

MEMORANDUM FOR:                   Distribution

FROM:                               W/OPS1 - John McNulty

SUBJECT:                           Expansion of Console Replacement System (CRS)

1. Material Transmitted:

Engineering Handbook No. 7 (EHB-7), Communications Equipment, Section 3.4, Modification Note 41, Revision B, Console Replacement System Output Channel Expansion (Large 6 to a Maximum 9).

2. Summary:

Requests for Change AA376 authorizes CRS expansion for Weather Forecast Office (WFO) Glasgow, MT (GGW).

3. Effect on Other Instructions:

Modification Note 41, Revision B incorporates changes in the original procedure due to software updates required for the specific site listed. Modification Note 41, Revision B, supercedes previously released Modification Note 41, Revision A.

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**TOOLS AND TEST EQUIPMENT REQUIRED** : #1 and #2 Phillip screwdrivers  
 Test ASCII Database provided by W/OPS12  
 Small flat-blade jeweler's screwdriver  
 Root means square (RMS) voltmeter/dB meter  
 600-ohm dummy load with an RJ-11 plug attached  
 Anti-static workstation kit

**TIME REQUIRED** : 2 Hours

**EFFECT ON OTHER INSTRUCTIONS**: Modification Note 41 Revision B supercedes previously issued Modification Note 41, and 41, Revision A.

**AUTHORIZATION** : The authority for this modification is Request for Change AA376.

**VERIFICATION STATEMENT** : This procedure was tested and verified at National Weather Service Headquarters, Silver Spring, Maryland (SLVM2).

**GENERAL** : The attachments in this procedure contain the instruction to add output channel(s) to the CRS system.

**PROCEDURE** : Attachment **A** provides procedures for implementing this modification.  
 Attachment **B** (CRS Hardware Drawings) provides reference information.  
 Attachment **C** provides verification of the new physical configuration (used before applying power).  
 Attachment **D** provides a completed sample of a WS Form A-26, Maintenance Record.

REPORTING INSTRUCTIONS : Report the completed modification on a WS Form A-26 according to the instructions in Engineering Handbook No. 4 (EHB-4), Engineering Management Reporting System (EMRS), Part 2, and Appendix I. Include the following information on the WS Form A-26:

- a. An equipment code of **CRSSA** in block 7.
- b. A serial number of **001** in block 8.
- c. The **ASN** and **NSN** of the FEP in block 13.
- d. A Mod No. of **41B** in block 17a.
- e. **Serial number** for the FEP, ASM cards, and DECtalk cards in block 18.

A sample WS Form A-26 is provided as attachment **D**.

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Attachment **A** - Modification Procedure  
Attachment **B** - CRS Hardware Drawings  
Attachment **C** - New Configuration Physical Verification Procedure  
Attachment **D** - Sample WS Form A-26



**Attachment A**

**Modification Procedure**



## Attachment A Modification Procedure

### Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a Large 6-channel configuration to a Maximum 9-channel configuration. The modification procedure contains seven parts:

1. CRS Power-Down Procedures
2. Equipment Upgrade Procedures
3. CRS Power-Up Procedures
4. CRS Login, Application Software Error Verification, and Test Database ASCII File Loading Procedures
5. Post Hardware Expansion Channel Operability Verification Procedures
6. Adding New Transmitter Channels and Editing Site Database ASCII File Procedures
7. ASM Alignment Procedures

- NOTE:**
1. Read the entire procedure, and verify receipt of all required parts before proceeding with the actual modification.
  2. Coordinate with the operations staff before performing this procedure.

### CAUTION

**CRS must be down to perform this modification. The test messages contained in this modification should not be broadcast on any transmitter.**

**In addition, the database ASCII file will be recompiled, and all dictionary files will be lost! Switch to the backup NWR system, and ensure the dictionary files are backed up (see the *CRS System Administration Manual*) before performing this modification.**

- NOTE:**
3. Preliminary setup for the new FEP can be found in part 2, sections 2.1, 2.2, and 2.3. This can be performed without taking an operational system out of service.

## PART 1–CRS POWER-DOWN PROCEDURES

### 1.1 CRS Application Shutdown Procedure

1. Click on the **System** menu, and click on **Stop System**.
2. Wait until all icons on the *CRS System Status* menu turn **red**.

