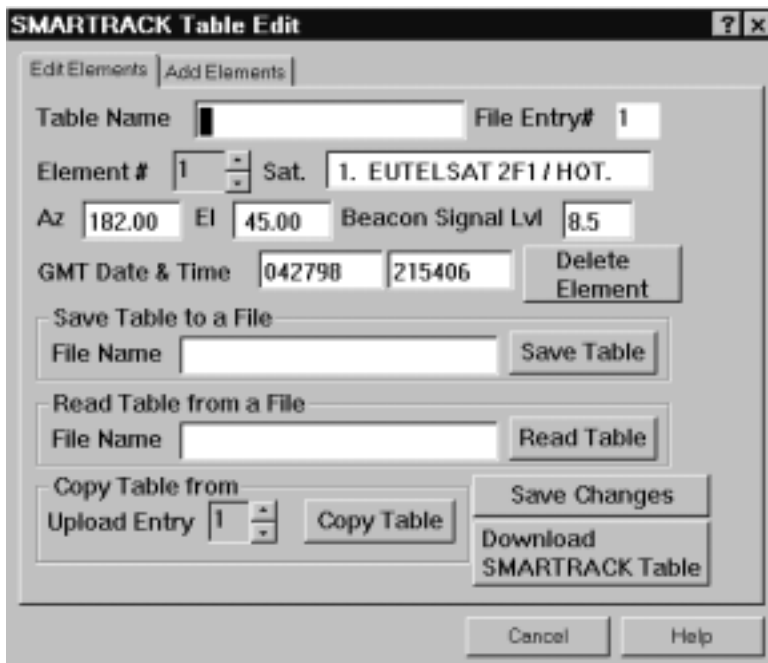


Figure 30.

## 6.2 SMARTRACK Element Add Property Sheet Page

The SMARTRACK Element Add page. This page of the SMARTRACK Table Edit property sheet will only add SMARTRACK elements for the Table displayed on the screen when the property sheet was activated. An example of the property sheet page is shown in figure 31.

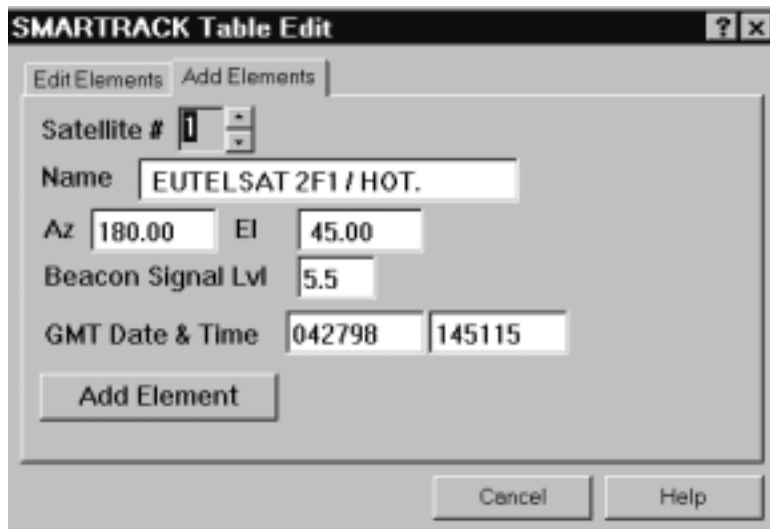


Figure 31.

Fields in the page are defined as follows:

**Satellite #** This field selects the satellite number for the element to be add.

**Name** This field displays the satellite name for the element being add.

**Az & El** The azimuth and elevation for the element.

**Beacon Signal Lvl**  
The expected beacon signal level in volts.

**GMT Date & Time**  
The GMT date and time for the table element. The GMT date and time is converted to Sidereal time when downloaded to the APC300. The date must be entered in the form mmddy and the time hhmmss.

**Add Element**  
This button adds the displayed element to the SMARTRACK table stored in memory which was the table displayed on the screen at the time that the property sheet was activated. It is inserted in order by Sidereal time.

### 6.3 SMARTRACK Table Download Dialog

This dialog is activated from the Commands menu or with **Ctrl-F6**. It displays the date and time when each SMARTRACK table was uploaded or the name given to operator defined tables. One of the tables must be selected and then the **Download SMARTRACK Table** button must be activated to start the download. An example of the dialog is shown in figure 32.



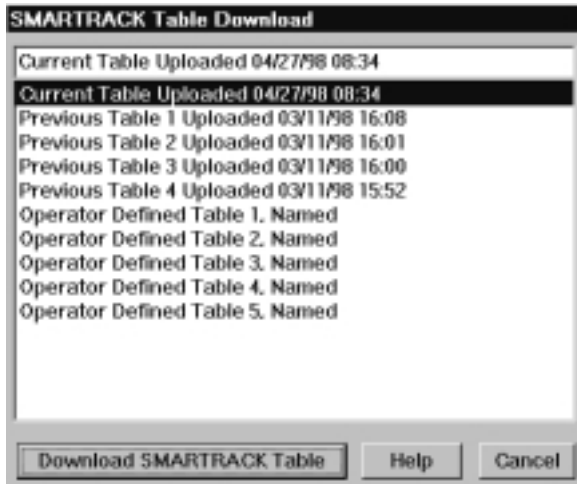


Figure 32.

## 6.4 Delete SMARTRACK Table Elements for One Satellite

This dialog is activated from the Commands menu. It is used to delete all SMARTRACK elements, from the APC300, for one satellite. After the elements are deleted, the remaining elements are uploaded from the APC300 and saved as the “Current SMARTRACK Table Elements”. An example of this dialog is shown in figure 32a.



Figure 32a.

## 7 ACULOG Data Plot Screen

Select the Screens menu and choose the ACULOG Screen item or enter **F9** to activate the ACULOG Data Plot screen. The ACULOG data collection feature will read the current coordinates and current beacon signal level on a periodic basis and plot the data on the screen and optionally store the data in a text file. The purpose of the feature is to allow monitoring and reviewing of inclined orbit satellites while the APC300 is Steptracking or SMARTRACKing to follow the satellite movements. An example of the ACULOG Data Plot screen is shown in figure 33a. The Az-El plot in the upper left part of the screen is a plot of the deviation of azimuth, horizontal axis, and elevation, vertical axis, from the coordinates of the current satellite’s defined position. Each Az-El pair is represented by a single point on the graph. Up to 5000 points are displayed on the graph. The satellite number and its azimuth and elevation are displayed above the Az-El plot. The APC300 must be on a satellite before ACULOG data collection will begin; however, data collection continues even if the antenna is moved away from the satellite. The lower left part of the screen displays the total number of data points collected and up to 15 of the most recent data points collected. The right half of the screen contains plots of the deviation of

signal level, elevation, azimuth and polarity versus time. The most recent point is at the right end of each graph. The time span for the graphs is displayed in the upper right corner of the screen. The time span depends on the data collection period and the screen resolution. The data points can be saved in a text file as they are collected. The first line of the file contains the satellite number, its defined coordinates and the sampling period in seconds. Each line after that contains GMT date and time, azimuth, elevation, polarity and signal level for one point. An example of the format of the file is shown below.

```
SAT 01,149.90, 62.40, 3.3,2
11/02/1999,20:59:09,149.97, 62.40, 2.7,0.00
11/02/1999,20:59:11,149.80, 62.40, 2.7,0.00
11/02/1999,20:59:13,149.82, 62.40, 2.7,0.00
11/02/1999,20:59:16,149.99, 62.40, 2.7,0.00
11/02/1999,20:59:18,149.99, 62.40, 2.7,0.00
11/02/1999,20:59:19,149.99, 62.40, 2.7,0.00
11/02/1999,20:59:21,149.99, 62.40, 2.7,0.00
```

If ACULOG data collection has not occurred since the utility program was started, the screen will be blank. If data collection is started and stopped, a message will be displayed above the Az-El plot indicating that data collection is stopped.

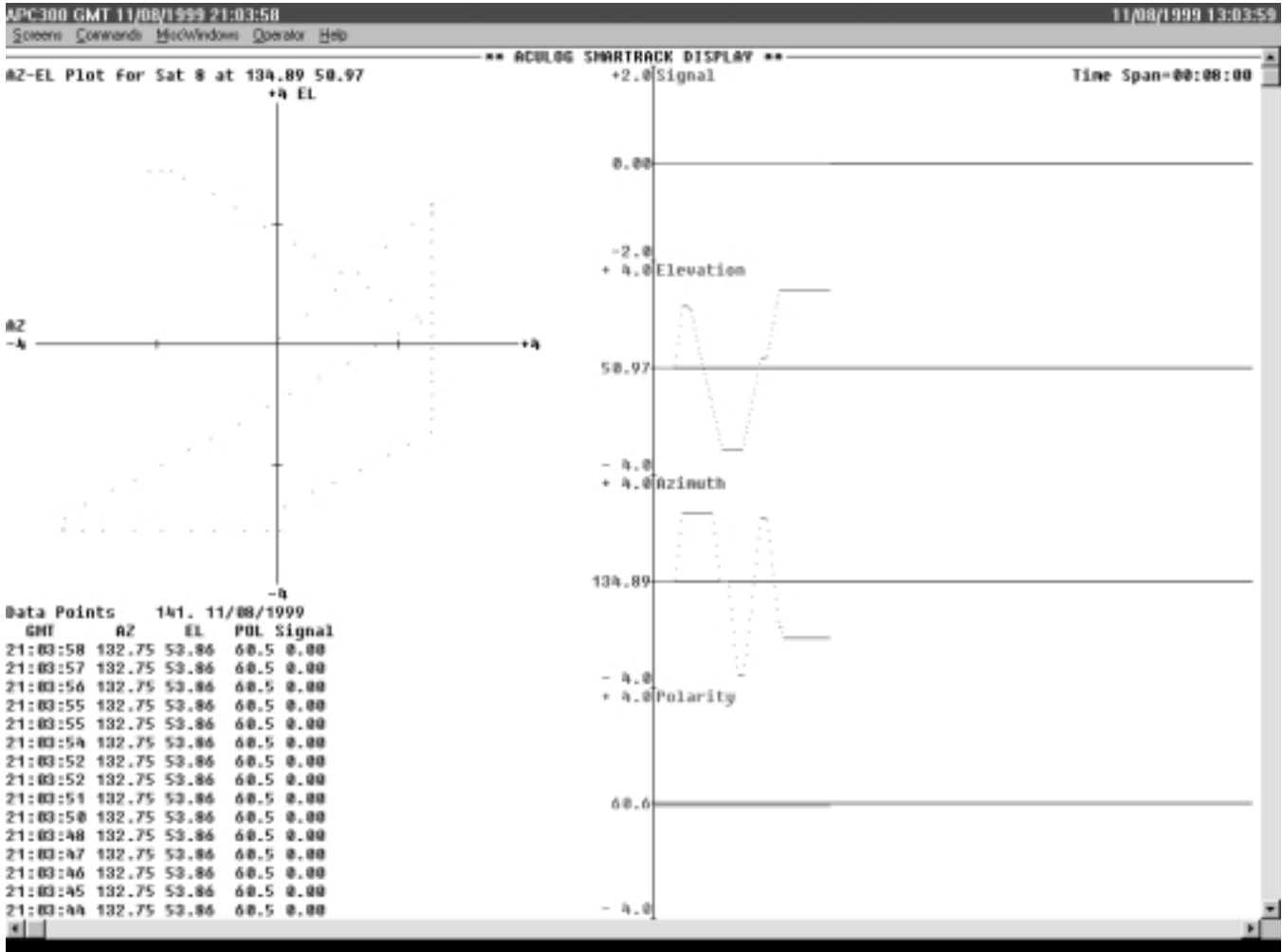


Figure 33a.

## 7.1 ACULOG Data Collection Control

The dialog shown in figure 33b is used to start and stop ACULOG data collection and to specify parameters for data collection. Fields in the dialog are defined as follows:

### Data Collection Period

This is the time in seconds between each retrieval of current coordinates and beacon signal level. The range is 1 to 900 seconds(15 minutes).

### Az-El Plot Scale

This is the range in degrees of the Azimuth versus Elevation plot display on the ACULOG screen. Azimuth is plotted on the horizontal axis and Elevation is plotted on the vertical axis. The center of the plot is the defined position for the satellite. The scale can be set to a fixed range of 1, 2, 4, 5, 7, 8 or 10 degrees or it can be set to Auto Scale. When Auto Scale is selected the range starts at 1 degree. When either azimuth or elevation deviates from the defined satellite position coordinates by more than the current plot range, the range is

automatically increased by 1 degree.

### Change Current Scale

This button is used to change the Az-El plot scale during ACULOG data collection.

### Data File Name

The name of a file where the collected coordinates and signal levels will be stored. If the file name is blank, then data collection will occur and be displayed on the screen but not saved in a file. If the data is saved in a file, it may be replayed after data collection is stopped using the Replay ACULOG Data dialog. The file name may include a drive and directory path.

### Start Data Collection

This button will start data collection using the data collection time period, Az-El plot scale and file name specified.

### Stop Data Collection

This button will stop data collection if it is in progress. Exiting the APC300 utility program will also stop data collection.



Figure 33b.

## 8 ACULOG Replay Data Plot Screen

Select the Screens menu and choose the ACULOG Replay Screen item or enter **F10** to activate the ACULOG Replay Data Plot screen. While a replay is in progress and this screen is selected, data points will be read from an ACULOG Data Collection file and displayed on the screen. The rate at which the data is replayed on the screen is selectable from 1 to 20 points per second. The replay rate has no relationship to the rate that the data points were collected. An example of the ACULOG Replay screen is shown in figure 33c.

### 8.1 Replay Old ACULOG Data

The dialog shown in figure 33d is used to start and stop replay of ACULOG data collected and stored in a file. Fields in the dialog are defined as follows:

#### Replay Speed

This is the number of points from the data file added to the screen each second. The range is 1 to 20 points per seconds. The rate can be changed during replay of a file.

#### Az-El Plot Scale

This is the range in degrees of the Azimuth versus Elevation plot display on the ACULOG screen. Azimuth is plotted on the horizontal axis and Elevation is plotted on the vertical axis. The center of the plot is the defined position for the satellite. The scale can be set to a fixed range of 1, 2, 4, 5, 7, 8 or 10 degrees or it can be set to Auto Scale. When Auto Scale is selected the range starts at 1 degree. When either azimuth or elevation deviates from the defined satellite position coordinates by more than the current plot range, the range is automatically increased by 1 degree.

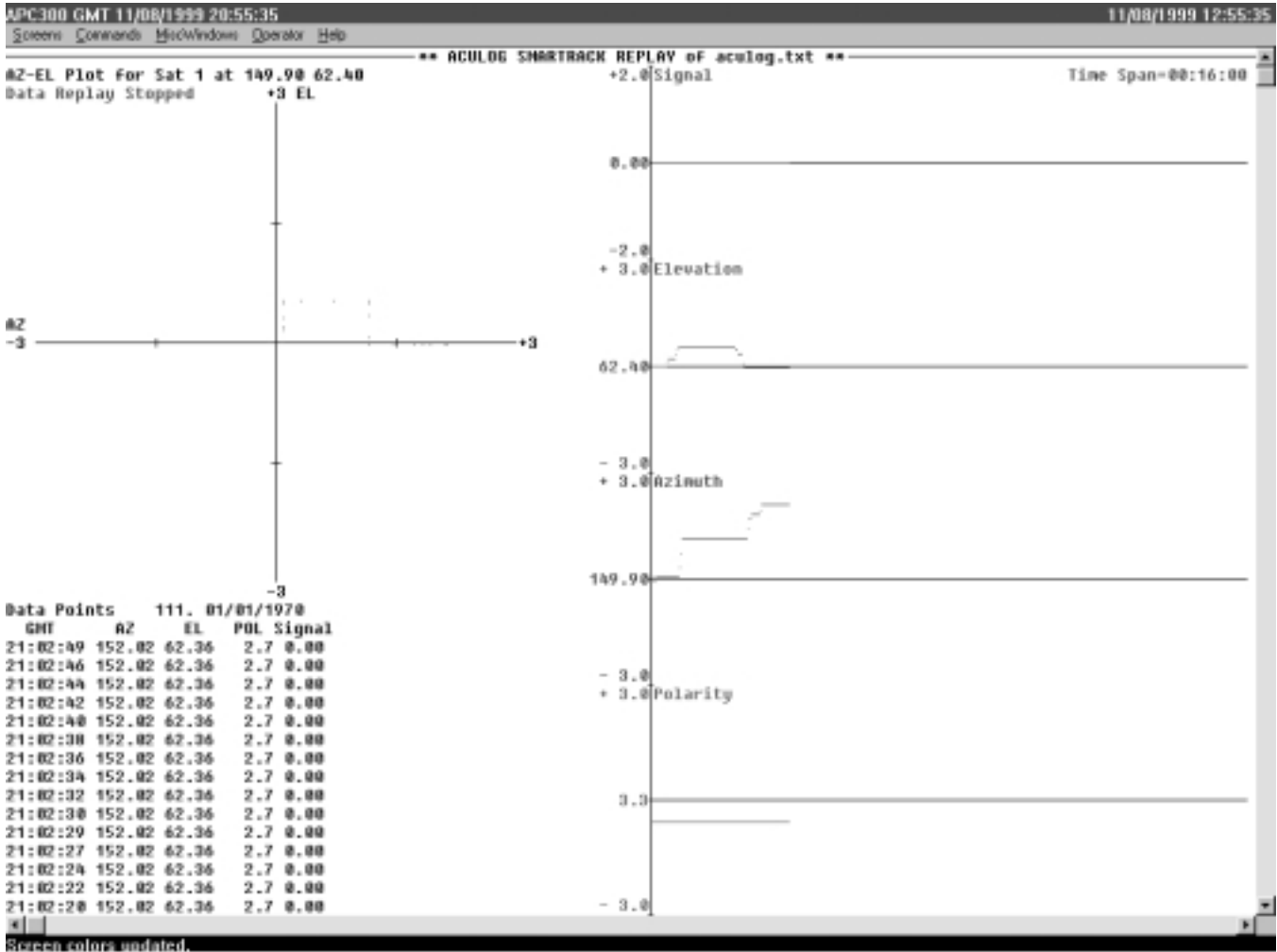


Figure 33c.

