



NEXRAD NOW

Volume 1 Issue 1

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Status of Build 9.0

The OSF is currently developing the Build 9.0 software load. The status is as follows:

- OSF Software Engineering has completed initial coding of all the software changes authorized by the System Recommendation and Enhancement Committee (SREC).
- The software changes have passed the unit and integration tests.
- System testing of Build 9.0 commenced on March 20, 1996.
- Operations testing has a tentative start date of early June.
- Beta testing is currently scheduled to begin in mid-July.
- Software is expected to be distributed to the field by mid-October.

In order for the field to install the new software immediately upon receipt in October, many of the sites need equipment upgrades. TCTOs, Mod Notes, and EEMs have been sent to the field requesting an inspection and a replacement of optical disk controller cards and hard drives for the RPG only. The optical disk controllers are in limited supply; therefore, the OSF has planned for a round robin retrofit. This means that old optical disk controllers need to be upgraded and returned to the sites. The sooner the retrofit is accomplished, the sooner

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Letter From The Editor

Welcome to NEXRAD NOW, an information publication of the WSR-88D Operational Support Facility (OSF). The purpose of this publication is to provide relevant information to those involved in the NEXRAD program. Through various projects, the OSF is continuously working on ways to enhance the performance of, as well as maintain and support, the WSR-88D. It is vital that we make the status of these projects available to you, our customer.

I will be serving as the editor for NEXRAD NOW. My sincere hope is that you find this information valuable to your daily operations. We are looking forward to upcoming features that will assist you even more.

If you have any ideas, suggestions, or comments for this publication, please let me know. You can reach me at (405)366-6540 ext. 3260, or my Internet address is csmith@osf.noaa.gov

Christina M. Smith

Return of WSR-88D *Tales from the Hotline*

During the early 1990s, the WSR-88D Hotline staff published and distributed four volumes of "lessons learned" from our experience supporting the WSR-88D system. These were very well received by field personnel throughout the user agencies, but our support workload soon consumed our staff resources available for this task. Now, after a hiatus of two years or so, Hotline 'Tales is back on track with a new editor and a new methodology!

The new editor of *WSR-88D Tales from the Hotline* is Cindy Chrisman, a senior Hotliner. While it is no longer feasible for us to assimilate and publish 'Tales in volumes, we will concentrate instead on individual topics with widespread applicability in the WSR-88D network, complete

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Letter From The OSF Director

As of this date, 138 WSR-88D weather radars have been deployed by the tri-agencies throughout the United States as well as several overseas locations. With approximately 20 radars remaining to be deployed, work in obtaining maximum utilization of this network of sophisticated technology has just begun.

The WSR-88D was designed to be an evolutionary system allowing for enhancements to the systems as technology improves and additional insight into the processes of the atmosphere is gained. Good examples of this are Software Builds 8.0 and 9.0 and the RPG rehost effort which began recently.

The number of on-going as well as planned future activities pertaining to the WSR-88D system, its operation and maintenance, and advances in operational meteorology are staggering. The OSF will use this forum and others such as a faxback system, WEB page, and a bulletin board system to keep you, our customers, fully informed concerning all aspects of the NEXRAD program. Any input, question, and/or comments which will enhance the flow of information to other tri-agency users will be greatly appreciated.

James D. Belville



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BUILD 9.0 CONT'D

all sites will be completed. Please get these inspections and replacements done as soon as possible so we can have a successful loading of Build 9.0 in October!

Should you have any questions regarding the specific changes in Build 9.0, please refer to the Build 9.0 Preview booklet that was sent out by the Operations Training Branch.

1Lt. Chris Lemanski



ATTENTION!!! ATTENTION!!!

In upcoming issues of NEXRAD NOW, you will see two exciting new features.

One of these features will be "Letters To The Editor", in which you can write, e-mail, or call with any questions about the radar or the OSF in general. These questions will then be answered in upcoming issues. Just remember, if you are experiencing a problem or have a question, chances are that others may as well.

