

# ***U.S. Air Force Dental Service***

---

*Integrity - Service - Excellence*

## **Dental Digital Radiology Solution**



**U.S. AIR FORCE**

---

Col(ret) Dennis Stuckey  
Col David Stanczyk  
AMSUS November 2007



- **A brief history of AF Digital Dental Radiology**
- **Software**
- **Hardware**
- **DDRS Implementation Strategy**
- **DDRS Configuration**
- **Phase I Lessons Learned**
- **What to do when DDRS comes to your DTF**
- **Tips and Tricks**
- **Other considerations**
- **Contact Information**



# Dental Digital Radiology 101

U.S. AIR FORCE

- **DDRS: Digital Dental Radiology Solution**
  - Includes entire AF digital dental radiology system
  - Sensors, Panoramics, Software, Computers, Servers etc.
- **Intraoral Sensors**
  - Direct Digital: Wired sensors (Schick, Kodak)
  - Indirect Digital: Photo-Stimulable Phosphor (PSP) Plates
- **Panoramics:** Direct Digital or PSP Conversion
- **Computer hardware:** Desktops, Laptops, Image storage (server computers and storage space)





U.S. AIR FORCE

---

# *Dental Digital Radiology 102*

- **DDRS must be connected to the Base / AF Network**
- **All DDRS hardware and software must have AF approval (CoN / ATC / DIACAP / SSAA)**
  - Process is very involved / time consuming / expensive
  - Must have periodic review and re-approval
- **Limited AF-approved DDRS hardware and software**
  - Must purchase approved items or risk denial of network use
  - All currently approved hardware is “top of the line”
  - Minimizes retraining on PCS; simplifies technical support



U.S. AIR FORCE

# ***History of AF Digital Dental Radiology Solution (DDRS)***

---

## **Goal**

Convert Air Force DTFs to Digital Dental Imaging as quickly as possible to avoid a global incompatibility between DTFs with digital and DTFs with conventional film-based radiology

## **Overall Objectives**

- Complete elimination of “wet-film” dental radiology
- Standardized software and hardware
- Worldwide/anywhere access to all digital images
- Leverage existing AFMS capabilities
- Integrate system with existing software applications: CDA and AHLTA



U.S. AIR FORCE

# *History of AF Digital Dental Radiology Solution (DDRS)*

---

- **Feb 1997:** Hickam AFB Dental Clinic deploys digital radiology
- **Late 1997:** HQ SGD halts deployment of digital dental radiology until standardized AF plan is created
- **1998 - 2004:** Various teams and committees are formed to determine optimum plan. Plan is created but no funding is available. Plan submitted to AF/SGR (Modernization Directorate) for initial funding
- **Sep 2004:** Lackland trainee processing center deploys digital panoramics
- **Aug 2005:** \$5.8M obtained from AF/SGR to begin 5+ year deployment.
- **Oct 2005:** \$3.6M obtained from AF/SGR. No promise for future year funding
- **May 2006:** \$15.5M in UFR funding obtained through efforts of AF/SGOD; AETC/SGD contributes additional \$4M
- **Sep 2007:** \$0.6M obtained from AF/SGR for Central Archive funding; AFRS receives \$2M for DDRS

**Total funding available (FY05-FY06): ~\$32M**



U.S. AIR FORCE

# ***Air Force Dental Technology Board (AFDenT)***

---

- **Team established in early 2004**
- **Charter was to finalize AF DDRS plan and obtain funding**
- **Membership**
  - Air Staff Dental
  - MAJCOM Dental Representatives
  - DECS Representative
  - AF/SGR Dental Representative
  - AF/SG Logistics Representatives
  - Others (AF PACS personnel, AF/SG finance rep, etc.)



U.S. AIR FORCE

# *Air Force Dental Technology Board (AFDenT)*

---

## **Multiple options explored, narrowed to two**

- Off-the-shelf COTS solution (MiPACS)
- Army Digital Radiology Solution (DIVVA)

## **Army product enticing but...**

- Decision occurred at time of maximum CDA unreliability
- Would incur costs to Army for central archive storage, maintenance and bandwidth (over \$400k/yr)
- Flexibility for AF-unique requirements?