### Change Scale/Speed

This button is used to change the Az-El plot scale or replay rate during replay of ACULOG data from a file.

### Enter File Name or Select File Name From List

The name of a file which was previously created using the ACULOG Data Collection feature of this program. The file name may include a drive and directory path. The name may be entered directly into the top field or if the top field is blank, the the file name

selected from the drop down list will be used. The names of the last 10 Aculog files created are saved and displayed in the list.

### Replay Start and End GMT Time

If the entire file is not to be replayed, then an starting or ending GMT date and time may be entered. The date and time must both be entered. If the date is blank, then the time filed is ignored. If the start date is blank, the replay starts at the beginning of the file and if the end date is blank, the replay ends at the end of the file. Dates are entered in the form mm/dd/yy or mm/dd/yyyy and times are entered hh:mm:ss; however, the seconds may be left off.

### Start Replay

This button will start replay using the replay speed, Az-El plot scale and file name specified.

### Stop Replay

This button will stop replay before all data points have been read from the replay file. Replay will automatically stop when all points have been read from the file and displayed.

### Pause Replay

This button will pause replay at the current point if replay is in progress.

### Restart Replay

This button will restart replay if replay is currently paused.

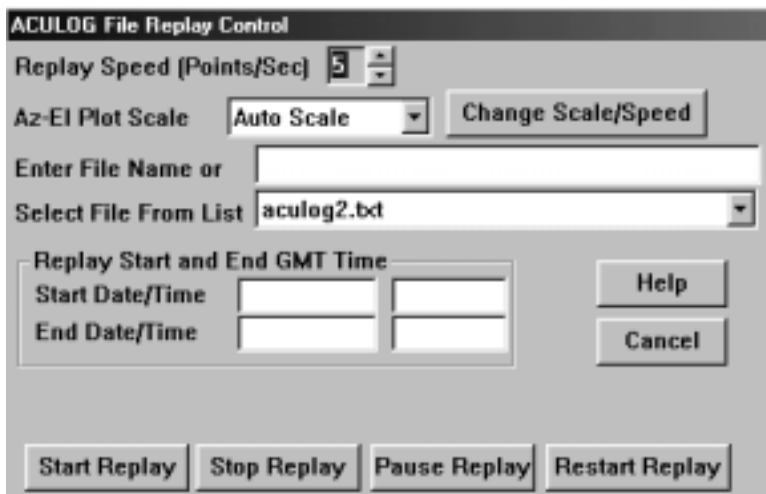


Figure 33d.

## 9 Satellite Pointing Angle Calculations

### 9.1 IESS-412 Calculations

This dialog is activated from the Commands menu. Its purpose is to calculate pointing angles for INTELSAT satellites using the IESS-412 calculation standard and the eleven parameter ephemeris data generated by INTELSAT. The program keeps a set of 11 parameter ephemeris data and pointing angles for each of the 40 satellites which can be defined in the APC300 satellite position table. Calculated pointing angles can be downloaded to the APC300 SMARTRACK Tables for satellites 1 through 10. If pointing angles are downloaded, then the APC300 satellite for the position and the INTELSAT satellite

## APC300 Utility Program

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for the ephemeris data must match; otherwise, it doesn't matter. The epoch date and time and the eleven parameter ephemeris data can be entered by the operator or they can be initialized from an INTELSAT provided 11 parameter data file. An example of the data file in the required format is shown in Figure 34a.

```
ROUTINE
FROM: INTELSAT WASHINGTON DC

TO: ALL STATIONS OPERATING AT 304.50 DEG EAST

SUBJECT: ELEVEN PARAMETER EPHEMERIS FOR INTELSAT 512/304.50
        DEG E

EARTH STATIONS PLEASE ON-PASS TO YOUR ADMINISTRATION

WEEKLY 11-PARAMETER DATA 980124

THE 11 PARAMETER EPHEMERIS AND EPOCH PREDICTING THE SPACECRAFT
MOTION ARE PROVIDED BELOW.

PLEASE ENTER THIS DATA INTO THE EPHEM.DAT FILE

YEAR  MONTH  DAY  HOUR  MINUTE  SECOND
98      01    24    00    00      00

THE EPHEMERIS VALUES ARE:

LM0          LM1          LM2
DEG. E      DEG/DAY      DEG/DAY/DAY
304.6000    .0024        -.000941 (MINUS)

LONC        LONC1        LONS          LONS1
DEG. E      DEG/DAY      DEG. E        DEG/DAY
.0297      .0014        -.0099 (MINUS) .0001

LATC        LATC1        LATS          LATS1
DEG. N      DEG/DAY      DEG. N        DEG/DAY
-.2466 (MINUS) -.0021 (MINUS) 3.0237        .0017

THE NOMINAL ORBITAL LOCATION FOR THIS SATELLITE IS 304.50 DEG. E

THE PREDICTED SATELLITE LONGITUDE AND LATITUDE AT 170 HOURS AFTER
EPOCH ARE 304.5596 DEG. E. AND 1.6181 DEG. N.

BEST REGARDS
MANAGER IOC
```

Figure 34a.

An example of the dialog is shown in figure 34b.

Figure 34b.

Fields and buttons other than the fields initialized from the 11 parameter data file are defined as follows:

**Satellite #** This is the APC300 satellite position number. The current satellite name for the position number selected is displayed in the **Name** field.

**Element Time Interval**

The time interval for calculating pointing angle starting at the epoch. The valid range for the time interval is 15 to 1440 minutes.

**INTELSAT 11-Parameter Data File**

The **File Name** field is the path and file name for the 11-parameter data file to be used to initialize the fields in the dialog. The **Satellite Name** is the name read from the file. Click on **Read Params. From File** to read the file and initialize the fields in the dialog.

**Calculate SMARTRACK Elements**

Activation of this button will calculate pointing angles to the satellite from the station location for 170 hours starting at the epoch. When the calculations are complete, the ephemeris data and pointing angles are saved in the IESS412.DAT file. If the calculated



latitude or longitude at 170 hours after epoch do not agree with the values in the **Predicted position 170 hours after Epoch** fields then a warning message is displayed indicating that the pointing angles are probably wrong due to parameter errors.

**Save Parameters**

This button saves the ephemeris parameters in the IESS412.DAT file. If any parameters have been changed since the previous pointing angle calculation, then the old pointing angles are deleted.

GMT DATE/TIME	AZ	EL	LONGITUDE	LATITUDE
03/15/98 00:00:00	117.95	32.07	319.4046	7.3216
03/15/98 02:00:00	117.82	32.89	319.4626	7.4835
03/15/98 04:00:00	117.81	32.81	319.5203	7.3579
03/15/98 06:00:00	117.91	31.84	319.5734	7.1858
03/15/98 08:00:00	118.13	31.57	319.6180	6.8900
03/15/98 10:00:00	118.46	31.22	319.6507	6.4757
03/15/98 12:00:00	118.98	30.79	319.6689	5.9499
03/15/98 14:00:00	119.44	30.28	319.6711	5.3218
03/15/98 16:00:00	120.06	29.72	319.6567	4.6820
03/15/98 18:00:00	120.75	29.89	319.6262	3.8831
03/15/98 20:00:00	121.50	28.42	319.5812	2.9388
03/15/98 22:00:00	122.29	27.72	319.5246	2.0238
03/16/98 00:00:00	123.10	26.98	319.4596	1.0740
03/16/98 02:00:00	123.91	26.23	319.3905	0.1857
03/16/98 04:00:00	124.72	25.48	319.3215	-0.8644
03/16/98 06:00:00	125.49	24.73	319.2571	-1.8196
03/16/98 08:00:00	126.23	24.00	319.2013	-2.7435
03/16/98 10:00:00	126.98	23.29	319.1578	-3.6203
03/16/98 12:00:00	127.51	22.63	319.1293	-4.4347
03/16/98 14:00:00	128.04	22.01	319.1176	-5.1729
03/16/98 16:00:00	128.49	21.46	319.1234	-5.8220
03/16/98 18:00:00	128.85	20.98	319.1462	-6.3710
03/16/98 20:00:00	129.12	20.59	319.1846	-6.8104
03/16/98 22:00:00	129.29	20.28	319.2359	-7.1326
03/17/98 00:00:00	129.37	20.08	319.2968	-7.3320
03/17/98 02:00:00	129.36	19.97	319.3633	-7.4853
03/17/98 04:00:00	129.26	19.98	319.4311	-7.3512
03/17/98 06:00:00	129.08	20.09	319.4957	-7.1706
03/17/98 08:00:00	128.82	20.31	319.5532	-6.8666
03/17/98 10:00:00	128.49	20.63	319.5999	-6.4444

Figure 35.

**View Elements**

This button activates a window for viewing the calculated pointing angles. An example of this window is shown in figure 35.

**Print Elements**

This button prints a report containing the APC300 satellite name, ephemeris parameters and the calculated pointing angles.

**Download Elements**

This button will download pointing angles from the current GMT date and time up to 24 hours after the current GMT date and time to the APC300 SMARTRACK table. Downloading is only valid for satellites 1 through 10. After the download is complete, the entire SMARTRACK table is uploaded and stored in the “Current SMARTRACK

Table” record of the SMRTRK.DAT file. If the APC300 software version is 2.8 or later, all of the SMARTRACK table elements for the satellite are deleted before the calculated elements are downloaded.

## 9.2 Two-Line Element Calculations

This dialog is activated from the Commands menu. Its purpose is to calculate pointing angles for satellites with orbital periods greater than 225 minutes using the NORAD SDP4 model. The program keeps a two-line orbital element set and pointing angles for each of the 40 satellites which can be defined in the APC300 satellite position table. Calculated pointing angles can be downloaded to the APC300 SMARTRACK Tables for satellites 1 through 10. If pointing angles are downloaded, then the APC300 satellite for the position and the two-line element satellite for the ephemeris data must match; otherwise, it doesn’t matter. The epoch date and time and the two-line element parameters can be entered by the operator or they can be initialized from a two-line element file. An example of part of a two-line element file in the required format is shown in Figure 36.

```

SL-3 R/B
1 00751U 64006D 98032.33640821 .00025473 38516-7 60191-3 0 9540
2 00751 56.2034 137.3057 8412829 70.3062 355.5978 1.04213487 19522
INTELSAT 1-F1
1 01317U 65028A 97272.05069733 -.00000304 00000-0 10000-3 0 5003
2 01317 14.1085 338.5835 0000828 295.5701 64.5688 1.00278379 22025
ATS 1
1 02608U 66110A 98031.04064607 +.00000102 +00000-0 +10000-3 0 00570
2 02608 014.3727 346.4363 0004152 110.7619 249.3215 01.00352025030814
INTELSAT 2-F2
1 02639U 67001A 98027.00000000 -.00000008 00000-0 10000-3 0 5999
2 02639 14.7527 353.2266 0018267 152.4739 344.0003 1.00221776 15354
INTELSAT 2-F3
1 02717U 67026A 97364.69498300 -.00000009 00000-0 10000-3 0 3725
2 02717 14.2184 350.3528 0030769 133.5149 226.7737 1.00298848 16018
INTELSAT 2-F4
1 02969U 67094A 97350.83126237 -.00000261 00000-0 10000-3 0 9239
2 02969 14.6712 350.4646 0014455 111.6937 248.4390 1.00294146 12420
ATS 3
1 03029U 67111A 98029.66395227 -.00000113 00000-0 10000-3 0 7480
2 03029 14.8265 353.4121 0012390 280.8563 348.0620 1.00272758110690
    
```

Figure 36.

Line one of the two-line element contains the epoch and three parameters and line two contains six more parameters. An example of the dialog is shown in figure 37.

Figure 37.

Fields and buttons other than those from the two-line element data file are defined as follows:

**Satellite #** This is the APC300 satellite position number. The current satellite name for the position number selected is displayed in the **Name** field.

**Element Time Interval**

The time interval for calculating pointing angles starting at the epoch. The valid range for the time interval is 15 to 1440 minutes.

Satellite Name and Epoch
ACTS 01/30/98 10:54:37
ACTS 01/30/98 10:54:37
AGILA 1 (PALAPA B2P) 01/26/98 08:57:04
AGILA 2 01/28/98 17:20:03
AMOS 01/29/98 12:21:09
AMSC 1 02/01/98 08:21:01
ANIK A1 (TELESAT 1) 01/31/98 23:59:21
ANIK A2 (TELESAT 2) 01/29/98 13:06:29
ANIK A3 (TELESAT-3) 01/26/98 17:39:33
ANIK B1 (TELESAT-4) 01/27/98 15:09:06
ANIK C3 (TELESAT-5) 01/28/98 22:54:53
ANIK D1 (TELESAT 6) 01/25/98 12:43:36
ANIK E1 01/28/98 00:57:23
ANIK E2 01/30/98 09:36:31
APPLE 01/27/98 18:33:25
APSTAR 1 02/01/98 05:40:27
APSTAR 1A 02/02/98 02:15:33

Figure 38.

**TLE File** The **File Name** field is the path and file name for the two-line element data file to be used to initialize the fields in the dialog. The **Satellite Name** is the name of the satellite selected from the file. Click on **Select Sat. From File** to activate a dialog, shown in figure 38, which displays a list of satellite names and epoch date and time from the selected file.

**Calculate SMARTRACK Elements**

Activation of this button will calculate pointing angles to the satellite from the station location for 170 hours starting at the epoch. When the calculations are complete the two-line element data and pointing angles are saved in the TLEDATA.DAT file.

**Save Parameters**

This button saves the two-line element parameters in the TLEDATA.DAT file. If any parameters have been changed since the previous pointing angle calculation, then the old pointing angles are deleted.

**View Elements**

This button activates a window, shown in figure 39, for viewing the calculated pointing angles.

GMT DATE/TIME	AZ	EL	LONGITUDE	LATITUDE
03/10/98 04:42:57	236.79	25.55	231.5973	-0.0100
03/10/98 06:42:57	236.80	25.54	231.5861	-0.0111
03/10/98 08:42:57	236.81	25.53	231.5771	-0.0090
03/10/98 10:42:57	236.82	25.53	231.5725	-0.0045
03/10/98 12:42:57	236.82	25.54	231.5734	0.0011
03/10/98 14:42:57	236.82	25.55	231.5793	0.0063
03/10/98 16:42:57	236.82	25.56	231.5885	0.0096
03/10/98 18:42:57	236.81	25.56	231.5986	0.0102
03/10/98 20:42:57	236.80	25.57	231.6063	0.0080
03/10/98 22:42:57	236.79	25.57	231.6096	0.0037
03/11/98 00:42:57	236.79	25.56	231.6074	-0.0016
03/11/98 02:42:57	236.79	25.55	231.6001	-0.0063
03/11/98 04:42:57	236.80	25.54	231.5891	-0.0092
03/11/98 06:42:57	236.81	25.54	231.5785	-0.0095
03/11/98 08:42:57	236.82	25.53	231.5697	-0.0072
03/11/98 10:42:57	236.83	25.53	231.5653	-0.0030
03/11/98 12:42:57	236.83	25.53	231.5664	0.0020
03/11/98 14:42:57	236.83	25.54	231.5725	0.0063
03/11/98 16:42:57	236.82	25.55	231.5807	0.0088
03/11/98 18:42:57	236.81	25.56	231.5918	0.0089
03/11/98 20:42:57	236.80	25.56	231.5995	0.0065
03/11/98 22:42:57	236.80	25.56	231.6027	0.0024
03/12/98 00:42:57	236.80	25.56	231.6003	-0.0022
03/12/98 02:42:57	236.80	25.55	231.5930	-0.0062
03/12/98 04:42:57	236.81	25.54	231.5804	-0.0085
03/12/98 06:42:57	236.82	25.53	231.5715	-0.0084
03/12/98 08:42:57	236.83	25.53	231.5628	-0.0060
03/12/98 10:42:57	236.83	25.53	231.5586	-0.0020
03/12/98 12:42:57	236.84	25.53	231.5599	0.0024
03/12/98 14:42:57	236.83	25.54	231.5662	0.0062

Figure 39.

**Print Elements**

This button prints a report containing the APC300 satellite name, two-line element parameters and the calculated pointing angles.

### **Download Elements**

This button will download pointing angles, from the current GMT date and time up to 24 hours after the current GMT date and time, to the APC300 SMARTRACK table. Downloading is only valid for satellites 1 through 10. After the download is complete, the entire SMARTRACK table is uploaded and stored in the “Current SMARTRACK Table” record of the SMRTRK.DAT file. If the APC300 software version is 2.8 or later, all of the SMARTRACK table elements for the satellite are deleted before the calculated elements are downloaded.

