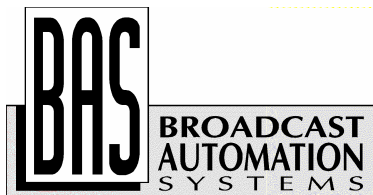


**AUTOPILOT
DLM
Satellite
Downlink
Manager**

**USER
GUIDE**



AUTOPILOT User Guide Rev 3.70 Nov. 2004.

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TABLE OF CONTENTS

INTRODUCTION.....	1
AUTOPILOT ENVIROMENT	2
Main Screen Display.....	2
Device Control.....	3
PULL DOWN MENUS	4
System Menu.....	4
Message Menu	5
Window Menu	5
View Menu.....	6
Help Menu	6
Schedule Menu.....	7
Antenna Menu.....	8
GETTING STARTED	9
System Status	9
Status Window Pull Down Menus and Controls	10
Status Window Control Panel Access.....	11
Direct Device Control	12
Moving a Satellite Dish	12
Controlling A Satellite Receiver.....	13
Scheduling Events (Automated Control).....	14
Schedule Controls	15
Scheduling Events.....	15
Conflict Checking.....	15
System Log.....	16
Current Messages.....	16
SYSTEM CONFIGURATION	17
Device Setup Window	17
Adding Satellite Names to AUTOPILOT	18
Cross Referencing Satellite Names.....	19
Editing the Satellite Tables	20
Antenna Menu Options	22

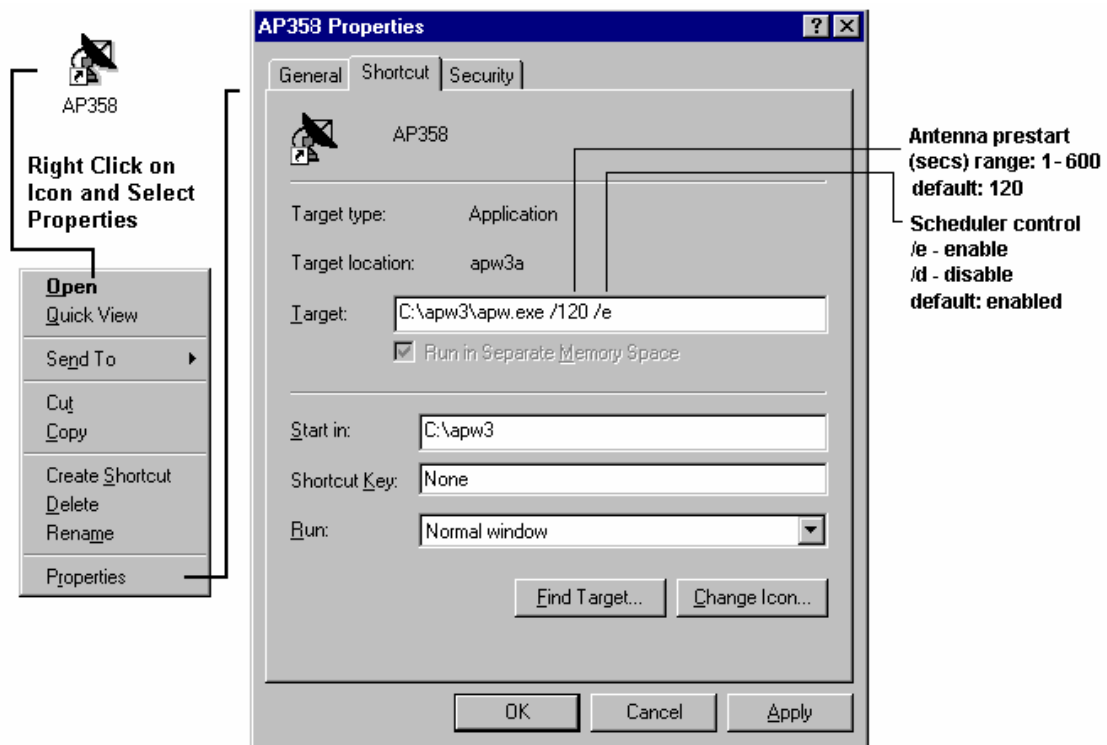
Autopilot Configuration Note - Version 3.700 and later

The following parameters can be added to the Autopilot command line as shown below.

Antenna Prestart: Advance time prior to event time when antenna starts moving to new position. This is done to insure that the antenna is in position prior to the event starting.

Scheduler Control: When Autopilot is started the scheduler can be set to automatically start.

Note that if the command line parameters are omitted (as shipped from the factory) the defaults are, prestart time 120 sec. , scheduler enabled.



AUTOPILOT DLM Satellite Downlink Manager

Introduction

AUTOPILOT is a Windows based Satellite Program Acquisition System designed to automate satellite recording by controlling steerable antenna systems, satellite receivers, routing switches and video recording devices.

Satellite delivered programming can be recorded simply by scheduling an entry on the event list. AUTOPILOT will then automatically position the satellite antenna, tune the receiver, and with the installed options, select routing switch source and destination and recording device control.

AUTOPILOT is an interactive, user friendly system featuring icons, moveable and re-sizeable windows, pull down menus and point and click selection of desired operations. Simple on screen controls enable the user to easily adjust and control device parameters.

A Main Display Screen provides an overview of the entire system. Icons or custom on-screen controls depict all resources on the system. The operator can click on various points on the screen to open individual windows or pull-down menus for device status and control. All devices are polled on a continuous basis with updated status information displayed on screen.

A system log is maintained to record all commands and actions initiated by the system.

A status window lists all of the devices connected to the system and an event scheduler provides the capability of automated recording. In addition, each device has an individual control panel associated with it.

Menu options are provided for configuring the system and for setting up and maintaining a satellite parameter database.

AUTOPILOT ENVIROMENT

Main Screen Display

The Main Screen Display consists of a Main Menu Bar at the top of the screen and three windows,

- System Status Window - displays the status information for each device on the system.
- Schedule Window - displays the event list for automated operation.
- Current Messages - information about the current state of the AUTOPILOT program.

