

MEMORANDUM FOR: Distribution

FROM: W/OPS1 - Mark Paese (Acting)

SUBJECT: Expansion of Console Replacement System (CRS)

1. Material Transmitted:

Engineering Handbook No. 7 (EHB-7), Communications Equipment, Section 3.4, Modification Note 48, Revision A, Console Replacement System Output Channel Expansion (Typical 4 to a Large 6).

2. Summary:

Request for Change AA614-001 authorizes CRS expansion for Weather Forecast Office (WFO) Dodge City, Kansas (DDC).

3. Effect on Other Instructions:

Modification Note 48, Revision A, incorporates a change in Part 7 and adds WFO DDC to the list of sites affected. Modification Note 48, Revision A, supercedes previously released Modification Note 48.

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COMMUNICATIONSEQUIPMENTMODIFICATIONNOTE48,RevisionA

(forElectronicsTechnicians)

Maintenance,Logistics,andAcquisitionsDivision

W/OPS12:GSS

SUBJECT : ConsoleReplacementSystem(CRS)OutputChannelExpansion

PURPOSE : ToexpandthecapabilitiesoftheCRSsystemfromaTypical
4-channeltoaLarge6-channelconfiguration.

SITES : SiteName SID Org.Code
AFFECTED WFODodgeCity,KS DDC WR9451

EQUIPMENT : CRS(B440)
AFFECTED

PARTSREQUIRED : ThepartsrequiredwillbeissuedtoeachsitebyW/OPS12fromthe
NationalLogisticsSupportCenter,undertheapplicableapproved
site-specificRequestforChange.

(1)Front-endprocessor(FEP)hold-downstrap(ASN:B440-STRAP)
(1)FEPcomputer(ASN:B440-2A2)
(1)FEPharddiskdrive(HDD)(ASN:B440-2A2A8-FEP)
(1)Localareanetwork(LAN)board(ASN:B440-1A8A10)
(1)LANcablesegment(ASN:B440-2W1)
(1)BNCteeconnector(ASN:B440-4J1)
(1)FEPswitchVGAvideocable(ASN:B440-2W3)
(1)FEPswitchPS/2keyboardcable(ASN:B440-2W4)
(2)DECtalkcards(ASN:B440-2A2A11)
(3)Audioswitchmodule(ASM)cards(ASN:B440-2A6A3)
(3)DECtalk-ASMAudiocables(ASN:B440-4W12)
(1)NOAAWeatherRadioSpecificAreaMessageEncoder
(NWRSAME)-audiocontrolpanel(ACP)interfacecable
(ASN:B440-1A5W4)
(1)DOSformatteddiskettewithCRStestdatabaseASCIIfiles
(providedbyW/OPS12)

PARTSSUPPLIED : Thefollowingpartsshallbeprovidedbythesite:
BYTHESITE (2)Transmitteraudiooutputcables
(1)NWRSAME(ifavailable)
Cablemarkingtagsandtie-wraps,asneeded

TOOLS AND TEST EQUIPMENT REQUIRED : #1 and #2 Phillip screwdrivers
 CRS test database ASCII files diskette provided by W/OPS12
 (see Parts Required)
 Small flat-blade jeweler's screwdriver
 Root mean square (RMS) voltmeter/dB meter
 600-ohm dummy load with a RJ-11 plug attached
 Anti-static workstation kit
 AM-48 test set

TIME REQUIRED : 3 Hours

EFFECT ON OTHER INSTRUCTIONS : Modification Note 48, Revision A, incorporates a change in Part 7 and adds WFODDC to the list of sites affected. Modification Note 48, Revision A, supersedes previously released Modification Note 48.

AUTHORIZATION : The authority for this modification is Request for Change AA614-001

VERIFICATION STATEMENT : This procedure has been verified at the National Weather Service Headquarters, Silver Spring, Maryland (SLVM2).

GENERAL : The attachments to this procedure contain instructions for adding output channel(s) to the CRS.

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 sample WS Form A-26, Maintenance Record.

REPORTING
INSTRUCTIONS

: Report the completed modification on a WS Form A-26 using 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** for the FEP in block 13.
- d. A modification number of **48A** in block 17a.
- e. **Serial number** for the FEP in block 18.

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

Mark Paese (Acting)
Chief, Maintenance, Logistics, and Acquisition Division

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

Attachment A
Modification Procedure

Attachment A Modification Procedure

Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a Typical 4-channel configuration to a Large 6-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 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. CRS Alignment Procedures

<p>NOTE:</p> <ol style="list-style-type: none">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.
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CAUTION

CRS must be down to perform the expansion modification. This modification contains test messages that should not be broadcasted on any transmitter.

In addition, the site 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 Administration Manual*) before performing this modification.

<p>NOTE: The new FEP setup procedures in part 2, sections 2.1 and 2.2, can be performed prior to shutting down the system. This will save downtime of the operational CRS system.</p>
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PART 1–CRS POWER-DOWN PROCEDURES

1.1 CRS Application Shutdown Procedure

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

1.2 UNIX Shutdown Procedure

NOTE: 1. CRS application shutdown is to precede the graceful power-down. After exiting 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 the **Maintenance** menu in the main CRS menu to access the *Maintenance* pull-down menu.
2. Click **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 4BKUP /sbin/shutdown -i0 -g0 -y

12. 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.
13. Type the following UNIX commands in the *xterm* window:
cd /
14. Press the **Enter** key.
15. Type **/sbin/shutdown -i0 -g0 -y**.
16. Press the **Enter** key. Each CRS processor for the system may be safely powered-down when UNIX indicates shutdown is complete with the message: *Press any key to reboot...* Do not reboot any machines; 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 equipment:

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

PART 2—EQUIPMENT UPGRADE PROCEDURES

NOTE: The new FEP setup procedures in part 2, sections 2.1 and 2.2, can be performed prior to shutting down the system. This will save downtime of operational CRS systems.