The second feature will be "From The

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'TALES CONT'D

them as quickly as possible, and make them electronically available on-line.

At the same time, we are updating former topics as appropriate and overhauling the 'Tales indexing system to make it more user-friendly.

The first installment of "new" 'Tales -- five new topics and six revised topics -- went on line with our new "faxback" system during the week of February 19th. This system can be reached at **800-874-6745**, where you will be voice-prompted through the process of requesting up to 5 documents per call. OCONUS DOD sites without access to "800" numbers should instead call Tinker AFB at DSN 312-884-1110 and ask for offnet to 366-6559. We suggest you start with Topic 1000, which is a catalog of all available topics. In the future, we will try to make 'Tales topics also available via the OSF web page, BBS, and possibly an FTP server, in addition to the faxback system.

Daryl Covey

Status Of WSR-88D Deployment

There are 138 operational WSR-88Ds with 312 Associated PUPs and 65 Non-Associated PUPs. They are located throughout the CONUS, Alaska, Hawaii, Guam, and Korea. There are 18 more WSR-88Ds on the current installation schedule which should be completed by October, 1996.

Rich Rasmussen

NEW INITIATIVES AT THE OPERATIONS TRAINING BRANCH

Several new initiatives have occurred at the OTB during the last few months: The mission of the Operations Training Branch (OTB) is to provide high quality training, enabling effective use of the WSR-88D to improve forecasts and warnings. Although the mission has remained unchanged for several years, delivery methods to achieve this training continue to evolve.

1. Instructors are presenting daily weather briefings that utilize modernized data sets such as N-AWIPS and GOES 8 & 9 data.
2. The OTB portion of the OSF Home Page continues to expand with the inclusion of the UCP Course Student Guide, Build 9.0 Summary, and other hot topics. (<http://www.osf.noaa.gov/otb/otb.htm>)
3. In addition to placing the Build 9.0 Summary on the Internet, we also mailed two printed copies to every PUP site (hard to miss that florescent yellow cover).
4. Our Supercell Explorer/Precipitation Suite Interactive Training Module on CD-ROM was also mailed to every site a few months ago. Reviews have been good, severe weather season is on us, so check it out if you haven't already.
5. We completed our fifth workshop in February, which addressed the needs of RFCs nationwide. The HAS Workshop signaled a transition from our regional workshops last year, to phenomena based workshops this year.

New training initiatives continue both in the residence courses and in distance learning. The changing environment of the field requires us to explore new ways of transferring knowledge. The OTB is committed to providing high quality training through innovative and effective methods.

John Ferree

NEW TOWER INSPECTION PROGRAM COMING

The OSF is working with the NEXRAD Agencies and the radar maintenance team at McClellan AFB, CA to organize a comprehensive preventative maintenance inspection (PMI) program for the WSR-88D antennas, radomes, pedestals, towers, and RDA shelters. The team will clean the radomes, tighten radome and pedestal bolts, check the tower for proper bolt tightness, inspect for corrosion, and other tower related inspections and repairs. The OSF Operations Branch and the team at McClellan AFB are developing the details to start a two- and four-year PMI cycle. A limited number of NWS sites will be visited in FY96, with the rest of the network accomplished in the following years. Sites will be notified with specific instructions and guidelines when they are scheduled for a visit. The McClellan AFB traveling team began these inspection visits in April. Plans to repaint the radomes are also being developed.

Rich Rasmussen

Receiver Front-End EMI Filter

In March of 1994, the OSF became aware of an electromagnetic interference (EMI) problem with the WSR-88D in Houston, TX. The problem manifested itself as a strobe on the low elevation radar products at one specific azimuth angle. Investigation of the problem led us to a multi carrier microwave distribution system (MMDS) as the source of our interference (sort of). The interfering source was not radiating any detectable energy on our radar frequency in Houston. So, if they weren't radiating on our radar frequency, how were they interfering with us?

