SweDish FAIRING CONTROL

This document describes how the RC3000 controls the fairing of the SweDish antenna system.

Hardware

To control the fairing the 3KF-WG-DRV1 module must be installed in the RC3000. This module connects to the fairing system via the J12 connector on the back of the RC3000. The following diagram shows the J12 pinout.
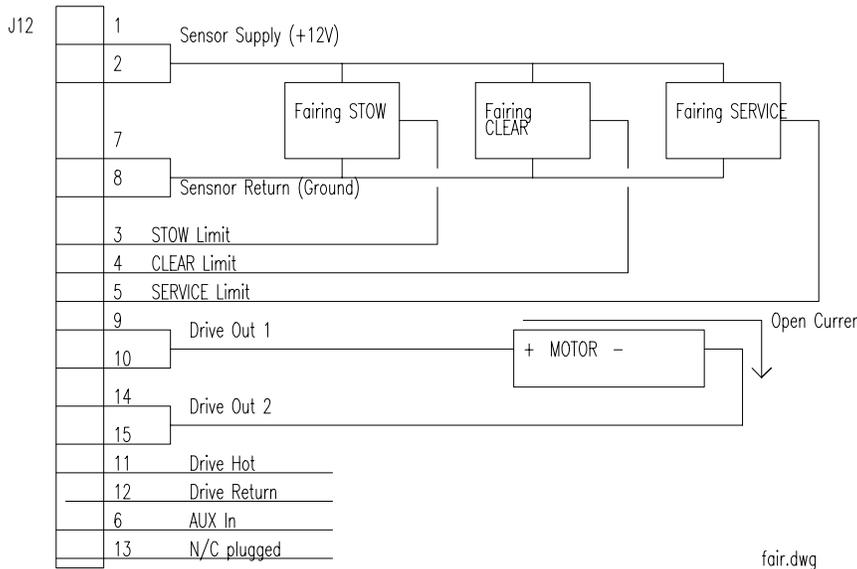
Software

Introduction. Control of the fairing is based on feedback from the fairing limit switches and the elevation stow switch. The fairing system may contain three limit switches:

STOW – This switch indicates the fairing is completely closed.

CLEAR – This switch indicates the fairing is in the "CLEAR" position.

SERVICE – This switch indicates the fairing is in the "SERVICE" position.

Some configurations of the SweDish antenna system will have all three switches while some may only have the STOW and CLEAR switches.

System Configuration. The type of fairing system configuration present is described to the RC3000 via the SYSTEM COMPONENTS configuration screen. At the FAIRING field either 0, 1 or 2 may be entered.

```
    GPS: 1                    CONFIG-SYSTEM
COMPASS: 1
FAIRING: 2
FAIRING CONTROL <0>NONE <1>3 SW <2>2 SW
```

0 indicates that no fairing control from the RC3000 is required. This would be the case where the external fairing control box is used.

1 indicates that fairing control from the RC3000 is to be enabled and that the 3 switch (STOW, CLEAR & SERVICE) fairing configuration exists.

2 indicates that fairing control from the RC3000 is to be enabled and that the 2 switch (STOW & CLEAR) fairing configuration exists.

Manual Fairing Control. When fairing control is enabled, manual control of the fairing may be initiated via the MANUAL mode screen. With fairing control enabled the MANUAL screen is slightly different.

```
AZIM:    0.0 STOW    SIG: 50          MANUAL
ELEV: -67.5 STOW    SAT:TELSTAR 402
 POL:    0.0         SPD:FAST FAIR:ST   CST
<0-9>JOG<BKSP>FAIR <MODE>MENU    14:25:47
```

The FAIR: field shows the current state of the fairing position switches:

ST fairing at STOW

CL fairing at CLEAR

SV fairing at SERVICE

-- no fairing switches activated

** multiple fairing switches activated (error condition)

Pressing the BKSP key puts the RC3000 into the FAIRING CONTROL screen.

```
                    FAIRING CONTROL
                      FAIR:CLEAR


<UP>SERVICE <DN>CLEAR
```

The FAIR field shows the current state of the fairing system: STOW, CLEAR, SERVICE, -------- (no switches active), OPENING or CLOSING.