## **10 APC300 Setup Wizard**

The APC300 Setup Wizard is intended to be run upon initial installation of an APC300 and its antenna. The wizard provides for selection of the antenna type and the appropriate setup parameters for the antenna. Parameters which may differ for each installation of an antenna are determined through active control and monitoring of antenna movement and interaction with the operator. At the end of the Setup Wizard the parameters will have been downloaded to the APC300 and saved in a file for future reference.

### **10.1 Setup Wizard Re-Start Page**

If the Setup Wizard was not completed the last time it was started, then the first page shown will be the one shown in figure 40. You have the option of starting over from the beginning or starting at the step executing when the wizard was canceled. If the step being executed was past the step where communications with the APC300 are established, then that step will be executed before skipping to the step which was previously executing. This page will be skipped if the wizard has never run before or if it was completed the last time that it was started.



Figure 40.

## 10.2 Setup Wizard Installation Reminder

The first step in the wizard is a reminder to verify that the antenna equipment has been installed according to the installation drawings. If so, continue to the next step by pressing the **Return** key or clicking on the **Next** button with the mouse. If this is the first time that the program has been run or the Setup Wizard has never been completed, then the Setup Wizard will be automatically started when the program starts. If the APC300 is already setup and you do not want to go through the Setup Wizard, then click on the **Cancel** button to stop the Setup Wizard and start the normal startup procedure, which consists of uploading parameters and satellite positions from the APC300.



Figure 41.

### 10.3 Setup Wizard Polarization Drive Page

If the antenna is not equipped with a polarization drive motor, then click on the **Pol Drive is NOT Present** check box before continuing to the next step.

If the **Pol Drive is NOT Present** box is checked, then steps concerning polarization limits and offset are skipped by the wizard.

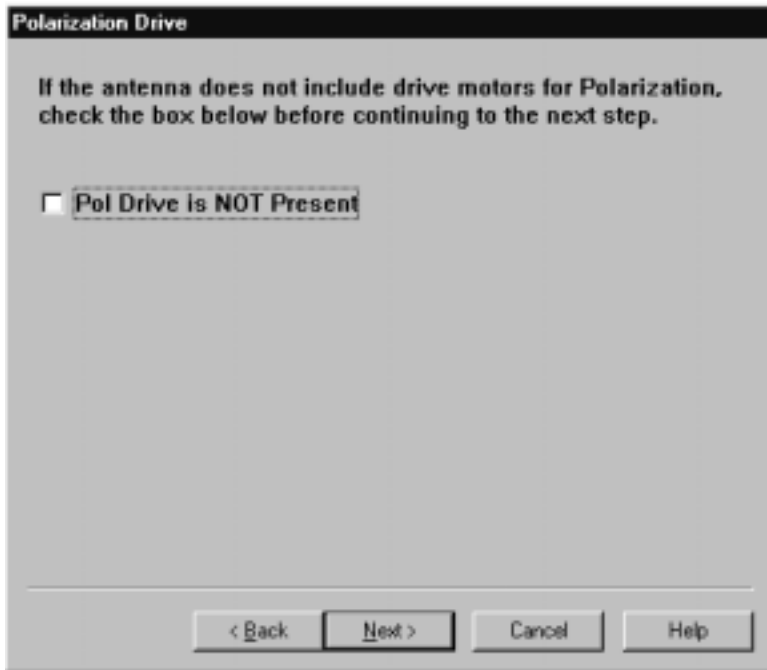


Figure 42.

#### 10.4 Setup Wizard Pol Drive Jumpers Page

If the antenna does not include polarization drive motors, then jumpers must be install in the resolver mating connector to satisfy the APC300's need to see polarization signals. The jumpers simulate the missing resolver signals. Another option for local motor controllers manufactured later than 10/93 is to wire jumpers to the antenna local motor controller resolver terminal strip TB1.





Figure 43.

TB1-19 to TB1-20 (Sin H to Sin L)  
TB1-22 to TB1-25 (Cos H to Ref H)  
TB1-23 to TB1-26 (Cos L to Ref L)

### 10.5 Setup Wizard Motor Check Page

The outdoor handheld motor controller should be used to verify that the connections for motor speed and direction are correct for each axis. This page is a reminder to do this, if it has not already been done. Continue to the next page when you have verified that the motor connections are correct.

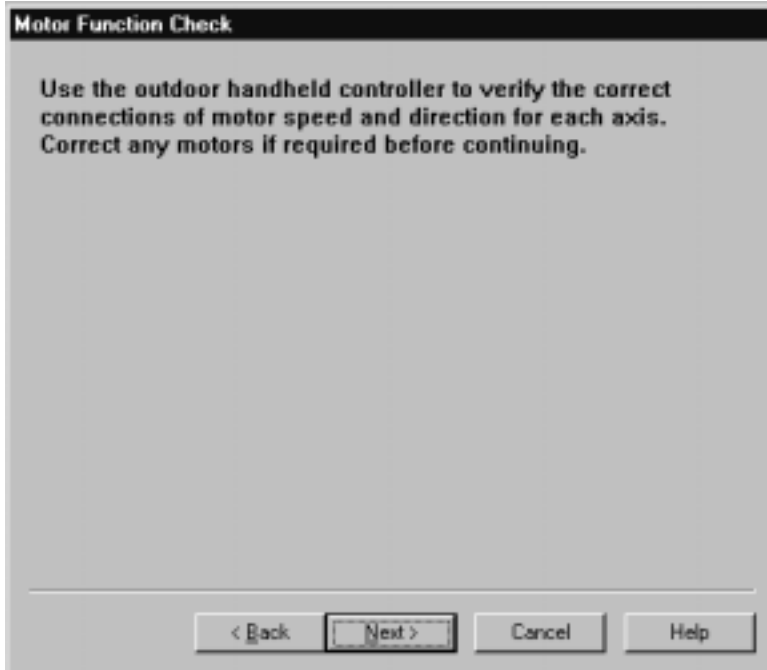


Figure 44.

## 10.6 Setup Wizard Limit Check Page

The limit switch check verifies that the hardware limit switches are working and verifies that moving the antenna through its full range does not cause problems with equipment inside the antenna hub.

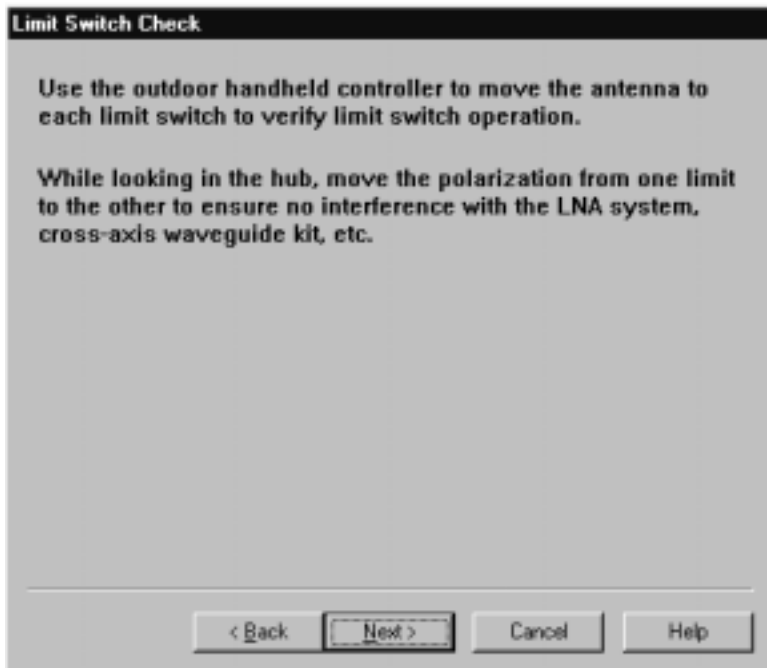


Figure 45.

## 10.7 Setup Wizard Station Location Page

This page of the Setup Wizard is for defining the station location which is required for INTELSAT ESS-412 and Two-Line Element pointing angle calculations. The hemisphere selection is required for proper operation of the APC300. An example of the page is shown in figure 46.

Figure 46.

Fields on this page are defined as follows:

**Station Name** The name or location of the station is used for documentation purposes.

**Station Latitude** The station location latitude, which must be in degrees East, is required for IESS-412 and Two-Line Element pointing angle calculations.

**Station Longitude** The station location longitude, which must be in degrees North, is required for IESS-412 and Two-Line Element pointing angle calculations.

**Height above IAU-1976**  
The earth station height above IAU-1976 ellipsoid in kilometers. This value is used in IESS-412 pointing angle calculations.

**Height above Mean Sea Level**  
The earth station height above mean sea level in kilometers. This value is used in

Two-Line Element pointing angle calculations.

### **Southern Hemisphere**

This field must be checked if the station is in the southern hemisphere and unchecked in the northern hemisphere.

## **10.8 Setup Wizard Antenna Type Page**

Set the Antenna type by selecting the size and band from the drop down lists. Selecting the size and band automatically selects the 3 dB beam width for Andrew antennas. An example of the page is shown in figure 47.

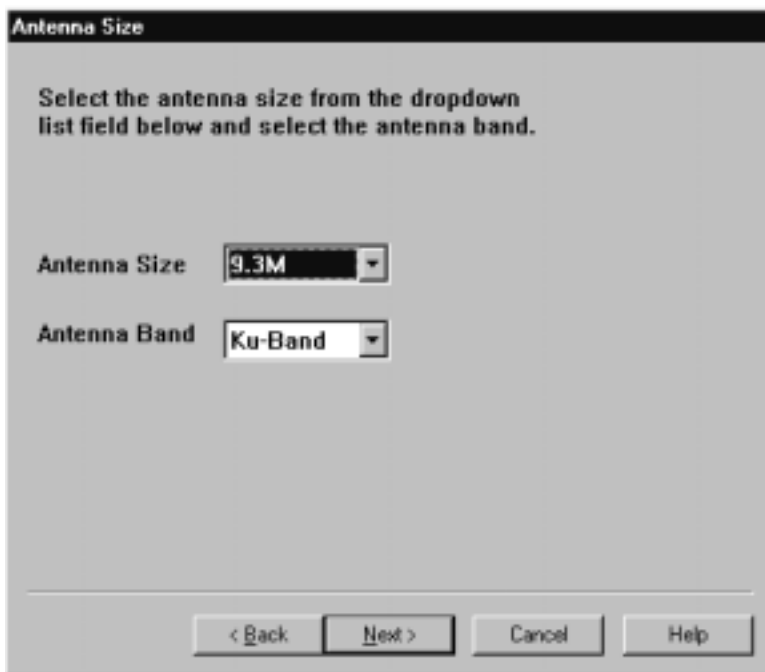


Figure 47.

## **10.9 Setup Wizard Resolver and Motor Kits**

Select the resolver kit, motor kit and polarization drive kit for the antenna. The correct kits must be selected because they will be used later to set some of the parameters in the APC300. The resolver scale factors for each axis are set according to the resolver kits selected. The motor kit is used to select other axis movement control parameters.

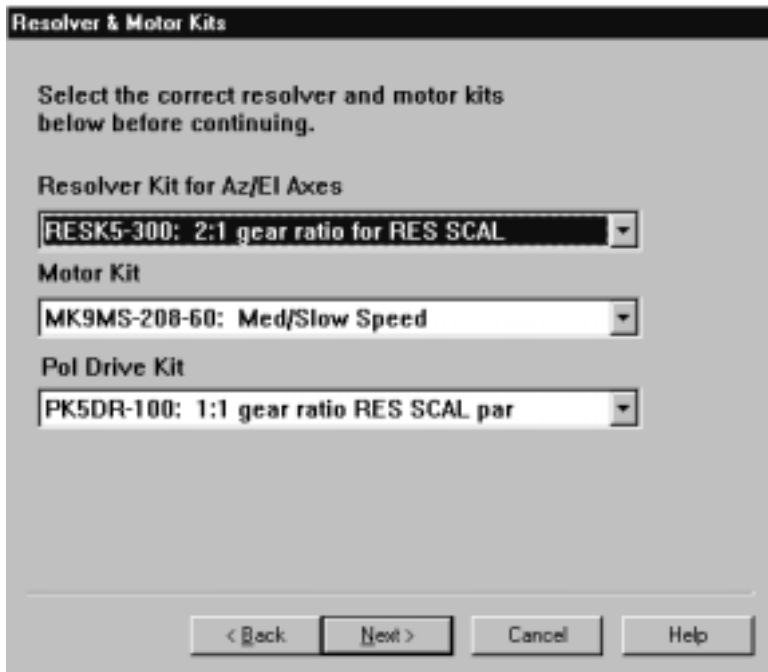


Figure 48.

## 10.10 Setup Wizard Checkout Page

The APC300 Checkout page is a reminder to be sure that the APC300 is operating properly and no faults are present before continuing with the setup procedure. Possible faults conditions listed on page 3-4 of the O & M Manual with references to paragraphs in the O & M Manual are as follows:

### POSITION ERROR LIMIT EXCEEDED

The axis has not been positioned within tolerance limits or it has been moved beyond limit without being command. Refer to paragraph 5.3.3 to correct limits.

### BATTERY BACKUP RAM DATA INVALID

Invalid checksum detected in battery backed RAM data during power-up. Refer to paragraph 4.5 for additional information.

### RESOLVER IMMOBLE

There was a mechanical failure of AZ or EL resolver or a jammed drive system. Refer to paragraph 6.4.1 "Troubleshooting".

### RDC HARDWARE FAILURE

The resolver-to-digital hardware is producing inconsistent data. The system is not able to determine an accurate antenna position.

### DRIVE HARDWARE FAILURE

The APC300 cannot properly move the antenna.

### BATTERY BACKED RAM HARDWARE FAILURE

Data cannot be transferred to or from battery backed RAM. All previously entered data has been lost and must be re-entered.

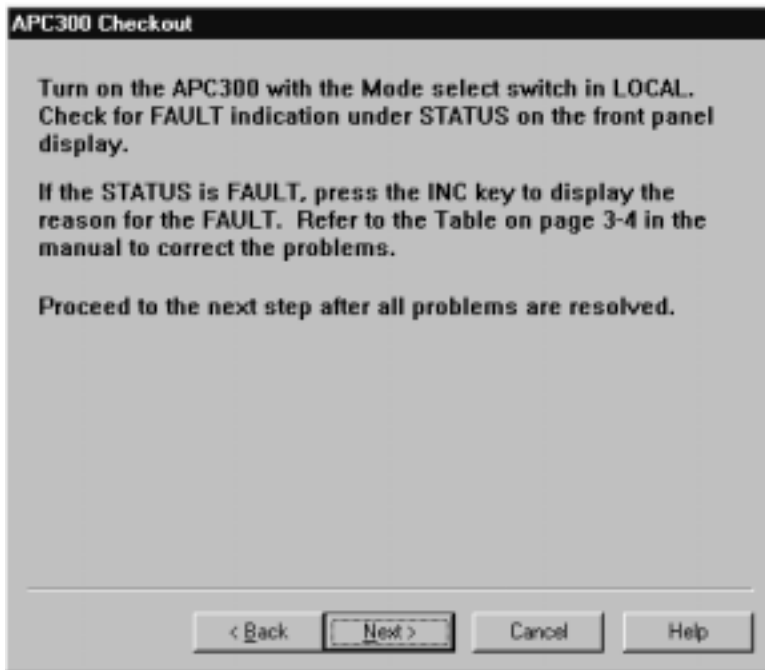


Figure 49.

### INVALID EPROM CHECKSUM

The control unit data checksum, determined during unit self test, does not agree with a predetermined value.

- AZIMUTH DIRECTION ERROR
- ELEVATION DIRECTION ERROR
- POLARITY DIRECTION ERROR

These faults indicate that the antenna moves in the wrong direction for the named axis when controlled by the APC300.

These faults may be reset by removing power and re-starting the system or by placing the LOCAL/REMOTE switch in REMOTE and back to LOCAL.

## 10.11 Setup Wizard Communications Check Page

Connect the serial cable supplied with the APC300 Utility Kit to the APC300 and the previously selected serial port on your computer. Change the Mode Select switch on the front of the APC300 to the REMOTE position. Click on the **Start Communication Test** button. The program will attempt to communicate with the APC300 by sending an RMGM command to read the GMT date and time, starting with the default baud rate of 1200. If the APC300 does not respond at 1200 baud, the program will try 2400, 9600 and 19200 before giving up and telling the operator to correct the problem and try again. If

communications with the APC300 is successful at a baud rate other than 1200, then the Utility program's communications port baud rate should be set to match that of the APC300 after the Setup Wizard is complete. This is done through the System Configuration CommPort Page. If the baud rate set in the Utility Program is not set to match the APC300, then it will have to search for the proper baud rate every time that it runs. After establishing communications with the APC300, the Mode Select status will be checked. If it is not REMOTE, then a message will be displayed and the program will wait for the switch to be changed to REMOTE before you can continue to the next step. An example of the page is shown in figure 50. Figure 51 shows the page after successful completion of the communications test.