## **AF Solution has multiple advantages**

- Utilized some existing AFMS medical PACS storage sites
- No cost for ongoing maintenance and bandwidth for Central Archive(s)
- Possible integration into existing and future AFMS initiatives
- Complete flexibility to adapt to AF-unique requirements

**Decision made to develop/deploy AF DDRS**

---

*Integrity - Service - Excellence*



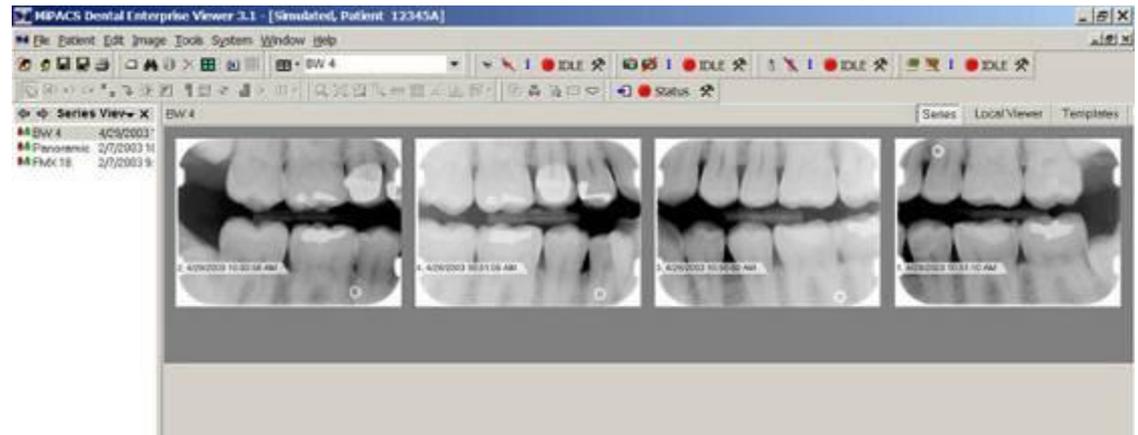
U.S. AIR FORCE

# AF Digital Dental Radiology Solution (DDRS) Software

## Medicor's MiPACS COTS Software



- Integrated image viewer and acquisition application
- Compatible with majority of digital dental imaging hardware
  - Both radiology and visible light (photos/video)
  - Other dental software such as Dolphin orthodontic application
  - DICOM compatible
- In use at multiple dental schools
- Also chosen as the VA's software solution





U.S. AIR FORCE

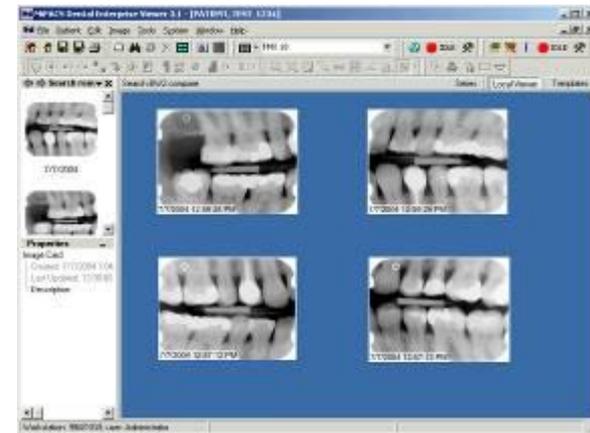
# AF Digital Dental Radiology Solution (DDRS) Software

## MiPACS Software Key Points

- Image exposed in DTR or central dental radiology department
- Image immediately available on MTF LAN via MiPACS server
- When implemented, image will migrate to Central Archive within hours
  - Images then available worldwide at any AF DTF or deployed location with Internet access and MiPACS software

## MiPACS Issues

- Largest deployment of MiPACS to date
  - requires “tweaking”
- Network approval currently only for local AFB use – not between bases
  - Process underway to acquire approval – expect 6-8 months
  - Until approved, will transport images from base to base with CDROMs





U.S. AIR FORCE

# AF Digital Dental Radiology Solution (DDRS) Hardware

## Dental Hardware Issues

- Schick sensors proven reliable / in use at multiple AF DTFs
- Kodak sensors are slightly bulkier but provide better image
- Wired digital sensors can't always be utilized due to bulk
  - AF DDRS provides storage phosphor sensors to use



## Storage Phosphor Sensors

- Nearly identical to film in size and use
- Require scanning to view
  - Process takes less than 20 seconds per sensor, longer for extra oral
- Same sizes available as with conventional film
  - Periapical, occlusal, pano and ceph, etc.



