

**BY ORDER OF THE COMMANDER
434TH AIR REFUELING WING**

**434TH AIR REFUELING WING
INSTRUCTION 21-107**



3 FEBRUARY 2023

Maintenance

***AIR TRAFFIC CONTROL EQUIPMENT
MAINTENANCE, RESTORATION, AND
COORDINATION***

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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(Col. Douglas A. Perry)

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This instruction implements Air Force Policy Directive (AFPD) 21-1 *Air and Space Maintenance*, dated 1 August 2018, Air Force Manual (AFMAN) 13-204 Volume 3, *Air Traffic Control*, dated 22 July 2020 and AFMAN 13-204 Volume 4, *Radar, Airfield, and Weather Systems AFRC Supplement*, dated 19 April 2021. It establishes the responsibilities and procedures for reporting interruptions, malfunctions, restoration priority and response times for applicable work centers within the 434th Operational Support Squadron (OSS), and necessary coordination between offices involved in those actions. This instruction applies to the Radar, Airfield, and Weather Systems (RAWS) Maintenance and Air Traffic Control (ATC) agencies on Grissom Air Reserve Base; and attachments **4** and **5** will also apply to Airfield Management and Weather Station. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See Department of the Air Force Instruction (DAFI) 90-160, *Publications and Forms Management*, dated 14 April 2022, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestor’s commander for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this publication are maintained In Accordance With (IAW) AFI 33-322, *Records Management and Information Governance Program*, dated 28 July 2021, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). Refer recommended changes and questions about this publication to the OPR using the Air Force (AF) Form 847, *Recommendation for Change of Publication*; route AF Form 847s from field through MAJCOM publication/forms managers. This publication may not be

supplemented at any level. Compliance with the attachments in this publication is mandatory. The use of the name or rank of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This revision Changed OPR, OG/CC, and ARW/CC to reflect current position occupants. Also, changed references to AFI 13-203 and 13-204 to AFMAN 13-204 Volume 3 Air Traffic Control and AFMAN 13-204 Volume 4 AFRC Supplement respectively. Removed references to ATCALs and changed to RAWS (Radar, Airfield, and Weather Systems) per AFMAN 13-204 Volume 4 AFRC Supplement. Removed references to Command Post support as Comm Squadron has assumed support of this equipment. Removed references to RMC (Regional Maintenance Center) in attachments **1** and **4** as we re-assumed full support in 2020. Added procedure for how to restart DASR antenna after wind event in **attachment 3**. Lastly, corrected call-in procedure in **Attachment 6** A6.1 and A6.2 to reflect current RAWS supervisor.

1. Scope: Establishes the responsibilities, coordination, and procedures for reporting interruptions, malfunctions, NO-NOTICE Preventative Maintenance, and response times for outages in work centers under the 434th OSS Radar, Airfield, and Weather Systems (RAWS) maintenance responsibility. It also establishes the restoration priorities. Whenever an operational mission requirement dictates an amendment of the Preventative Maintenance Inspection (PMI) schedule for RAWS in (See **Attachment 2**), the Chief of Maintenance (COM) will make the request for change to the Airfield Operations Manager (AOM). **(T-3)**.

2. Scheduled Maintenance:

2.1. Prior to releasing equipment for scheduled PMIs (**Attachment 2**), ensure the following actions have been completed:

2.1.1. ATC Watch Supervisor/Controller-in-Charge (WS/CIC) will access the current forecasted weather conditions. Forecasted weather will be a least 3000ft ceiling and 5 miles visibility thru the period the requested RAWS equipment is to be withdrawn from service. **(T-3)**.

2.1.2. WS/CIC will assess the current and known forecasted traffic conditions within Grissom's delegated airspace thru the forecasted PMI period. **(T-3)**.

2.1.3. After release WS/CIC will advise effected agencies that the RAWS equipment has been removed from service. **(T-3)**.

3. Unscheduled Maintenance:

3.1. Significant downtime request of RAWS equipment that will impair the flying mission will be coordinated as far in advance as possible with the Airfield Operations Manager or in his absence the Air Traffic Manager (ATM) during normal duty hours, Monday-Friday, 0730L to 1530L. This will allow the AOM/ATM to sufficiently coordinate the request and obtain Operations Group (OG/CC) approval. The following should be provided if known: RAWS system affected, estimated start work day, estimated time that the RAWS equipment will be removed from service, and if Flight Check will be required. **(T-3)**.

