

RDA 8.11.7 Release Notes (3 Mar 2008)

These notes cover changes made in RDA since release 8.11.6 of 4 Jan 2008. If you are upgrading from an earlier release, please read those notes also. Revised to svn [19727].

Installation Changes

1. Changes made to the release cdrom, see IRIS Release notes 1. and 2.

New Features

1. The RCP8 had additional support for pedestal heaters and fans in the Vaisala pedestal.
2. The RCP8 now has support for a motor driver alarm, try resetting the alarm automatically. In some cases the motor driver alarm will cause the RCP8 to shutdown and require a manual reset. Trac #394.
3. To support full 360 degree RHI antenna scans, the RCP8 elevation trigger blanking max angle was +90, Trac #383.

RDA 8.11.6 Release Notes (4 Jan 2008)

These notes cover changes made in RDA since release 8.11.5 of 9 Nov 2007. If you are upgrading from an earlier release, please read those notes also. Revised to svn [19402].

New Features

1. Added support for the ARA ACU-3 Antenna controller to the RCP8 (Trac #283). This is used on some WMI radars. There are new setup questions added in the site/custom section to support this:

Use ARA ACU-3 Antenna: YES

Serial port: /usr/sigmet/config/rcp8_ara_acu-y

Baud rate: 19200

Choose: None Odd Even

Data parity: Odd

ID of BITE status packets: 0x08

Fixed time lag of angles: 1.0 ms

Poll for position every 20 ms

Offset of 15 mapped status bits: 40

Control bit for reset: 40

Simulator Serial port: /usr/sigmet/config/rcp8_ara_acu-x

If you answer “Yes” to the initial question and supply a serial port, you get the ARA_ACU3 thread visible on the “help view” screen. If you put a string into the Simulator port, you get the ARA_ACU3-Sim thread. The example above show how to configure the simulator to talk to the main thread using fifos. You need to create these 2 files using the **mkfifo** command.

There are 15 TSC TWT status bits output in the BITE packet, as follows. For a detailed description of the bit meanings and the command set see the ICD.

Char	Function
1	SYNC Byte (C0 Hex)
2	Identification byte (User Choice)
3	Status Bits EL1 AZ6 AZ5 AZ4 AZ3 AZ2 AZ1
4	Status Bits ELF AZF EL6 EL5 EL4 EL3 EL2
5	Status Bits - - - - - Timeout
6	Spare byte
7	END OF MESSAGE (FF Hex)

These same 15-bits are mapped to the specified status bits. The fundamental period at which the RCP8 polls the ARA for position is set by the “Poll for position” question. All other activity, like polling for status happens once a second. Command output happens once a second unless there is a change.

2. The RVP8 now has the ability to synthesize individual trigger lines whose start time alternates from pulse to pulse about the midpoint between pulses. For example, the following trigger definitions:

```
RVP8> mt0
Parameters for Pulsewidth #0
-----
Enter trigger starts as: <Fixed Offset> <PRT Fraction> <Flags>
Flags: 'M' - PRT Fraction alternates about pulse midpoints

Trigger #1 - Start:      0.00 usec
              #1 - Width: 1.00 usec      High:YES
Trigger #2 - Start:    -5.00 usec + (0.5 +/- 0.100000) * PRT
              #2 - Width: 1.00 usec      High:YES
```

will create two triggers 1µsec wide, the first starting regularly at time zero (range zero), and the second starting 5µsec earlier than the midpoint between pulses +/- 10% of each inter-pulse period. At 1KHz PRF, trigger #2 would alternately appear 395µsec and 595µsec after time zero. This starting time specification would be created by typing “-5 .1 M”.

Bug Repairs

1. The RCP8 antenna servos now perform much better in the case where no IO62 card is installed and the servos run at 50Hz.
2. A bug was repaired in the RCP8 Tach/Pos consistency check in which the check would sometimes cause inappropriate shutdowns.
3. To support antennas which can do a full elevation scan, we removed the ant_lib signal when the elevation goes from +270 to -90 degrees, Trac #350.
4. Fixed bugs in the RCP8 TSC_TWT control interface detected during factory installation. The raw monitor of the TSC Modulator interface now prints ASCII.
5. *RHEL5 systems only*: Fixed a bug with the ant_lib log files: It was not deleting the old files the way it was supposed to.

RDA 8.11.5 Release Notes (9 Nov 2007)

These notes cover changes made in RDA since release 8.11.4 of 24 Oct 2007. If you are upgrading from an earlier release, please read those notes also. Release was svn 19251.

Important Upgrade Notes

1. We have changed the IRIS manuals system to use the resident **acroread** on your Redhat system. Please see the IRIS Important Upgrade Notes 1. for details.