If multiple switches are active, the abbreviations of the sensed switches are flashed. For example, if ST and CL are flashing it means that the RC3000 senses that both the STOW and CLEAR switches are currently activated. The message "ERROR – MULTIPLE SWITCHES" is placed on the bottom line indicating that an incorrect switch configuration exists.

The bottom line of the screen prompts the user for action to be taken or shows the current action in progress. Actions that will open the fairing are initiated by the UP key and actions that will close the fairing are initiated by the DN key. The following table shows the actions that may be initiated based on

the current state of the fairing switches. Actions allowed from a certain fairing position may be different depending on whether the two switch (2:) or three switch (3:) fairing configuration is enabled.

FAIR:	Message	<UP> action	<DN> action
STOW	<UP>CLEAR	Opens fairing until the CLEAR switch is activated	Closing fairing further is not allowed from this position
CLEAR	3:<UP>SERVICE <DN>STOW 2: <DN>STOW	3:open to SERVICE 2:no further opening allowed	Close to STOW
SERVICE (N/A for 2:)	3: <DN>CLEAR	No further opening allowed	Close to CLEAR
-------- (unknown position)	<UP>OPEN <DN>CLOSE	Open until CLEAR or SERVICE	Close until CLEAR or STOW
ST CL SV (multiple switches)	ERROR – MULTIPLE SWITCHES	No movement allowed	No movement allowed

When the UP key is pushed, the FAIR: field will flash "OPENING" and the bottom line will display a message indicating what switch the controller is looking to see in order to stop the fairing. The following screen shows how the display will appear after the UP key was pressed with the fairing in the STOW position.

```
                        FAIRING
CONTROL
                   FAIR:OPENING

MOVING TO CLEAR <STOP>
```

Similarly during movements initiated by the DN key, the FAIR field will show "CLOSING".

Note that any movement may be halted by pressing the STOP key. All opening and closing movements will also "time out" after approximately 15 seconds.

All fairing movements are also disabled if the elevation stow switch is not activated. If the elevation stow switch is not active, the FAIR: field will display "ELEV" and the bottom line will show the message "ELEV MUST BE STOWED".

Automatic Fairing Movements. When fairing control is enabled, automatic movement of the fairing may be made as part of the DEPLOY, INIT or STOW movements.

Deploy, Init. When enabled, fairing control will attempt to open the fairing to the CLEAR position if the fairing is currently at the STOW position. The message "OPENING FAIRING TO CLEAR POSITION" will be displayed.   After opening the fairing, the normal DEPLOY sequence will start.

If the CLEAR or SERVICE switch is not activated, the message "FAIRING NOT AT CLEAR POSITION <MODE>EXIT" will be displayed. The rest of the DEPLOY sequence will not continue in this condition.

If the fairing is already at the STOW or SERVICE position, the DEPLOY will continue. Note that if the fairing is at an unknown position (no switches activated), automatic movement of the fairing will not be attempted.

Stow. When enabled, fairing control will attempt to close the fairing after the normal STOW elevation, polarization and elevation sequence has occurred. During the fairing movement the message "CLOSING FAIRING TO STOW POSITION" will be displayed. If the fairing movement times out and the fairing stow switch is not activated, the message "FAIRING NOT AT STOW POSITION <MODE>EXIT" will be displayed.

The fairing close movement will not begin if the elevation is not at stow. The message "ELEV NOT AT STOW POSITION   <MODE>EXIT" will be displayed.

Shake. When enabled, fairing control will open the fairing to the CLEAR position before the rest of SHAKE's move #1 is accomplished. At the end of move #3, fairing control will close the fairing to the STOW position.

NOTE: for SweDish, move #3 is hardcoded to be a STOW operation. Target positions for move #3 programmed via the CONFIG-SHAKE screen are ignored. Also for SweDish, the SHAKE operation should be initiated with the pod totally stowed (azimuth, elevation and fairing).