One of the components in the NEXRAD receiver chain is a low noise amplifier, located in the pedestal. This amplifier is designed to provide approximately 28 dB gain to the radar return energy before it is applied to the first mixer for down conversion to the IF frequency. Ideally, the amplifier should take all input signals, amplify them by 28 dB, and pass them on to the mixer. When confronted with a large number of input signals, however, or when presented with a few large amplitude signals, the amplifier no longer behaves as an ideal amplifier, and begins to behave as a mixer.

A mixer, when presented with two signals, produces output signals at many different frequencies, including the sum and difference of the frequencies and multiples of these. This is a basic function of a mixer, and is a desirable and useful feature. When it occurs in an amplifier,

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OCONUS MAPS

What do Guam, Korea, Okinawa, the Azores, and Puerto Rico have in common with the US Geological Survey (USGS) mapping data used for NEXRAD maps? If you guessed nothing, you are absolutely correct. The NEXRAD program is installing WSR-88D systems outside the United States at locations on DOD facilities in Guam, Korea, Okinawa, and the Azores. A sixth system is being installed at a FAA facility in Puerto Rico, where it will support the missions of NWS, FAA, and DOD.

Developing quality background maps to support the diverse requirements of the tri-agency users of these overseas systems was a challenge for the OSF. Following the OSF Director's charge that, "...there would be no second class maps for these sites," members of the OSF's Software Engineering staff have built maps for Anderson Air Base, Guam; Camp Humphreys and Kunsan Air Base, Republic of Korea; and Kadena AB, Okinawa-shima Japan. Using MapInfo®, a computer-based geographic information system, databases and charts from American Digital Cartography®, the Defense Mapping Agency, Microsoft®, and others, the OSF team developed software, researched, and analyzed data that created the detailed custom overlays supporting the staff at these locations. Since four of the six sites are on islands and the other two on a peninsula, the OSF has even developed a new latitude-longitude mesh overlay to support over-water reporting requirements.

The OSF has scheduled map development for Puerto Rico and the Azores in the next quarter. Future initiatives to enhance WSR-88D map overlays have been identified.

Ron Guenther

Receiver/Signal Processor Calibration

A new RDA Receiver/Signal Processor (RSP) calibration procedure was recently released in Change 6 of the RDA Maintenance Manual (NWS EHB 6-510, AF TO 31P1-4-108-152, FAA TI 6460.1 V7). The primary calibration procedure is located in section 6-6.28, but please note that a new and improved Path Lost Measurements section (6-6.31) was also included in the Change 6 release. The primary calibration procedure has extensive checks and calibration processes designed to calibrate each WSR-88D system's inherent reflectivity accuracy to within 1 dBZ. It is very important that we maintain the calibration of all WSR-88D systems to the best degree possible in order to ensure the data quality of the meteorological algorithms across the entire network.

All sites should perform the new calibration procedure at least once, and then again at any time that repairs/alignments are performed within the receiver area (main channel or any test paths) or at any time you suspect a possible calibration inaccuracy. One important item to note is the calibration processes are only as good as the test equipment used. Therefore, it is imperative that the procedures be performed using calibrated test equipment; the calibration should be current within the last year.

Paul Krenek

(Continued from page 3) **EMI FILTER CONT'D**

however, it's a problem.

In Houston, the energy from the MMDS was being mixed in the NEXRAD low noise amplifier, and one of the mixing products happened to be very close to our operating frequency. The receiver processed this energy as a valid radar return, and presented the result as a strobe. Since the radar uses a pencil beam, the problem only occurred when the system was looking at the MMDS.

The solution to the problem, already tested in Houston, is to install a preselect bandpass filter in the pedestal in front of the low noise amplifier. This filter allows the radar return energy to pass on to the amplifier, but attenuates or blocks the energy from the MMDS and other emitters not on our frequency. This prevents the presentation of multiple, high energy signals to the amplifier, and eliminates the mixing products and resultant strobe. It is important to note that this modification will not degrade the radar's performance.