### 1.2 UNIX Shutdown Procedure

**NOTE:** 1. The shutdown of the CRS application is just one task before the graceful power-down. After stopping the CRS application software, implement a “controlled/orderly UNIX shutdown with NO automatic reboot” on the main processor (MP), and implement a “controlled/orderly UNIX shutdown” on all FEPs. Upon completion of the controlled/orderly UNIX shutdown, power-down the processors in the following order: MPs first followed by the FEPs.

1. Click on the **Maintenance** menu in the main CRS menu to access the *Maintenance* pull-down menu.
2. Click on **UNIX Shell** in the *Maintenance* pull-down menu. A *UNIX xterm* window pops up for the entry of UNIX commands.
3. Type the following UNIX command in the *xterm* window:  
**su root**
4. Press the **Enter** key. The shell responds with a prompt to enter root passwords.
5. Type the password for the root.
6. Press the **Enter** key. The shell prompt changes to a pound sign indicating that all subsequent UNIX command entries have root authority.
7. Type the following UNIX command in the *xterm* window:  
**rsh 5MP /sbin/shutdown -i0 -g0 -y**
8. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 5MP. UNIX on processor 5MP shuts down.
9. Type the following UNIX command in the *xterm* window:  
**rsh 1FEP /sbin/shutdown -i0 -g0 -y**
10. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 1FEP. UNIX on processor 1FEP shuts down.
11. Type the following UNIX command in the *xterm* window:  
**rsh 2FEP /sbin/shutdown -i0 -g0 -y**

12. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 2FEP. UNIX on processor 2FEP shuts down.
13. Type the following UNIX command in the *xterm* window:  
**rsh 4BKUP /sbin/shutdown -i0 -g0 -y**
14. Press the **Enter** key. The shell command prompt returns after displaying a confirmation of shutdown initiation on 4BKUP. The UNIX on processor 4BKUP shuts down.
15. Type and enter the following UNIX commands in the *xterm* window:
  - a. Type **cd /**.
  - b. Press the **Enter** key.
  - c. Type **/sbin/shutdown -i0 -g0 -y**.
  - d. Press the **Enter** key. Each CRS processor for the system may be safely powered-down when UNIX indicates shutdown is complete with the following message:  
**Press any key to reboot...**

**NOTE:** 2. Do not reboot any machine; go to section 1.3.

### 1.3 CRS Hardware Power-Down Procedure

Power-down all CRS equipment at the operator's station and in the equipment room by turning off the following:

<u>Operators Station</u>	<u>Equipment Room</u>
0MP and Monitor	4BKUP
5MP and Monitor	1FEP
NWRSAME (all)	2FEP
	LAN Bridge
	LAN Server
	Monitor
	Printer
	Audio switching assembly (ASA) power supplies
	Modem

## PART 2—EQUIPMENT UPGRADE PROCEDURES

- NOTE:**
1. The new FEP setup procedures in part 2, sections 2.1, 2.2, and 2.3 can be performed prior to shutting down the system. This will save downtime of a CRS system currently operational.
  2. Attachment **D** contains the Modification Data Pad. Technicians are asked to complete the form while performing the modification. Use the completed form to assist in reporting serial number data in the EMRS.

### 2.1 Preliminary 3FEP Setup Procedures

- NOTE:** Removing and replacing circuit cards must be accomplished in an antistatic work area, using approved antistatic procedures.

1. Remove the right side cover of the new 3FEP unit using the following procedure:
  - a. Remove the right three screws located on the back of the system unit (see attachment **B**, figure A-1). These screws secure the right side access panel of the system to the chassis.
  - b. Pull the panel backward while lifting it upward.
2. Remove the screws holding expansion slot covers 1, 2, 3, and 4, and retain the screws (see attachment **B**, figure A-13).
3. Remove the expansion slot covers.
4. Install the new LAN card (ASN: B440-1A8A10) in expansion slot number 1, and reinstall a retaining screw.

### 2.2 Installation of the HDD and Cage Combination Procedure

1. Align the three slides on the HDD cage with the three slots on the upper left corner of the chassis.
2. Insert the slides into the slots holding the HDD cage at an angle away from the chassis.
3. Slide the HDD cage towards the bottom of the chassis, and swing the HDD cage into the chassis body.
4. Align the two screw slots at the top with the threaded holes in the chassis, and secure the HDD cage with two screws.
5. Secure the HDD cage with a single screw at the tab located at the lower right corner of the HDD cage (see attachment **B**, figure A-13).