3.2. Non-significant downtime request of RAWs equipment that will not impair flying mission—the requested equipment has a redundancy and/or the RAWs equipment can be brought back to service in a moment notice—will be coordinated with and released at the discretion of the ATC WS/CIC. **(T-3)**.

3.3. Maintenance request of significant RAWs downtime outside normal duty hours (**Paragraph 5**) will be coordinated thru the ATC WS/CIC. **(T-3)**. The ATC WS/CIC will give notice of the specific equipment requested and downtime to the appropriate agencies; for example, the Command Post will relay to 434th OG/CC or designated representative. **(T-3)**. The ATC WS/CIC will defer maintenance downtime request until approved by the OG/CC or designated authority. **(T-3)**.

3.4. Emergency conditions that warrant the immediate withdraw of Grissom's RAWs will be immediately reported to the ATC WS/CIC through the COM with the final determination and coordination to shut down the RAWs equipment by ATC. **(T-3)**.

3.5. When manpower or other limitation to resources does not permit simultaneous repair of multiple RAWs outages, the restoral priorities listed (**Attachment 4**) will be adhered to unless otherwise specified coordinated between COM (or a designated representative) and the customer. **(T-3)**.

3.6. The RAPCON is designated as the primary NOTAM monitor facility and serves as the focal point for all information concerning RAWs performance. The ATC WS/CIC will advise Airfield Management for NOTAM dissemination and/or airfield advisory, and Federal Aviation Administration (FAA) affected agencies if approved. **(T-3)**.

3.7. To the maximum extent possible, planned interruptions of RAWs will be scheduled during periods which ensure the least impact to operational flying activities. **(T-3)**.

4. Responsibilities and Coordination:

4.1. ATC will:

4.1.1. The WS/CIC will ensure that the equipment outage and completion of the requested equipment downtime is appropriately logged in the RAPCON and/or Control Tower Facility Event log. **(T-3)**.

4.1.2. The WS/CIC will notify the ATM when equipment identified in **paragraph 4.1.1** returns to operational service. **(T-3)**.

4.1.3. When request for unscheduled RAWs equipment downtime is denied such as for less than adequate weather, the WS/CIC will ensure that the RAWs technician is afforded an alternate time table and the time is coordinated prior as noted above. **(T-3)**.

4.1.4. Notify ATM/RAWs Maintenance of all interruptions/malfunctions of assigned equipment/systems that affect Approach Control Operations (ACO).

4.1.5. The WS/CIC will log out the affected equipment with RAWs at extension 688-4444. **(T-3)**. After RAWs maintenance normal duty hours, see **paragraph 5**, follow equipment restoration priority (**Attachment 4**) and call-back procedures (**Attachment 6**). Immediately report the shutdown or failure of RAWs to the NOTAM dispatch center, Airfield Management, to include RAPCON/TOWER published frequencies, Air Traffic

Information System (ATIS), etc. Notify the ATM and Airfield Operations when equipment identified in [paragraph 4.1.1](#) returns to operational service if a NOTAM is in effect.

4.1.6. Coordinate the release of RAWS equipment that will affect approach control operations with the opposite facility prior to releasing the equipment to maintenance.

4.1.7. Notify the duty weather observer of any suspected problems with the FMQ-19 wind information for verification.

4.1.8. Verify equipment outage status with RAWS maintenance (Phone Numbers [Paragraph 4.1.5](#)) on weekdays, except holidays, between 0730-0830 local.

4.1.9. Report immediately the shutdown or failure of RAPCON primary frequencies and/or DASR to the tower and Chicago Air Route Air Traffic Control Center (ARTCC).

4.1.10. Notify all affected facilities when wind velocity is forecasted/sustained at 55 knots or greater. WS/CIC will implement procedures for free-wheeling the DASR antenna ([Attachment 3](#)).

4.2. RAWS will:

4.2.1. Ensure when the RAWS facility is removed from service, the identification feature is turned off. **(T-3)**.

4.2.2. Coordinate approvals with the WS/CIC, who will in-turn notify other affected facilities if necessary when: **(T-3)**.

4.2.2.1. Maintenance requires shutdown of an operation position.

4.2.2.2. Equipment modifications or changes in technical data, which affect operator use of the equipment, are accomplished.

4.2.2.3. FAA flight check will render ILS out of service.

4.2.3. Will advise the RAPCON WS/CIC when a situation precludes continued operation of DASR. **(T-3)**.

4.2.4. If a delay occurs between the time when the approval is given for shutdown and of actually shutdown, the RAWS maintenance technician will again verify with the WS/CIC concurrence prior to taking the affected RAWS facility off the air. **(T-3)**.