New Features

1. We have added support in the **RCP8** for the TSC TWT transmitter used in the NOAA G4 aircraft, under contract with Malibu (Trac #280). There are new setup questions added in the site/custom section to support this:

Use TSC TWT Interface: YES

```
T/R Serial port: /usr/sigmat/config/tsc_tr-y
Modulator Serial port: /usr/sigmat/config/tsc_mod-y
ID of BITE status packets: 0x06
ID of QBITE status packets: 0x07
Offset of 23 mapped status bits: 20
Offset of 10 mapped control bits: 20
Simulator T/R Serial port: /usr/sigmat/config/tsc_tr-x
Simulator Mod Serial port: /usr/sigmat/config/tsc_mod-x
```

If you answer “Yes” to the initial question and supply either serial port, you get the TSC–TWT thread visible on the “help view” screen. If you put a string into either Simulator ports, you get the TSC–TWT–Sim thread. The example above show how to configure the simulator to talk to the main thread using fifos. You need to create these 4 files using the **mkfifo** command.

You can monitor the traffic transmitted and received from these two serial lines using the “monitor sio” command. Once you are in monitor mode, then type something like “raw xtsc_tr rtsc_tr”. Other available data is “xtsc_mod” and “rtsc_mod”.

There are 23 TSC TWT status bits output in the BITE packet, as follows. For a detailed description of the bit meanings, see the ICD.

Char	Function
1	SYNC Byte (C0 Hex)
2	Identification byte (User Choice)
3	Status Bits 6 5 4 3 2 1 0
4	Status Bits 13 12 11 10 9 8 7
5	Status Bits 20 19 18 17 16 15 14
6	Status Bits 23 22 21
7	Spare byte

8 END OF MESSAGE (FF Hex)

There are 4 TSC TWT qualitative values output in the QBITE packet, as follows:

Char	Function
1	SYNC Byte (AF Hex)
2	Identification byte (User Choice)
3-4	Frequency code (actually only 6 bits)
5-6	Receiver protector leakage measurement
7-8	Transmitter power measurement
9-10	Reflected power measurement
11	END OF MESSAGE (FF Hex)

The TSC TWT simulator is fairly simple. For the T/R port, it sends a 9-byte response containing all zeros, except for the first and last byte, and bytes 2 and 3 are copied from bytes 2 and 3 of the command (which have the same meanings). Also the qualitative values are set to: Frequency code=50, Receiver protect leakage=100, Transmitter power=150, and Reflected power=200. If no command, or a bad command arrives, then the whole payload is zero. For the Modulator port, it sends the string "<1R0011?0000>\n", where the "?" is set to "0" or "1" based on the command supplied. If no command, or a bad command arrives, then the payload is all "0".

RDA 8.11.4 Release Notes (24 Oct 2007)

These notes cover changes made in RDA since release 8.11.3 of 12 Oct 2007. If you are upgrading from an earlier release, please read those notes also.

New Features

1. There are no significant changes specific to RDA, however the color changes to support 256 colors do impact the RDA real-time display. See the IRIS release notes 1.

RDA 8.11.3 Release Notes (12 Oct 2007)

These notes cover changes made in RDA since release 8.11.1 of 4 April 2007. If you are upgrading from an earlier release, please read those notes also. There was no release 8.11.2. Revised up to svn 19028.

Installation Changes

1. *RCP8 Systems only:* Because of the GPIB support, you now need to install a new library for the RCP8 to run. If you are installing a new system, this is covered in the sigconfig script, or in the steps described in the *Software Installation Manual*. If you are upgrading, you will need to install a new rpm. This is supplied both on our ftp site, and on the cdrom in the sigmet/RHEL4/extras/RPMS directory. Here is the command to install:

```
# rpm -Uhv linux-gpib-lib-3.2.09-1.EL.i686.rpm
```

If you are using the gpib feature, then you will also need to install the kernel module. There is a common kernel module rpm, and a version specific to the installed kernel. We provide two driver RPMs for RHEL4 kernels, and one for RHEL5:

```
# rpm -Uhv linux-gpib-kmod-common-3.2.09-1.EL.i686.rpm
# rpm -Uhv kmod-linux-gpib-3.2.09-1.EL.2.6.9_5.EL.i686.rpm

# rpm -Uhv linux-gpib-kmod-common-3.2.09-1.EL.i686.rpm
# rpm -Uhv kmod-linux-gpib-smp-3.2.09-1.EL.2.6.9_5.EL.i686.rpm

# rpm -Uhv linux-gpib-kmod-common-3.2.09-1.el5.i686.rpm
# rpm -Uhv kmod-linux-gpib-3.2.09-1.el5.2.6.18_8.el5.i686.rpm
```

If you have a different kernel, then contact sigmet for instructions.