6. Hook up the HDD cable to the HDD. Cable connectors are keyed and only fit one way. Connect the other end of the HDD cable to the Small Computer Systems Interface (SCSI) connector on 3FEP motherboard.
7. Connect a power connector from the power supply to the HDD.

### 2.3 DECtalk Cards Input/Output (I/O) Address Configuration Procedure

1. Configure each new DECtalk card for the appropriate I/O address through switch 2 (SW2), as defined in Table 1 and pictured in attachment **B**, figure A-11.

**NOTE:** 1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP, located in slots 2 through 6.

**Table 1.** DECtalk Card Switch 2 (SW2) Settings

Module Number	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	I/O Address	PC Slot
4	off	off	off	off	on	on	380	6
3	off	off	on	on	off	on	360	5
2	on	off	on	off	off	on	328	4
1	off	on	off	on	off	off	250	3
0	off	off	off	on	off	off	240	2

**NOTE:** 2. Regardless of FEP, DECtalk card configuration remains constant, meaning modules 0, 1, 2, 3, and 4 are configured the same for each FEP.

2. Use table 1 to set up a DECtalk card with the I/O address: 240. Install the DECtalk card into slot 2 of 3FEP, and reinstall a retaining screw.
3. Using table 1, set up a DECtalk card with the I/O address: 250. Install the DECtalk card into slot 3 of 3FEP, and reinstall a retaining screw.
4. Using table 1, set up a DECtalk card with the I/O address: 328. Install the DECtalk card into slot 4 of 3FEP, and reinstall a retaining screw.
5. Replace the 3FEP cover, using the reverse procedure in section 2.1, step 1.

**NOTE:** 3. Perform Part 1, CRS Power-Down Procedure before proceeding.

## 2.4 3FEP Computer Installation Procedure

1. Install 3FEP in the CRS main unit cabinet.
2. Install the new 3FEP switch VGA video cable (ASN: B440-2W3) between 3FEP video out and switch position C.
3. Install the new FEP switch PS/2 keyboard cable (ASN: B440-2W4) between 3FEP keyboard connection and switch position C.
4. Install the new LAN cable segment (ASN: B440-2W1) and BNC tee (ASN: B440-4J1) connector to connect the 3FEP PC into the existing CRS LAN (3FEP connects between 2FEP and 5MP). (See attachment **B**, figure A-15).

## 2.5 ASM Card Installation Procedure

1. Remove ASA slots 7, 8, and 9 covers by removing the two screws.

**NOTE:** There are five jumpers to be set on each ASM card.

2. Take one of the new ASM cards (ASN: B440-2A6A3) and set the jumpers for slot 7 of the ASA in accordance with table 2.

**Table 2.** ASM Card Jumper Settings

	ASA Slot #	Silence Alarm Jumper "JP1"	ACP Channel Sel. Jumper "JP2" & "JP3"	BKUP Live/ Playback Cntrl Jumper "JP4"	FEP Select Jumper "JP5"
ASM 1 (channel 1)	1	EN (Enable)	1	BUL2	FEP1
ASM 2 (channel 2)	2	EN (Enable)	2	BUL2	FEP1
ASM 3 (channel 3)	3	EN (Enable)	3	BUL2	FEP1
ASM 4 (channel 4)	4	EN (Enable)	4	BUL2	FEP2
ASM 5 (channel 5)	5	EN (Enable)	5	BUL2	FEP2
ASM 6 (channel 6)	6	EN (Enable)	6	BUL2	FEP2
ASM 7 (channel 7)	7	EN (Enable)	7	BUL2	FEP3
ASM 8 (channel 8)	8	EN (Enable)	8	BUL2	FEP3
ASM 9 (channel 9)	9	EN (Enable)	9	BUL2	FEP3
ASM PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

3. Install the new ASM card into slot 7 of the ASA chassis, and tighten the two screws.
4. Repeat steps 2 and 3 for each of the remaining ASM cards.

### 2.6 New DECTalk-ASM Audio Cable Installation Procedure

Using write-on cable labels, mark and connect the DECTalk-ASM audio cables in accordance with table 3.