4.2.5. Will contact the affected ATC facility prior to beginning maintenance on any online RAWS equipment. Prior coordination is also required for maintenance activities, which may interfere with online equipment, i.e., testing spare radios on an operational frequency. No work may begin until ATC is contacted and releases the equipment to maintenance. **(T-3)**.

4.2.6. Will inform the appropriate facility when maintenance action has been stopped/completed. The appropriate facility then determines the operational status of equipment and will notify RAWS as soon as equipment operation is verified. Maintenance will return RAWS component to ATC NLT the expiration of the scheduled downtime. This will ensure sufficient time for ATC checks and alignments. **(T-3)**.

4.2.7. Will advise tower prior to making adjustments to the DASR, which may affect the performance of the TDW, unless safety of flight requires immediate action. **(T-3)**.

4.2.8. RAWS COM will coordinate RAWS flight inspection activities and is the central point of contact for flight inspections and/or operational evaluation deficiencies. If flight check is going to be required following a maintenance activity, COM will notify the ATM as far in advance as possible so appropriate scheduling can be accomplished with the OG, and Flight Inspection Field Office (FIFO). (T-3).

4.2.9. RAWS maintenance will respond to outages IAW response time requirements listed in (Attachment 5). (T-3).

5. RAWS Maintenance Hours:

5.1. Normal RAWS Maintenance duty hours are defined, except of holidays, as Monday thru Friday, 0630-1500 local. Specific start and stop times vary for each technician.

6. ILS Ground Checks:

6.1. While performing ILS ground checks, RAWS maintenance will comply with 434 OSS/OSAA OI 13-206, Airfield Management Procedures and Programs. Also, see Attachment 7. (T-3).

7. RAWS Facilities Auxiliary Power:

7.1. All RAWS facilities at Grissom have auxiliary power. Facilities are identified to be equipped in having the following auxiliary power:

7.1.1. VORTAC, building #714, facility/site has backup power generator also system on UPS.

7.1.2. 05 Localizer, building #702, shelter has backup generator also system on batteries. Batteries are rated to sustain localizer for minimum of 30 minutes.

7.1.3. 05 Glide Slope, building #731, shelter has backup generator also system on batteries. Batteries are rated to sustain glide slope system for minimum of 30 minutes.

7.1.4. 23 Localizer, building #705, shelter has backup generator also system on batteries. Batteries are rated to sustain localizer for minimum of 30 minutes.

7.1.5. DASR, building #624, facility/site has UPS and backup generator. UPS will sustain system for 20 minutes.

7.1.6. GATR, building #716, facility/site has UPS and backup power generator

7.2. Base Civil Engineering Contract Maintenance, BOS Contractor, performs all maintenance and monthly testing according to contractual agreement outlined in BOS contract.

7.3. BOS Contractor will perform generator start-ups when generator fails to start on its own. All installed generators have an automatic transfer switch sensing the loss of commercial power. (T-3).

7.3.1. Generator training for RAWS Maintenance not required.

7.4. BOS Contractor performs monthly generator start-ups running generator for minimum one-half hour.

7.5. BOS Contractor notifies RAWS maintenance prior to generator test.

7.6. BOS Contractor notifies RAWs Maintenance when generator degrades from a green status.

7.6.1. RAWs will notify Airfield Operations Management and ATM of degraded generator status. **(T-3)**.

7.7. During power outage, RAWs Maintenance ensures affected facilities are operational. If not, RAWs notifies CE, Airfield Operations Management, and ATM.

7.8. BOS Contractor has mobile generator available to support loss of facility primary backup generator.

7.9. BOS Contractor monitors generator fuel tank for fuel consumption adding fuel as needed for continual auxiliary power support.

THOMAS O PEMBERTON, Col, USAF
Commander

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

434 OSS/OSAA OI 13-206, Airfield Management Procedures and Programs, 13 December 2021

AFMAN 13-204 V3, *Air Traffic Control*, 22 July 2020

AFPD 21-1, *Air and Space Maintenance*, 1 August 2018

AFMAN 13-204 V4 AFRC Supplement, *Radar, Airfield, and Weather Systems*, 19 April 2021

AFI 33-322, *Records Management and Information Governance Program*, 28 July 2021

DAFI 90-160, *Publications and Forms Management*, 14 April 2022

GARBI 13-201, *Grissom ARB Airfield Operations*, 20 April 2020

GARBI 13-213, *Grissom Airfield Driving Program Supplement*, 20 July 2021

Adopted Forms

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ACO—Approach Control Operations