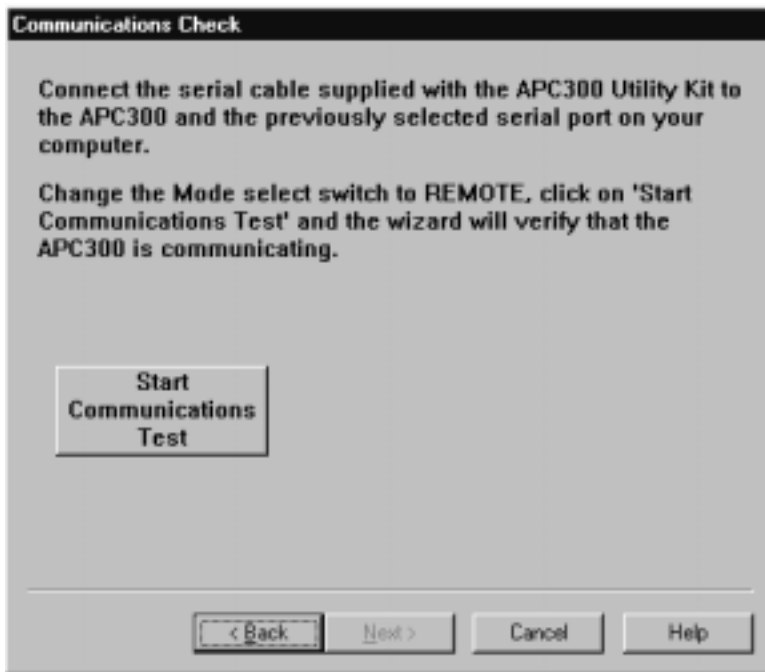


Figure 50.

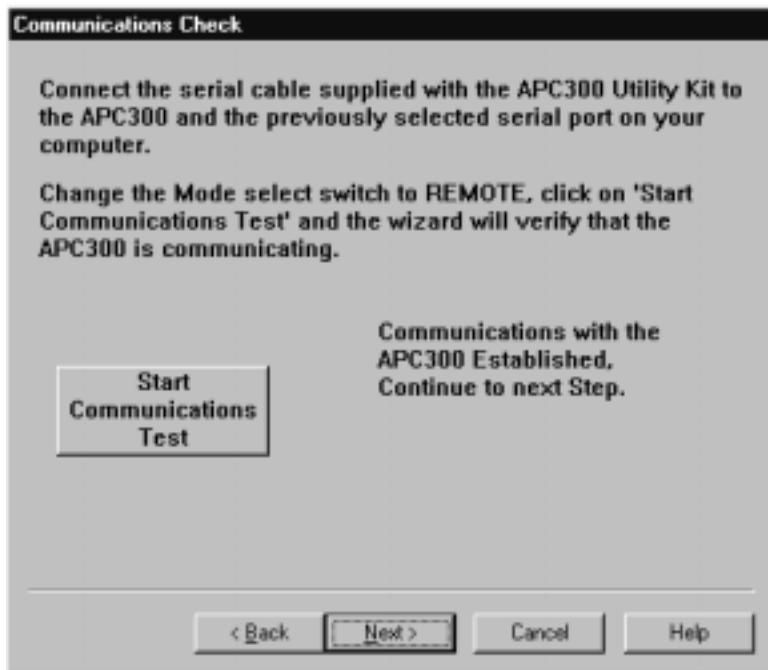


Figure 51.

When the **Next** button is activated, the hemisphere and polarization drive options will be downloaded to the APC300 and the axis scale factors will be set according to the motor drive kits and downloaded to the APC300.

## 10.12 Setup Wizard Pol Limits Page

If the antenna includes a polarization drive motor, then the limits and offset must be set before continuing with the procedure to set the azimuth and elevation offsets. Manually move the antenna polarization in the counter clockwise direction with the handheld controller until the limit switch is activated. While the antenna is moving, the current Pol reading from the APC300 will be displayed in the Setup Wizard Page. If the antenna moves in the clockwise direction, an error message window will pop up indicating that the antenna is moving in the wrong direction. When the limit switch is reached, click on the **Limit Switch Activated** button. The offset required to convert the current pol reading to 2.0 degrees will be displayed. If everything is correct, click on the **Next** button to continue to the next step. The counter clockwise limit position will be assumed to be 2.0 degrees and the polarization software minimum limit will be set to 3.0 degrees. The polarization offset will be set so that the current resolver reading is converted to 2.0 degrees. The polarization maximum will be set to 179.0 degrees. When the **Next** button is activated, the pol offset will be downloaded and the current pol reading should change to 2.0 degrees.

If the Setup Wizard has been previously run and this step was executed, then the button shown in figure 52 which says **Accept Limit 3.0, Offset 45494** will display the previous calculated offset. Click on the button to accept the previous offset and skip moving the polarization to the counter clockwise limit. If this step has not been previously run, then the button will be blank.



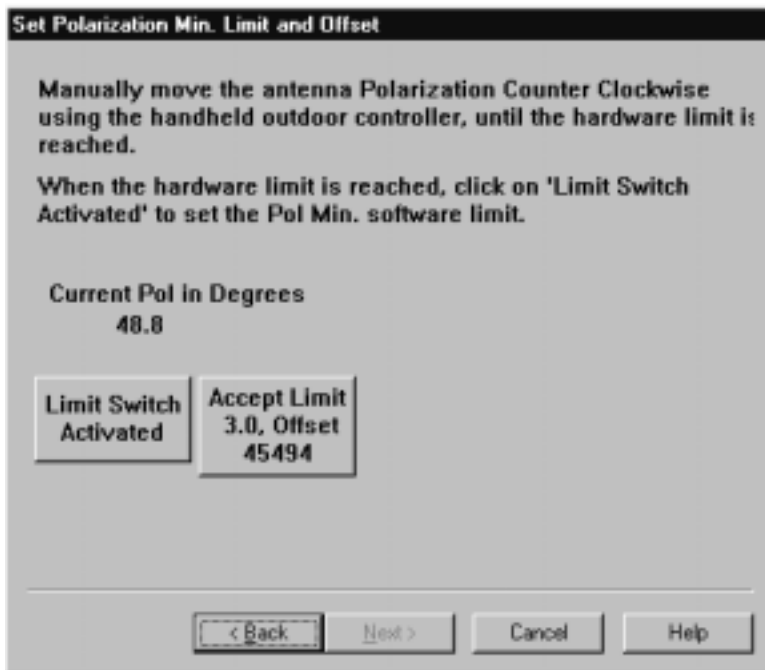


Figure 52.

### 10.13 Setup Wizard Move to Stationary Satellite

This step is required to determine the azimuth and elevation offset parameters. The satellite coordinates will later be used to set the overshoot and stop distance for each axis in order to optimize antenna movement. Peak the antenna on a stationary satellite, whose azimuth and elevation pointing angles are known for your site, using the front panel Jog commands or the handheld controller.

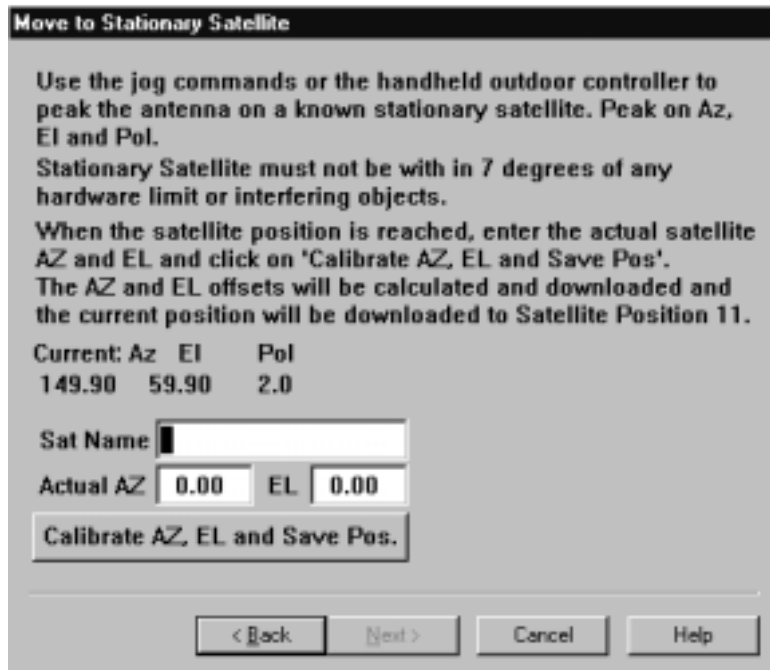


Figure 53.

If pol drive is present, then the pol must also be moved away from the limit or else the satellite position will not be valid. While the antenna is moving, the axis coordinates, as read by the APC300, will be displayed on the page as shown in figure 53.

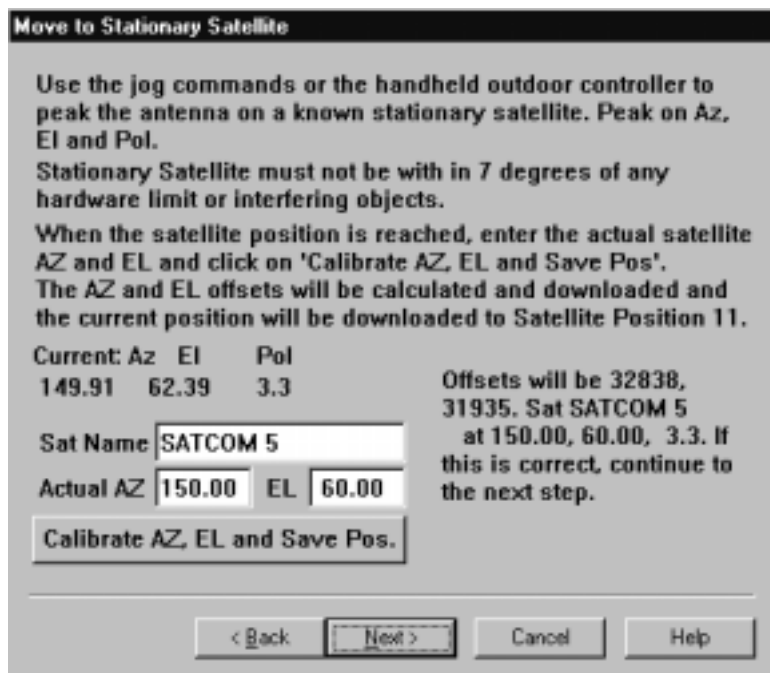


Figure 54.

If this step has previously been performed, the **Next** button will be enabled so that you may skip to the next step.

When the antenna is peaked on the satellite, enter the actual azimuth and elevation and the satellite name in the fields on the page and click on the **Calibrate AZ, EL and Save Pos** button. The calculated offsets required to convert the displayed current azimuth and elevation to the entered azimuth and elevation will be displayed and the **Next** button will be enabled as shown in figure 54. Click on the **Next** button to download the offsets to the APC300. A warning message window will pop up indicating that the Mode Select switch on the APC300 must be toggled in order for the APC300 to start using the new offsets to calculate the current position. The antenna coordinates and the entered satellite name will be downloaded to the APC300 satellite position table as position 11. Another test satellite position will be downloaded to position 12 with coordinates set 5.0 degrees higher than position 11.

### 10.14 Setup Wizard Azimuth East Limit Page

Manually move the antenna azimuth in the east direction with the handheld controller until the limit switch is activated. While the antenna is moving, the current azimuth reading from the APC300 will be displayed in the Setup Wizard Page. If the antenna moves in the west direction, an error message window will pop up indicating that the antenna is moving in the wrong direction. When the limit switch is reached, click on the **Limit Switch Activated** button. In the northern hemisphere, the azimuth minimum will be set to one degree higher than the limit and in the southern hemisphere, the azimuth maximum will be set to one degree lower than the limit. If everything is correct, click on the **Next** button to continue to the next step.

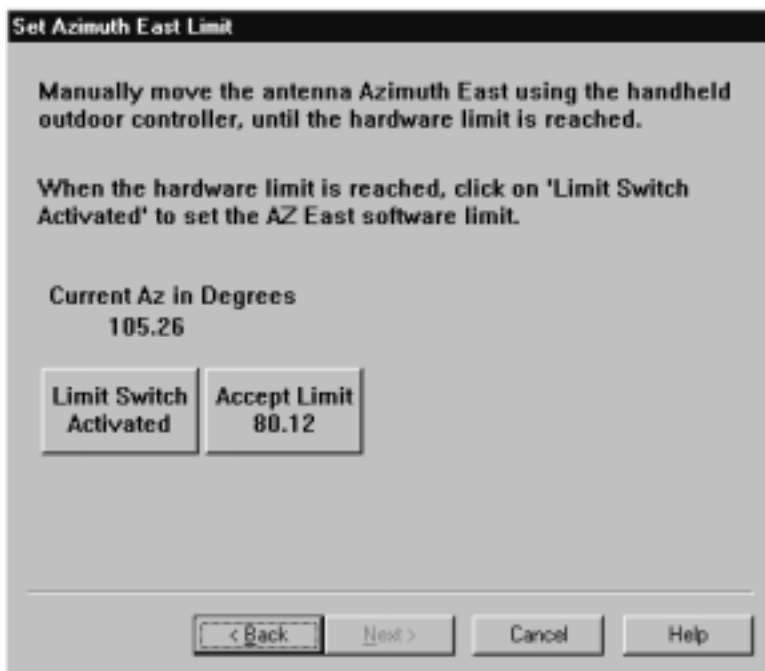


Figure 55.

If the Setup Wizard has been previously run and this step was executed, then the button shown in figure 55, which says **Accept Limit 80.12** will display the previous limit. Click on the button to accept the previous limit and skip moving the azimuth to the east limit. If this step has not been previously run, then the button will be blank.

### 10.15 Setup Wizard Elevation Down Limit Page

Manually move the antenna elevation in the down direction with the handheld controller until the limit switch is activated. While the antenna is moving, the current elevation reading from the APC300 will be displayed in the Setup Wizard Page. If the antenna moves in the up direction, an error message window will pop up indicating that the antenna is moving in the wrong direction. When the limit switch is reached, click on the **Limit Switch Activated** button. The elevation minimum will be set to one degree higher than the limit. If everything is correct, click on the **Next** button to continue to the next step.

If the Setup Wizard has been previously run and this step was executed, then the button shown in figure 56, which says **Accept Limit 14.26** will display the previous limit. Click on the button to accept the previous limit and skip moving the elevation to the down limit. If this step has not been previously run, then the button will be blank.

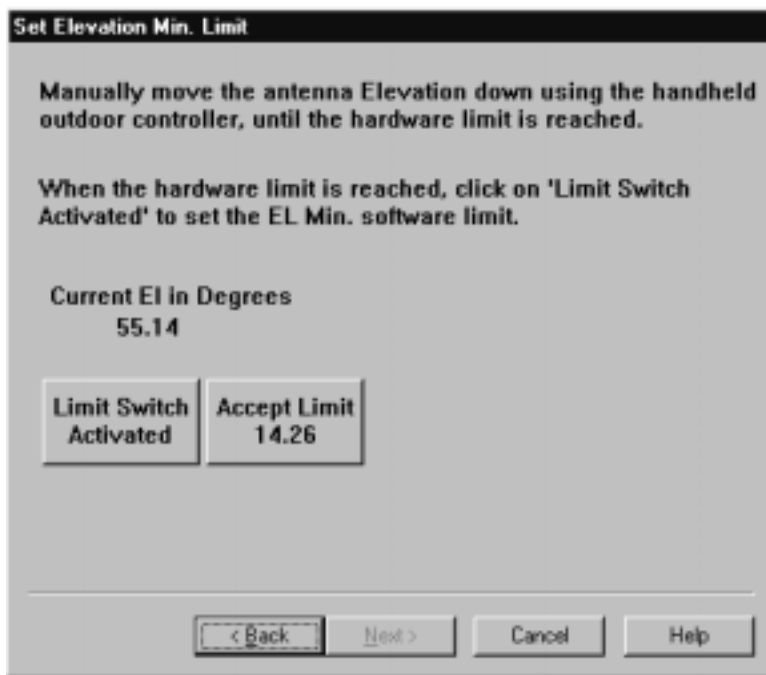


Figure 56.

### 10.16 Setup Wizard Azimuth West Limit Page

Manually move the antenna azimuth in the west direction with the handheld controller until the limit switch is activated. While the antenna is moving, the current azimuth reading from the APC300 will be

displayed in the Setup Wizard Page. If the antenna moves in the east direction, an error message window will pop up indicating that the antenna is moving in the wrong direction. When the limit switch is reached, click on the **Limit Switch Activated** button. In the northern hemisphere, the azimuth maximum will be set to one degree lower than the limit and in the southern hemisphere, the azimuth minimum will be set to one degree higher than the limit. If everything is correct, click on the **Next** button to continue to the next step.

If the Setup Wizard has been previously run and this step was executed, then the button shown in figure 57, which says **Accept Limit 198.67** will display the previous limit. Click on the button to accept the previous limit and skip moving the azimuth to the east limit. If this step has not been previously run, then the button will be blank.