2.1 New 2FEP LAN Board and Hard Drive Installation 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 **2FEP** 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 through 4, and 6 (see attachment **B**, figure A-13). Retain the screws for use in 1FEP and 4BKUP (see section 2.3, step 5).
3. Remove and retain the expansion slot covers for use in 1FEP and 4BKUP (see section 2.3, step 5).
4. Install the new LAN card in expansion slot number 1, and reinstall a retaining screw.

2.2 Installation of the Hard Disk Drive 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 port 2 on the 2FEP motherboard.
7. Connect a power connector from the power supply to the HDD.

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

2.3 1FEP and 4BKUP DECtalk Card Removal Procedure

NOTE: 1. Removing and replacing circuit cards must be accomplished in an antistatic work area, using approved antistatic procedures.

1. Remove all cabling from 1FEP and 4BKUP, and remove from the equipment rack to the antistatic work area (see attachment **B**, figure A-5).
2. Remove the DECtalk cards from slot 5 of both the 1FEP and 4BKUP units using the following procedure:
 - a. Access the DECtalk cards by removing the right three screws located on the back of the system unit. These screws secure the right side access panel of the system to the chassis (see attachment **B**, figure A-1).
 - b. Pull the panel backward while lifting it upward.
3. On 1FEP and 4BKUP, remove and retain the screws holding the DECtalk cards in expansion slot 5 (see attachment **B**, figure A-13).
4. Remove the DECtalk cards from the expansion slots by placing your hands on the right and left edges of the card and pulling the card up out of the chassis.

NOTE: 2. These two DECtalk cards will be placed in the new 2FEP.

5. Place one of the expansion slot covers removed from the new 2FEP in 1FEP and 4BKUP at expansion slot 5, using one of the removed screws.
6. Replace 1FEP and 4BKUP right side covers, reversing the procedure in step 2.
7. Replace 1FEP and 4BKUP in the CRS main unit cabinet.
8. Reconnect all cabling to 1FEP and 4BKUP with the exception of the DECtalk to ASM/audio switch controller (ASC) audio cables.

2.4 New 2FEP DECtalk Card Configuration for the Appropriate Input/Output Address Procedure

NOTE: 1. Depending on the CRS site configuration, there may be as many as five DECtalk cards per FEP. DECtalk cards are identified as module numbers 0, 1, 2, 3, and 4.

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

Table 1. DECtalk Card Switch 2 (SW2) Settings

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

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 the new 2FEP.
3. Use table 1 to set up a DECtalk card with the I/O address: 250. Install the DECtalk card into slot 3 of the new 2FEP.
4. Use table 1 to set up a DECtalk card with the I/O address: 328. Install the DECtalk card into slot 4 of 2FEP.
5. Use table 1 to set up a DECtalk card with the I/O address: 380. Install the DECtalk card into slot 6 of 2FEP.
6. Replace the 2FEP cover using the reverse procedure in section 2.1, step 1.

2.5 2FEP Computer Installation Procedure

1. Install 2FEP in the CRS main unit cabinet.
2. Install the new FEP switch VGA video cable between 2FEP video out and switch position B.

3. Install the new FEP switch PS/2 keyboard cable between 2FEP keyboard connection and switch position B.
4. Install the new LAN cable segment and BNC tee connector to connect the 2FEP PC into the existing CRS LAN; 2FEP shall be connected between 4BKUP and 5MP (see attachment **B**, figure A-15).

2.6 ASM Card Installation Procedure

1. Remove ASA slot 5, 6 and PB2 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, and set the jumpers for slot 5 of the ASA according to table 2.
3. Install the new ASM card into slot 5 of the ASA chassis, and tighten the two screws.
4. Repeat steps 2 and 3 for each of the remaining new ASM cards.
5. Reset the jumpers using table 2 for the existing ASM card in slot 4.

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 PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1
ASM PB2 (mon/playback chan 2)	PB2	DIS (Disable)	PB2	PB	FEP2

2.7 DECTalk-ASM Audio Cable Installation Procedure

1. Using write-on cable labels, mark and connect the new FEP2 DECTalk-ASM audio cables according to table 3.
2. Connect and relabel the new and existing DECTalk-ASM audio cables on 1FEP according to table 3 with the exception of the unused slot 5 DECTalk-ASM cable labeled 1-4. Tie the unused cable back with a tie-wrap.

Table 3. DECTalk to ASM Audio Cables

From	To	Cable Label
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
1FEP DECTalk 5 "J2" Port	ASM PB1 "IN Port"	1-5
2FEP DECTalk 5 "J2" Port	ASM PB2 "IN Port"	2-5

CAUTION

Ensure the unused DECTalk-ASM cable 1-4 is not connected to any ASM port.

2.8 Operational and Spare ASC Jumper Setting and Cable Installation Procedure

1. Disconnect five DECTalk-ASC audio cables (labeled as 4-1, 4-2, 4-3, 4-4, and 4-5).
2. Disconnect the two ACP-ASC audio cables.
3. Disconnect the ASC-4BKUP parallel port interface cables.
4. Disconnect the two ACP-ASC control cables.
5. Loosen the four front panel screws and extract the ASC card.
6. On both the operational and spare ASC, set the backup channel configuration using the seven jumpers on JP1. Using all seven jumpers, move the jumpers to the side of the block listing the number of output channels for your site configuration, the center row of pins being common. (Example: Using **Figure 1** as a reference, if your site configuration had 5, 6, 9, or 10 channels, each jumper would connect from the center row of pins to the top row of pins. If your site

configuration had 1, 2, 3, 4, 7, 8, 11, 12, or 13 channels, each jumper would connect from the center row of pins to the bottom row of pins.)