**Table 3.** DECtalk to ASM Audio Cables

<b>From</b>	<b>To</b>	<b>Cable Label</b>
1FEP DECtalk 1 "J2" Port	ASM 1 "IN Port"	1-1
1FEP DECtalk 2 "J2" Port	ASM 2 "IN Port"	1-2
1FEP DECtalk 3 "J2" Port	ASM 3 "IN Port"	1-3
2FEP DECtalk 1 "J2" Port	ASM 4 "IN Port"	2-1
2FEP DECtalk 2 "J2" Port	ASM 5 "IN Port"	2-2
2FEP DECtalk 3 "J2" Port	ASM 6 "IN Port"	2-3
3FEP DECtalk 1 "J2" Port	ASM 7 "IN Port"	3-1
3FEP DECtalk 2 "J2" Port	ASM 8 "IN Port"	3-2
3FEP DECtalk 3 "J2" Port	ASM 9 "IN Port"	3-3
1FEP DECtalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECtalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

### 2.7 New Transmitter Audio Output Cables Installation Procedure

1. Connect the "OUT 1" port of the new ASM cards at slots 7, 8, and 9 of the ASA chassis by installing the new audio output cable to the demarc panel position for the new transmitters.
2. Install the new NWRSAME (if available) into the top panel of the 5MP workstation (if available).
3. Install the NWRSAME-ACP interface cable from the NWRSAME rear connector to the "NWRSAME INPUT socket 1" port of ACP2 rear panel (this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME) (if available).

**NOTE:** This completes the hardware modification.

## PART 3—CRS POWER-UP PROCEDURES

### \*\*\*WARNING\*\*\*

Prior to powering-up the FEPs, perform the *New Configuration Physical Verification* procedure contained in attachment C to verify proper system configuration. Failure to perform the procedure, can result in transmitter broadcasts assigned to incorrect output channels.

### 3.1 Power-Up FEP Procedure

1. Press the **ON/OFF** switch (located on the front center right of the enclosure) to power-up the FEPs. A green power LED on each FEP lights when the power is on. The FEPs can be powered-up in any sequence. The FEPs go through a memory check, display the system configuration [as recognized by the basic I/O system (BIOS)], then boot the embedded operating system. At the completion of the boot process, the console screen displays the prompt:

#### **Console Login:**

The embedded operating system automatically initializes to a pre-set level and then waits for final start-up commands from the master MP.

**NOTE:** The FEPs share a common console through the *Shared Monitor Switch*. The console displays messages while completing the boot process of the FEP currently switched in.

2. Use the *Shared Monitor Switch* to select the next FEP. The console monitor displays:  
**Press <F1> to resume, <F2> to Setup.**
3. Press **F1** to complete the boot process. The prompt displays:  
**Console Login:**
4. Repeat for each remaining FEP.

### 3.2 Power-Up Main Processors Procedure

- NOTE:** 1. Power-up 0MP as the master main processor and 5MP as the shadowing processor.

Press the **ON/OFF** switch (located on the front center right of the enclosures) to power-up the MPs. A green power LED on each MP lights when the power is on. The MPs can be powered-up in any sequence. The MPs go through a memory check, file system check, system configuration verification (as recognized by the BIOS), and then boot the embedded UNIX operating system. At the completion of the boot process, the workstation screen displays the *CRS Login* screen. The MPs are now ready for the initialization of the CRS application software.

- NOTE:** 2. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To continue the login process click on the **Acknowledge** button.
3. Whenever the MPs are powered-up, they automatically step through the boot process to the multiuser mode without operator intervention.

### 3.3 CRS Application Software Installation on the New FEP Procedure

1. If the 0MP was rebooted, at the *Login GUI* window, login as the root user. Click the **KDE Desktop Application Starter** icon (the big K Wheel icon) in the lower left part of the *KDE Desktop* panel. If the 0MP was not rebooted, proceed to step 2.
2. Click on the **SCO Control Center** pop-up menu selection.

- NOTE:** 1. You also may start the *SCO Control Center* by clicking on the **SCO Admin** icon on the KDE Desktop panel (the *Swiss Army Knife* icon).

3. Select and double-click on the **Software\_Management** menu selection.
4. Double-click the **Applications Installer** menu selection.
5. Insert the CD-ROM into the CD drive of the selected installation MP, then select **CD-ROM\_1** from the pop-up menu, following the *Install from:* prompt in the upper half of the **Application Installer** window.
6. After the CRS application package icons (**crsopsais**, **crsopsfpm** and **crsopsmpm**) are displayed immediately below the *Install from* prompt, select **crsopsais**, and click on **Install** (Note: **crsopsfpm** and **crsopsmpm** can only be installed indirectly through **crsopsais**).