New Features

1. The RCP8 now supports a new optional thread to interface to an ARA ACU-3 antenna controller. Trac #283
2. We have added a new RDA daemon called “**dspmuxd**”. This program allows a single network based application to talk to two RVP8s using the same interface as used for a single RVP8. This is used for a dual-pulse scheme used with a long compressed pulse. In such a case. Documentation is available in machine generated doxygen format. Trac #298.
3. Added support in the RCP8 for MELCO Turkey-01 Q-BITE packet reading and writing. A built-in simulator is also included for loopback testing.
4. The RCP8 now has a feed-forward servo to handle drive belt stretching on the Vaisala pedestal, as well as other types of pedestals for which a linear antenna model is not an accurate representation. This “servo” is actually an open loop velocity trajectory that does not rely on instantaneous tachometer or position feedback to reach a desired angle. Its internal parameters are adaptive so that each open loop trajectory will be adjusted based upon earlier motion paths.

5. The RVP8 Random Phase (RPHASE) processing mode now runs approximately 3.5x faster than before. The speedup is entirely in the spectral whitening algorithm which is numerically equivalent to the prior algorithm (sorted spectrum / objective noise), but implemented in a much more efficient manner for x86 processors.
6. The RCP8 now supports an HPIB interface to a signal generator, allowing IRIS/Antenna to control the generator's output power level, RF On/Off, and modulation (pulse or CW).

Bug Repairs

1. RCP8 Dehydrator serial port configuration changed from number to path string. Canbus writesync timeout written to file, but program is not terminated. Enable/disable radar control through canbus. This is for the case where only encoders connected to canbus are used.
2. Repaired missing ray following certain PRF sector transitions.
3. Changed the RVP8's default configuration to have the clock speed set to 71.9364, which is our standard shipped clock. It was 32 MHz.
4. In HydroClass processing, fixed a bug producing intermittent rings of NoMet data at the half range point.

RDA 8.11.1 Release Notes (4 Apr 2007)

These release notes cover changes made to the SIGMET Radar Data Acquisition platform. The last public release was RDA-8.11.0 dated 13 December 2006. If you are upgrading from an earlier version please also read the release notes that have been published since then.

New Features

1. The RVP8 now supports trigger blanking via an RS-422 input signal on the 9-pin “D” connector of the RVP8/Rx Rev.C PCI card. A differential signal may be applied at pins 4&9 to force triggers into a blanked state when configured by the following **Mc** setup question:

Pin-4 - 400:Trig4 401:Trig8 402:Trigin 403:TgBlank :

Whenever this *TgBlank* option is used, please also remember to select the subset of triggers that will actually be blanked via the **Mt** menu.

2. The RVP8 angle sync command (LSYNC) now has the option of allowing “short” rays to be processed. Synchronized rays ordinarily will be the full width of successive table entries (in the static case) or the full requested pulse count (dynamic case). A new bit modifies the behavior in both modes to allow short rays to be produced, wherein the pulse count is less than expected due to encountering some feature in the CPI (usually a trigger transition) that would normally have resulted in the entire ray being thrown out. When this bit is set it becomes the responsibility of the user’s code to check the pulse count that went into each ray and discard those that are too short to contain useful data.

The third argument of *dspw_syn_mode()* has been changed in a backward-compatible manner to allow this new feature to be activated.

3. The RCP8 now has support for a serial interface to a ADH-2A COM automatic air dehydrator used to pressurize the waveguide. The dehydrator is polled for status and full status information is transmitted in BITE packets along with pressure, temperature, air flow and duty cycle measurements. Additionally, a RS422-RS232 converter and cabling is needed to establish a working connection.

There are new TTY setup questions in the “site custom” section to turn on/off dehydrator feature, set the BITE and QBITE ids and to setup the COM port number where the dehydrator is connected to. The dehydrator itself must be configured to use default address 0x30. When configuring a new dehydrator, you will need to set the serial line permissions to 666 as detailed in the *Software Installation Manual*, section 1.4.3.

Bug Repairs

1. Fixed a bug in the JPOLE algorithm within **HydroClass**. The MBFs were ignoring ZDR. This has a minor impact on all processing, particularly high Z’s, Trac #144.
2. Fixed a severe bug in HydroClass in the RVP8 in the second half of the processed range. This is because of the dual processor implementation, Trac #173.

RDA 8.11.0 Release Notes (13 Dec 2006)

These release notes cover changes made to the SIGMET Radar Data Acquisition platform. The last public release was RDA-8.10.10 dated 28 October 2006. If you are upgrading from an earlier version please also read the release notes that have been published since then.