This solution, implemented as ECP F0032, has been approved by the Configuration Control Board (CCB) and the Program Management Committee (PMC). A contract for modification kits will be awarded this year, with projected kit delivery to all field sites in FY 97. All field sites are being modified because many of them are currently experiencing this same problem, and many more will experience this problem as more of these MMDS systems come on-line.

Russ Cook

OSF Releases WATADS Software

On February 14, 1996 the OSF released the WSR-88D Algorithm Testing And Display System (WATADS) software to all NEXRAD agencies. WATADS displays WSR-88D base data and algorithm output on Hewlett-Packard UNIX workstations, such as NWS Science Applications Computers and on Sun UNIX workstations. The software allows users to easily change algorithm adaptable parameters off-line, emulating the effects the changes would have on the WSR-88D system--making it a powerful tool for optimizing algorithm

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Additional Kohler Generator Spare Parts

Generator spare parts have not been readily available for site requisition from the National Logistics Support Center (NLSC) in Kansas City. Site Electronic Technicians need these parts to repair generator failures.

Technical Manual(TM) Illustrated Parts Breakdown (IPB) data changes and NLSC spares stocking for the Onan and Kohler Generator parts are underway. The Onan Generator and its associated parts used in Limited Phase Production WSR-88D systems are being reidentified to Unit Designation 10-1 in the IPB and as R400-10xxx-1 at the NLSC with Defense Logistics Support Center (DLSC) assigned National Stock Numbers (NSN). The Kohler Generator and its associated parts used in Full Scale Production WSR-88D systems will remain as Unit Designation 10 in the IPB and as R400-10xxx at the NLSC with DLSC assigned NSNs. Following are the Kohler parts being added and initially spared at NLSC. These parts should be available for requisition from the NLSC in the next few months:

- microcontroller assembly (p/n B-294548)
- 10 relay PCB assembly (p/n D-294303)
- space heater (p/n 2E441)
- interior temperature sensor (p/n 753-PB-X0)
- AC voltmeter (p/n 282816)
- DC voltmeter (p/n 253329)
- water temperature gauge (p/n 282898)
- oil pressure gauge (p/n 282897)
- neon lamp (p/n 291740)
- voltage regulator PCB (p/n C-255670)
- LED circuit PCB (p/n A-257099)
- field exciter assembly (p/n 257081)
- starter solenoid (p/n 291891)
- relay (p/n 259391)
- pressure switch (p/n 271662)
- oil pressure sender (p/n 264390)
- water temperature sender (p/n 268298)
- temperature switch (p/n 290090)

Jill Stichler

You Think You Need an UPS, But You Get a TPS?

Many WSR-88D users and maintainers believe that an Uninterruptable Power Source (UPS) is needed to protect RDA electronics. Instead of an UPS we intend to provide RDAs with a TPS, or Transition Power Supply. What is a TPS? It can be viewed as another name for an UPS, but with a slightly different focus. An UPS normally provides power during a few, long term power outages. A TPS provides power for numerous short-term power "transitions" like power transfers or power sags. A WSR-88D TPS is really needed to correct two RDA problems. One problem is the power loss during transitions between commercial power and the standby power generator. The second problem is poor power quality at remote RDA sites.

Because the RDA computer must shut down during power transfers, the resultant VCP restarts cause loss of valuable data. The downtime is longer than the actual power transition because the Micro5 computer automatically runs diagnostic routines during power-up. Many RDAs are located in remote, rural areas with poor commercial power. Commercial power at these sites is characterized by sags, spikes and other anomalies which shorten the life of the delicate RDA electronics. The power sags may not be sufficiently severe to cause a power transfer, but can damage electronics. A TPS will prevent RDA power loss during power transitions and will isolate the RDA electronics from commercial power anomalies

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TPMS CONT'D

like sags and spikes.