**Key:** Dual system guarantees that 100% elimination of wet-film radiology

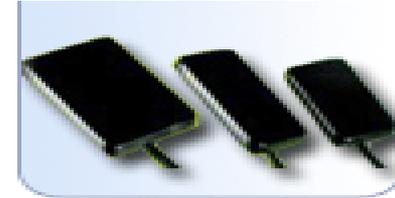


# Approved DDRS Digital Hardware

U.S. AIR FORCE

- **Digital (wired) Sensors**

- Schick vs. Kodak
- Phase II Dilemma: Which to choose?



- **Digital Panoramic Devices**

- Planmeca ProMax
- Kodak 8000 Panoramic
- Schick CDR PanX





U.S. AIR FORCE

# Approved DDRS PSP Devices

## Air Techniques PSP Sensors / Scanners

- Same sizes and techniques as film
- Still need to process the image
- Overall cost much less than digital sensors
- DDRS uses both digital and PSP sensors
  - PSP is intended for use as a secondary system





U.S. AIR FORCE

# Approved DDRS Panoramics

## ■ **Planmeca ProMax**

- Multiple configurations: Pan only; Ceph and Tomo add-ons
- Extraoral BWXR capability standard
- Cone beam 3D add-on: ~\$100k
  - No current MiPACS integration



## ■ **Kodak 8000 Panoramic**

- Has Ceph add-on capability
- No conversion to Cone beam currently
- Large footprint



- **Schick CDRPanX** – Pan only; none in current proposals





U.S. AIR FORCE

# ***AF Digital Dental Radiology Solution (DDRS) Hardware, etc.***

---

## **Other Hardware**

- Some ability for DDRS to fund additional hardware
  - X-ray tube heads, workstations, digital intraoral cameras
- Standardized IT hardware: Dell, HP etc.
- Adequate image storage space for 3-5 years at each DTF

## **Other issues**

- Vital to have an integrated team composed of other MTF sections
  - MEMO / BMET
  - Facilities
  - IT / Systems (Comm. Sq also involved)
  - Logistics

**Key:** Standardized “back-end” hardware & MTF buy-in for local support



# *Central Archive Capability*

U.S. AIR FORCE

---

- **DDRS includes dual Global Image Repositories**
  - Located at Wright Patterson AFB and Robins AFB
  - AFRS contracted, expect ADAF soon
- **DDRS will provide funding to purchase**
  - No current charge to AFDS to maintain
  - PACS administrator being provided by HQ AFMC/SG
- **Current CoN and SSAA doesn't apply to Central Archive**
  - AF/SGR is working to modify
- **Unsure of deployment date but should be by mid-CY08**
- **Global load-balancing and fail-over capability**



U.S. AIR FORCE

---

# *What's happened so far?*

## **DDRS Phase I**

- **19 DTFs are running DDRS now**
- **FY05 Funds Used (except for Sheppard)**
- **DTFs Completed:** Maxwell, Malmstrom, USAFA, Elmendorf, Sheppard, Eielson, Robins, FE Warren, Hill, Hickam; Wright-Patterson, Kadena, Hanscom, Eglin, Edwards, Kirtland, Tinker, Misawa, Yokota
- **Completion of Phase I:** July 2007