The screenshot shows the AutoPilot DLM software interface with three main windows and a menu bar. The menu bar includes 'System', 'Schedule', 'Window', 'View', and 'Help'. The 'System Status' window displays a table of resources. The 'Schedule' window displays a list of events. The 'Current Messages' window displays system status messages. The status bar at the bottom shows 'SCHEDULE ENABLED', 'master', 'Server up', and '09/30/1999 12:47:33'.

System Status Window

Antenna	Satellite	Receiver	Channel	Event	Audio 1	Audio 2	Audio 3	Lock
STEER 1		SAT019			6.200	6.170	6.170	LOCK
		SAT020			6.200	6.800	6.800	LOCK
		SAT021			6.200	6.800	6.800	LOCK
		SAT035	11739		-77	0.00		LOCK
STEER 2	SBS6	SAT022	7 3L		5.750	6.200	6.800	LOCK
		SAT023	5 2		6.200	6.800	6.800	LOCK
		SAT024	not shown		6.800	6.200	6.800	LOCK
		SAT033						LOCK
STEER 3	GE 1	SAT025	16 16		6.800	6.200	6.800	LOCK
		SAT026	not shown		6.800	6.200	6.800	LOCK
		SAT027	22 22		6.800	6.800	6.200	LOCK

Schedule Window

S	DAYS	START	EVENT	VCH	ANTENNA	SATELLITE	RECEIVER	CHANNEL
.	Th	04:20:00	CONUS	NA	STEER 2	SBS6	SAT022	7 3L
.	Th	10:15:00	100 HUNTLEY STREET	NA	STEER 3	ANIK E1	SAT025	16 8B
.	Th	11:00:00	KEY OF DAVID	NA	STEER 1	TSTAR 4	SAT021	24 24
.	Th	11:50:00	GERMAN JOURNAL	NA	STEER 3	GE 1	SAT027	22 22
.	Th	12:50:00	RUSSIAN TV	NA	STEER 2	SBS 5	SAT022	36 12L
.	Th	12:55:00	N/W Live	NA	STEER 1	ANIK E1	SAT019	33 19
.	Th	13:45:00	CHINA NEWS/CAST	NA	STEER 3	GALAXY 3R	SAT025	48 24K
.	Th	15:50:00	GERMAN JOURNAL	NA	STEER 3	GE 1	SAT027	22 22
.	Th	16:05:00	CONUS	NA	STEER 2	SBS6	SAT022	7 3L
.	Th	17:50:00	GERMAN JOURNAL	NA	STEER 3	GE 1	SAT027	22 22
.	Th	18:20:00	NBC NIGHTLY NEWS	NA	STEER 1	GE 1	SAT020	27 3K

Current Messages Window

TIME	DATE	DEVICE	MESSAGE
19:16:29	09/28/1999	Schedule	Event GERMAN JOURNAL started.
19:16:29	09/28/1999	Schedule	Event CONUS started.

Main Menu - access to system options
System Status - displays current settings for all resources
Schedule Window - displays event list
Message Window - displays information about current system status
Current User Login | **Server Status**
 SCHEDULE ENABLED | master | Server up | 09/30/1999 12:47:33

Additional windows can be opened by selecting various options from the Menu Bar or double-clicking on specific areas of the screen.

Device Control

Device Control Windows are provided for antenna and receiver control.

The screenshot displays the 'AutoPilot DLM Demo' software interface. It features a main menu at the top with options: System, Message, Window, View, and Help. Two primary control windows are shown:

- Rx 01 (Receiver Control):** This window is titled 'Updating Rx...' and includes fields for 'Ch/Tnpdr' (set to 6 6), 'Polarity' (H/V), 'Band' (C/Ku), and 'Format' (GALAXY 6). It also shows 'Rf Level: -60 dBm'. Below these are three audio channels (Audio 1, 2, 3) and a video section, each with 'Frequency' and 'Level' controls. The video section also includes an 'IF BW' control.
- Ant 01 (Antenna Position Control):** This window is titled 'IN MOTION' and shows 'Satellite: SPACENET 4'. It displays position data: 'El: 240', 'Az: 301', and 'Pol: 93'. A 'Jog' control panel includes directional buttons (U, S, E, D, W) and 'CCW'/'CW' buttons. A 'Satellite List' dropdown is set to 'SPACENET 4', with a 'Move to...' button below it. There are also 'H' and 'V' buttons and an 'AutoPol' checkbox. The status bar at the bottom right shows the date '10/10/1997' and time '07:19:16'.

Annotations on the left side of the image point to specific features:

- Main Menu:** — System Message Window View Help
- Receiver Control:** — access to system options.
- Antenna Position Control:** — select antenna position.
- Receiver Control:** — satellite receiver tuning.

PULL DOWN MENUS



System Menu



This menu is used for system administration and provides options for configuring the system.

FUNCTION

Description

Configure

The configure option is used to enter information on the devices to be controlled by AUTOPILOT. Device names, addresses and communication parameters are entered with this option.

Sat Table

The Sat Table option enables the user to enter and maintain a list of programming information for each satellite. This option is used to enter new satellite data and to modify existing transponder information.

Cross Ref

This option is used to cross reference the satellite position names entered into the antenna controller with the satellite tables used by AUTOPILOT. This option is normally only used during initial system configuration or when a new antenna controller is added to the system.

Exit

End program operation

Message Menu



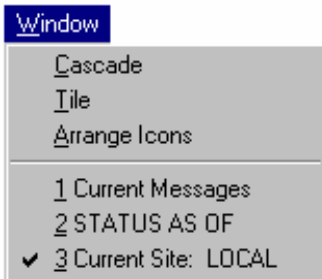
FUNCTION

Description

Clear All

Clear all messages in the Current Message window.

Window Menu



FUNCTION

Description

Cascade
Arrange Icons

Standard windows function to cascade windows on the screen
Arranges any minimized windows on the screen.

1
2
3

This section lists open windows with a check beside the active window.

View Menu



FUNCTION

Description

Status

Select the Status Window as the active window.

Site

Select the Site Window as the active window.

Message

Select the Current Message Window as the active window.