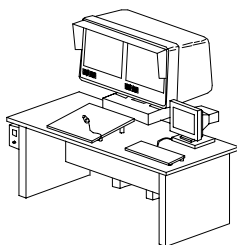
Selection of the correct TPS is critical since most UPS devices cannot satisfy RDA unique power requirements. The RDA power demand is characterized by severe, short-term peaks. For example, the antenna motors draw up to 170 amps from one to ten seconds during antenna elevate and retrace.

Since the new TPS must be housed in a shelter, there are other requirements that can be satisfied by a single project. Many remote RDA sites require maintenance benches, storage space and sanitary facilities for staff. The OSF and OSO3 are working together on a project to provide a Transition Power Maintenance Shelter (TPMS) for RDAs. The shelter will house a TPS, a maintenance workbench, a storage cabinet and an electric toilet. At those sites with existing building space, a TPS only will be installed.

In coordination with NWS regions, the FAA, and the Air Force, mark-ups of each site drawing are being developed. The mark-ups will show the new shelter location and other related site work, such as moving fences and gates.

As with most large projects, the TPMS will take time before deliveries start.

Rex Reed



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WATADS CONT'D

adaptable parameters. The software uses recorded Level II data on 8mm tape only. The following algorithms are available using WATADS:

WSR-88D Baseline Algorithms (Build 8.0)

- Mesocyclone
- Tornado Vortex Signature
- Storm Series
- Velocity Dealiasing
- Precipitation Processing
- Hail Detection
- VAD Wind Profile
- Storm Relative Velocity

Enhanced NSSL Algorithms (under development)

- Mesocyclone Detection
- Tornado Detection
- Storm Cell Identification and Tracking*
- Hail Detection*

* These algorithms will be available in Build 9.0.

The National Severe Storms Laboratory (NSSL) developed WATADS for the OSF. The software is available to NEXRAD agencies (NWS, DOD, FAA) and groups in formal collaborative agreements with a NEXRAD agency (e.g., COMET partners). NSSL will provide support through a WATADS Help Desk by calling (405) 366-0533. You can download the software through the Internet or send your request for an 8mm tape copy to the WATADS focal point listed below. The software comes with documentation describing how to use WATADS and information on the available algorithms.

The algorithm studies generated by using this software tool have the potential to regionalize the algorithms, making the WSR-88D even more effective. We expect WATADS to be extremely useful in conducting these studies. We invite researchers to collaborate with OSF personnel in conducting algorithm studies using WATADS and to forward their results to the OSF and NSSL.

WATADS Focal Point:

E-mail: watads@nssl.sun.nssl.noaa.gov

Web Information: <http://www.nssl.noaa.gov/~watads>

Phone: (405) 366-0533

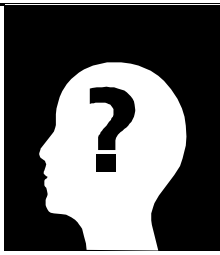
OSF WATADS Coordinator (for Algorithm studies):

Capt. Jerry Davis

E-Mail: jdavis@osf.noaa.gov

Phone: (405)366-6530 ext. 2226

Capt. Jerry Davis



OPERATIONS TIPS



Delta Sys Cal

The delta sys cal number at the UCP and PUP are rounded to 0.25 dBZ increments. Therefore, if the system is fairly stable, you could see slight variations at the RDA (shown with 0.01 dBZ resolution) while the UCP and PUP numbers may not update.

Do You Know Where Your WSR-88D Tapes Are?

On occasion, sites have situations where software or adaptation data needs to be reloaded on the RDA, RPG, or PUP. The OSF has sent each site copies of their operating system, dead system, application software, and adaptation tapes. We recommend that each site designate a safe and environmentally-controlled area where the most recent version of these tapes are stored. These tapes should be clearly marked as “master” tapes and only removed if you need to reload your system, being careful not to load previous versions. This will avoid the situations where your site could be inoperable until duplicate tapes can be shipped to your site from the OSF.