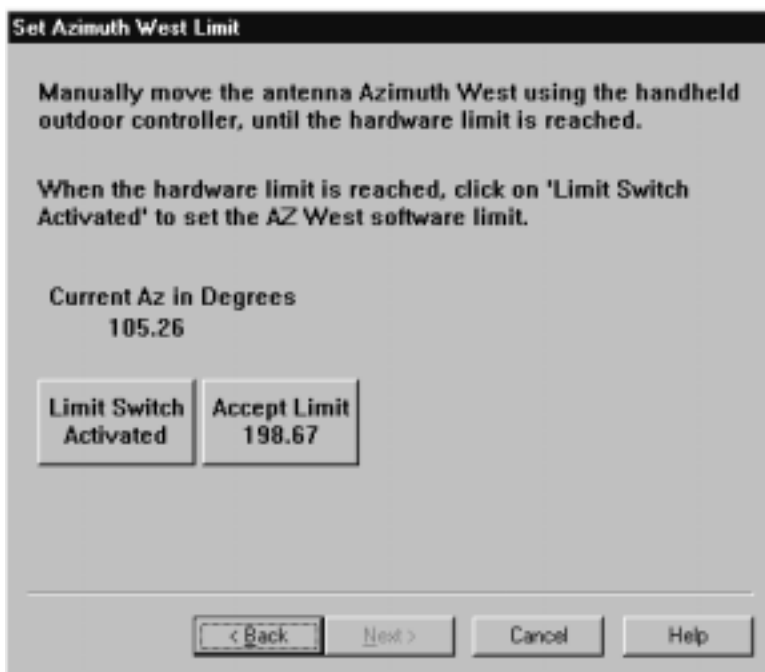


Figure 57.

### 10.17 Setup Wizard Elevation Up Limit Page

Manually move the antenna elevation in the up direction with the handheld controller until the limit switch is activated. While the antenna is moving, the current elevation reading from the APC300 will be displayed in the Setup Wizard Page. If the antenna moves in the down direction, an error message window will pop up indicating that the antenna is moving in the wrong direction. When the limit switch is reached, click on the **Limit Switch Activated** button. The elevation maximum will be set to one degree lower than the limit. If everything is correct, click on the **Next** button to continue to the next step.

If the Setup Wizard has been previously run and this step was executed, then the button shown in figure 58, which says **Accept Limit 83.67** will display the previous limit. Click on the button to accept the

previous limit and skip moving the elevation to the up limit. If this step has not been previously run, then the button will be blank.

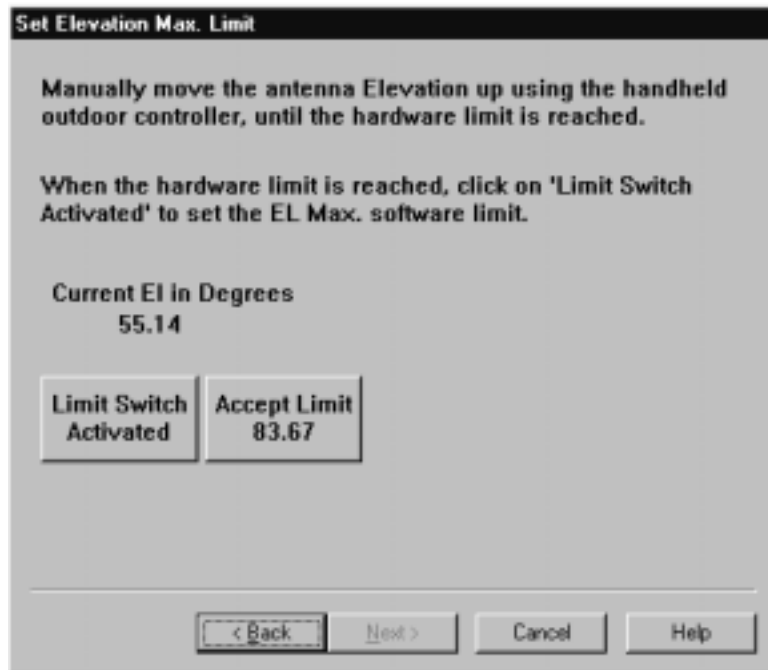


Figure 58.

### 10.18 Setup Wizard Overshoot and Stop Distance Page

The overshoot and stop distance are axis parameters which enable the APC300 to stop the antenna as close as possible to the desired coordinates on the first attempt at moving to a satellite position. The overshoot is the expected distance that the antenna will continue to move after the slow motor as been turned off. The stop distance is the distance from the desired coordinate where the fast motor is turned off and the slow motor takes over moving the rest of the way to the desired coordinate. If polarization drive is present, there will be only one motor so the stop distance does not apply to polarization. The retry parameter is set to zero for this step so that the APC300 will stop moving the antenna after the first motor activation even if the new coordinates are not within the tolerance limits from the desired coordinates. The default overshoot distances, tolerances, pulse times, stop distances and pause times are downloaded to the APC300 before this step begins. The antenna will be moved between satellites 11 and 12, which were previously downloaded to the APC300. Each move requires the operator to click on the **Move to Satellite** button to start the move. While moving the **Status** will be “Motion”, the **Sat#** will be zero and the current coordinates will be displayed. When the new position is reached, the **Status** should be “Normal”, the **Sat#** will be 11 or 12 and the current coordinates will be displayed. If the **Status** changes to “Fault”, it will be necessary to send a **Fault Reset** command before continuing. The overshoot and stop distances, tolerances, pulse times and pause times, which have been downloaded are displayed on the page. The numbers are displayed in hundredths of a degree or hundredths of a second. For example, the overshoot shown in figure 59 would be .03 degrees for azimuth, .04 degrees for

elevation and 1.40 degrees for polarization. When moving to position 11, if the antenna stops short in any axis, the overshoot parameter will be decreased by .01 degrees for the axis. If the antenna travels past in any axis, the overshoot will be increased by .01 degrees. When moving to position 12, if the antenna stops short in any axis, the overshoot parameter will be decreased by .01 degrees for the axis. If the antenna travels past in az or el, the stop distance will be increased by .1 degrees. Following each move with one or more axes not within tolerance, the new overshoot and stop distances will be updated and there will be a prompt displayed indicating which parameters changed and that the **Move to Satellite** button must be clicked to start the next move. The **Stop/Skip This Step** button may be used to accept the last downloaded overshoot and stop distances and enable the **Next** button to allow continuing to the next step. If the antenna stops within tolerances for each axis, the **Next** button will be enabled to allow continuing to the next step. After completion of this step the retry parameter will be set to 2 for each axis and downloaded to the APC300.

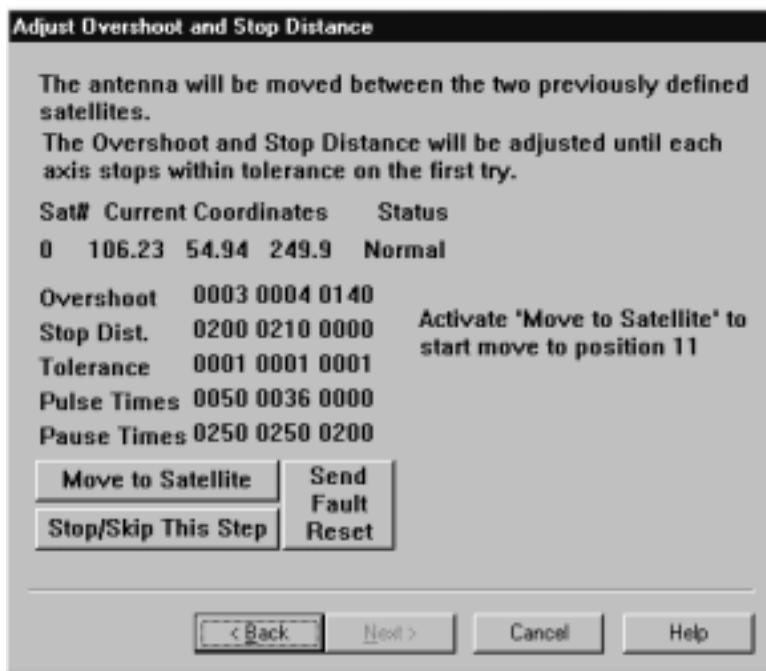


Figure 59.

## 10.19 Setup Wizard SMARTRACK Page

The Setup Wizard provides for setting SMARTRACKing parameters; however, if you do not plan to use the APC300 to SMARTRACK or Steptrack inclined orbit satellites, you may skip setting up the parameters. Check the **Setup SMARTRACKing Parameters** and click on the **Next** button to setup these parameters.

If SMARTRACKing parameters are not setup, then default values for these parameters will be set and downloaded to the APC300. SMARTRACKing parameters are identified in the Signal Filter Page section.



Figure 60.

### 10.20 Setup Wizard Beacon Receiver Slope Page

Set the beacon receiver dB/Volt slope which will be used to set the Detect Level later.



Figure 61.



### 10.21 Setup Wizard Move to Inclined Orbit Satellite

Enter the coordinates of an inclined orbit satellite and click on the **Move to Coordinates** button to move the antenna to the coordinates. Peak on the inclined orbit satellite, using the front panel jog switches, and ensure that the beacon receiver is set to the correct frequency and locks onto the beacon. The current coordinates and beacon voltage are displayed on the page and updated as they change. When peaked on the satellite, enter its name in the **Sat. Name** field and click on the **Save Sat as Pos 1** button. The satellite name and current coordinates will be downloaded to the APC300 in satellite position 1. An example of this page is shown in figure 62. Click on the **Next** button to continue to the next page. If the inclined orbit satellite position has been previously set and downloaded, the **Next** button will be enabled immediately and you may skip this step.

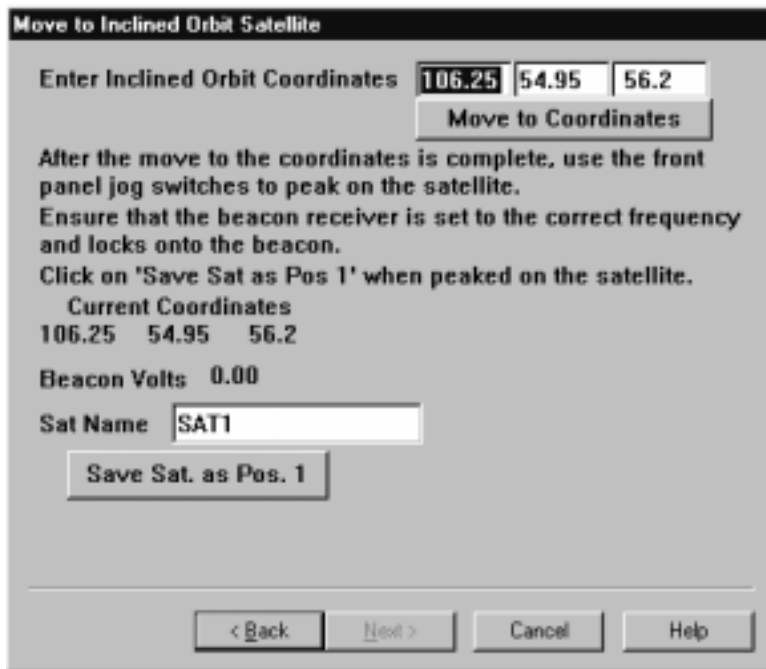


Figure 62.

### 10.22 Setup Wizard Beacon Level Adjustment Page

The optimum signal level is 8 volts. The display should indicate the input signal close to eight volts when the satellite is peaked. Many video receivers can not supply the optimum level and many beacon receivers provide too great a signal. The APC300 has an amplifier built in to correct this problem. Take the top cover off the APC300 and look to the rear panel. At J2 is the dual amplifier input module. Locate variable resistor R14, it is a multi-turn potentiometer located just to the left of IC U1.

Slowly adjust R14 until eight volts is obtained while peaked upon the desired satellite.

If too much signal is the problem and adjusting R14 doesn't bring the level down to eight volts, R18 is the primary signal input voltage divider. It may be used to reduce large signals up to 15 volts.

When the beacon voltage optimization procedure is finished, click on the **Next** button to continue to the next step.

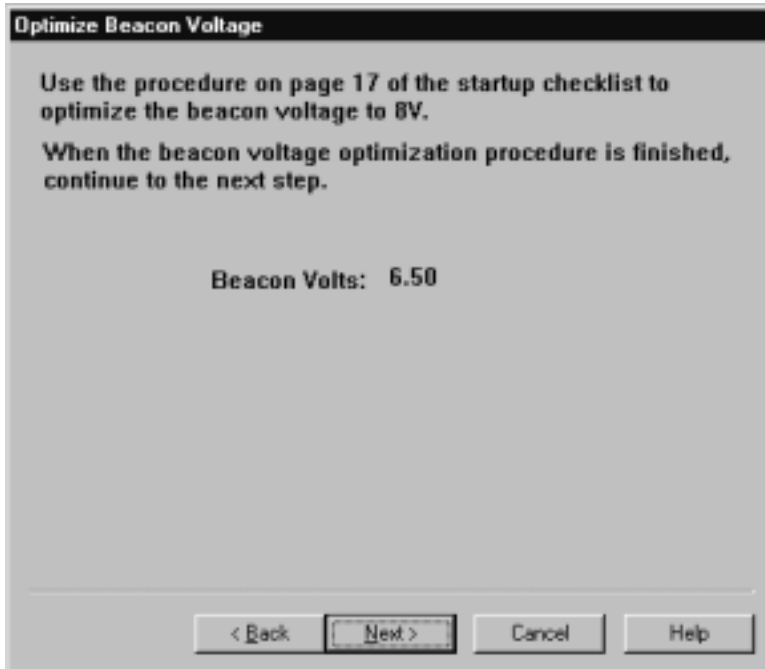


Figure 63.

### 10.23 Setup Wizard Signal Filter Page

The purpose of this page is to adjust the tracking signal filter so that the beacon level does not vary by more than .05 volts while peaked on a satellite.

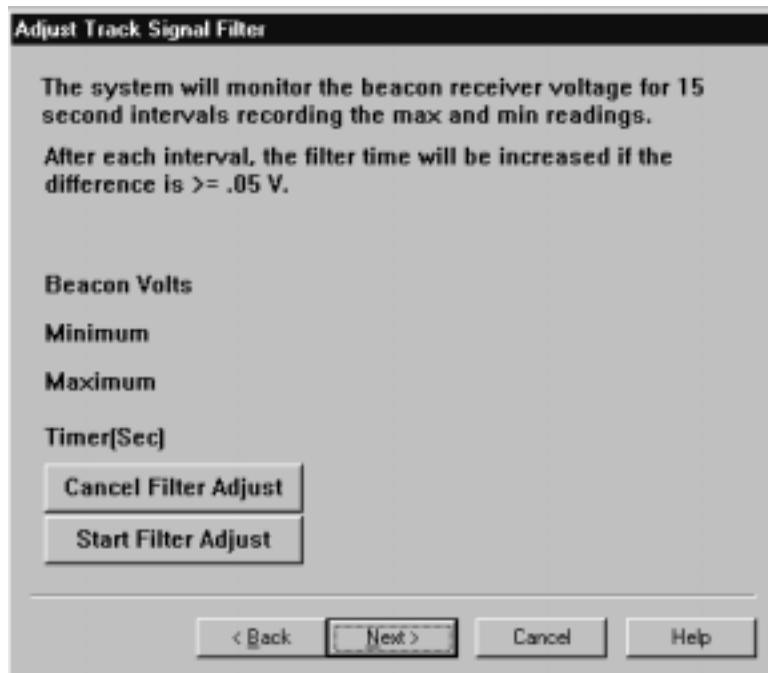


Figure 64a.

It is important to stay peaked on the satellite while the signal filter adjustment procedure is performed or else the difference in beacon voltage during a 15 second period will not be below .05 volts and the optimum filter time cannot be determined. Click on the **Start Filter Adjust** button to start the procedure. If this procedure has already been performed, the **Next** button will be enabled so you may go to the next step. An example of this page, before the procedure is started, is shown in figure 64a. The signal filter will be initially set to 0 seconds. The procedure will read the beacon voltage as fast as it can for a 15 second period or as soon as the difference between the maximum and minimum reading is greater than or equal to .05 volts. If the difference is greater than or equal to .05 volts, the signal filter will be increased by 1.3 seconds and downloaded to the APC300. This cycle will continue until the difference is less than .05 volts or until the filter time reaches 3.9 seconds. If the filter time is set to 3.9 seconds and the difference is still too large, then the procedure will stop and the following prompt will be displayed.

“The beacon level is not stable. Please re-peak the antenna on the inclined satellite and click on 'Continue' button to try again”

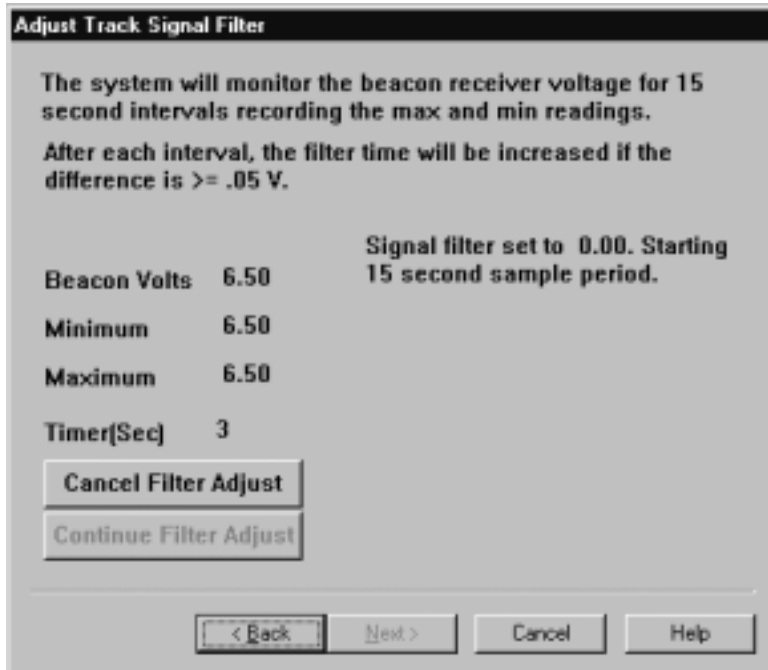


Figure 64b.