7. Respond to the prompts displayed in the **Add Application: crsopsais** and **auto\_install** terminal windows.

**NOTE:** 2. The *Add Application: crsopsais* window and the *auto\_install* window are used to display the installation activity log as well as the prompts to the installation operator. The log information and the prompt sequences vary depending on the responses to the prompts.

8. When the installation process completes, the CRS displays the following:

**NOTE:** 3. Shutting down the installation MP [0MP | 5MP] is an option. It is not necessary to shut down after the software has been installed on an FEP. A shut down is RECOMMENDED after CRS software has been installed on an MP to ensure that the installation MP [0MP | 5MP] and the other MP [0MP | 5MP] are functionally synchronized as CRS master and CRS shadow.

**Continue [0MP | 5MP] shutdown? (Default: y)**

9. Press **Enter** to continue.

**NOTE:** 4. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. To display the *Login* screen and continue the login process click on the **Acknowledge** button.

10. The FEP physically connected through the Shared Monitor Switch starts itself automatically following shutdown. To complete the startup sequence for the remaining FEPs, use the **Shared Monitor Switch** on the equipment rack to select the next FEP for rebooting. The console monitor displays:

**Press <F1> to resume, <F2> to Setup.**

11. Press **F1** to complete the boot process. The prompt displays:

**Console Login:**

12. Repeat for each remaining FEP.

## PART 4—CRS LOGIN, APPLICATIONS SOFTWARE ERROR VERIFICATION, AND TEST DATABASE ASCII FILE LOADING PROCEDURES

### 4.1 CRS Login Procedure

- NOTE:**
1. For Build 6.4 and higher: Following power-up, CRS displays the *Security Screen*. The operator must acknowledge the *Security Screen* by clicking on the **Acknowledge** button to continue the login process.
  2. The *CRS Login Screen* allows you to log onto CRS. This screen contains two fields: *Login ID* and *Password*. The fields are provided to allow you to type in your assigned login ID and password.

1. Type **admin** (for system administrator) in the *Login ID* field, and press **Enter**. The cursor moves to the *Password* field.
2. Type in your assigned password, and press **Enter** to complete the CRS login process. The system displays the *CRS main* display. In addition, the system displays the following error message:  
**System is not operational. Perform 'Start CRS' to start system.**
3. Click on **OK** to clear the message.

- NOTE:**
3. The error message is only a status message indicating CRS is not running.

### 4.2 CRS Applications Software Installation Error Verification Procedure

1. Open a UNIX Shell:
  - a. Click on **Maintenance**.
  - b. Click on **UNIX Shell**.
2. Type **grep ERROR /crs/install.log** and press **Enter**.
3. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x145 or x144.
4. Type **grep WARNING /crs/install.log** and press **Enter**.
5. Ensure there are no error messages. Any error messages must be reported to the CRS Site Support Staff at 301-713-0191 x145 or x144.

- NOTE:** Ignore any IP address error messages.

#### 4.3 CRS Test Database ASCII File Loading Procedure

**NOTE:** 1. The following instructions for loading the CRS test database ASCII file assume everything is being done with OMP set as the MP.

1. Place the diskette with CRS test database ASCII files in the OMP diskette drive to copy the desired file from the diskette to CRS.
  - a. Type **mdir a:** and press the **Enter** key to display a directory listing of the files on the test database diskette. There are 13 files on the diskette with the following filename convention:  
**TYP W\_CFG.ASC**      where  $W = 1 - 4$   
**LRGX\_CFG.ASC**      where  $X = 5 - 8$   
**MAX Y\_CFG.ASC**      where  $Y = 9$   
**MAXZ\_CF.ASC**      where  $Z = 10 - 13$   
( $W$ ,  $X$ ,  $Y$ , and  $Z$  represent the number of transmitters supported by your CRS)
  - b. Locate the applicable test database ASCII file.
  - c. Type **mcopy -t a:filename /crs/data/SS/filename** (where *filename* is the name of the CRS test database ASCII file to be used).
  - d. Press the **Enter** key.
2. Click and hold the left mouse button on any white space, move the cursor to select **XCRS\_SITE Utility**, and release the button to bring up the *XCRS\_SITE Utility* window.
3. Click on the **Select ASCII Site Setup** button to bring up the list of ASCII files.
4. Select the desired database ASCII filename copied from the diskette in section 4.3, step 1.c, and double click.