Help Menu



FUNCTION

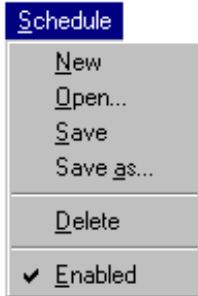
Description

About

Displays the About Box showing Version Number and Copyright for the AUTOPILOT software.

Schedule Menu

This menu appears when the Schedule window is open.



<i>FUNCTION</i>	<i>Description</i>
New	Create new schedule file.
Open...	Open an existing schedule file.
Save	Save the currently open file.
Save as..	Save the currently open schedule file to a user specified file name.
Delete	Delete the currently open schedule file.
Enabled	Enable/Disable scheduler: the scheduler will only run if this option is checked.

Antenna Menu



***** NOTE: This menu appears ONLY when an antenna control panel is opened. *****

<i>FUNCTION</i>	<i>Description</i>
Jog Duration	Enter Jog duration parameters for antenna fine tuning.
Reset	Reset Antenna Controller. (RC2000 ONLY)
Query Enabled	Enable/Disable Remote mode (RC2000 ONLY)
Upload Sats	Upload list of pre-programmed satellite names from controller.
RCI Edit	Remote Satellite position editor (RC2000 ONLY)

**Refer to Antenna Menu Options in this User Guide for more detail.
(pages 22 & 23)**

Getting Started

This section provides an introduction to the features of AUTOPILOT and outlines the procedures for starting the program and basic operation.

System Status

The system status window displays current settings for all devices on the system and provides a launching point for accessing control functions.

Current Satellite
and pull-down list

Antenna
Name |

Current Channel
and pull-down list

Receiver
Name |

Scheduled
Program
Name |

Current Satellite
Receiver Audio
and pull-down list

Audio 1 | Audio 2 | Audio 3 |

Antenna
Receiver
Lock |

Antenna	Satellite	Receiver	Channel	Program	Audio 1	Audio 2	Audio 3	Lock
Ant 01	GALAXY 6	Rx 01	4 4		6.200	6.800	5.800	LOCK
		Rx 02	19 19		6.800	6.200		LOCK
Ant 02	SPACENET 4	Rx 03	3 2		6.800	6.200		LOCK
		Rx 04	26 20H		5.800	6.200	6.800	LOCK

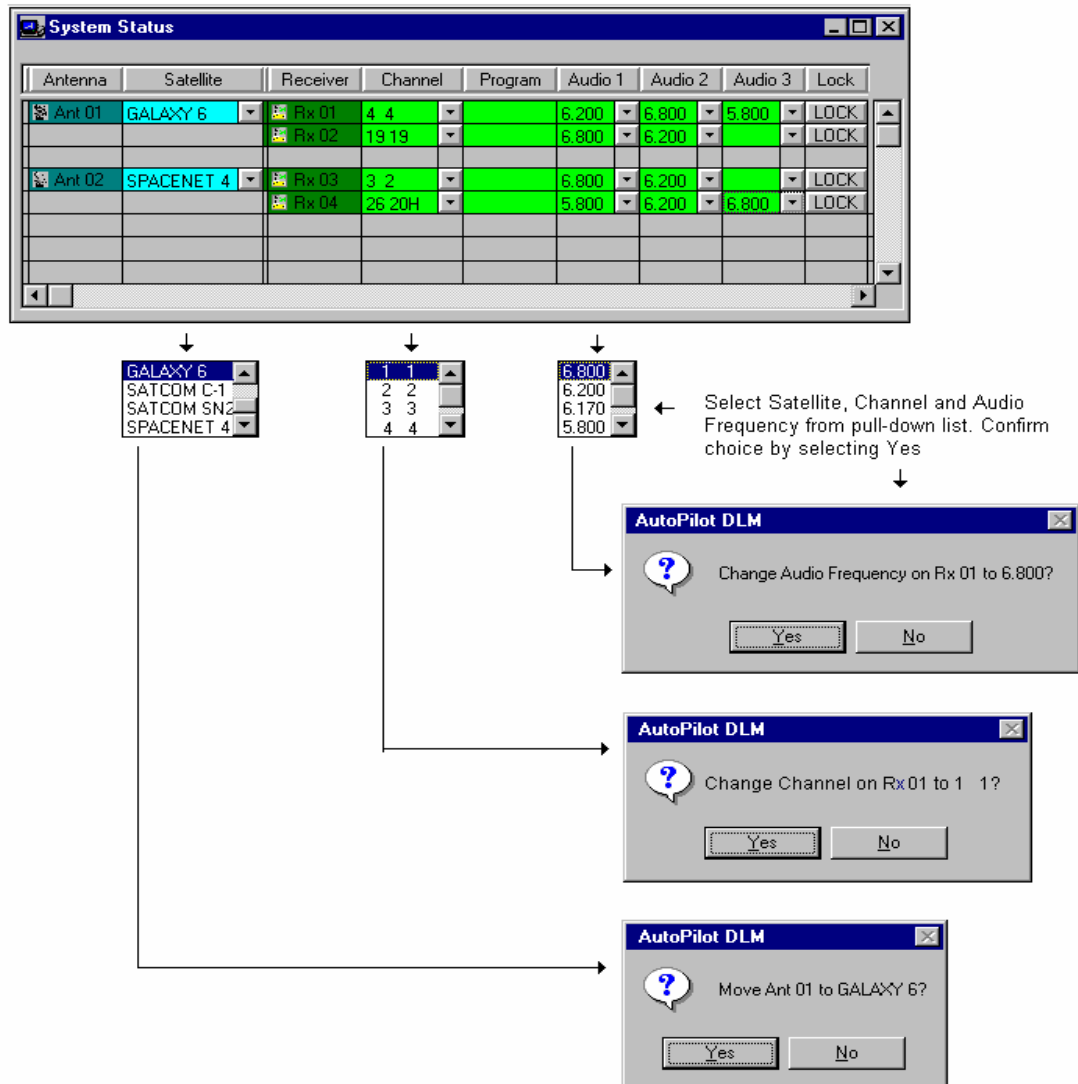
Status Window Pull Down Menus and Controls

The Status Window provides quick access to the following functions:

- Antenna Position (Satellite)
- Satellite Receiver Channel Number or Transponder (Channel)
- Satellite Receiver Audio Frequencies (Audio1, 2, 3)
- Antenna/Receiver Lock Out (LOCK)

These functions provide rapid control of key functions and enable the operator to perform last minute changes quickly.