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFSATCOM—Air Force Satellite Communication

AFPD—Air Force Policy Directive

AFRIMS—Air Force Records Information Management System

AOM—Airfield Operations Manager

ARW—Air Refueling Wing

ASR—Airport Surveillance Radar

ATC—Air Traffic Control

ATIS—Automatic Terminal Information System

ATM—Air Traffic Manager

BOS—Base Operations Services

CE—Civil Engineering

CMA—Controlled Movement Area

COM—Chief of Maintenance

CP—Command Post
CS—Communication Squadron
DASR—Digital Airport Surveillance Radar
ETVS—Enhanced Terminal Voice Switch
FAA—Federal Aviation Administration
FIFO— Flight Inspection Field Office
ILS—Instrument Landing System
LED—Light-Emitting Diode
MAJCOM—Major Command
NOTAM—Notice to Airmen
OPR—Office of Primary Responsibility
PIDP—Programmable Indicator Data Processor
PMI—Preventative Maintenance Inspection
PSR—Primary Surveillance Radar
RAPCON—Radar Approach Control
RAWS—Radar, Airfield, and Weather Systems
RCP—Radar Control Panel
RDS—Records Disposition Schedule
SCDI—Site Control and Data Interface
SSR—Secondary Surveillance Radar
STARS—Standard Terminal Automation Replacement System
TDW—Tower Display Workstation
WS/CIC—Watch Supervisor/Controller-in-Charge

Attachment 2

SCHEDULED PREVENTIVE MAINTENANCE INSPECTION**Figure A2.1. Scheduled Preventive Maintenance Inspection.**

SCHEDULED PREVENTIVE MAINTENANCE INSPECTION		
SYSTEMS	TIME	DAY
GPN-30 (DASR)	0600-0900	MONDAY
FSQ-208 (STARS)	0600-0900	WEDNESDAY
GRN031V1R (Glideslope)	*	
GRN030V2R (Localizer)	*	
FMQ019 R (Weather)	**	
ANFRN045R (TACAN)	0800-1000	TUESDAY
ANFRN044R (VOR)	0800-1000	TUESDAY
*Must have prior coordination with Air Traffic Manager and/or RAPCON Supervisor **Must arrange with Weather Supervisor and ensure that no weather events will be happening during maintenance window.		

Attachment 3

PROCEDURES FOR FREE-WHEELING/STOPPING AND STARTING THE DASR ANTENNA

A3.1. PROCEDURE FOR STOPPING BEFORE HIGH WIND EVENT

A3.1.1. Ensure that the Radar Control Panel (RCP) has control.

A3.1.2. Determine which channels of the Primary Surveillance Radar (PSR), Secondary Surveillance Radar (SSR), and Site Control Monitoring Interface (SCDI) are selected.

A3.1.2.1. Look at the SELECTED buttons/indicators.

A3.1.2.1.1. Green Light-Emitting Diode LED beneath A: Channel A is selected.

A3.1.2.1.2. Green LED beneath B: Channel B is selected.

A3.1.3. Place the unselected channels of the PSR, SSR, and SCDI into Maintenance mode.

A3.1.3.1. Press the PSR/SSR/SCDI A or B buttons for the unselected channels.

A3.1.3.1.1. LEDs will change to amber.

A3.1.4. Place the selected channels of the PSR, SSR, and SCDI into Maintenance mode.

A3.1.4.1. Press the PSR/SSR/SCDI A or B buttons for the selected channels.

A3.1.4.1.1. LEDs will change to amber. NOTE: If any of the channel LEDs illuminates red instead of amber or green, continue with the procedure. Even though red indicates a failed channel, the antenna can still be shut down.

A3.1.5. Press the Antenna button.

A3.1.5.1. LED will change from green to red, indicating the antenna has stopped rotating.

A3.1.5.1.1. Several buttons on the RCP will illuminate red, because stopping the antenna causes both the PSR and SSR transmitters to shut down.

A3.2. PROCEDURE FOR STARTING AFTER HIGH WIND EVENT

A3.2.1. Press the Antenna button to start rotation.

A3.2.1.1. LED will change from red to green indicating the antenna has started rotating.

A3.2.2. Place the selected channels of the PSR, SSR, and SCDI into Operational mode.

A3.2.2.1. Press the PSR/SSR/SCDI A or B buttons for the selected channels.