**NOTE:** 2. The directory selection block has a default directory name of */crs/data/SS*, and the file filter block has a default file name of */crs/data/SS/\*.ASC*. If the desired filename does not appear, it may have copied to the wrong directory in section 4.3, step 1.c. If that is the case, change the default directory name to the directory specified in section 4.3, step 1.c. The other reason the filename does not appear is because it is being filtered out. Remember, UNIX is case sensitive and if copied with an asc extension in lower case, it does not display. Change the filter file name to */crs/data/SS/\*.asc*, and the filename displays.

5. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.
6. Click on **DO NOT CLEAR the Dictionary-related table data selecting box** to deselect this option.

7. Click on the **Start Site Configuration** button. The system displays:  
**Will now perform FULL site reconfiguration. Continue?**
8. Click on **OK**. The “wristwatch” and the “working” message display. Several messages scroll by. The last message reads:  
**Finished with site configure**  
The “wristwatch” and “working” message disappear. Ensure there are no error messages at the completion of the site configuration process.
9. Restart CRS by clicking on **Start CRS System**. The system displays:  
**The CRS system will be STARTED. Continue?**
10. Click on **OK**. The “wristwatch” and the “working” message display. Several messages scroll by. The last message refers to starting 4BKUP. The “wristwatch” and “working” message disappear.
11. Click on **Exit** to close the *XCRS\_SITE Utility* window.
12. Click on the **UNIX shell** window to select it. At the prompt type **Exit** and press **Enter** to close the UNIX Shell.
13. Open the *System Status* window.
  - a. Click on **System**.
  - b. Click on **System Status**.
14. Monitor the *System Status* window and ensure the system is operational.

## **PART 5—POST HARDWARE EXPANSION CHANNEL OPERABILITY VERIFICATION PROCEDURES**

### 5.1 Channel Operability Verification Procedure

**NOTE:** CRS test database ASCII files contain test messages configured for continuous broadcast for channel operability verification.

1. Connect a monitor speaker or headphones to the ACP.
2. Using the *Channel Select* control, select each channel, one at a time, and monitor the output for the correct message (i.e., With Channel one selected, the message output is: *This is transmitter one, audio switch module one.*).

## 5.2 FEP Backup Mode Channel Operability Verification Procedure

1. Click on **Maintenance**.
2. Click on **Front-End Processor Switch**.
3. Select **1** in the *Front-End Processor Switch* window under *FEP*.
4. Select **Out** under *Switch*.
5. Select **Yes** under *Backup*
6. Click on the **Save the current record** icon to execute the FEP switch process. The *Question* box displays:  
**Switch out the FEP FULLY offline ???**
7. Click on **OK** to continue. The system displays the “wristwatch” and the message:  
**“Requesting FEP Switchout”**.
8. Monitor the *FEP1* and *BKUP* system status icons and verify FEP1 is in backup mode and the *BKUP* icon displays the online status.
9. Upon completion of the FEP switch process, repeat section 5.1 steps 1 and 2.
10. Upon completion of the FEP backup mode channel operability verification, perform the following to display the *Front-End Processor Switch* window:
  - a. Click on **Maintenance**.
  - b. Click on **Front-End Processor Switch**.
11. In the *Front-End Processor Switch* window under *FEP*: select **1**.
12. Under *Switch*: select **IN** to switch FEP1 back in.
13. Click on the **Save the current record** icon to execute the FEP switch process. The system displays the “wristwatch” and the message displays:  
**Requesting FEP switch-in...**
14. Monitor the *FEP1* and *BKUP* System Status icons and verify FEP1 is online and the *BKUP* icon displays the backup mode status.
15. When the system returns to normal operation, perform the following steps to close the *Front-End Processor Switch* window and stop CRS:
  - a. On the *Front-End Processor Switch* window:
    - 1) Click on **File**.
    - 2) Click on **Exit**.
  - b. On the *Main CRS* menu:
    - 1) Click on **System**.

- 2) Click on **Stop System**.
  - 3) Click on **OK**.
  - 4) Click on **Close**.
16. Monitor the *System Status* window and verify the CRS application has stopped.