The **Continue Filter Adjust** button, shown in figure 64b, will be enabled. When re-peaked on the satellite, click on this button and the procedure will start again with the filter time set to 1.3 seconds. If the filter time reaches 3.9 seconds again and the difference is still too large, the procedure will be terminated and the filter time will be set to 1.3 seconds.

At the completion of this step, whether the difference is below .05 volts or not, the following parameters will be downloaded to the APC300.

<b>Track Cycle Time</b>	(ETC)
<b>Track Error Level</b>	(ETE)
<b>Track Threshold</b>	(ETT)
<b>Scintillation Enabled</b>	(ESE0)
<b>Beacon Error Detect Time</b>	(EED)
<b>Beacon Switchover Time</b>	(ESD)
<b>Steptrack Distance</b>	(ETD)
<b>Steptrack Detect Level</b>	(EDL)
<b>Track Signal Filter</b>	(ETF)
<b>Steptrack Pause Time</b>	(ETP)
<b>Steptrack Tolerance</b>	(ETL)
<b>Steptrack repeat Count</b>	(ETR)
<b>SMARTRACK Reset Time</b>	(ECT)
<b>SMARTRACK Minimum Move</b>	(EST)
<b>Box Limits</b>	(EBOX)
<b>Resolver Check Distance</b>	(ESPD)

Acceptance Percentage (MPA)

### 10.24 Setup Wizard Start SMARTRACK Page



Figure 65.

This step will enable SMARTRACKing for the previously defined and downloaded satellite position one and it will send a command to the APC300 to move to satellite one, if the **Start SMARTRACK** check box is checked when the **Next** button is clicked.

### 10.25 Setup Wizard Completion Page

This page is displayed at the completion of the Setup Wizard. The setup parameters and satellite positions derived during the setup procedure have been downloaded to the APC300 or saved in a file. When the **Finish** button is selected, the Setup Wizard Parameter Edit property sheet shown in figure 67 will be activated.

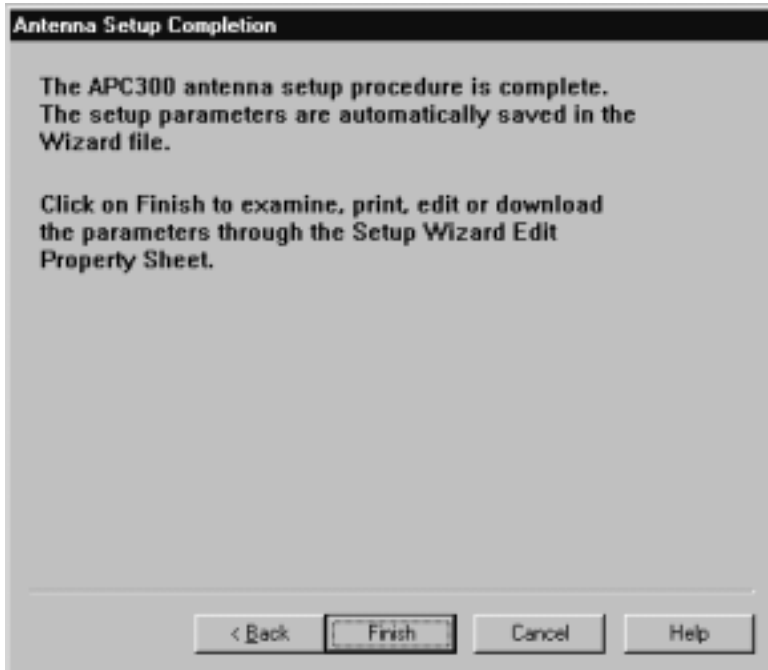


Figure 66.

The Setup Wizard Parameter Edit property sheet allows viewing of all parameters derived by the Setup Wizard. Any parameter may be changed and saved in the Setup Wizard parameter file and/or downloaded to the APC300. The parameters may also be printed.

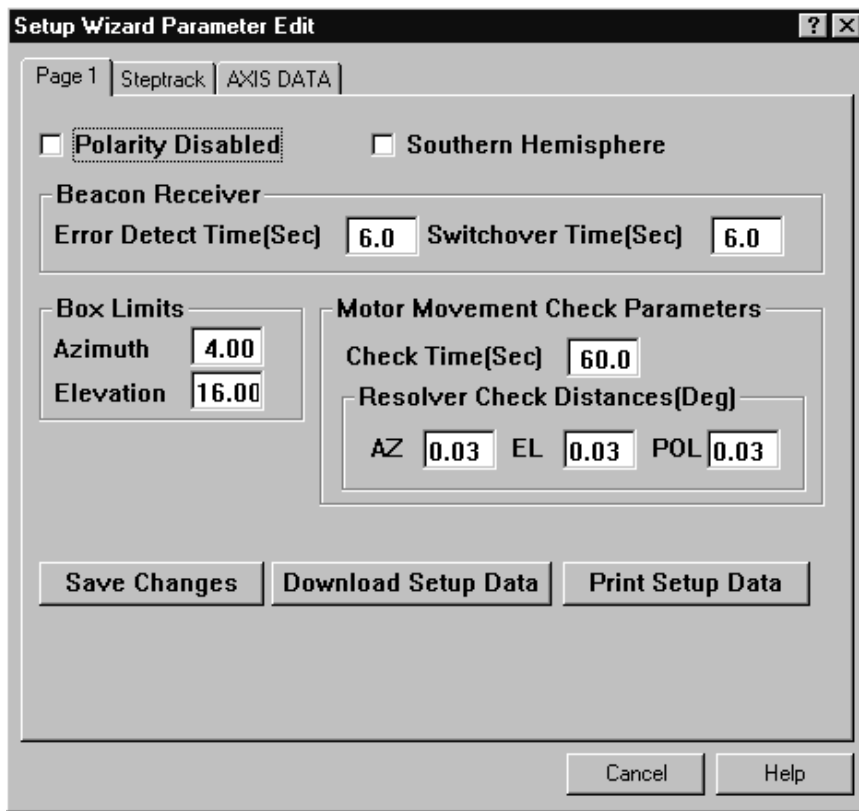


Figure 67.

## 11 APC300 SMARTRACK Setup Wizard

The SMARTRACK Setup Wizard is a subset of the complete Setup Wizard which includes only the steps required to set the SMARTRACK and Steptrack related parameters. The wizard pages which are included in the SMARTRACK Setup are as follows:

- Setup Wizard Antenna Type Page
- Setup Wizard SMARTRACK Page
- Setup Wizard Beacon Receiver Slope Page
- Setup Wizard Move to Inclined Orbit Satellite
- Setup Wizard Beacon Level Adjustment Page
- Setup Wizard Signal Filter Page
- Setup Wizard Start SMARTRACK Page
- Setup Wizard Completion Page

## 12 System Operators Screen

The Operator ID screen displays a list of operators defined for the system. The system includes security features to insure that only authorized personnel are allowed to use the system. The screen may be activated through the Screens menu or with **F9**. An example of the Operator ID screen is shown in

figure 68. Operators may be printed when this screen is displayed by selecting Reports from the Screens menu or with **F8**.

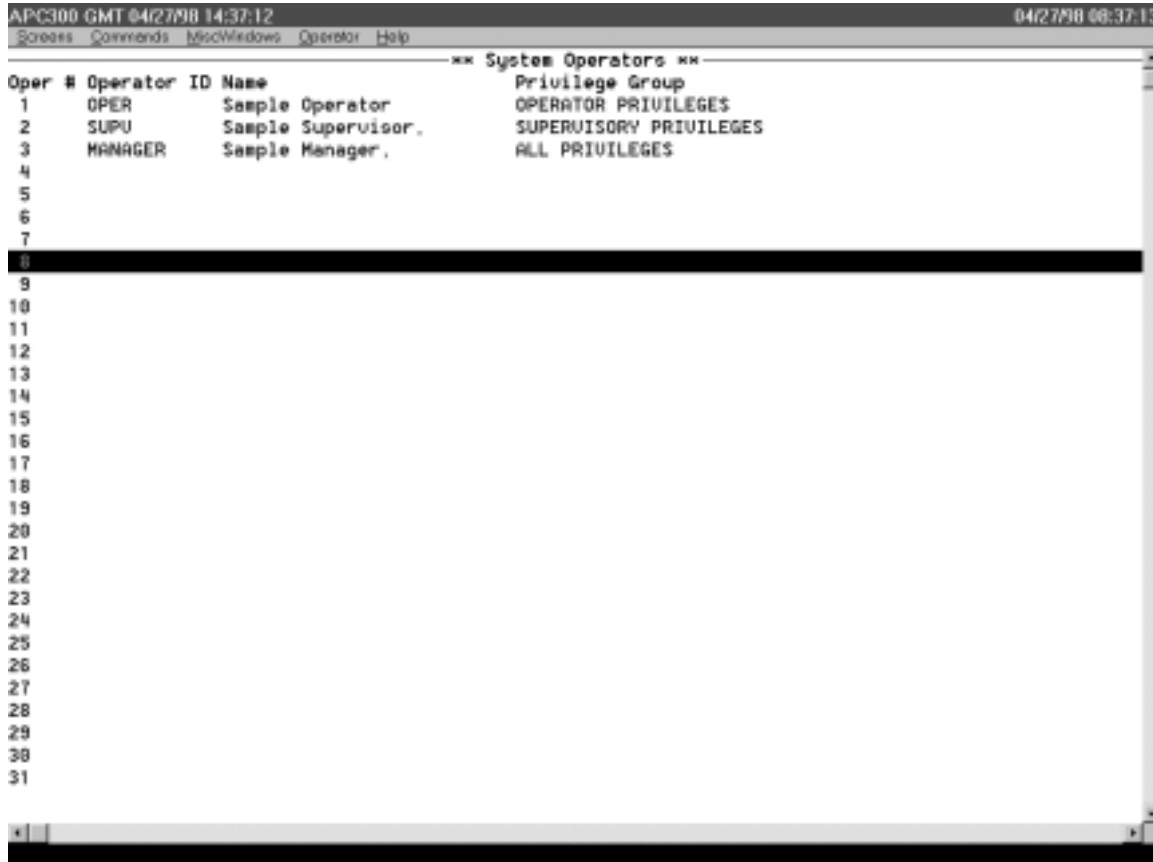


Figure 68.

## 12.1 Adding and Editing Operators

This menu item activates a dialog for adding, changing and deleting operators. An example of this dialog is shown in figure 69.

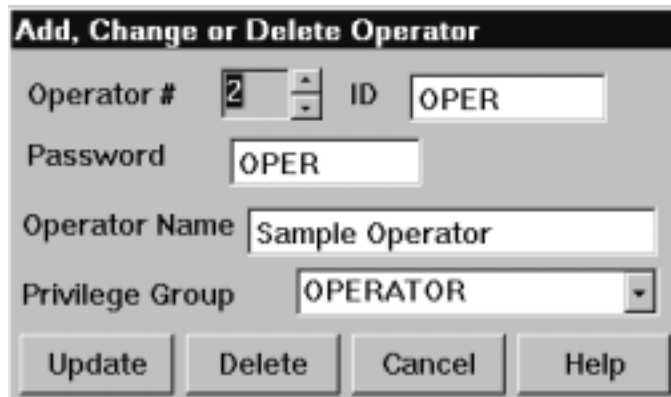




Figure 69.

Fields in the window are defined as follows:

- Operator #** This spin button selects the operator whose parameters are displayed.
- ID** This field defines the identification code name for the operator. It is used when the operator logs on to identify the operator. The ID can be up to 8 characters. The operator ID is not case sensitive.
- Password** This is the password used to verify operators when logging on to the system. It can be up to 8 characters. Password is not case sensitive.
- Privilege Group** The privilege group for an operator defines the types of operations that the operator is allowed to perform. The privilege groups are defined as follows:

**DOWNLINK OPER**

This privilege allows an operator to send commands to receivers and antenna controllers but not to uplink devices and to generate reports.

**OPERATOR** This privilege allows an operator to send commands to all devices and generate reports.

**SUPERVISORY**

This privilege includes OPERATOR privileges and allows for a system shutdown or program exit, defining satellite positions for the antenna controller, defining events and defining equipment configurations and changing terminal color selections.

**ALL** This privilege allows an operator to have access to all features of the system such as defining operators and changing anything in the Configuration Property Sheet.

**Operator Name** The operator name is simply used to identify the operator since the operator ID is too short for the operator's name.

**Update** This button will add or replace the displayed operator.

**Delete** This button will delete the displayed operator's definition.

## 12.2 Operator Logon

You can activate the operator logon dialog with the LogOn menu item in the Operators menu or with the **Ctrl-F9** Hot Keys. You can log off the current operator with the LogOff menu item in the Operators menu or with the **Ctrl-F10** Hot Keys. This dialog window provides for logging on to the system. An example is shown in figure 70.

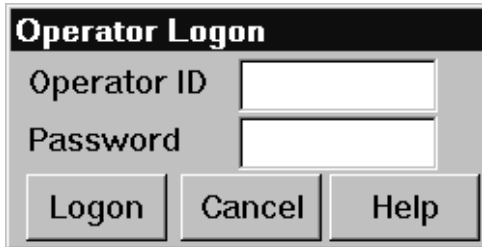


Figure 70.

Fields in the window are defined as follows:

**ID** Enter the ID for the operator logging on to the system. Entry is not case sensitive.

**Password** Enter the password for the operator. Entry is not case sensitive.

**Logon** Select this button after entry of the ID and password to log on to the system.

### 13 File Directory Screen

The File Directory screen displays system file definitions for binary files which have a file extension of DAT. The File Directory is for system maintenance and normally should not be changed by site personnel. It may be activated through the Screen menu or with **F10**. There is one reason why site personnel may want to make changes to the File Directory and that is to increase the number of alarms kept for the Alarm History Window. The messages displayed in the Alarm History Window are kept in file ALARMQUE. The number of records in this file is the maximum number of alarms kept by the system. The File Directory may be printed when this screen is displayed by selecting Reports from the Screens menu or with **F8**. An example of the File Directory screen is shown in figure 71.

N	FILE TYPE	REC SIZE	HDR SIZE	NUMBER RECORDS	RECORD #	REC GROUPS	FILE NAME	COMM FILE	OPER IF	FILE CRC	REC CRC	REST BKUP	QUEUE FILE	CREATE 0 FILE	DEFINE 0 FILE	
	CURSTATE	125	32	1	0	0	CURSTATE	Yes	Yes	No	No	No	No	Yes	Yes	Nc
	N/A	28	48	0	0	0	FILEDIR	Yes	Yes	Yes	No	Yes	No	No	Yes	Nc
	COMMPORT	65	32	4	0	0	HOSTPORT	Yes	Yes	Yes	No	No	No	Yes	Yes	Vec
	GROUP	64	32	0	0	4	DEUCONFG	Yes	Yes	No	No	No	No	No	No	Vec
	GROUP	86	32	0	0	4	RTDB	Yes	Yes	No	No	No	No	No	No	Nc
	GROUP	1271	32	0	10	4	APCSETUP	Yes	Yes	No	No	No	No	No	No	Vec
	GROUP	2985	32	0	10	4	APCPOS	Yes	Yes	No	No	No	No	No	No	Vec
	GROUP	28027	32	0	10	4	SMRTRK	Yes	Yes	No	No	No	No	Yes	Yes	Nc
	GROUP	13757	32	0	40	4	IESS412	Yes	Yes	No	No	No	No	Yes	Yes	Nc
	GROUP	13733	32	0	40	4	TLEDATA	Yes	Yes	No	No	No	No	Yes	Yes	Nc
	N/A	160	48	3000	0	0	ALARMQUE	Yes	Yes	No	No	No	Yes	No	No	Nc
	N/A	158	48	300	0	0	ALARMPRI	Yes	Yes	No	No	No	Yes	No	No	Nc
	N/A	158	48	2000	0	0	COMMQUE	Yes	Yes	No	No	No	Yes	No	No	Nc
	OPER ID	40	32	64	0	0	OPERID	Yes	Yes	No	No	No	No	No	No	Vec
	NUMBERED	16	48	0	0	0	TRNCMD01	Yes	Yes	No	No	No	Yes	No	No	Nc

Figure 71.

### 13.1 Adding and Editing File Directory Entries

The File Directory Edit menu item activates the Add or Change File Directory dialog. It can also be activated by selecting a File Directory entry with the mouse from the File Directory screen. An example of this dialog is shown in figure 72. Fields in the window are defined as follows:

**Rec #** This spin button field selects the file directory entry displayed in the dialog. It may be entered directly or changed with the arrow keys or mouse.

**Name** Enter the name for the file, not including the extension because the extension is always .DAT.

**File Type** Select the file type from the following list of valid types. The file type defines some special quality about the file.

**N/A** No special file type.

**COMMPORT** This is the host Comm. Port definition file which is named HOSTPORT.

**CURSTATE** This is the Current State file. There is only one file with this type and it must be

- NUMBERED**      named CURSTATE. This defines a file whose name ends with a two digit number where the first six characters in the name are the same for all files belonging to the same numbered group.
- GROUP**        This defines a file as a two dimensional array of records where the number of records in a group and the number of groups are defined in special fields.
- TERMPORT**     This is the terminal Comm. Port definition file which is named TERMPORT.