The LOCK function enables an operator to manually override scheduled events and lock an antenna / receiver chain on a satellite channel.



Access to Device Control Panels

For more detailed device control, individual control windows can be opened for each device by double-clicking on the device name in the status window. A detailed description of these control panels is described in the Direct Device Control section.

Antenna	Satellite	Receiver	Channel	Program	Audio 1	Audio 2	Audio 3	Lock
Ant 01	GALAXY 6	Rx 01	4 4		6.200	6.800	5.800	LOCK
		Rx 02	19 19		6.800	6.200		LOCK
Ant 02	SPACENET 4	Rx 03	3 2		6.800	6.200		LOCK
		Rx 04	26 20H		5.800	6.200	6.800	LOCK

Double click on the Receiver column to open the Receiver window.

Updating Rx... Ch/Tnpdr Polarity Band Format

Rf Level: -60 dBm [6 6] [H/V] [C/Ku] GALAXY 6

Video: Frequency 3820.0 Level 60 IF BW 36/31/25/22/18/16

Audio 1: Frequency 6.200 Level 50 B/W W/M/N

Audio 2: Frequency 6.800 Level 50 B/W W/M/N

Audio 3: Frequency 5.800 Level 50 B/W W/M/N

Double click on the Antenna column to open the Antenna window.

Ant 01

IN MOTION

Position: Satellite: [SPACENET 4] Move to... H V

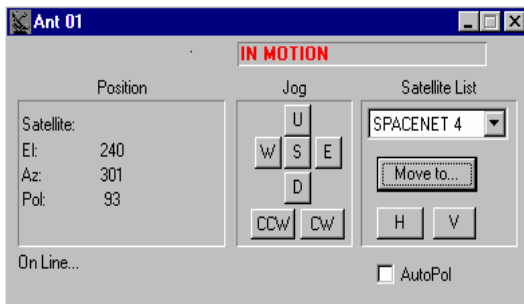
El: 240 Az: 301 Pol: 93

Jog: [U/D/CCW/CW] [W/S/E]

On Line... AutoPol

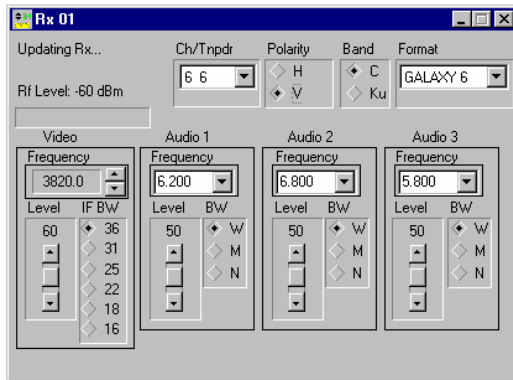
Direct Device Control

MOVING A SATELLITE DISH



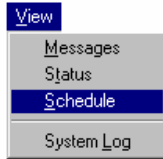
1. FROM THE STATUS WINDOW, Double-Click on the antenna you wish to move. The Antenna Control Window will open.
2. Click on the Satellite List down arrow button to display a list of satellites and click on the desired satellite.
3. Click on the "MOVE TO" button to initiate action. An "IN MOTION" indicator will appear to confirm that the dish is moving.
4. The position data will update as the dish moves to the new position.
5. Use the JOG controls to fine-tune the antenna position. NOTE that the 'S' button will stop antenna motion at any time.

CONTROLLING A SATELLITE RECEIVER

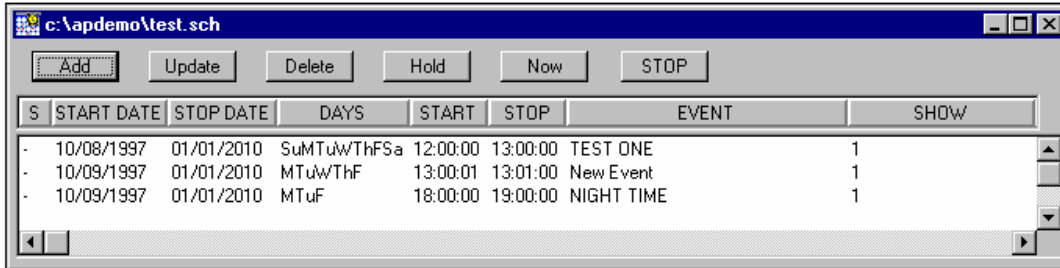


1. FROM THE STATUS WINDOW, Click on a Receiver Name to open the Receiver Control Window.
2. Select a channel by clicking on the Ch/Tpndr down arrow button and then click on the desired channel. NOTE that the up/down arrow keys can also be used to scroll through the channels.
3. Once selected, AUTOPILOT will update the receiver with the desired transponder information including all settings for frequency, polarization, band, IF bandwidth, video level and all audio settings. These settings are defined in the Satellite Table for each satellite format.
4. Other parameters such as IF bandwidth or video level can be changed by pointing and clicking on the desired function.

Scheduling Events (Automated Control)

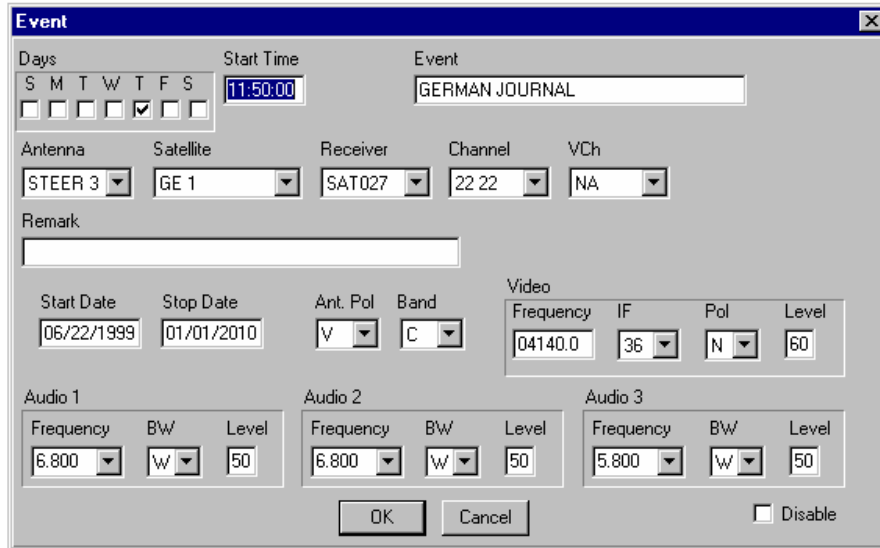


Select "Schedule" from the View Menu to schedule events.



