

## RVP7 V07 Release Notes

These notes cover changes made to the RVP7 code since release V06 of 7 March 1998. If you are upgrading from an earlier release, please read those notes also.

### Bug Repairs

1. A bug has been fixed in which a single-board RVP7 could not process the full 2048 bins in PPP modes (1024 bins in FFT modes) when range averaging was enabled. If N-to-1 range averaging was used, then the last (N-1) bins could not be selected.

### New Features

1. It is now possible to print the FIR filter coefficients that are designed internally by the RVP7. Use the new "#" subcommand from within the "Ps" plotting command. The coefficients are normalized so that the maximum absolute value is 1.0. This feature is intended for users who wish to analyze the details of the time and frequency response of their filter.
2. The algorithm for sampling the parallel TAG inputs has been improved. Previously, the 32 TAG lines were debounced by reading every 0.4μsec until two identical bit patterns were found. However, this amount of time was too short to reliably reject the transitions between values, and bad angles would sometimes be passed through. The result would be occasional failures of the dynamic angle sync algorithm, resulting in rays that contained fewer pulses than would be expected. The new sampling algorithm now scans for 3.0μsec of continuous agreement in TAG values.
3. The dynamic angle sync algorithm will now produce a ray if more than one second of time elapses between crossings of sync angle boundaries. This prevents timeouts when the RVP7 is trying to sync to a stationary antenna.
4. The Real Time Monitor can now show the present polarization selection, i.e., horizontal, vertical, or alternating.
5. A new version of the programmable logic device at U8 of the RVP7/IFD is now available. The new part (IFD-2-U8) sends additional status bits down the fiber link, and allows the RVP7 to distinguish and report problems in 1) the uplink cable to the IFD, and 2) the user's phase locked clock in a Rev.C receiver operating with a klystron radar. The new PLD is compatible with all versions of the RVP7/IFD circuit board (i.e., Rev.A, Rev.B, and Rev.C), but requires at least Rev.7 ROM code on the main board to handle it. New RVP7/IFD's will begin shipping with this part, but there is no reason to upgrade older receivers unless the additional status information is absolutely necessary.
6. Several new error and status bits have been added to the GPARM immediate status word #2. Bit #4 indicates an error in the uplink cable to the RVP7/IFD. Bit #7 indicates a problem with the user's phase locked clock in a Rev.C receiver operating with a klystron radar. Bit #11 indicates that the RVP7/IFD test switches are not in their normal operating position. The IRIS ASCOPE utility has been improved to report these errors.

7. The Real Time Monitor can now show the status of the IFD module, fiber downlink, and coax uplink.
8. A new line of text has been added to the View-Status TTY printout. The line shows the status of the IFD module, fiber downlink, and coax uplink, as well as the measured power level and frequency of the burst pulse.
9. A new configuration option for the SIO serial port has been added in the Mc setup section. It is now possible for the RVP7 to output serial antenna records which are based on the azimuth and elevation TAG bits (either real or simulated). These serial packets are in RCV02 format, and are transmitted at the rate of two per second. The AZ and EL angle fields are properly filled in, as are the AZ and EL velocity, milisecond time stamp, and the pulse width status bits. The velocities are estimated from the last half second of angle travel. This SIO option is intended for use on a system that has IRIS and an RVP7, but no antenna controller to generate the serial antenna information directly. The SIO receiver is unused in this mode, and it will ignore any characters that happen to be sent to the RVP7.
10. The RVP7 will now ignore most command opcodes from its SCSI or parallel interface whenever its TTY setup monitor is still running. This will almost certainly result in the timeout of any user application that attempts to run the RVP7 in this mode. However, an abrupt timeout of this sort is less confusing than the former behavior, in which the RVP7 would give the general appearance of running correctly. The opcodes which are allowed through are: TTYOP, IOTEST, OTEST, RBACK, and GPARM.
11. It is now possible to configure the header words that accompany each ray of processed data from the PROC command. A new opcode (CFGHDR) has been added to select the words or groups of words that are to be included in each ray header. The traditional four TAG words may, of course, still be selected; but you may also append the PRT for the ray, the number of pulses in the ray, and a milisecond time stamp. The CFGHDR opcode is flexible and can accomodate more header words that may be needed in the future. The current header configuration may be read back in GPARM Word #43. The OPPRM Word #2 Bit #11 has been renamed and reinterpreted as a No-Headers (NHD) bit, rather than a No-TAGs (NTG) bit.

## Setup Changes

1. A new setup question has been added to the "Mt" section to set the polarization to "Vertical", "Horizontal", or "Alternating".
2. The ZDR setup question in the "Mp" section has been expanded to include the choice of whether dBZ and dBt are computed from the sum of the horizontal and vertical polarizations, or from the horizontal alone.
3. The "Maintain separate noise levels for each PW" question in the Mp section has been removed. The RVP7 now always keeps separate noise levels for each pulsewidth. Since the noise level is guaranteed to change whenever the matched FIR filter bandwidth

changes, it has never made sense to use the noise level from one pulse width while acquiring data for another. This option is somewhat of a relic from the past, and has finally been removed. The GPARM immediate status word #2 Bit #6 that was assigned in Rev.4 to convey the state of this setup question has been returned to being an unused bit (since no user code was ever written for it). Note that the IRIS INGEST process has traditionally requested a new noise measurement whenever the pulsewidth changed, and thus was compatible with either setting of the former setup question. INGEST will soon offer the option of keeping noise levels separately, which will generally speed up the starting of tasks.

4. There are four new setup questions in the M\* (standalone settings) section that allow you to set the power-up value and the current value of the receiver noise level for each pulsewidth. Both noise levels are shown in dBm, and you may alter either one from the TTY. The power-up levels are assigned by default when the RVP7 first starts up, and whenever the RESET opcode is issued with Bit #8 set. Likewise, the current noise level (for the current pulsewidth) is revised whenever the SNOISE opcode is issued. These new setup questions are intended for applications in which the RVP7 must operate with a reasonable default value up until the time that an SNOISE command is actually received. It may also be used to compare the receiver noise levels during normal operation, which serves as a check that each FIR filter is behaving as expected when presented with thermal noise. The new noise setup questions, as well as the previous ones for setting the sampling range and PRF, have been moved to the top of the M\* section to make them easier to use interactively.
5. New setup questions have been added in support of New Features described above and numbered 4. , 7. , and 9.