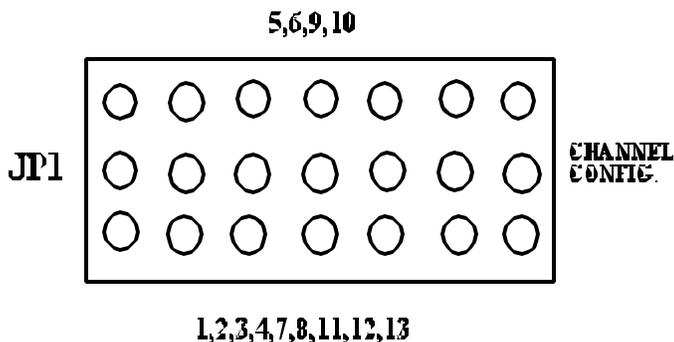


Figure 1. ASM Card Jumper Block

7. Insert the ASC back into the ASA, and tighten the four front panel screws.
8. Reconnect the two ACP-ASC control cables.
9. Reconnect the ASC-4BKUP parallel port interface cable.
10. Reconnect the two ACP-ASC audio cables.
11. Reconnect existing DECTalk-ASC audio cables on 4BKUP according to table 4 with the exception of the unused cable labeled 4-4. Tie the unused cable back with a tie-wrap.

Table 4. DECTalk to ASC Audio Cables

From	To	Cable Label
4BKUP DECTalk 1 "J2" Port	ASC "BKUP Audio 1" Port	4-1
4BKUP DECTalk 2 "J2" Port	ASC "BKUP Audio 2" Port	4-2
4BKUP DECTalk 3 "J2" Port	ASC "BKUP Audio 3" Port	4-3
4BKUP DECTalk 5 "J2" Port	ASC "BKUP Audio 5" Port	4-5

CAUTION

Ensure the unused DECTalk-ASC cable 4-4 is not connected to any ASC port.

2.9 New Transmitter Audio Output Cable Installation Procedure

1. Connect the OUT1 port of the new ASM card at slots 5 and 6 of the ASA chassis by installing the new audio output cables to the demarc panel position for the new transmitter.
2. Install the new NWRSAMEs (if available) to the top panel of the 5MP workstation.
3. Install the NWRSAME-ACP interface cable from the NWRSAME rear connector to the “NRRSAME INPUT socket 1” port of ACP2 rear panel (this connects to pins 2, 6, 7, 9, and 10 of the NWRSAME).

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 (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)], and 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 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 (on the front center right of the enclosure) 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 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 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 Procedure for the New FEP

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 the **SCO Control Center** pop-up menu selection.

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

3. Select and double-click 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 **crsopsmppm**) are displayed immediately below the *Install from* prompt, select **crsopsais**, and click **Install**.

NOTE: 2. The CRS application package icons, **crsopsfpm** and **crsopsmppm** can only be installed indirectly through **crsopsais**.

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

NOTE: 3. 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:
Continue [0MP | 5MP] shutdown? (Default: y)

NOTE: 4. 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.

9. Press **Enter** to continue.

NOTE: 5. 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 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, APPLICATION 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*. To continue the login process, click the **Acknowledge** button.
 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 **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 **Maintenance**.
 - b. Click **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 completed with OMP set as the MP.

1. Open a *UNIX Shell*:
 - a. Click **Maintenance**.
 - b. Click **UNIX Shell**.
2. 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:

TYPW_CFG.ASC	where $W = 1 - 4$
LRGX_CFG.ASC	where $X = 5 - 8$
MAXY_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 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.
3. 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.
4. Click the **Select ASCII Site Setup** button to bring up the list of ASCII files.
5. Select the desired database ASCII filename that you 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 may 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.

6. Select *Initialize System Configuration and Database* to ensure the entire system database and configuration is erased and replaced.
7. Click the **Start Site Configuration** button. The system displays:
Will now perform FULL site reconfiguration. Continue?
8. Click **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. Any error messages must be reported to CRS site support staff at 301-713-0191 x145 or x144.
9. Restart CRS by clicking on **Start CRS System**. The system displays:
The CRS system will be STARTED. Continue?
10. Click **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 **Exit** to close the *XCRS_SITE Utility* window.
12. Click 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 **System**.
 - b. Click **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 **Maintenance**.
2. Click **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 the **Save the current record** icon to execute the FEP switch process. The *Question* window displays:
Switch out the FEP FULLY offline ???
7. Click **OK** to continue. The system displays the “wristwatch” and the “Requesting FEP Switchout” message.
8. Monitor the *1FEP* and *4BKUP* system status icons, and verify that the *1FEP* is in backup mode and the *4BKUP* 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 **Maintenance**.
 - b. Click **Front-End Processor Switch**.
11. Select **1** in the *Front-End Processor Switch* window under *FEP*.
12. Select **IN** under *Switch* to switch *1FEP* back in.

13. Click the **Save the current record** icon to execute the FEP switch process. The system displays the “wristwatch” and the message:
Requesting FEP switch-in...
14. Monitor the *1FEP* and *4BKUP* system status icons and verify that the *1FEP* is online and the *4BKUP* 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 **File**.
 - 2) Click **Exit**.
 - b. On the *Main CRS* menu:
 - 1) Click **System**.
 - 2) Click **Stop System**.
 - 3) Click **OK**.
 - 4) Click **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 the **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 the **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 the *Mnemonic*.