To Enter Events:

- Click on "Add" to enter new events
- Double click on the event line to edit events.



Recording of satellite programming can be automated using the scheduling function. If the schedule window is not currently open, select the Schedule option from the View Menu. Once open, events can be entered via the Event window. Click on the Add button to enter new events or use the Update button to edit events (or just double-click on the event line to be edited)

Schedule Controls

Add	- Add an event to the list.
Update	- Update an event already in the schedule.
Delete	- Delete an event from the schedule.
Hold	- Hold the selected event (do not execute).
Now	- Execute the event immediately.
Stop	- Stop the event immediately.

Scheduling Events

The events can be scheduled on a weekly basis by clicking on the days of the week. One Time Only (OTO) events are scheduled by selecting a Start and Stop date for the event.

To schedule an event the following fields are required: Event Name, Antenna, Satellite, Receiver, and Channel

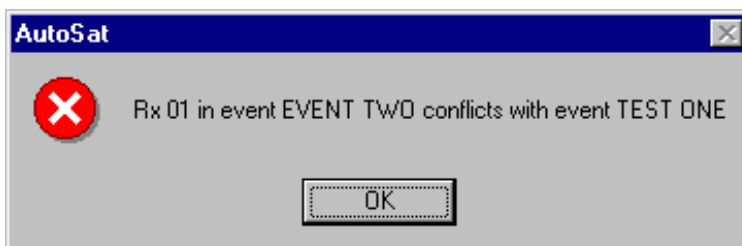
The receiver parameters shown in the Event window (Frequency, IF BW, etc.) can also be adjusted.

The **Disable** function allows an event to be entered but will ignore the time and date entries. In effect this event will not be scheduled.

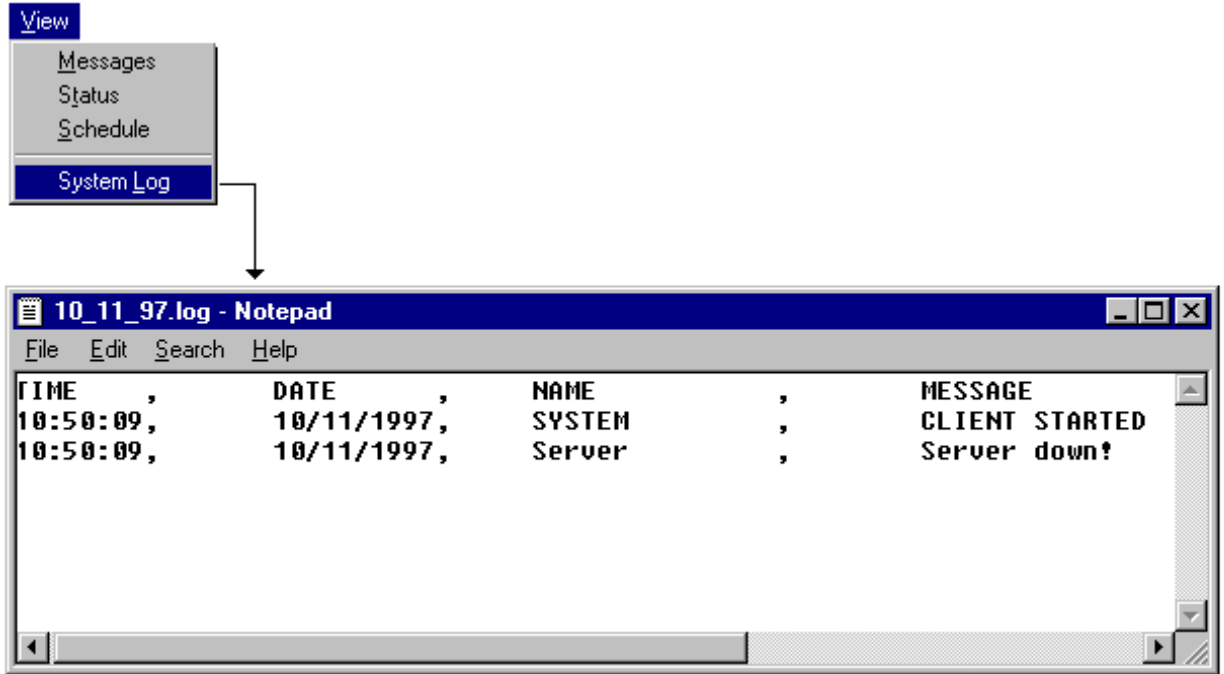
The Disable function can be used to create a set of 'Macros'. In other words, events with no times associated with them. These events can be executed manually by an operator by using the 'NOW' button in the Schedule Window.

Conflict Checking

Event conflicts are automatically checked by AUTOPILOT and a warning displayed indicating the conflicting event name.



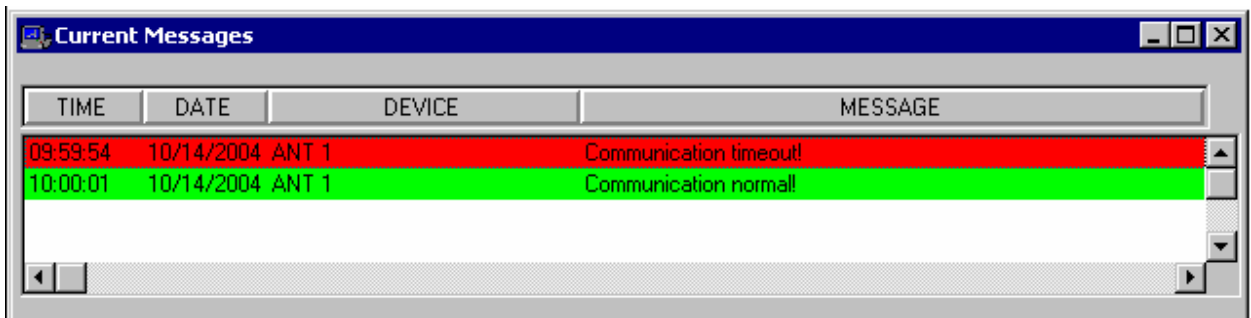
System Log



A daily system log is maintained on disk as filename <date> log. This file records all activities on the system including record events, channel changes and error messages. The daily log can be viewed by selecting System Log on the View Menu.