Important Upgrade Notes

1. Starting with this release, you will need to install the Kvaser canbus library in order to compile or run the RCP8. This is available on our release cdrom, and can be installed as follows:

```
# cd /mnt/cdrom/sigmet/drivers/kvasercan-4.2.1-3
# rpm -Uvh lib.i686.rpm
```

This will install on any version of RedHat Linux. However for canbus support you should be at RHEL4 or higher. Documentation files are installed at location /usr/share/doc/can-lib-1.0.1.

If you are using the Vaisala antenna pedestal, then you will be using the canbus you will need to install the Kvaser kernel module. You need to match it to your specific kernel version. Here are instructions from the cdrom. If you need a kernel module for a different kernel version, contact sigmet.

```
# cd /mnt/cdrom/sigmet/drivers/kvasercan-4.2.1-3
# rpm -Uvh kmod-common-i686.rpm
# rpm -Uvh kmod-smp-2.6.9_5.EL.i686.rpm
```

If you are installing from the web, you can pick up these same rpms from our ftp site:

```
ftp.sigmet.com://outgoing/os_patches/linux/RHEL4/kvasercan-4.2.1.3
```

Bug Repairs

1. The acquisition of (I,Q) data from the **RVP8/Rx card** would sometimes fall behind when the PCI data rate exceeded ~40MBytes/sec. This would only happen in a very heavily loaded dual-pol system.
2. A bug fixed in **HydroClass** that caused all the echoes to appear in the “NoMet” class, when the melting layer height was at a value below 300 m (MSL), approx.
3. **HydroClass** generates more informative messages in cases the configuration file missing and/or inconsistent. Trac #41, #42, #58.
4. The **HydroClass dpolapp** utility is significantly enhanced, please check the –help option to see details. This includes generating a default dpolapp.conf file with the “–generate:” option.
5. **HydroClass** data type is now set invalid in **ascope** whenever ZDR cannot be computed. Fixed a bug in which HydroClass fault pop-ups in **ascope** were only visible for a fraction

- of a second. Also we signal and do not compute HydroClass whenever the melting level is set to undefined. Trac #39, #38, #68,
6. In **HydroClass**, the default rule strength (RS) threshold values of the CSU hydrometeor classifier have been updated such that bins of low consistency ($RS < 0.3$, previously no thresholds, 0.0) are now classified as non-metrological echoes. Such bins enter into 'NoMet', or are thresholded, depending on the threshold settings in `dpolapp.conf`. The JPOLE preclassifier default membership function of ZDR has been restored to the literature values. These settings in `dpolapp.conf` can be tuned by advanced users to optimal performance for each climate and site, as before.
 7. **HydroClass** configuration file (**`dpolapp.conf`**) comment lines have been improved.
 8. Excess messages in `rvp8.log` "Shared global section already there <rvp8_hclass>" removed.
 9. The RVP8 tries to assemble a CPI, even during config errors. A typical config error would be requesting dual polarization on a signal pol radar. A side effect of skipping the CPI assembling was that the time, az, and el of all rays were set to zero. This could cause users to waste time trying to figure out why angles are missing, rather than looking for the config error.

New Features

1. The **RCP8** now supports the Canbus used on Vaisala pedestals. Canbus enables connecting multiple sensors through a pair of wires to the system. Data from sensors is encapsulated to the the canbus messages with identifiers, which are sent to the canbus for system control and monitoring. Messages from sensors are processed and BITE packets are sent for BITE to show the status of system.

To use the Canbus on your radar system, be sure to install the kernel module as discussed above under Important Upgrade Notes. Then in the RCP8 setups accessible via `antx`, in the site custom section you will find a question "Use CAN-Bus serial control/status:". Set this to "Yes" and it will enable the Canbus thread. You can also enter here the IDs of the two BITE packets in which the sensor data is sent.

Canbus is written into two parts:

can_kvaser.c: Interface to the canbus using Kvaser USBcanII. If the interface to the canbus is changed, this software module might need to be rewritten.

canbus_main.c: Software module to handle incoming messages from canbus and to send outgoing commands to canbus. This is using the `can_kvaser` interface. Current version has handling for messages from azimuth and elevation encoders, azimuth and elevation tachometers, temperature sensors (az-motor, el-motor, radome, equipment bay), motor currents and status of motor drivers. More handlers can be added if needed. Data is sent further in BITE packets.

Definitions needed are located in file `canbus.h`. This file includes canbus speed definitions, message IDs, scale factors for sensors and other canbus specific timers and limits.