When the software is reloaded, the adaptation files on disk are overwritten and all adaptation data on the disk is lost. If the adaptation data is not backed up prior to the software reload, the adaptation data modifications must be entered again manually.

The following files should be backed up following any changes and kept on hand in the event that a software reload is required.

1)	PUP	ADAPT.DAT UFFILE.DAT BACKGRND.DAT EBMFILE.DAT	-adaptation data -user functions definitions -default background maps -edited background maps
2)	RPG	ADAPT.DAT ADAPSTONE.DAT ADAPTTWO.DAT BACKGRND.DAT HYOCCULT.DAT HYSECTRS.DAT	-default adaptation data -modified adaptation data -modified adaptation data -maps for dial-up dissemination -used by the hydrology algorithms -used by the hydrology algorithms
3)	RDA	ADAPT.DAT ADAPTCUR.DAT RDACLUT.DAT RDABYPAS.DAT LONGTERM.DAT	-baseline adaptation data -current adaptation data -clutter suppression region data -clutter bypass map data -RDA calibration data

Level II and Power Source Transfers

Did you know that when you command a power source switch at the RDA, the Level II recorder rewinds the tape to the beginning, and then works its way back to the proper point by checking each recorded volume scan? This process can take up to 45 minutes. In the meantime, severe weather may be rolling through your area and you are not recording it to tape. To prevent missing recording significant weather events, switch the power source at least an hour ahead of any anticipated severe weather. Build 9.0 will speed up the rewind process so that it should take no more than three minutes to complete.

Having Level II Recording System Problems?

If your site has just recently installed the Level II recording system or if the RDA software has been reloaded, it is possible that the following Adaptation data is "F" instead of "T".

If the RDA or RPG status of Archive II indicates "Not Installed", then check the following:

Tower Adaptation Data Line #1 should read "T"

If your site has had problems in getting the Level II juke box to automatically load blank tapes after the recorder has filled the first tape, you might try verifying the following adaptation data:

Wideband Adaptation Line #7 should read "T"

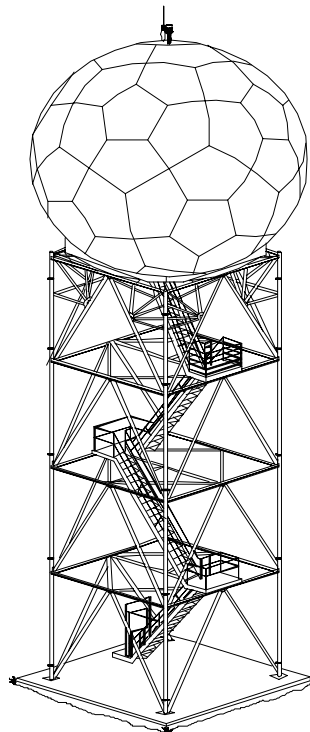
If problems persist, call the WSR-88D Hotline at 1-800-643-3363 for further assistance.

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Field". I would like to include articles written by field personnel on ways you have found to improve the capability or daily operations of the WSR-88D. Some examples would be creative solutions to local problems such as clutter suppression, optimum slant range, etc. This form of information sharing will be a valuable asset to the NEXRAD program.

Please submit any questions or suggested articles to the Editor. If you have any additional questions, feel free to call me.

Christina Smith



NEXRAD NOW is a periodic information publication from the WSR-88D Operational Support Facility.

Address correspondence to:

NEXRAD NOW Editor
WSR-88D Operational Support Facility

Phone: (405) 366-6540 ext. 3260
FAX: (405) 366-6553
Banyan E-Mail: christys@ddir@wosf
Internet: csmith@osf.noaa.gov
James D. Belville.....Director
Richard Vogt, Don Burgess, Lt. Col. G. Anderson White, Lt. Col. Timothy Crum, Edward Berkowitz, Rex Reed, Deirdre Jones.....Senior Editors
Christina M. Smith.....Editor