A3.2.2.1.1. LEDs will change to green. NOTE: If any of the channel LEDs illuminates red instead of green, continue with the procedure using the redundant system of the PSR, SSR, and SCDI.

A3.2.3. Place the unselected channels of the PSR, SSR, and SCDI into Operational mode.

A3.2.3.1. Press the PSR/SSR/SCDI A or B buttons for the unselected channels. LEDs will change to green.

Attachment 4
EQUIPMENT PRIORITY LIST

Figure A4.1. Priority 1.

<u>PRIORITY 1</u>
<i>AIRFIELD SYSTEMS:</i>
AN/GRN-30 (Active Localizer) *
AN/FRN-45
AN/FRN-44
AN/GRN-31 (Active Glide Slope) *
<i>RADAR:</i>
DASR
STARS
<i>AIRFIELD SYSTEMS (GROUND RADIO):</i>
Air Traffic Control Radios
Air Traffic Control Recorders

Figure A4.2. Priority 2.

<u>PRIORITY 2</u>
<i>AIRFIELD SYSTEMS:</i>
AN/GRN-30 (Inactive Localizer)
AN/GRN-31 (Inactive Glide Slope)
Automatic Meteorological Station (AN/FMQ-19)
<i>AIRFIELD SYSTEMS (GROUND RADIO):</i>
Flight Data System
ATIS (Automatic Terminal Information Service)
Base Operation Radio
Base Weather Radio
*An active runway ILS system will always take precedence over an inactive runway ILS system.

Attachment 5

EQUIPMENT RESTORATION RESPONSE TIMES

A5.1. Operational capability is the ability of the assigned system to satisfy mission requirements and is defined as follows:

A5.1.1. Outage: Red-Ability of the equipment is limited or degraded to a point that mission requirements cannot be met.

A5.1.2. Impairment: Amber-Ability of the equipment is limited; however, mission requirements can still be met.

A5.1.3. Fully Operational: Green-Equipment is fully mission capable.

A5.2. The customer may determine that response to any priority is not required until the next duty day if adequate back-up capability exists to satisfy mission requirements.

A5.3. RAWs technicians during duty hours are not to exceed the listed response times unless unusual circumstances warrant a delay—for example, weather, higher priority maintenance, runway closer, etc.

A5.4. Normal RAWs duty hours are defined as Monday through Friday, with core duty hours as 0900-1500 (except for holidays). Specific start and stop times vary for each functional area.

A5.5. Response Times (During Normal Duty Hours): The response times listed below may vary IAW [paragraph 4.3](#).

Table A5.1. Response Times (During Normal Duty Hours).

PRIORITY	RED OUTAGE	AMBER OUTAGE
1	NLT 1 Hour	NLT 1 Hour
2	NLT 1 Hour	NLT Next Duty Day

A5.6. Response Times (During After Duty Hours): The response times listed below may vary IAW [paragraph 4.3](#).

Table A5.2. Response Times (During After Duty Hours).

PRIORITY	RED OUTAGE	AMBER OUTAGE
1	NLT 3 Hours (plus travel)*	NLT 4 Hours (plus travel)*
2	NLT 4 Hours (plus travel)*	Next Duty Day

*Customer may determine that response is not required until next duty day if adequate back-up/work around is sufficient.

Attachment 6**RAWS MAINTENANCE AFTER-DUTY-HOURS CALL-BACK PROCEDURES**

A6.1. Call RAWS maintenance supervisor's cellular phone: Supervisor's cellular phone number will be made available. If no answer, leave a voice mail message and wait ten minutes. NOTE: The call-back procedures will be utilized for calling in RAWS equipment outages. (T-3). This procedure pertains only to systems listed in the equipment priority list, [Attachment 4](#).

A6.2. If another ten minutes goes by and still no reply, send a group text out to the RAWS team using cell numbers provided in the RAWS/ATS Emergency Contact List. (T-3).

Attachment 7**CONTROLLED MOVEMENT AREA AWARENESS- ILS GROUND CHECKS**

A7.1. RAWs maintenance ILS ground check areas that are inside of the CMA:

A7.1.1. 23 Localizer near-field degree marks- 10/90 thru 10/150

A7.1.2. 05 and 23 Localizer centerline far-field markers

A7.2. CMA procedures, definition, and diagram are located in GARBI (Grissom Air Reserve Base Instruction) 13-213 GRISSOM AIRFIELD FLIGHTLINE DRIVING PROGRAM SUPPLEMENT and GARBI 13-201 GRISSOM AIR RESERVE BASE AIRFIELD OPERATIONS