U.S. AIR FORCE

---

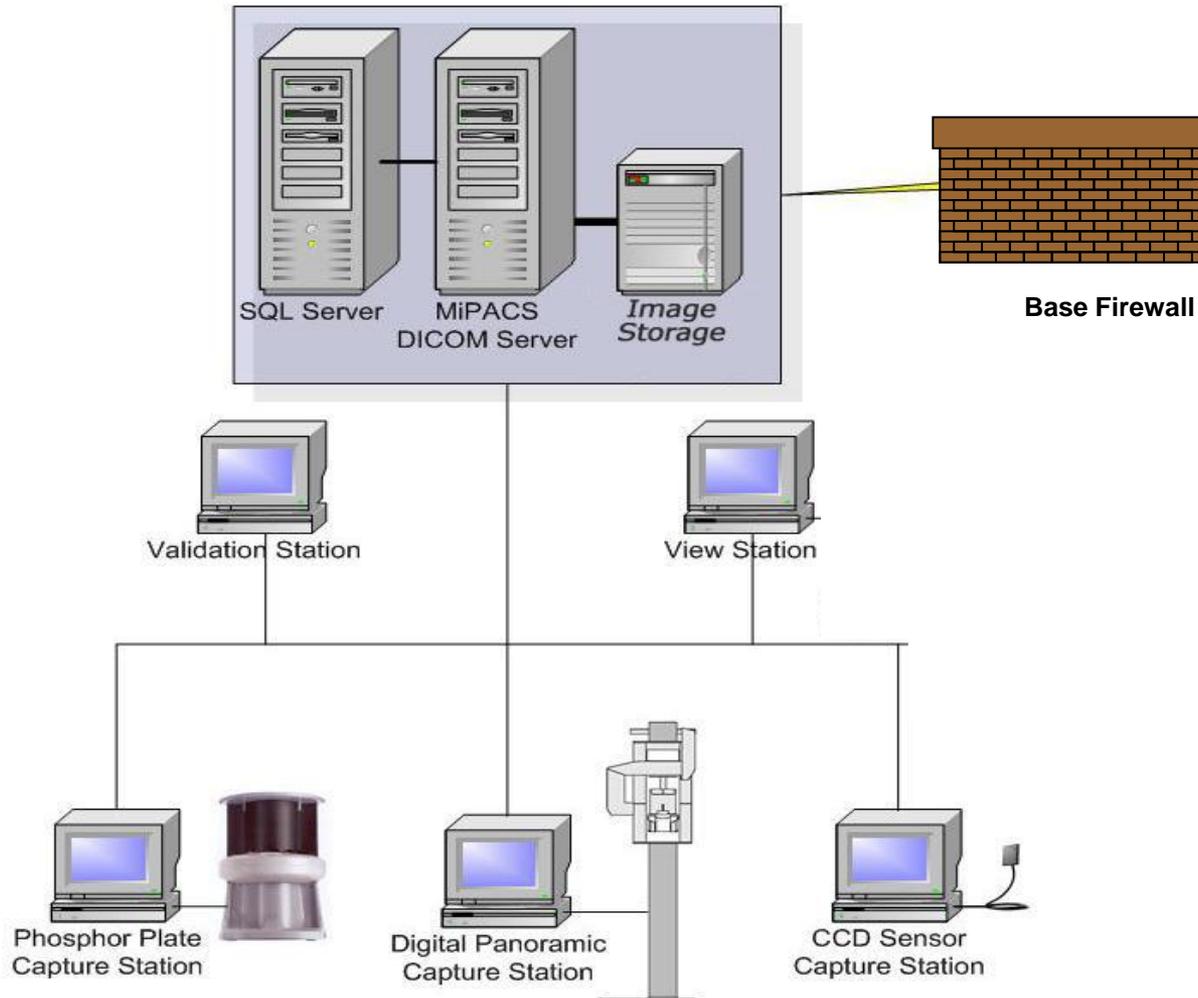
# DDRS Phase II

- **62 DTFs Included**
- **Purchase Orders being released now**
- **Contracting Process Changed vs. Phase I**
  - Will have significant Government Purchased Equipment
  - May speed process and cost less
- **All proposals were reviewed complete**
  - Nearly all had significant disconnects
- **Expect first deployment early FY08**
- **Phase II includes**
  - Enterprise software license
  - Central Helpdesk support by Force3
  - Central storage/archive server at Wright Patterson
  - Concurrent AFRC DDRS deployment