Current Messages

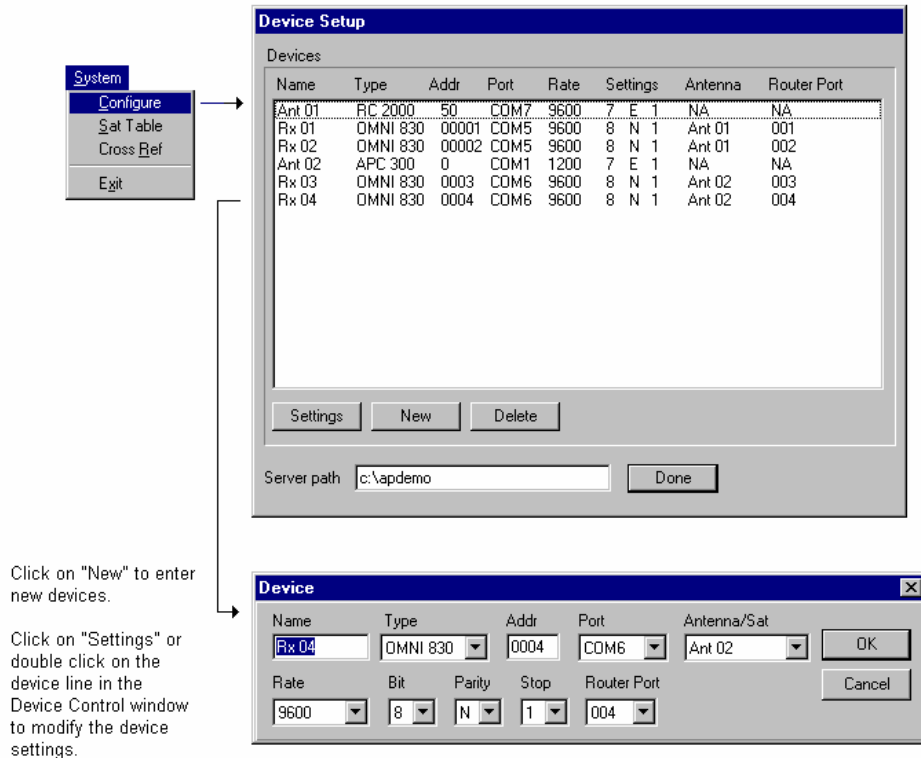
The Current Message window displays recent activity by the AUTOPILOT system and indicates error conditions by a RED highlight. Normal messages are displayed in GREEN.



SYSTEM CONFIGURATION

Device Setup Window

The Device Setup Window provides access to parameters used to setup devices in the system.



1. Select Configure on the System Menu to open the Device Control window.
2. Click on the NEW button to bring up the Device Window.
3. Enter the Name, Type, Address, Port and Communication parameters (Rate, Bit, Parity, Stop). Click on OK when complete. Repeat for all devices to be controlled by AUTOPILOT.

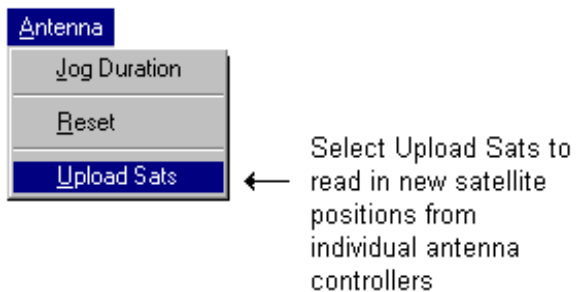
For satellite receivers, enter the antenna to which the receiver is connected and a router input number if the receiver output is to be switched via a routing switch.
4. To modify an existing entry, use the Settings option or double-click on the entry.
5. Entries can be deleted by clicking on the item to be removed and selecting the Delete option.

Adding Satellite Names to AUTOPILOT

When the AUTOPILOT system is first setup or when adding new satellite names to the list, the names must be entered into AUTOPILOT.

To Add New Satellites:

