

APPENDIX - VSAT MODE

INTRODUCTION

This appendix details operations of the RC3000's "VSAT" mode.

VSAT mode is intended to be used when the following conditions exist:

- 1) the mobile satellite terminal is to be run by operators with limited training
- 2) the same satellite and polarization orientation are to be used
- 3) the mobile satellite terminal will typically be positioned on the satellite for long periods of time (days or weeks) between relocations of the vehicle
- 4) the RC3000 is equipped with a GPS receiver and Fluxgate compass to allow automatic calculation of the satellite pointing solution

VSAT mode limits the RC3000 functions that the operator may perform to LOCATE, STOW and RECALL. To perform other functions or to change operating parameters, the RC3000 must be taken out of VSAT mode and expert access permission established.

NOTE: VSAT "mode" refers to the overall functioning of the RC3000. VSAT is not a mode in the same sense as MANUAL, LOCATE, TRACK, etc. are modes.

This appendix will refer to the baseline RC3000 manual by placing the paragraph number of the User's Manual in parenthesis.

PRIOR TO ENTERING VSAT MODE

VSAT mode should not be entered until the RC3000 has been well calibrated with the antenna and receiving systems. VSAT mode requires that the LOCATE, RECALL and STOW modes all work well.

In order to achieve good performance, ensure that:

- 1) the azimuth, elevation and polarization axis are well calibrated
- 2) the Fluxgate calibration procedure as been performed and yields good results
- 3) the source of signal strength has been well calibrated

Before entering VSAT mode, the satellite to be used and the polarization orientation (H or V) has been selected as part of a LOCATE function.

ENTERING VSAT MODE

VSAT mode is selected from the SYSTEM DEFINITION configuration screen (3.3.1.2.1).

```

GPS: 1                                CONFIG-SYSTEM
COMPASS: 1  ANT_SIZE: 120  WAVEGUIDE: 0
MODE: 2
<1>LOCATE <2>MENU <3>MANUAL <4>VSAT

```

When the value of 4 is entered for the MODE item, the RC3000 will enter VSAT "mode".

When VSAT mode is entered, expert access permission (3.3.1.1.1) is set to NORMAL. This itself will prevent the operator from accessing most configuration items and some functions of the RC3000. VSAT mode will further limit operator actions as described later.

After VSAT mode is entered, the RC3000 switches to the MENU screen.

VSAT MODE OPERATION

The following describes VSAT mode operation by showing a typical sequence of events.

Suppose that the satellite vehicle has been relocated and parked at a new location. Upon powering up the RC3000, the SAVED MOUNT POSITION screen (3.2) is displayed.

```

                                SAVED MOUNT POSITION
38°56N  94°44W 218.1          31DEC99 23:59
<YES>USE SAVED POSITION
<BKSP>CLEAR POS (DELETES STORED SATS)

```

This screen shows the saved latitude, longitude and true heading of the mount along with the date and time that this information was saved. The operator needs to recognize that the mount has been relocated and select BKSP to clear out the saved position. After clearing out the saved mount position, the MENU screen will appear.

```

1-LOCATE SATELLITE                                MENU
2-STOW ANTENNA
                                                CST
<1-2>SELECT <MODE>MANUAL          14:37:23

```

In VSAT mode, the MENU screen only gives the operator two functions that can be performed. Since the operator previously cleared out the saved mount position (and also any STORED satellites), the option to LOCATE is available. Selecting 1 will put the RC3000 into LOCATE mode.

```

POS:      39°01N  94°49W  180.1          LOCATE
SAT:GALAXY 7      91.0W          AZ:-31.1
                                                EL: 40.0
                                                READY TO LOCATE
                                                PRESS <ENTER>

```

In VSAT mode, the LOCATE screen does not allow the operator to select a satellite. The selected satellite (and polarization) will be the last one chosen prior to entering VSAT mode.

When LOCATE is first entered, the mount's position will be automatically initialized with data from the GPS receiver and the Fluxgate compass. There may be a delay of several minutes while the GPS receiver generates a navigation solution. After the GPS generates lat/lon, the local magnetic variation is calculated and applied to the magnetic heading from the compass to form the true heading of the mount.

The latitude, longitude and true heading will be displayed in the POS: field. The pointing solution will be displayed in AZ: and EL: and the messages "READY TO LOCATE" and "PRESS ENTER" will be flashed. When ENTER is selected the RC3000 will automatically begin positioning the antenna to locate the satellite. The polarization angle for the previously selected Horizontal or Vertical orientation will be automatically calculated.

```

AZIM:  0.0 (  -6.1)                LOCATE
ELEV: -61.7 (  44.7)                SAT:GALAXY 7
POL:   0.0 (  40.3)
MOVING TO (TARGETS) <STOP>HALT MOTION

```

The autopeak function will be performed according to how it was configured (signal source, lock condition, scan range, etc.) prior to entering VSAT mode.

Following the completion of the LOCATE function, the RC3000 will be placed in MANUAL mode.

```

AZIM:  -6.1(  -6.1)    SS1:695      MANUAL
ELEV:  44.6(  44.7)    SAT:galaxy 7
                                SPD:SLOW      CST
<0-9>JOG ANTENNA <MODE>MENU      14:25:47

```

In VSAT mode the manual jog speed will be initialized to SLOW to allow fine tuning of the azimuth and elevation axes positions.

Polarization movement is not allowed since it is difficult to notice significant differences in signal strength without large movement in the polarization axis. It will be assumed that the calculated polarization angle will orient the polarization axis sufficiently.

After fine tuning in azimuth and elevation, the operator should try to confirm that the antenna has been placed on the correct satellite. For example, confirmation could be achieved by recognizing if the modem has generated a signal lock.

Following positive identification of the satellite, the operator should press the MODE key to enter MENU mode. When MANUAL mode is exited, all the data (sat name, az/el/pol position, etc.) that is saved as part of a STORE function is automatically retained. The mount's latitude, longitude and true heading is also saved.

Since the satellite's data has been STOREd, the MENU mode will now allow the operator to RECALL or STOW the antenna.

```

1-RECALL SATELLITE                MENU
2-STOW ANTENNA
                                CST
<1-2>SELECT <MODE>MANUAL          14:37:23

```

At this point the antenna is on the satellite and the operator may choose to turn off the RC3000.

When the RC3000 is turned back on, the SAVED MOUNT POSITION screen will again appear.

```

SAVED MOUNT POSITION
39°01N  94°49W 180.1              06FEB01 14:37
<YES>USE SAVED POSITION
<BKSP>CLEAR POS (DELETES STORED SATS)

```

The operator should recognize that the vehicle has not moved and select YES. Again the MENU screen will appear giving the operator the choice of STOWing the antenna or RECALLing the saved azimuth, elevation and polarization positions for the satellite.

If the antenna has been previously stowed (or otherwise manually moved), the RECALL function will automatically move to the STOREd azimuth, elevation and polarization angles. Following RECALL the RC3000 will be placed in MANUAL mode in case any peak up on the satellite is required. Again the RC3000 may be turned off if so desired.

EXITING VSAT MODE

To bring the RC3000 out of VSAT mode, expert access permission must be restored to INSTALL or SUPER USER and the initial mode must be set to something other than VSAT.