- 3) Type **mmmmm** and press **Enter** (where *mmmmm* 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 the *Call Sign*.
 - 2) Type **a** and press **Enter** at the program prompt to add *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) Type **a** and press **Enter** at the program prompt to add the *Location*.
 - 3) Enter the *Location* (in the same manner as the *Mnemonic* and *Call Sign*), up to a length of 40 ASCII characters.
 - 4) 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 verifies a new transmitter is necessary.
 - 2) Type **y** and press **Enter**. The program returns the assignment of each transmitter to its proper processor and slot. The program tells you the appropriate database ASCII file has been updated and the original has been saved with the .SAV extension.

6. The program asks if another transmitter is needed. If so, repeat steps a through e 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 **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 **Start Site Configure**. The question box displays:
Will now perform FULL site reconfiguration. Continue?
5. Click **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 **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 **Exit** to close the *XCRS_SITE Utility* window.
9. Open the *Alert Monitor* window:
 - a. Click **System**.
 - b. Click **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–CRS Alignment Procedures

NOTE: 1. When performing any of the following alignments, the system output at the ASM card must be disconnected and terminated into the AM-48 test set.

2. In the following sections, all procedures must be performed, but **ONLY** for the added transmitters, i.e., added ASM cards, **NOT starting from channel one**.
3. During alignment in section 7.1, CRS remains operational. However, the audio to each transmitter being tested will be interrupted while the transmitter is being aligned.

7.1 Backup Live Alignment Procedures

Three alignments need to be made on the CRS. These alignments should be performed in the following sequence:

1. ACP Ref Mark Alignment
2. ASM Card Alignment
3. NWRSAME Alignment

During BUL, alert and transfer tones are generated by the ACP and NWRSAME tones are generated by the NWRSAME panel. Reference table 5, *Tone Frequencies, Tolerances, and Duration* as necessary for the following alignments.

Table 5. Tone Frequencies, Tolerances, and Duration

Tone Type	Frequency	Tolerance	Duration	Tolerance
Primary to Secondary Transfer	1800 Hz followed by 2400 Hz	± 5 Hz ± 5 Hz	5 sec. 5 sec.	± 0.5 sec. ± 0.5 sec.
Secondary to Primary Transfer	2400 Hz followed by 1800 Hz	± 5 Hz ± 5 Hz	5 sec. 5 sec.	± 0.5 sec. ± 0.5 sec.
Alert Tone 1	1050 Hz	$\pm 0.3\%$	10 sec.	± 2 sec.
*Alert Tone 2	1200 Hz	$\pm 0.3\%$	10 sec.	± 2 sec.
*Alert Tone 3	1350 Hz	$\pm 0.3\%$	10 sec.	± 2 sec.
*Alert Tone 4	1500 Hz	$\pm 0.3\%$	10 sec.	± 2 sec.
*Alert Tone 5	1650 Hz	$\pm 0.3\%$	10 sec.	± 2 sec.

* Not currently used—reserved for future use.

NOTE: 1. This alignment requires two people: one in the operations room, and one in the equipment room.

The following equipment is required:

1. Ameritec AM-48 Transmission Test Set to read the audio signal level
2. Small jeweler's screwdriver

3. RJ-11 phone cable (approximately 6 feet)

- NOTE:**
2. When performing any of the following alignments, the system output at the ASM card must be disconnected and terminated into the AM-48 test set. The AM-48 must be set to the 600-ohm internal terminator.
 3. The OUT1 and OUT2 jacks on the ASM card front panel are not isolated from each other. Using a second output affects the output of the first.
 4. The ACP Ref mark alignment must be done by site personnel. Both the ASM card alignment and NWRSAME alignment cannot be performed until the ACP Ref mark alignment is done.
 5. Starting at this point, for the rest of Part 7, X will be used to denote any added transmitters/ASM cards that need to undergo adjustment or calibration procedures.

7.1.1 ACP Ref Mark Alignment

Calibration Procedures:

1. Power on the **AM-48 Test Set** using the rocker switch (upper right side).
2. Set the **AM-48 Test Set** controls as indicated in table 6 (refer to the *AM-48 Instruction Manual* for further explanations on setup).

Table 6. AM-48 Test Set Controls

Function	Left Side of Test Set
Volume	Mid position
MON RCV, MON SND, Talk Switch	Mid position
Term, BRDG	Term
TONE, PULSE, ON HK	TONE
900 ohm, 600 ohm	600 ohm
2w, 4w, 4w REC	2w
	Right Side of Test Set
ABS, REL, SEND	ABS
DAMP, OFF	OFF
SEL Filter	C-MSG (Displayed at bottom of LCD reader) (Printed on Bottom of display)
SEL MEASURE	L/F (Printed on Bottom of display)
SEL SEND	Quiet (Printed on Bottom of display)
MF, DTMF, SHIFT	DTMF

SF SKP, NOR, X TONE	NOR
RCL/STC, PRINT	Mid position

3. Connect the RJ-11 cable to the 4W RCU jack on the bottom of the AM-48.
4. Remove the transmitter *X* feed output RJ-11 plug from the ASM card output jack.
5. Connect the AM-48 Test Set to the ASM card output jack corresponding to Transmitter *X*.
6. Position the ACP **Channel Select** knob to *X* (transmitter *X*).
7. Set the index mark on the front of the ACP *Tone* volume control knob to the **Ref** position.
8. To start BUL on Channel No.*X*, push the **Transmitter Select X** button and the **Transmitter Select Enable** button in sequence. These controls are in the *BACKUP LIVE* area on the front of the ACP.
9. Push the **Transfer/Alert Tones 1** button to cause the ACP to generate the 1050 Hz alert tone. The duration of the 1050 Hz alert tone is 10 seconds.
10. Observe the VU meter on the ACP front panel. It should indicate **0** on the red scale.
11. If the VU meter does not indicate a reading of **0**, adjust the **Tone** volume control until that level is obtained.
12. Repeat steps 3, 4, and 5 until a reading of **0** is obtained. When the *Tone* volume control is set to the true reference position, the ACP provides the selected alert tone level of 0.