# Local DDRS Structure

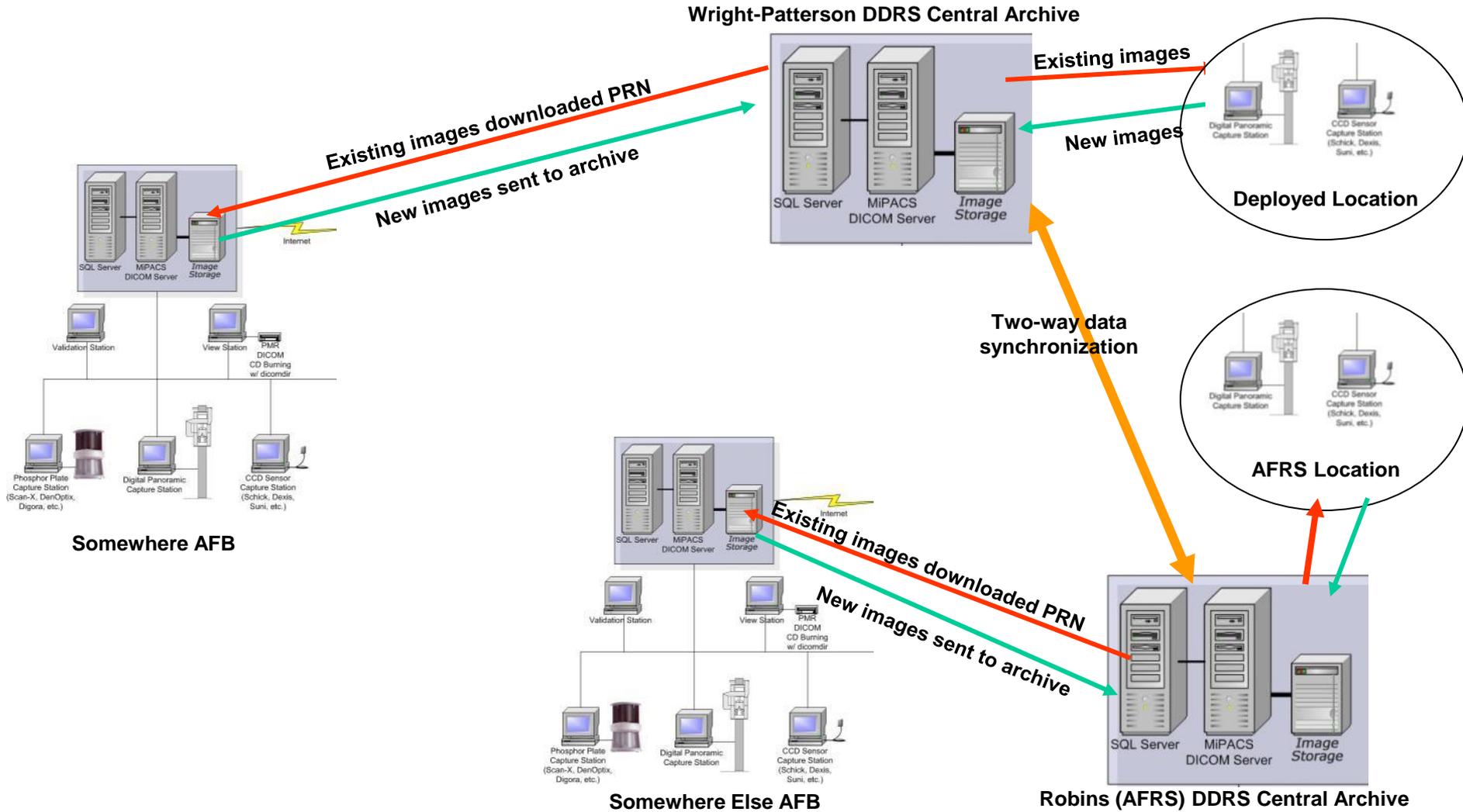
U.S. AIR FORCE





# Final DDRS Global Structure

U.S. AIR FORCE





U.S. AIR FORCE

# ***AF Digital Dental Radiology Solution (DDRS) Deployment***

---

## **■ Use of an “Integrator”**

- Civilian “integrator” functions are available
- Help to design, provide costing, order, install/configure, train and support a technology system
- Provide a “turn-key” system based upon customer input