## **PART 6—ADDING NEW TRANSMITTER CHANNELS AND EDITING SITE DATABASE ASCII FILE PROCEDURES**

### 6.1 Adding New Transmitter Channels Procedure

1. Click and hold the left mouse button on any white space, move the cursor to select **XCRS\_SITE Utility**, and release the button to bring up the *XCRS\_SITE Utility* window.
2. Click on **Select ASCII Site Setup** button to bring up the list of ASCII files.
3. Select the current site database ASCII file and double click.
4. Click on **Add Transmitter(s)** button to start the **addxmt** program. It displays the number of transmitters currently available, the next available transmitter to be added, and its appropriate processor and slot.
5. Use the following steps to add a new transmitter to the Site Database ASCII file:
  - a. **Mnemonic**
    - 1) Type option number **1** and press **Enter** to select *Mnemonic*.
    - 2) Type **a** and press **Enter** at the program prompt to add *Mnemonic*.
    - 3) Type **mmmmm** and press **Enter** (where mmmm is the desired mnemonic), up to a length of 5 characters. The program returns the *Mnemonic*.
    - 4) Type **0** or press **Tab** and press **Enter** to complete the *Mnemonic* selection.
  - b. **Call Sign**
    - 1) Type option number **2** and press **Enter** to select *Call Sign*.
    - 2) Type **a** and press **Enter** to select the *Call Sign*.
    - 3) Enter the **Call Sign** in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.
    - 4) Type **0** or press **Tab** and press **Enter** to complete the *Call Sign* selection.

c. **Frequency**

- 1) Type option number **3** and press **Enter** to select *Frequency*. The *Frequency* option only allows a selection of one of the seven choices listed.
- 2) Type **n** and press **Enter** (where n is the desired *Frequency* choice). The program returns the *Frequency* choice by displaying an asterisk next to the *Frequency* selection.
- 3) Type **0** or press **Tab** and press **Enter** to complete the *Frequency* selection.

d. **Location**

- 1) Type option number **4** and press **Enter** to select *Location*.
- 2) Enter the *Location* (in the same manner as *Mnemonic* and *Call Sign*) up to a length of 40 ASCII characters. The program returns the *Location*.
- 3) Type **0** or press **Tab** and press **Enter** to complete the *Location* selection.

e. **Add Transmitter**

- 1) Type option number **5** and press **Enter** to use all the parameters defined in the first four steps to configure a new transmitter in the database ASCII file. The program indicates a new transmitter is needed.
  - 2) Type **y** and press **Enter**. The program returns the assignment of each transmitter to its proper processor and slot. The program indicates the appropriate database ASCII file has been updated and the original has been saved with the .SAV extension.
6. The program then asks if another transmitter is needed. If yes, repeat steps 5a through 5e for the next new transmitter. If not, type **n** and press **Enter** to exit the program.

## 6.2 Editing the Site Database ASCII File Procedure

1. When exit **addxmt** is done, the *Question* box displays:  
**Ready to recompile selected ASCII file. Continue?**
2. Click on **Cancel** to close the *Question* box.
3. Select **Initialize System Configuration and Database** to ensure the entire system database and configuration is erased and replaced.
4. Click on **Start Site Configure**. The *Question* box displays:  
**Will now perform FULL site reconfiguration. Continue?**

5. Click on **OK** to recompile the database ASCII file. Upon completion of the database ASCII file recompile process, the system displays:  
**Finished with site configure.**
6. Restart CRS by clicking on **Start CRS System**. The system displays:  
**The CRS system will be STARTED. Continue?**
7. Click on **OK**. The “wristwatch” and the “working” message display. Several messages scroll by. The last message refers to starting 4BKUP, and the “wristwatch” and “working” message disappear.
8. Click on **Exit** to close the *XCRS\_SITE Utility* window.
9. Open the *Alert Monitor* window:
  - a. Click on **System**.
  - b. Click on **Alert Monitor**.

**NOTE:** No attempt is made by **addxmt** to establish station identifiers, broadcast programs, broadcast suites, message types, voice parameters, keep-alive messages, interrupt messages, etc. for the new transmitters. These must be configured through the CRS graphical user interface (see the *CRS Site Operator’s Manual*) and updated in the site database ASCII file.

## PART 7–ASM ALIGNMENT PROCEDURES

**NOTE:** The output of each added ASM card must be aligned before placing in service. The alignments must be performed in the following sequence:

1. Verify ACP **Ref. Mark** Alignment.
2. ASM Card Alignment.

### 7.1 Verify ACP Ref. Mark Alignment Procedure

**NOTE:**

1. The ACP Ref. mark alignment can be performed independently and does not require the use of any tool or equipment.
2. Transmitter x in this procedure refers to the channel under test.

1. Set up the CRS for Backup Live (BUL). No system database is required.
2. Set the index mark on the **tone volume control** knob to the *Ref.* position.

3. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel x. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

**NOTE:** 3. Do not send audio to a transmitter while performing this procedure.

4. Push the **Alert Tone 1** button to generate the 1050 Hz warning alert tone (WAT).
5. Ensure the VU meter on the ACP front panel indicates **0 dBm**.

**NOTE:** 4. The duration of 1050 Hz WAT is 10 seconds.

6. Adjust the tone volume control for a reading of **0 dBm**.
7. Repeat steps 4, 5, and 6 as necessary to obtain a reading of **0 dBm**.

**NOTE:** 5. When the tone volume control is set to the true Ref. position, the ACP provides the selected WAT output level of **0 dBm**.

8. To stop BUL, first push the **Enable** button, then push the **Transmitter x** button.

## 7.2 ASM Card Alignment Procedure

**NOTE:**

1. This alignment requires two people: one in the operations room, and one in the equipment room.
2. When performing any of the following alignments, the system's output(s) must be disconnected from the telecommunications link and terminated into a 600-ohm load. All audio signal level measurements are taken across the 600-ohm load.

1. Assemble the following required Equipment:
  - dB Meter to read the audio signal level
  - Small jeweler's screwdriver
  - 600-ohm dummy load with RJ-11 plug attached.
2. Set up the CRS for BUL. No system database is required.
3. Set the index mark on the **tone volume control knob** to the *Ref.* position.
4. Push the **Transmitter x** and **Enable** buttons in sequence to start BUL on channel **X**. The buttons are located in the **BACKUP LIVE** block area on the ACP front panel.

5. Plug the RJ-11 connector (with the 600-ohm load attached) into the RJ-11 jack of **OUT 1** on the ASM of transmitter **X** (output channel **X**).
6. Connect the dB meter across the 600-ohm load.
7. Push the **Alert Tone 1** button to send a WAT to the **OUT 1** jack of ASM card 1.
8. Measure and record the signal level in dB across the 600-ohm load.
9. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the ASM front panel until a reading of **0 dBm** is obtained across the 600-ohm load.

**NOTE:** 3. Table 4 provides equivalent  $V_{rms}$  and  $V_{p-p}$  values related to dBm (all referenced to 600-ohms) as an aid in referencing readings taken with measurement equipment that may not read directly in dBm.

**Table 4.** Voltages vs dBm (into 600-ohm load)

dBm	RMS	P-P	dBm	RMS	P-P	dBm	RMS	P-P
10	2.440	6.93	-4	0.480	1.35	-17	0.110	0.301
9	2.183	6.17	-5	0.430	1.20	-18	0.097	0.270
8	1.946	5.50	-6	0.390	1.03	-19	0.087	0.240
7	1.734	4.90	-7	0.345	0.96	-20	0.0775	0.215
6	1.546	4.37	-8	0.306	0.85	-21	0.690	0.194
5	1.377	3.89	-9	0.275	0.76	-22	0.061	0.170
4	1.228	3.47	-10	0.245	0.68	-23	0.054	0.152
3	1.094	3.01	-11	0.213	0.61	-24	0.048	0.135
2	0.975	2.75	-12	0.192	0.54	-25	0.043	0.120
1	0.869	2.46	-13	0.173	0.48	-26	0.039	0.108
0	0.775	2.15	-14	0.154	0.43	-27	0.034	0.09622
-1	0.690	1.94	-15	0.138	0.38	-28	0.031	0.085
-2	0.610	1.70	-16	0.125	0.34	-29	0.028	0.076
-3	0.540	1.52				-30	0.024	0.068

- NOTE:**
4. The WAT output from the ACP nominally lasts 10 seconds. It is recommended that a second person push the **Alert Tone1** button for a near continuous tone output. This will smooth out the calibration effort and minimize the time required.
  5. Primary (Out1) and secondary (Out2) outputs are two independent outputs. However, the output level of Out1 is affected by approximately 1.5 dB if Out2 is loaded.
  6. During BUL, the VU meter monitors the ACP tone output, not the output of the ASM card. The ACP tone output is sent to the ASM card via the ASC for final output.

10. Repeat steps 7, 8, and 9 as necessary to obtain a reading of **0 dBm** for the channel under test.
11. To stop BUL, first push the **Enable** button and then push the **Transmitter x** button.
12. Repeat steps 1 through 10 to align each of the new ASM cards in the system.
13. Activate each ASM card output by pushing the respective **Transmitter x** button and then the **Enable** button.