NOTE: If the final position does not coincide with the ACP Ref marking, a non-permanent mark (tape, sticker, etc.) can be made on the panel of the final alignment position so operators do not incorrectly change the tone knob back to align with the Ref marking. **DO NOT** deface the front of the ACP with any kind of permanent marking!

13. Make sure to keep the Ref position as aligned in this procedure. Do not change this position unless another alignment is needed. Place a note to inform the operators not to touch the knob.
14. To stop BUL, push the **Transmitter Select Enable** button and the **Transmitter Select X** button in sequence.

7.1.2 ASM Card Alignment

Alignment Procedures:

1. Ensure the AM-48 Test Set is connected to the ASM card output jack corresponding to Transmitter X.
2. Ensure the index mark on the *Tone* volume control knob is set to the reference position as determined in section 7.1.1, *ACP Ref Mark Alignment* procedure.
3. Position the ACP **Channel Select** knob to **X** (Transmitter X).
4. Start BUL on ASM output channel No.X by pushing the **Transmitter Select X** button and the **Transmitter Select Enable** button in sequence. These buttons are located in the *BACKUP LIVE* block area on the front of the ACP.

NOTE:

1. The alert tone output from the ACP lasts for only 10 seconds. It is recommended that a second person push the **Alert Tone 1** button for a near continuous tone output. This smooths out the calibration effort and minimizes the time required.
2. 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 by way of the ASC for final output.

5. Push the **Transfer/Alert Tones 1** button to send an alert tone to the ASM card No. X output.
6. Using a small jeweler's screwdriver, adjust the transmitter gain control potentiometer through the small hole in the ASM front panel (located above the **In** jack) until a reading of **0** dBm (as close to 0 dBm without going positive) is measured on the AM-48 Test Set.
7. Repeat steps 4, 5, and 6 until a reading of **0** dBm is obtained.
8. Push the **Pri/Sec** transmitter transfer tone button to send out 5 seconds of 1800 Hz tone followed by 5 seconds of 2400 Hz tone.
9. Verify a reading of 0 dBm (± 1.5 dBm) on the AM-48 Test Set for the *Transfer Tones*.
10. Push the **Sec/Pri** transmitter transfer tone button to send out 5 seconds of 2400 Hz tone followed by 5 seconds of 1800 Hz tone.
11. Verify a reading of 0 dBm (± 1.5 dBm) on the AM-48 Test Set for the *Transfer Tones*.
12. To stop BUL, push the **Transmitter Select Enable** button and then the **Transmitter Select X** button in sequence.
13. Repeat steps 1 through 12 to align each of the added ASM cards in the system. Remember that each ASM card output is activated by selecting the appropriate transmitter on the **Channel Select** knob and by pushing the respective **Transmitter X** button and then the **Transmitter Select Enable** button. ASM

card 1 corresponds to Transmitter 1, ASM card 2 corresponds to Transmitter 2, etc.

7.1.3 NWRSAME (ECR-200) Panel Calibration

NOTE: 1. When performing the following calibration, the system output of the ASM card must be disconnected, and the AM-48 Test Set connected in its place. Refer to AM-48 set up in section 7.1.1, step 1.

The NWRSAME (ECR-200) calibration must be performed by site personnel.

A small screwdriver is required to adjust the NWRSAME gain control potentiometer.

Calibration Procedures:

NOTE: 2. The front panel key sequence on the NWRSAME for a continuous NWRSAME preamble tone output is TEST and then SEND. Pressing the CANCEL key stops the sequence.

1. Ensure the AM-48 Test Set is connected to the ASM card output jack corresponding to Transmitter *X*.
2. Ensure the *Tone* volume control knob is set to the index mark as determined in section 7.1.1, *ACP Ref Mark Alignment* procedure.
3. Position the ACP **Channel Select** knob to **X** (Transmitter *X*).
4. Start BUL on ASM output channel No.1 by pushing the **Transmitter X** button and the **Enable** button in sequence. These are located in the *BACKUP LIVE* block area on the front of the ACP.
5. Initiate a continuous NWRSAME preamble tone output from the NWRSAME panel by pressing the **TEST** key once and then the **SEND** key.
6. Observe the VU meter reading on the front of the ACP.
7. Locate the output gain control potentiometer on the back of the NWRSAME panel next to the terminal block.
8. Observe the AM-48 Test Set and adjust the gain control potentiometer for a reading of $-4.5 \text{ dBm} \pm 0.5 \text{ dBm}$ on the AM-48. This should correspond to between (approximately) -2.0 and -3.0 on the ACP VU meter.

NOTE: 3. The output gain potentiometer is the only control on the back panel of the NWRSAME. Since it is a single turn potentiometer, adjustment of the control is very sensitive.