## **■ Force3 chosen as sole integrator for DDRS**

- Experienced with dental digital imaging
- Performed system deployment at Lackland in 2004/5
- Have a history of good IT design and support
- Phase II contract awarded 17 September 2007





U.S. AIR FORCE

# *So what happens when it's my DTF's time to convert to DDRS?*

---

## **Day 120+**

- Force3 sends a detailed DDRS questionnaire
- Teleconference #1
- Contracting Task order / Purchase order released
- Facility preparation requirements?

## **Day 90+**

- On-site survey by Force3
  - Report generated within five days
- Additional coordination teleconferences
- Equipment is ordered by Force3

## **Day 30-60**

- Equipment arrives at MTF
- Need to inventory, configure computers, finish facility preparations



U.S. AIR FORCE

# *So what happens when it's my DTF's time to convert to DDRS?*

---

## **Day 1 – 5** (Monday - Friday)

- Implementation team arrives
- Computers, servers and other hardware installed

## **Day 6** (Monday)

- MiPACS software installed and configured
- All imaging equipment configured and tested (downtime?)

## **Day 7** (Tuesday)

- DDRS hands-on training: software and hardware

## **Day 8 – 9** (Wednesday +/- Thursday)

- Clinical use of DDRS with trainers present

## **Day 10** (Friday)

- Force3 outbrief
- Implementation team departs



U.S. AIR FORCE

# *So what happens when it's my DTF's time to convert to DDRS?*

---

## **Day +30**

- Optimization visit #1 (2 – 3 days)
- Force3 engineer and trainer return
- System checked and “optimized”
- Training reinforced

## **Day +60 ~ +90** (2 – 3 days)

- Optimization visit #2
- Force3 engineer returns
- System checked and “optimized”
- Minimal training opportunity



# *Lessons Learned from Phase I*

U.S. AIR FORCE

---

- **Local MTF support is crucial**
  - MTF IT / Comm Sq, Facilities, BMET, Logistics
  - It's an AFMS program, not "just dental"
- **DTF Leadership support is critical**
  - Need buy-in from the top
  - May need to force certain practice changes
- **A few DDRS "champions" on the DTF staff are needed**
- **Don't expect this to be a complete "turn-key" installation**
  - The system works, it's the people that need to work with it
- **Technology isn't 100% reliable – expect some downtime**



# ***Support and Maintenance***

**U.S. AIR FORCE**

---

- **First source of help should be DTF DDRS Champion**
  - Then utilize MTF BMETs / IT section before engaging Force3
  - If still no resolution, contact Mr. Jackson, Chief DDRS Tech Support
  
- **Software support and maintenance is centrally funded**
  - Includes software patches and upgrades
  - Includes software helpdesk via Force3
    - 0800 – 1800 ET, M-F
    - [ddrs-support@force3.com](mailto:ddrs-support@force3.com) or 1-888-711-0204 (option #2)
  
- **Hardware support is via the hardware manufacturer**
  - Warranty is generally 1 -3 years
  - Force3 will initially assist
  - May want to consider locally-funded maintenance contract
    - Server, ScanX, Sensors?



# *Tips for a Smoother DDRS Deployment*

- **Start planning early**
- **Establish a DTF DDRS implementation team**
  - Take advantage of digital radiology training opportunities
    - AADA course, professional conference courses, etc.
  - Review DDRS info on DECS Website
    - <https://decs.nhgl.med.navy.mil/>
  - Review Force3 DDRS Website
    - <https://secure.force3.com/AFDDR>
    - User: F3AFDDR Password: dental
- **Establish a MTF DDRS implementation team**
- **Dial in to DDRS telecons for the DTF before you**
- **Consider sending your DDRS champion to an “over the shoulder” at the DDRS deployment before you**