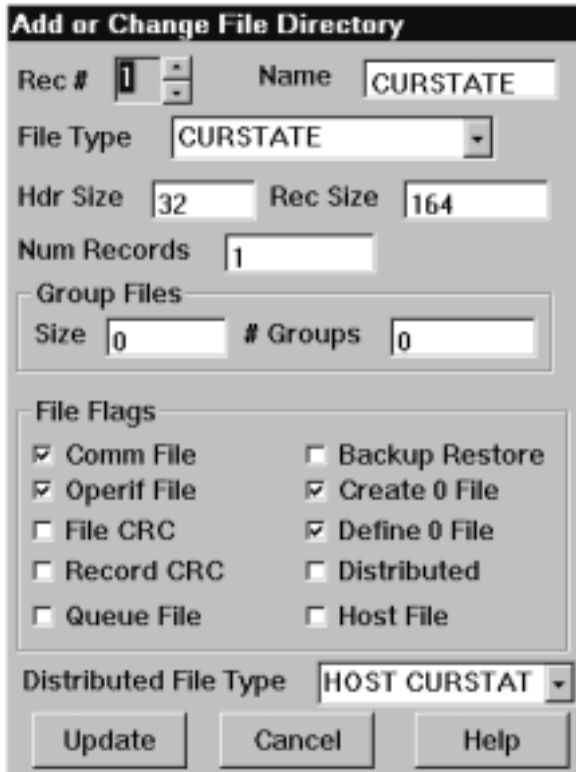


Figure 72.

- OPER ID**        This file type identifies the Operator ID definition file which must be named OPERID.
- Hdr Size**      This field defines the size of the file's header in bytes. Zero indicates that the header size in the file's header will be accepted as correct.
- Rec Size**      This field defines the size of the file's records in bytes. Zero indicates that the record size in the file's header will be accepted as correct.
- Num Records**   This field defines the number of records in the file if it is not zero and the file is not a GROUP file. If this field is zero, then the file header defines the number of records. If it is not zero and not a group file, then the number of records in the file will be set to this value when the system starts up.

- Group Files** These fields only apply to GROUP files. The **Size** field sets the number of records in a group for group files and the **# Groups** field sets the number of groups in the file. The number of records in the file is always the group size times the number of groups.
- File Flags** These check boxes define special properties for files as follows:
- Comm File** If checked, this file is used by the communications program.
  - Operif File** If checked, this file is used by the operator interface program.
  - File CRC** If checked, this file has a CRC in the header which is recalculated each time the any record in the file is changed. The CRC is validated when the system starts up to check for file corruption.
  - Record CRC** If checked, this file has a CRC at the end of every record which is recalculated each time that a record is written to the file. The record CRCs are validated when the system starts up to check for file corruption.
  - Queue File** If checked, this file is a queue file whose records are treated like a circular queue. Examples of this type of file are the Alarm History file, ALARMQUE and the Priority Alarm file, ALARMPRI.
  - Backup Restore**  
If checked, this file will be restored from the backup directory at start up if it does not exist and has a bad CRC.
  - Create 0 File** If checked, this file will be created at start up if it does not exist even though the number of records for the file is zero. If not checked, the file will not be created at start up if it does not exist and the number of records for the file is zero.
  - Define 0 File** If checked, this file will be defined at start up if it exists even though the number of records for the file is zero. If not checked, the file will not be defined at start up if it does exist and the number of records for the file is zero.
  - Distributed** If checked, this file is a file which is copied to all terminals. Any updates to the file at any terminal or the host are copied to all other terminals.
- Distributed File Type**  
This field is used to identify "Distributed" files when updates are sent to the terminals or the host.

## 13.2 DAT File Status Window

The DAT File Status Win menu item activates a window which displays current information about \*.DAT files defined for the terminal operator interface program. It is used as a system maintenance tool. An example of this window is shown in figure 73.

Data in the window can be scrolled vertically and horizontally.

FILE	OPEN	HNDL	HDR	RECL	# RECS	BYTES	READS	WRITES	OPENS	ERRS
CURSTATE.DAT	0	3	32	125	1	157	2	0	2	0
FILEDIR.DAT	0	4	48	28	15	468	166	0	12	0
HOSTPORT.DAT	0	4	32	65	4	292	8	0	1	0
DEUCONFG.DAT	0	3	32	64	32	2080	32	0	1	0
RTDB.DAT	1	3	32	86	32	2784	2	6	1	0
APCSETUP.DAT	0	5	32	1271	40	58872	47	5	30	0
APCPOS.DAT	0	5	32	2985	40	119432	54	5	35	0
SMRTRK.DAT	0	5	3228027	40	1121112	22	5	9	0	0
IESS412.DAT	0	8	3213757	160	2201152	1	0	1	0	0
TLEDATA.DAT	0	8	3213733	160	2197312	1	0	1	0	0
ALARMQUE.DAT	0	5	48	160	3000	488048	78	16	71	0
ALAMPRI.DAT	0	4	48	158	300	47448	0	0	0	0
COMMQUE.DAT	0	4	48	158	2000	316048	697	1334	23	0
OPERID.DAT	0	5	32	40	64	2592	248	0	8	0

Figure 73.

## 14 Alarm History and Debug Trace Windows

The alarm history and debug trace windows are activated from the MiscWindows menu.

### 14.1 Alarm History Window

You can activate the alarm message history window with the Alarm Msgs menu item in the MiscWindows menu or with the **Alt-F5** Hot Key. The maximum number of messages in the history file is set by the number of records in file ALARMQUE which is defined in the File Directory. An example of this window is shown in figure 74.

```

Alarm History Window
04/27/98 08:41:05 I-Operator 65. FSC logged ON
04/27/98 08:35:37 W-APC300 9 Meter, Summary fault alarm NORMAL
04/27/98 08:35:37 I-APC300 9 Meter, Mode changed to LOCAL
04/27/98 08:34:20 I-APC300 9 Meter, Setup upload completed.
04/27/98 08:34:18 I-APC300 9 Meter, Satellite position upload completed.
04/27/98 08:34:09 I-APC300 9 Meter, SMARTRACK table upload completed.
04/27/98 08:33:58 I-APC300 9 Meter, SMARTRACK table upload request by operator
04/27/98 08:33:20 I-APC300 Communications Utility startup
Msg 1 thru 8 of 1347
    
```

Figure 74.

You can print selected entries from the queue file with the Print Queue Entries dialog activated with the **P** key. The dialog is shown in figure 75.

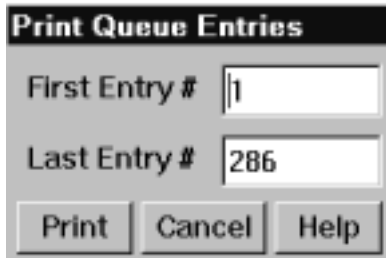


Figure 75.

This dialog window provides for selecting a range of entries from a history queue file such as the "Alarm History Window" and printing them.

**First Entry #** This is the first queue entry to be included in the report. Entry numbers are indicated at the bottom of the queue window.

**Last Entry #** This is the last queue entry to be included in the report. Entry numbers are indicated at the bottom of the queue window.

The Search for Text in Queue File dialog can be activated with the **S** key in order to find any text string in the file. This dialog window provides for finding text strings in a queue file display window. This includes the tag read history files and the alarm history files. The dialog is shown in figure 76.

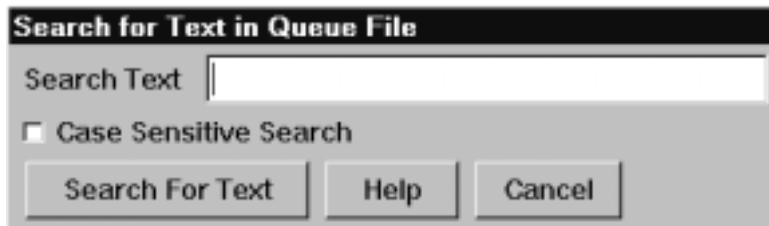


Figure 76.

Fields in the window are defined as follows:

**Search Text** This field is for entry of the text string to find in the queue file. The search will start when the Return key is pressed following entry of the text or when the Search for Text push button is activated.

**Case Sensitive Search**

This check box indicates whether the search is case sensitive. If checked then a text string must match the entered string exactly, including upper and lower case letters, in order for a match to occur.

**Search for Text**

This push button starts the search for the string in the Search Text field. The search starts with the queue entry currently displayed at the top of the window. When a match is found, the queue entry with the match is placed at the top of the window.

## 14.2 Priority Alarm History Window

The Priority Alarm menu item activates the Priority Alarm History window. An example is shown in figure 77.

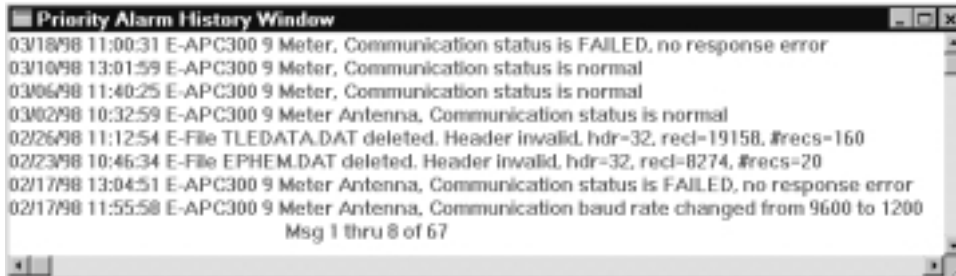


Figure 77.

This window displays a limited history of all priority alarm messages generated by the system. The maximum number of messages in the history file is set by the number of records in file ALARMPRI which is defined in the File Directory. Priority alarms are generated when any problem is detected which indicates some important failure in the system. The Priority Alarm History window is automatically activated whenever a priority alarm is generated, unless that feature is disabled through the Terminal page of the system configuration Property sheet.

The Search for Text in Queue File dialog can be activated with the **S** key in order to find any text string in the file. You can print selected entries from the queue file with the Print Queue Entries dialog activated with the **P** key.

## 14.3 Communication Debug Trace Window

The Debug Trace menu item activates the Debug Trace window. This window displays a limited history of all debug messages generated by the communications program. The Debug Trace should always be disabled unless system maintenance personnel need it to help find a system problem. The maximum number of messages in the history file is set by the number of records in file COMMQUE which is defined in the File Directory.



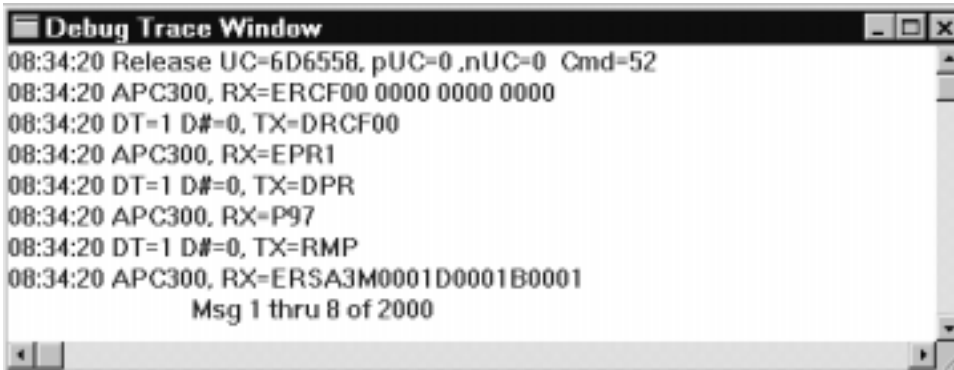


Figure 78.

The Search for Text in Queue File dialog can be activated with the **S** key in order to find any text string in the file. You can print selected entries from the queue file with the Print Queue Entries dialog activated with the **P** key. The **M** key will activate the Comm. Trace Queue Control dialog which provides for enabling and disabling the debug trace and for selecting a communication port for comm port message tracing. This dialog is shown in figure 79. Fields in this dialog are defined as follows:

**Comm. Trace Enabled**

Check this box to enable the communications debug trace.

**Comm Port**

Select the communications port for debug tracing. Zero indicates that all ports will be traced.

**Save Changes**

Select this button to save any changes made.

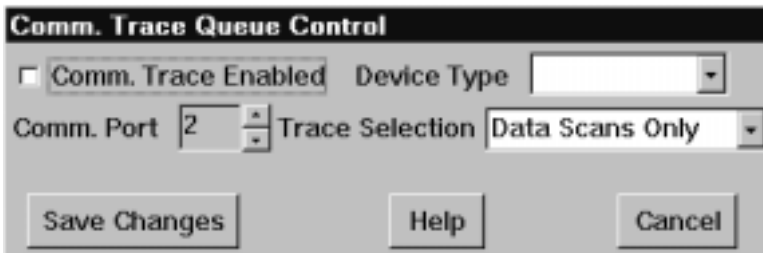


Figure 79.

## 15 System Configuration Property Sheet

The Configuration Property Sheet menu item in the MiscWindows menu activates the Configuration Property Sheet dialog. It can also be activated with the **Alt-F10** Hot Key combination. The Configuration Property Sheet provides for defining system parameters, terminal parameters, terminal colors, communication ports, system terminal definitions, device and Digital Input configurations and setting the date and time.

## 15.1 Station Page

This page in the Configuration Property Sheet provides for viewing and optionally changing parameters for the utility program. An example of the Station page is shown in figure 80. Fields in this Property sheet page include the following:

**Station Name** This is the name for the earth station or its location or owner.

**Station Latitude** The station location latitude which must be in degrees East is required for INTELSAT ESS-412 and Two-Line Element pointing angle calculations.

**Station Longitude** The station location longitude which must be in degrees North is required for INTELSAT ESS-412 and Two-Line Element pointing angle calculations.

### Height above IAU-1976

The earth station height above IAU-1976 ellipsoid in kilometers. This value is used in INTELSAT ESS-412 pointing angle calculations.

### Height above Mean Sea Level

The earth station height above mean sea level in kilometers. This value is used in Two-Line Element pointing angle calculations.

### Disabled Features:

**Security** This check box is used to disable logon security. If the box is not checked, then all operations involving changing parameters or files or sending commands to devices require that an operator with the correct privilege be logged on. If the box is checked, then logging on is not required for any operation.

**Alarm Print** This check box is used to disable printing of alarm messages. If the box is not checked, then all alarm and event messages will be printed if the printer is online. If the box is checked, then alarm and event messages will not be printed.

### Priority Alarm Win

This check box is used to disable automatic display of the Priority Alarm History Window whenever a priority alarm is generated.

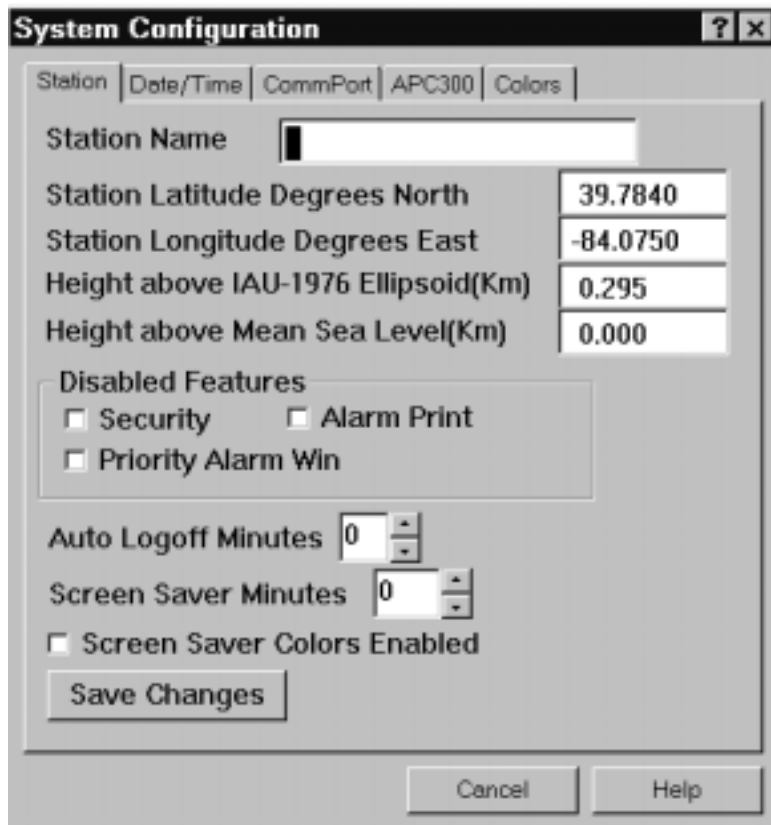


Figure 80.

**Screen Saver Minutes**

This field enables or disables the screen saver feature for this terminal. If the field is zero then the screen saver is disabled. If not zero, then the field is the number of minutes from the last keyboard entry or mouse click until the screen saver will be activated. Normally, the screen saver will be terminated by any key entry or by clicking the left mouse button. The ESC key should be used if the screen is not returned to normal by other keys.

**Screen Saver Colors Enabled**

This check box is used to set the screen saver mode. If not checked, the screen saver will set the screen to black. If checked, the screen saver will set the screen to a different color every five seconds.

**Auto Logoff Min**

This field enables or disables the automatic operator logoff feature and sets the time period for the automatic logoff. If the time is zero, then there will be no automatic logoff. If the time is not zero, then the operator will be logged off if there is no keyboard entry or mouse clicks for the Auto Logoff period.

**Save Changes**

This field must be used to save any changes made.