9. Push the **CANCEL** key on the NWRSAME to stop the generation of the preamble.

10. Push the **Enable** button and **Transmitter X** button in sequence to stop BUL.

NOTE: 4. The levels for voice, warning tone, and SAME messages have been selected to optimize the detectability by a receiver. This maximizes the transmitter modulation deviation without causing distortion. The levels selected herein assume frequency response of the telecommunications line to the transmitter is relatively flat and the pre-emphasis circuit in the transmitter is within 1.0 to 2.0 dB of the required 6.0 dB per octave. If these assumptions are not correct, measurements at the audio input at the transmitter site on a case by case basis may be necessary to obtain the optimum modulation (corresponding to a deviation of 4.5 kHz for the NWRSAME tones). If these adjustments to the NWRSAME level are necessary (when based on the levels at the transmitter site audio input), the corresponding levels at the ASM card output should be recorded.

7.2 CRS Alignment Procedures for Normal Operation (to match BUL Alignment)

During normal operation, all audio output levels from the DECTalk cards are controlled by the CRS application software through the graphic user interface (GUI) to adjust the alert tone amplitude, transmitter transfer tone amplitude, NWRSAME tone amplitude, and voice volume.

- NOTE:**
1. Do not put the CRS on-the-air while performing the following procedures.
 2. When performing any of the following alignments, the system output at the ASM card must be disconnected and terminated into the AM-48 test set. The AM-48 must be set to the 600-ohm internal terminator.
 3. Any output amplitude changes, which were made through the GUI, will be permanently saved on the system disk. They will remain unchanged in the system unless the operator makes another amplitude change, restores a backup database, or recompiles a new database.
 4. This alignment requires two people: one in the operations room, and one in the equipment room.
 5. In the event the 4BKUP processor has replaced one of the FEPs, the CRS software matches the DECTalk amplitude settings for the affected DECTalk cards of the replaced FEP.

Four adjustments to the DECTalk cards need to be made under the *Transmitter Configure* menu. These adjustments should be performed in the following sequence for each transmitter:

1. DECTalk Card Alert Tone Output Level Adjustment
2. DECTalk NWRSAME Tone Output Level Adjustment
3. DECTalk Transmitter Transfer Tone Output Level Adjustment
4. DECTalk Synthesized Voice Output Level Adjustment

The following equipment is required for these adjustments:

1. Ameritec AM-48 Transmission Test Set
2. RJ-11 phone cable (approximately 6 feet)

7.2.1 DECTalk Card Alert Tone Output Level Adjustment

NOTE: 1. Position the *ACP Channel Select* knob to correspond with the transmitter under adjustment.

The alert tone output level adjustment is accomplished as follows:

1. Power on the **AM-48 Test Set** using the rocker switch (upper right side).
2. Set the **AM-48 Test Set** controls as indicated in table 6.
3. Connect the RJ-11 cable to the 4W RCU jack on the bottom of the AM-48.
4. Starting with *Transmitter* number *X*, remove *Transmitter X* feed output RJ-11 plug from the ASM card output jack.
5. Connect the AM-48 Test Set to the ASM card output jack corresponding to *Transmitter X*.

NOTE: 2. The OUT1 and OUT2 jacks on the ASM card front panel are not isolated from each other. Using a second output will affect the output of the first.

6. Click the **Emergency Override** hot key (**E** button) on the *CRS Main Menu* for an *Emergency Override window*.
7. Select a message type from the *Message Type* display list.

NOTE: 3. The selected message type must be defined in the *Broadcast Program* of the selected transmitter. Consult the CRS focal point for a correct message type to select for a specific transmitter.

8. Click the **Area Selection** button and specify a listening area/transmitter combination by clicking the **Zones** drop down menu and select **Transmitters**.
9. In the *Choices* section under *Transmitters*, click the transmitter in the displayed list which corresponds to the added ASM card undergoing calibration. The first transmitter name corresponds to ASM card 1, the next transmitter corresponds to ASM card 2, etc.
10. In the *Areas* box, select an area corresponding to the transmitter under test.
11. Click the single arrow under the *Areas* box. This copies the area to the *Selections Areas/Zones* box.
12. Check the *Affected Transmitters* box to ensure only the transmitter under test is bolded.

NOTE: 4. If multiple transmitters appear in bold in the *Affected Transmitters* box, proceed to the next step. If not, skip to step 15.

13. Remove the area with multiple transmitters by clicking that area (in the *Selections Areas/Zones* box) and clicking the **eraser** icon and the bottom right of the *Areas/Zones* box. This removes the area from the *Areas/Zones* box.
14. Repeat steps 9 through 11 to choose another area.
15. Click the **OK** button to return to the *Emergency Override* window.
16. Select the **Alert** button (box turns red when selected) and deselect the **SAME Transmitter** (box turns gray) to have the DECTalk card output only the 1050 Hz alert tone. Only the transmitter in bold should be deselected. The transmitters that are grayed out are not affected.
17. Click the **Transmit** button to start the emergency override broadcast of the alert tone.

NOTE: 5. The ACP VU meter does not monitor the final output of the ASM card. The amplitude of the monitored signal (from the VU meter) is 1.2 higher than the amplitude of the final output of the ASM card (i.e., the 1050 Hz *Alert Tone*). When the ASM card's final output amplitude is set to 0 dBm (using the AM-48 Test Set), the VU meter reading should indicate a level of + 1.2 (± 0.5). Therefore, the VU meter can be used to measure the output level in conjunction with the AM-48 Test Set. For the transmitter switching tones and NWRSAME tones, the output is lower at the higher frequencies.

18. Observe the VU meter (red scale) and the AM-48 Test Set and note the readings.
19. Wait for the *On the Air Broadcast* window, click the **Stop** button, then click **Exit**.