U.S. AIR FORCE

# *Tips for a Smoother DDRS Deployment*

---

- **Disestablish x-ray processors as soon as possible**
  - Consider draining chemicals on first clinical use day
- **Set local policy regarding PSP use**
  - Is intended to supplement direct digital sensors
- **Consider switch to horizontal BWXR for younger patients**
  - Use PSP for vertical BWXR upon request
- **System maintenance is crucial**
  - Monitor backups
  - Ensure images are reviewed / approved by dental officers
- **Prepare for and practice server downtime contingency plan**



U.S. AIR FORCE

# *What's in a DDRS Deployment Package?*

---

## **Required items**

- ScanX reader and PSP plates
- Wired digital sensors (Kodak for Phase II)
- Digital or PSP-converted panoramics/ceph/tomo
- MiPACS software
- Local server for image storage
  - Includes backup capability

## **Optional Items**

- Computer workstations
- Intra-oral cameras
- X-ray tube heads



U.S. AIR FORCE

# ***Business Practices Changes***

---

- **PCS Dental Record In- and Outprocessing**
  - Will need to use CDRs until DDRS globally deployed
  - Have developed a standardized preprinted CDR
    - Includes HIPAA and Privacy Act Statements
    - Much cheaper / faster than printing
  
- **How do we provide duplicates of film based radiographs?**
  
- **AFMOA-S will develop DDRS Policies**



U.S. AIR FORCE

# *To Print Or Not To Print?*

- DDRS philosophy is not to print
- Most DTFs don't get printers as part of DDRS
- AF entry-point DTFs get diagnostic quality printers
  - Lackland, Maxwell, USAFA
- But...anticipate on-going need to have printed Panos
- Can dental clinics utilize Medical Radiology printers?





## **CDA**

- Army has their own dental digital imaging system
- Army system integrated into CDA
- Currently working to have CDA / MiPACS integration

## **AHLTA**

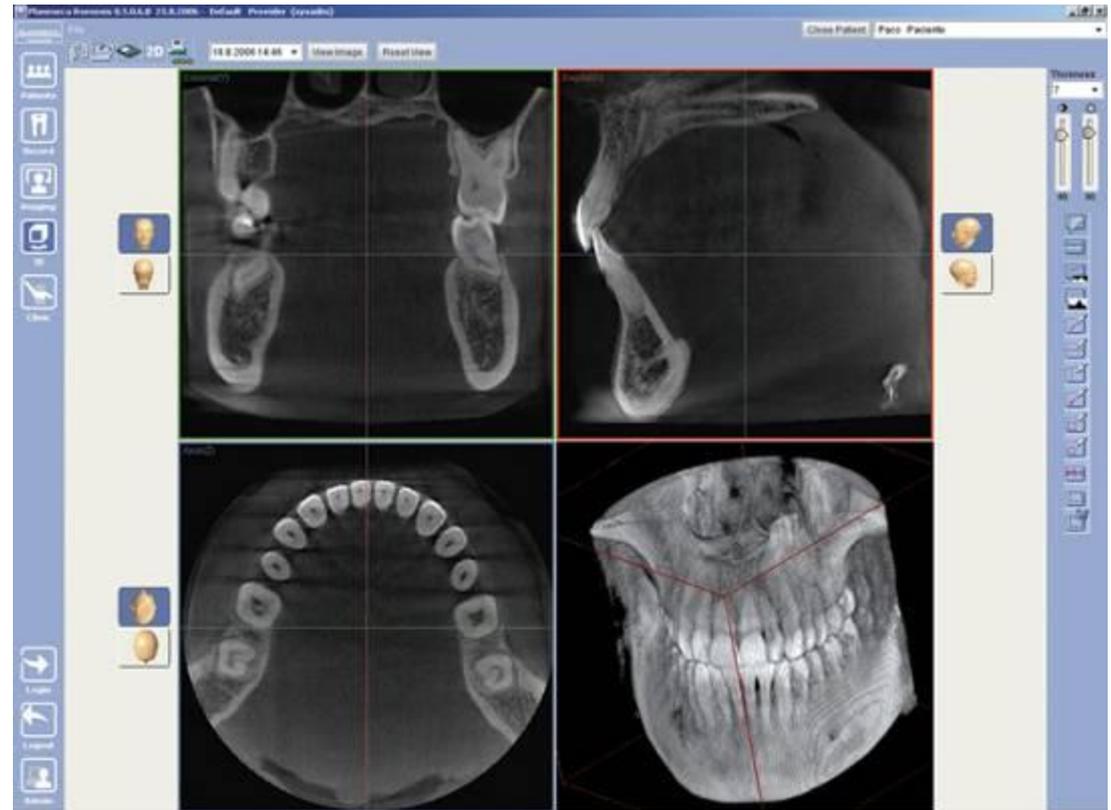
- DoD working to integrate Documents, Files and Images into AHLTA
- AFDS has active members on this team to ensure MiPACS images are available within AHLTA