**15.2 Date/Time Page**

This page in the Configuration Property Sheet provides for setting the current date and time for the

system. The date and time shown initially are the current date and time when the Configuration Property Sheet was activated. This page is shown in figure 81.

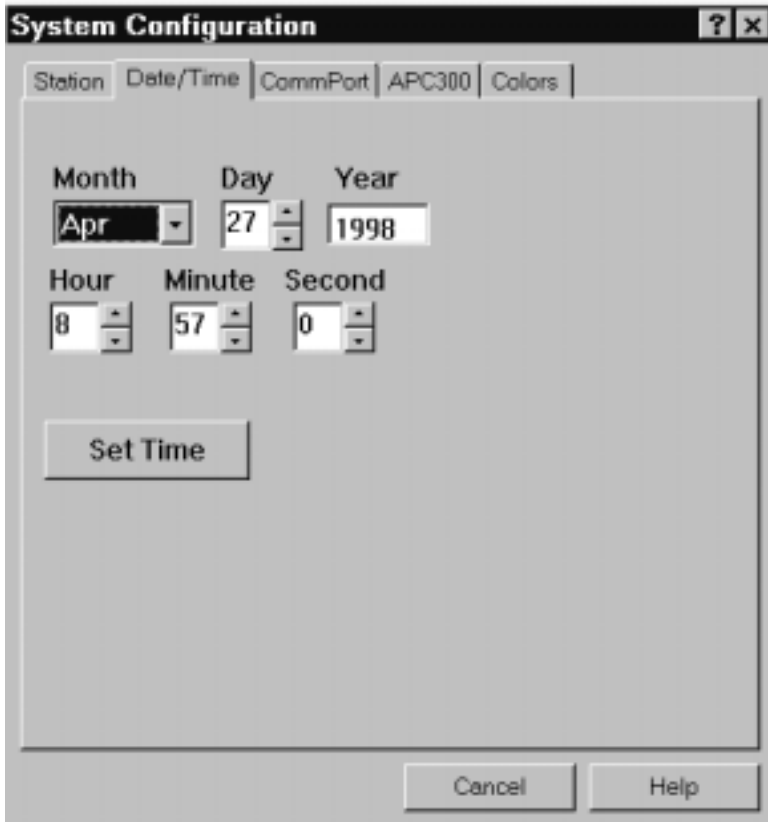


Figure 81.

### 15.3 Colors Page

This page in the Configuration Property Sheet provides for viewing and optionally changing the colors used to display text on screens and windows. The top box lists the color categories with the currently selected color for each category is shown in the box to the left of the label. The currently selected category will have a black \* in the middle of the color box. The GPI colors area shows all of the possible colors. The box for the category currently selected will have a black \* in the middle. Change the color for the selected category by clicking on the box for the new color. This page is shown in figure 82.

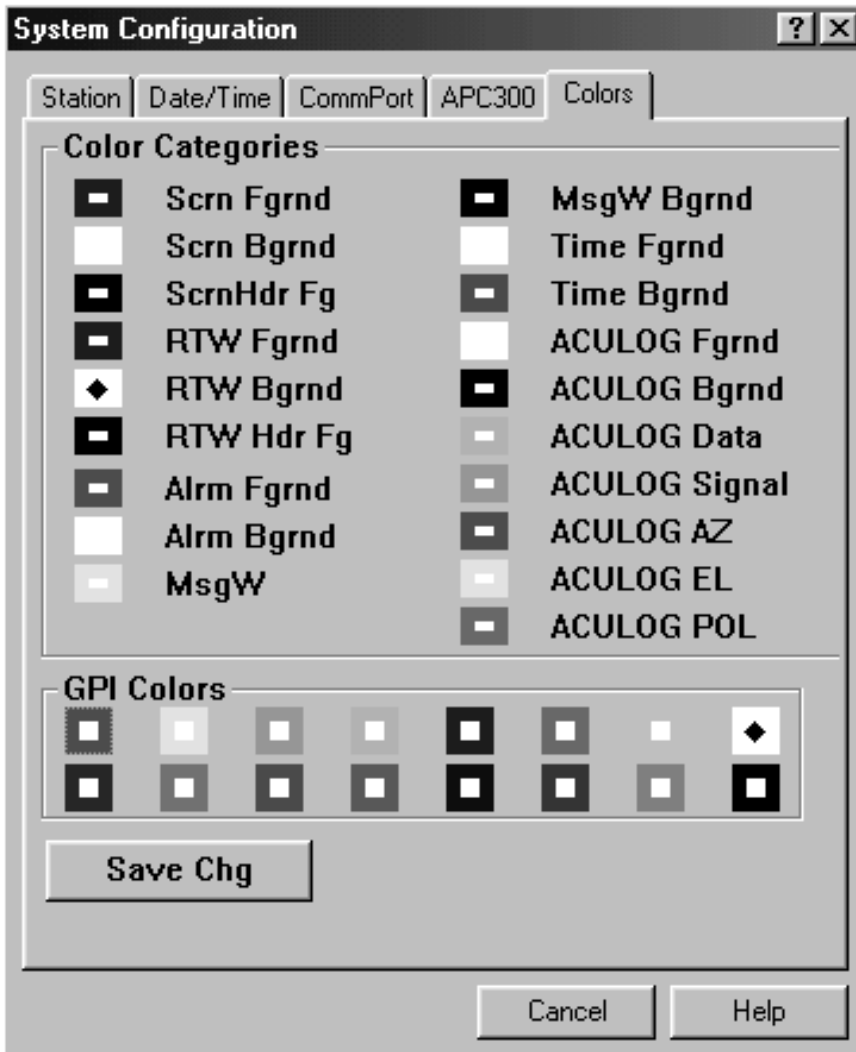


Figure 82.

## 15.4 CommPort Page

This page in the Configuration Property Sheet provides for viewing and optionally changing serial port definition and configuration. Normally, all serial ports are setup correctly when the program is installed and should not be changed by the user. An example of the page is shown in figure 83. Fields in this Property sheet page include the following:

- Port #** This spin button selects the comm. port whose parameters are displayed. The comm. port can be changed with the arrow keys or the mouse.
- Name** The port name identifies the comm port hardware to the operating system. The name is the device name used by the operating system device driver for the port. It is not just a label for the comm. port. The standard PC comm. ports are named COM1 and COM2.
- Port Defined** This check box enables and disables the port definition.
- Dial Up Port** This check box defines the port as a dial-up phone line. Dial up phone lines are not

supported for this system.

- Baud Rate** This field defines the port baud rate in BPS. The default communication parameters for the APC300 are 1200 baud, 7 data bits and even parity.
- Data Bits** These buttons define the number of data bits in each byte.
- Parity** This field defines the parity bit which may be associated with each character.
- Scan Delay** This field defines the time delay between each message transmitted on the comm. port. It is used to slow down polling for devices which will not operate properly if they are polled too rapidly.
  
- Save Chg** This field must be used to save any changes made. When any change is made to the Comm. Port definitions the program must be stopped and restarted.

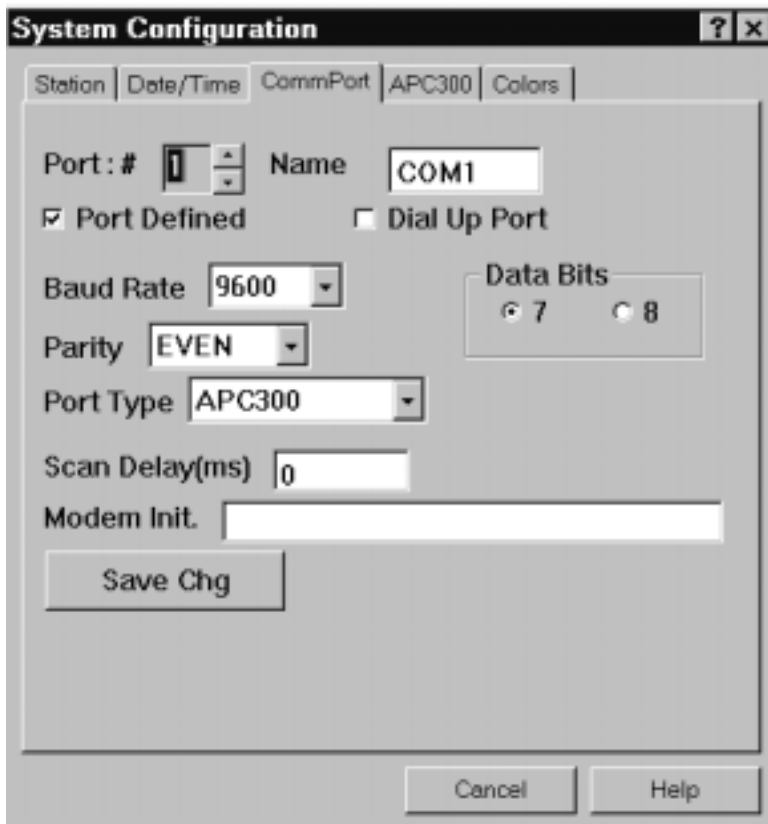


Figure 83.

### 15.5 APC300 Antenna Page

This page in the Configuration Property Sheet provides for viewing and optionally changing APC300 configuration parameters. Normally, all device configurations are set when the APC300 optional software is installed and never changed. An example of this page is shown in figure 84. Fields in the dialog page are as follows:

- APC300 #** This spin button field selects the APC300 # whose configuration is displayed.
- Device Present** This check box field must be checked if the APC300 is to be monitored and controlled by the system. It indicates whether the APC300 is present.
- Comm. Port** This field defines the serial communications port used to talk to the APC300 controller.
- Jog Degrees** These fields define the movement in degrees for each axis when a jog command is sent to the antenna.
- Save Chg** This field must be used to save any changes made. When any change is the program must be stopped and restarted.

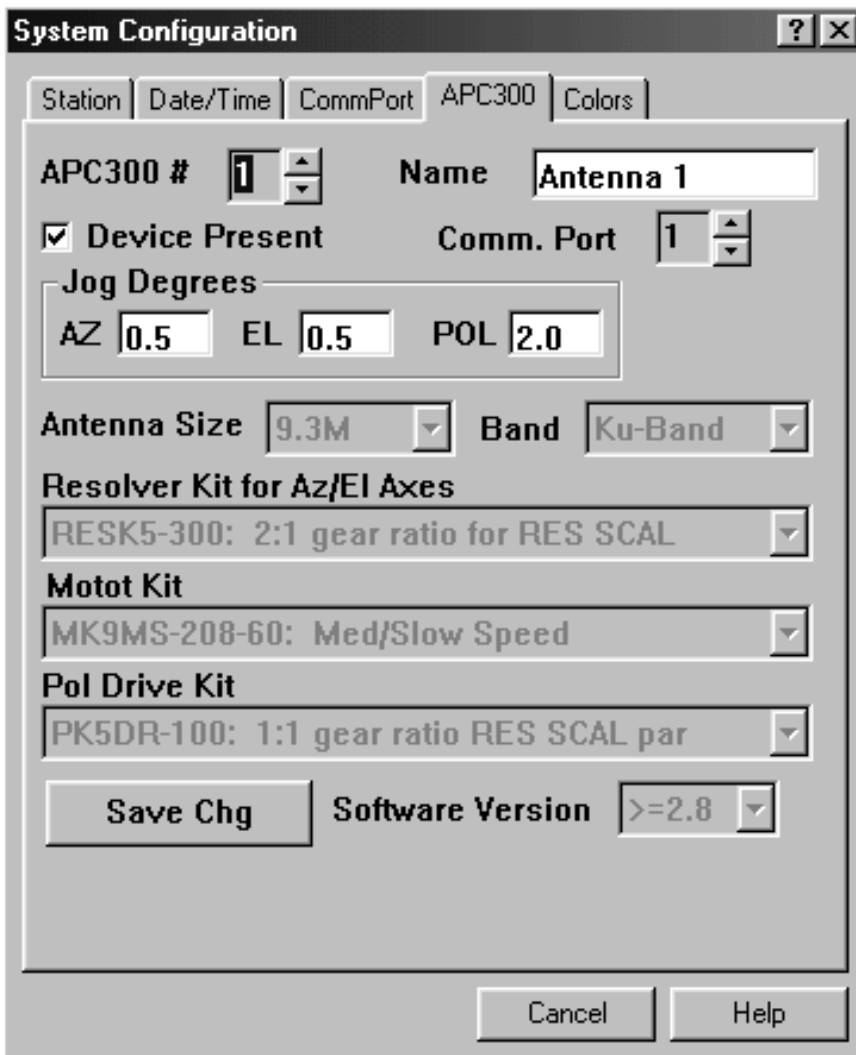


Figure 84.

## 16 Communications Debug Console

The Communications Debug Console is a DOS window which can be activated from the MiscWindows menu or with **F11**. It can be closed with **Shift-F11** or from the MiscWindows menu. The window can be hidden but not closed by clicking anywhere outside of the window with the mouse. To restore the window, after it has been hidden, enter **Ctrl-Esc** and click on APC300 Debug in the Windows 95 task bar. This window is for debugging program problems and APC300 communications problems and should not normally be used by a customer. An example of the window is shown in figure 85.



Figure 85.

To display all communications with the APC300, enter the following commands.

1. Enter 'l' to select the APC300 communications port(Usually 1).
2. Enter 'd' to turn on communications debug.
3. Enter 's' repeatedly to select the type of communications messages to display. For example, if you are having trouble with a command such as "Move to a Satellite" then select "Commands Only" with the 's' key so that the command will not be scrolled off the window by the continuous data retrieval messages.

## 17 Software Installation and Update Instructions

This section contains installation and software update instructions for the Andrew APC300 Utility Program. The procedure for installing or updating the software is summarized below.

Select the **Run** command from the **Start** menu and enter A:SETUP in the **Open** field.

The Setup program will display a window shown in figure 85 with a dialog for entry of the folder path



where the software is to be installed. If you do not want the software installed in the default path, which is C:\APC300, then change the partition and directory to the desired location. The path may include sub-directories. If the directory does not already exist, it will be created. If any errors occur, an error window will pop-up; otherwise, a window will pop up indicating that the installation or update is complete.

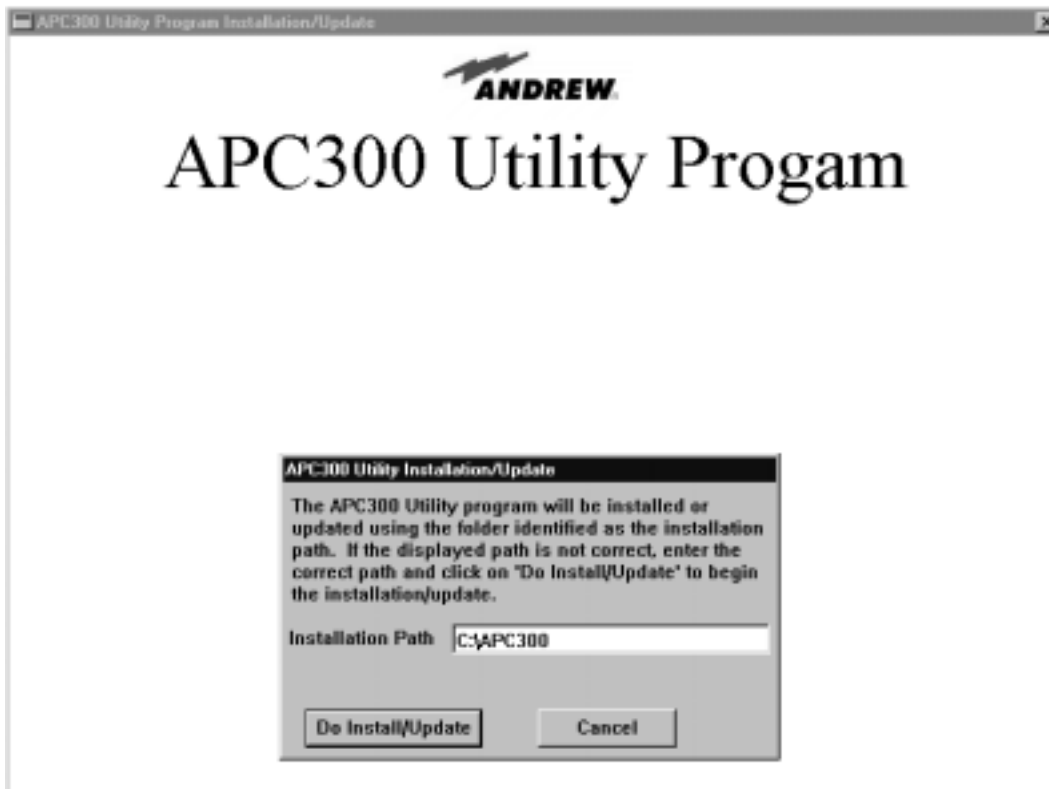


Figure 85.

If you did not use the default installation path, then the shortcut icon copied to the Windows Desktop will not be correct. You must change the path in the shortcut properties as follows:

Click on the APC300 icon with the right mouse button. A menu should pop up. Click on the **Properties** menu item and the dialog shown in figure 86 will appear. Change C:\apc300 in the **Target** and **Start in** fields to the installation path previously entered and click on **OK**.



Figure 86

Double clicking on the APC300 icon on the desktop should now start the APC300 Utility program. The first time that the program runs, it will create several files which require about 7MB of disk space. Refer to the **Startup Procedure** in section 1.1 for instructions on configuring the communications port.