20. Click the **Delete** button to delete the created emergency override message.
21. If the measured output level of the DECTalk generated alert tone does not equal 0 dBm on the AM-48 Test Set (+ 1.2 [\pm 0.5] on the ACP VU meter), then go to step 22. Otherwise, go to section 7.2.2.
22. Select the **Transmitter Configure** window under the *Transmitters* menu (see Section 3, Figure 21, of the *Site Operator's Manual*).
23. Click the selected **Transmitter** from the *Transmitters* list followed by the **Amplitudes** button to access the *Amplitudes* window (see Section 3, Figure 23, of the *Site Operator's Manual*).
24. Move the **Alert Tone Amplitude** slider to increase or decrease the alert tone output amplitude, as necessary, to equal 0 dBm on the AM-48 Test Set (+ 1.2 [\pm 0.5] on the ACP VU meter). A good starting point on the *Alert Tone Amplitude* is **15**.
25. Click the **OK** button to return to the *Transmitter Configure* window.
26. Click the **Save** button (diskette icon) to save the new DECTalk card *Amplitude* settings.

NOTE: 6. After the *Save* key is clicked, the new settings will replace the old values. The new DECTalk amplitude settings will be downloaded to the associated DECTalk card. Downloading time ranges from one minute to several minutes depending on the size of the current broadcast message. The downloading process will not start until the end of the current broadcast message is reached.

27. Go back to section 7.2.1, step 6, and repeat the measurement process for the same selected transmitter until the respective tone amplitude generated by that specific DECTalk card is equal to 0 dBm on the AM-48 Test Set (+ 1.2 [\pm 0.5] on the ACP VU meter).

7.2.2 DECTalk NWRSAME Tone Output Level Adjustment

NOTE: 1. The AM-48 Test Set is unable to measure this short-burst NWRSAME tone at the ASM card output. Optionally, an analog AC voltmeter (like the HP 400E) with a 600 ohm load can be used in place of the AM-48. The voltmeter should read -4.5 dBm at the ASM output.

The levels for voice, warning tone, and SAME messages have been selected to optimize detectability by a receiver. This maximizes the transmitter modulation deviation without causing distortion. The levels selected herein assume frequency response of the telecommunications line to the transmitter is relatively flat and the pre-emphasis circuit in the transmitter is within 1.0 to 2.0 dB of the required 6.0 dB per octave. If these assumptions are not correct,

measurements at the audio input at the transmitter site on a case by case basis may be necessary to obtain the optimum modulation (corresponding to a deviation of 4.5 kHz for the NWRSAME tones). If these adjustments to the NWRSAME level are necessary (when based on the levels at the transmitter site audio input), the corresponding levels at the ASM card output should be recorded.

The output level adjustment is as follows:

1. Click the **Emergency Override** hot key on the *CRS Main Menu* for an *Emergency Override window* (see Section 3, Figure 77, of the *Site Operator's Manual*).
2. Select a message type from the *Message Type* display list.
3. Click the **Area Selection** button and specify a listening area/transmitter combination by clicking the **Zones** drop down menu and select **Transmitters**.
4. In the *Choices* section under *Transmitters*, click the transmitter in the displayed list which corresponds to the added ASM card undergoing calibration. The first transmitter name corresponds to ASM card 1, the next transmitter corresponds to ASM card 2, etc.
5. In the *Areas* box, select an area corresponding to the transmitter under test.
6. Click the single arrow under the *Areas* box. This copies the area to the *Areas/Zones* box.
7. Check the *Affected Transmitters* box to ensure only the transmitter under test is bolded.

NOTE: 2. If multiple transmitters appear in bold in the <i>Affected Transmitters</i> box, proceed to the next step. If not, skip to step 10.

8. Remove the area with multiple transmitters by clicking that area (in the *Areas/Zones* box) and clicking the **eraser** icon and the bottom right of the *Areas/Zones* box. This removes the area from the *Areas/Zones* box.
9. Repeat steps 4 through 6 to choose another area.
10. Click the **OK** button to return to the *Emergency Override* window.
11. Select the **SAME Transmitter** button (box turns red) and deselect the **Alert** (box turns grey) to have the DECTalk card output the NWRSAME tones only.
12. Click the **Transmit** button to start the emergency override broadcast of the NWRSAME tones.
13. Observe the VU meter (red scale) and note the reading.
14. Click **Exit**.
15. Wait for the *On the Air Broadcast* window, click the **Stop** button, then click **Exit**.

16. Click the **Delete** button to delete the created emergency override message.

NOTE: 3. The level on the VU meter will be +1.2 (± 0.5) higher than the actual output of the ASM card (i.e., if the output at the ASM card is -4.5 dB, the VU meter will indicate between -3 and -4). If the level needs adjustment, go to step 17. Otherwise, go to section 7.2.3.

17. Select the **Transmitter Configure** window under the *Transmitter* menu (see Section 3, Figure 21, of the *Site Operator's Manual*).
18. Click the selected **Transmitter** from the *Transmitters* list followed by the **Amplitudes** button to access the *Amplitudes* window (see Section 3, Figure 23 of the *Site Operator's Manual*).
19. Move the **SAME Tone Amplitude** slider to increase or decrease the NWRSAME output amplitude, as necessary, to obtain correct level on the VU meter (see step 13). A good starting point on the *SAME Tone Amplitude* is **6**.
20. Click the **OK** button to return to the *Transmitter Configure* window.
21. Click the **Save** button (diskette icon) to save the new DECTalk card *Amplitude* settings.

NOTE: 4. After the **Save** key is clicked, the new settings replace the old values. The new DECTalk amplitude settings are downloaded to the associated DECTalk card. Downloading time ranges from one minute to a several minutes depending on the size of the current broadcast message. The downloading process does not start until the end of the current broadcast message is reached.