U.S. AIR FORCE

# 3D Dental Imaging

- “New” on the market
- AF already has several with more planned
- Big push from manufacturers
- Images areas new to dentists
  - Who reads these images?





U.S. AIR FORCE

# AF DDRS Deployment Sequence

- **Priority list approved by AFMOA-South**
  - Will be posted on DECS DDRS website  
<https://decs.nhgl.med.navy.mil/>
  
- **First Phase II DTFs**
  - DTFs with dental training mission
  - CONUS DTFs in close geographical proximity
  - Complete deployments to PACAF and AFSPC
  - Estimate completion Summer 2008
  
- **Next in line**
  - Geographically sequenced
  - West to East coast
  - Europe
  - Estimate completion Spring 2009



U.S. AIR FORCE

# AF DDRS POCs

- **Colonel David A. Stanczyk, USAF, DC**

Commander, 10th Dental Squadron  
AF Consultant in Dental Technology Integration  
U. S. Air Force Academy  
Phone: (719) 333-5129 (DSN 333-5129)  
Fax: (719) 333-5633 (DSN 333-5633)  
[david.stanczyk@usafa.af.mil](mailto:david.stanczyk@usafa.af.mil)

- **Colonel (Dr.) Dennis D. Stuckey, USAF, DC (ret.)**

Consultant AF Digital Dental Radiology  
Cell: (210) 378-8814/ Office: (210) 496-6314  
[dennis.stuckey@gmail.com](mailto:dennis.stuckey@gmail.com)

- **Mr. Willie Jackson, MCSE, CCNA, A+**

Chief, AF Digital Dental Radiography Technical Support  
Com: 719- 333-5190 (DSN: 333)  
[willie.jackson@usafa.af.mil](mailto:willie.jackson@usafa.af.mil)



# AF DDRS POCs

U.S. AIR FORCE

---

■ **Colonel José E. Ibáñez-Pabón, Col, USAF, DC**

Chief, Clinical Systems Division  
Air Force Modernization Directorate  
Com: (703) 681-6464 (DSN 761)  
Jose.ibanez-pabon@pentagon.af.mil

■ **Colonel Lon Warren, USAF, DC**

Detachment 1 USAFSAM  
USAF Dental Evaluation and Consultation Service 310C B Street,  
Building 1H Great Lakes, IL 60088-5259  
DSN 792-7677 Commercial (847) 688-7677 FAX (847) 688-7667  
Lon.Warren@med.navy.mil

■ **Major Steven Casimir , Maj, USAF, MSC**

Chief, Resource Management Healthcare Technologies  
Air Force Clinical Engineering  
AF/SGRM, Ft Detrick, MD  
Com: 301-619-7445 (DSN 343)  
stephen.casimir@detrick.af.mil



- **A brief history of AF Digital Dental Radiology**
- **Software**
- **Hardware**
- **DDRS Implementation Strategy**
- **DDRS Configuration**
- **Phase I Lessons Learned**
- **What to do when DDRS comes to your DTF**
- **Tips and Tricks**
- **Other considerations**
- **Contact Information**

# ***U.S. Air Force Dental Service***

---

*Integrity - Service - Excellence*

## **AF Digital Dental Radiology Solution**



**Discussion  
and  
Questions**

**U.S. AIR FORCE**

---