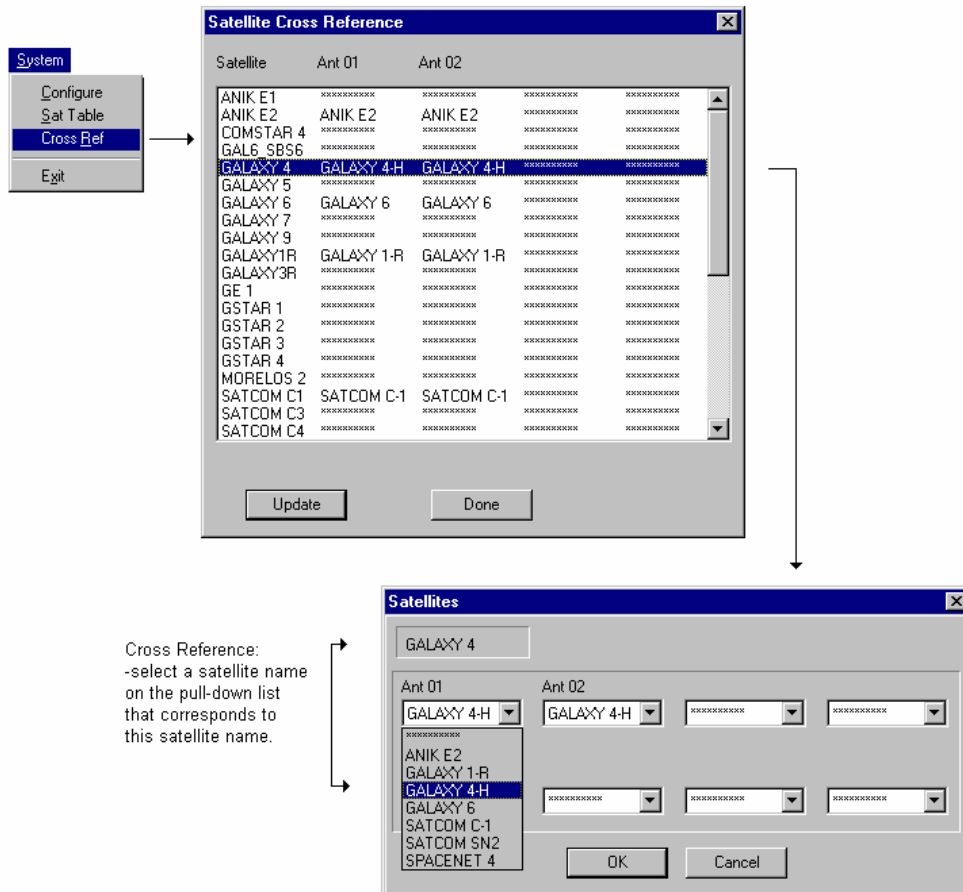
1. Program each antenna controller connected to AUTOPILOT with the new satellite position information. (Refer to the manufacturers' documentation for information on programming new satellite positions.)
2. Open the Antenna control window for the antenna controller just programmed. (Double click on the controller name on the status window.)



3. Select Upload Sats from the Antenna Menu to upload the new position information to AUTOPILOT.
4. Follow the procedure outlined in the following section to cross-reference the satellite names.

Cross Referencing Satellite Names

The satellite names programmed into each antenna controller must be cross-referenced or ‘linked’ to the corresponding satellite table in AUTOPILOT. This is necessary to ensure that when a satellite position is chosen the antenna will automatically move to the correct position AND the receiver(s) connected to that dish will be automatically set up for the correct format.

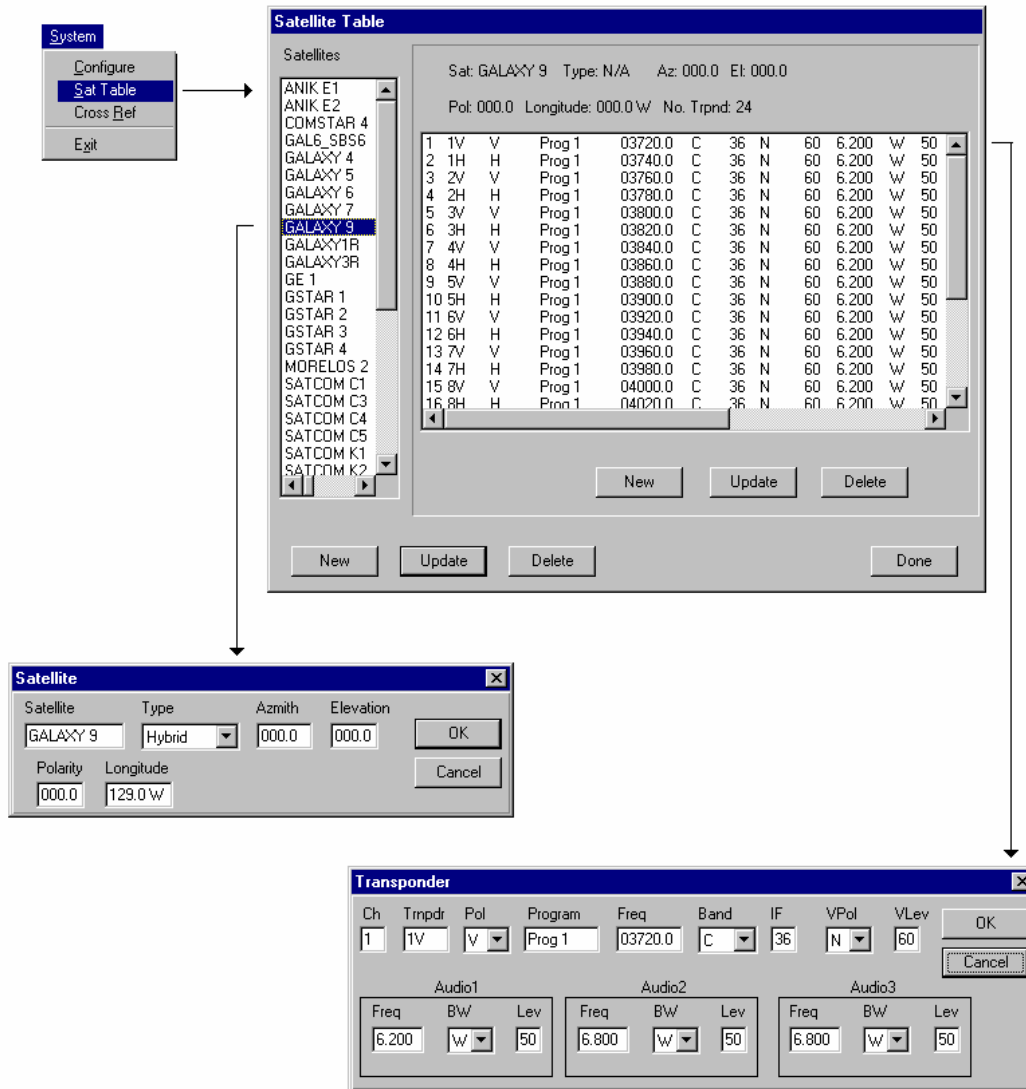


Cross-reference the names programmed into each controller with the satellite names in the AUTOPILOT Satellite Table as follows:

1. Select Cross Ref on the System Menu to display the Satellite Cross Reference Window.
2. Double-click on a satellite name.
3. The Satellites window will appear. Using the pull down list for each dish on the system, select the appropriate satellite name on the list. Click OK when complete.
4. Repeat item 2 and 3 for each satellite that you wish to access with AUTOPILOT.