22. Return to section 7.2.2, step 1, and repeat the measurement process for the same selected transmitter until the respective tone amplitude generated by that specific DECTalk card indicated the correct level on the VU meter (see step 13).

7.2.3 DECTalk Transmitter Transfer Tone Output Level Adjustment

The output level adjustment procedure is as follows:

1. Select the **Transmitter Configure** window under the *Transmitter* menu (see Section 3, Figure 21, of the *Site Operator's Manual*).
2. Click the selected **Transmitter** from the *Transmitter* list. In the *Attributes* section under *Mode*, if the *Primary* button is red, select the *Secondary* button. Conversely, if the *Secondary* button is red, select the *Primary* button.

3. Click the **Save** button (diskette icon). A popup question window displays with:
Mode has been modified. Do you want to change mode?
4. Click **OK**.

- NOTE:**
1. Changing transmitter mode from *Primary* to *Secondary* sends out 5 seconds of 1800 Hz tone followed by 5 seconds of 2400 Hz tone.
 2. Changing transmitter mode from *Secondary* to *Primary* sends out 5 seconds of 2400 Hz tone followed by 5 seconds of 1800 Hz tone.

5. Measure and record the transmitter transfer tone output level with the AM-48 Test Set connected to the ASM card output jack corresponding to Transmitter X.
6. If the output level of the DECTalk transmitter transfer tones are not 0 dBm (± 1.5 dBm), go to step 7. Otherwise, click the **Exit** button to quit the *Transmitter Configure* window and go to section 7.2.4, step 1.
7. Select the *Transmitter Configure* window under the *Transmitter* menu (see Section 3, Figure 21, of the *Site Operator's Manual*).
8. Click the selected **Transmitter** button followed by the **Amplitudes** button to access the *Amplitudes* window (see Section 3, Figure 23, of the *Site Operator's Manual*).
9. Move the **Transfer Tone Amplitude** slider to increase or decrease the *transmitter transfer tone* output amplitude, as necessary, to match that measured in step 5. A good starting point on the *Transfer Tone Amplitude* is **15**.
10. Click **OK** button to return to the *Transmitter Configure* window.
11. Click the **Save** key to save new DECTalk card *Amplitude* settings.

- NOTE:**
3. After the *Save* key is clicked, the new settings replace the old values. The new DECTalk amplitude settings are downloaded to the associated DECTalk card. Downloading time ranges from one minute to a several minutes depending on the size of the current broadcast message. The downloading process does not start until the end of the current broadcast message is reached.

12. Return to step 2 and repeat the measurement process for the same selected transmitter until the respective tone amplitude generated by that specific DECTalk card, and measured at the associated ASM card output, equals that measured and recorded in step 5.

7.2.4 DECTalk Synthesized Voice Output Level Adjustment

NOTE: 1. The **Voice Amplitude** setting has no effect on the voice level output. The audio level output of the DECTalk card is controlled by the **Volume** setting under **Voice Parameters**.

1. Observe the VU meter to ensure peak deflection is approximately **0** (± 2.0). If adjustment is required, go to step 2. If no adjustment is needed, go to step 12.
2. Click the *Transmitters* menu, then select the **Transmitter Configure** window (see Section 3, Figure 21, of the *Site Operator's Manual*).
3. Click **Amplitudes**.
4. Move the **Voice Amplitude** slider to **25**.

NOTE: 2. All CRS output level measurements and alignments should be made with the AM-48 Test Set connected to the appropriate ASM card output.

5. Click the **OK** button to return to the *Transmitter Configure* window.
6. Click **Voice Parameters**.
7. Move the **Volume** slider to **25** (a good starting point).
8. Click the **OK** button to return to the *Transmitter Configure* window.
9. Click the **Save** hot key to save the new DECTalk synthesized voice amplitudes.

NOTE: 3. After the **Save** key is clicked, the new settings replaces the old values. The new DECTalk amplitude settings are downloaded to the associated DECTalk card. Downloading time can range from one to several minutes depending on the size of the current broadcast message. The downloading process does not start until the end of the current broadcast message is reached.

10. Observe the VU meter to ensure peak deflection is approximately **0** (± 2.0).
11. Repeat steps 6, through 10, as necessary, to obtain proper level.
12. Repeat the four DECTalk card output level adjustments in sections 7.2.1, 7.2.2, 7.2.3, and 7.2.4 on every added DECTalk card output channel in the CRS. Remember, ACP channel select 1 corresponds to ASM card 1 and transmitter 1, channel select 2, corresponds to ASM card 2 and transmitter 2, etc.

NOTE: 4. At the completion of the alignment procedure, disconnect the test equipment and return the system to normal operation.

7.2.5 Live Voice and Digitized Voice Output Level Adjustment

The output level of live voice and digitized voice is controlled by the microphone volume **Mic** control on the front of the ACP. When the index mark of the microphone volume control knob is set to the **Auto** position, voice volume is automatically adjusted by the *Symetrix 425 Voice Processor*. A positive “click” is felt when this mode is selected. When the microphone volume control is not set to the **Auto** position, voice volume is manually controlled. Voice output level is displayed using the VU meter on the front of the ACP.

7.2.6 Matching the CRS Outputs for BUL Operation

For BUL, the operator can adjust the **Tone** volume control on the front of the ACP to adjust the output level for the alert tones, transmitter transfer tones, and NWRSAME tones. During BUL, alert tones and transmitter transfer tones are generated by the ACP. NWRSAME tones are generated by the NWRSAME. The live voice output level is controlled by the **Mic** volume control on the front of the ACP.