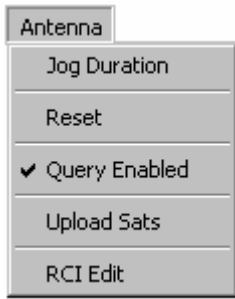
EDITING THE SATELLITE TABLES

AUTOPILOT includes a satellite database containing transponder information for each satellite. From the Sat Table entry on the System Menu, changes to satellite channels, addition of new channels or entirely new satellite tables can be created.



EDITING THE SATELLITE TABLES (cont'd)

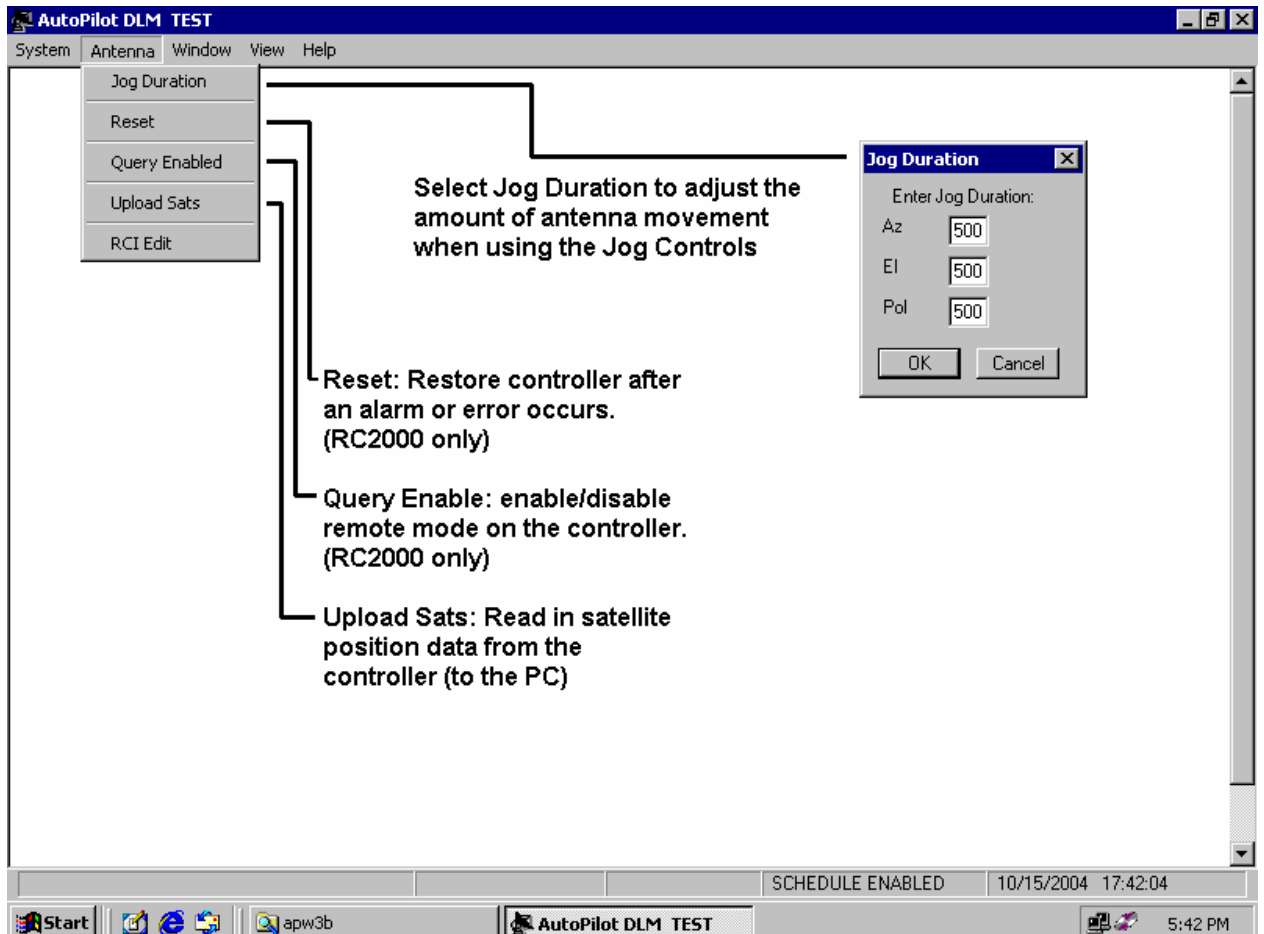
1. Select the Sat Table option on the System Menu.
2. The Satellite Table window will appear showing a list of satellites on the left side with a corresponding list of transponder information displayed for each satellite.
3. For new satellite names, click on the NEW button in the bottom left corner of the window. To modify an existing name, click on UPDATE. The Satellite window will appear.
4. Enter the satellite name, type and longitude (The azimuth, elevation and polarization fields may be left blank). Click OK when complete.
5. For Transponder information, click on the New or Update buttons in the transponder section. The Transponder window will appear.
6. To modify an existing table, double-click on the line to be changed. A window will appear that allows entry of channel name, frequency, etc. Type in the desired frequency for that transponder and change any other relevant parameters. Click on the OK button when complete. Repeat this procedure for other transponder entries.
7. Click on the DONE button when all transponders have been modified.



Antenna Menu Options

*** NOTE: This menu appears ONLY when an antenna control panel is opened. ***

<i>FUNCTION</i>	<i>Description</i>
Jog Duration	Enter Jog duration parameters for antenna fine tuning.
Reset	Reset Antenna Controller alarm conditions. (RC2000 ONLY)
Query Enabled	Enable/Disable Remote mode (RC2000 ONLY)
Upload Sats	Upload list of pre-programmed satellite names from controller.
RCI Edit	Remote Satellite position editor (RC2000 ONLY)



RCI Edit Menu



The following functions are used to enter and update positions in the RC2000 controller.

<i>FUNCTION</i>	<i>Description</i>
Upload	Upload satellite position parameters <i>from</i> the antenna controller.
Download	Download satellite position parameters <i>to</i> the antenna controller.
Load	Load list of pre-programmed satellite names and positions from hard drive.
Save	Save list of pre-programmed satellite names and positions to hard drive.

