

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 64, Console Replacement System Output Channel Expansion (Typical 2 to a Typical 3).

2. Summary:

Request for Change ARH104 authorize CRS expansion for Weather Forecast Office Fairbanks, Alaska (AFG).

3. Effect on Other Instructions:

None.

Distribution:

W/OPS12 - J. Nathan

W/OS612 - B. Ryman

W/OPS13 - J. Sabel (2)

W/AR41 - F. Peters

W/OPS13 - M. Brown

W/AR4x1 - N. Marchbanks

W/OPS16 - A. Morris

W/WFO - AFG - R. Davis

W/OPS32 - W. Hart

COMMUNICATIONS EQUIPMENT MODIFICATION NOTE 64 (for Electronics Technicians)
 Maintenance Branch
 W/OPS12: GSS

SUBJECT : Console Replacement System (CRS) Output Channel Expansion

PURPOSE : To expand the capabilities of the CRS from a Typical 2-channel to a Typical 3-channel configuration

AFFECTED SITES : Site Name SID Org. Code
 WFO Fairbanks, AK AFG WV9261

EQUIPMENT AFFECTED : CRS (B440)

PARTS REQUIRED : The parts required are issued to each site by W/OPS12 from the National Logistics Support Center under the applicable approved site-specific Request for Change.

(2) DECTalk cards (ASN: B440-2A2A11)
 (1) Audio switch module (ASM) cards (ASN: B440-2A6A3)

(2) DECTalk-ASM audio cables (ASN: B440-4W12)
 (1) NOAA Weather Radio Specific Area Message Encoder (NWRSAME)-audio control panel (ACP) interface cable (ASN: B440-1A5W4)
 (1) DOS formatted diskette with CRS test database ASCII files (provided by W/OPS12)

PARTS SUPPLIED BY THE SITE : The following parts shall be provided by the site:
 (1) Transmitter audio output cable (prepared by the site)

(1) NWRSAME (if available)
 Cable marking tags as needed

TOOLS AND TEST EQUIPMENT REQUIRED : #1 and #2 Phillips 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 an RJ-11 plug attached
Anti-static workstation kit

- TIME REQUIRED : 2 Hours
- EFFECT ON OTHER INSTRUCTIONS : None.
- AUTHORIZATION : The authority for this modification are Request for Change ARH104.
- VERIFICATION STATEMENT : This procedure was tested and verified at National Weather Service Headquarters, Silver Spring, Maryland (SLVM2).
- GENERAL : The attachments to this procedure provide the instructions for adding output channels 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 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. A Mod No. of **64** in block 17a.
- A sample WS Form A-26 is provided as attachment **D**.

John McNulty

EHB-7
Issuance 01-18
10/17/01

Chief, Maintenance, Logistics, and Acquisition Division

Attachment **A** - Modification Procedure

Attachment **B** - CRS Hardware Drawings

Attachment **C** - New Configuration Physical Verification

Attachment **D** - WS Form A-26 Sample

Attachment A

Modification Procedure

Attachment A Modification Procedures

Overview

This modification note provides instructions for expanding a Console Replacement System (CRS) from a Typical 2-channel configuration to a Typical 3-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. 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 the expansion modification. This modification contains test messages that should not be broadcast 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.

PART 1-CRS POWER-DOWN PROCEDURES

- 1.1 CRS Application Shutdown Procedure
 1. Click the **System** menu.
 2. Click **Stop System**.

3. 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 front-end processors (FEP). 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 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:
 - a. **cd /**
 - b. Press the **Enter** key.
 - c. Type **/sbin/shutdown -i0 -g0 -y**
 - d. Press the **Enter** key. You may safely power down each CRS processor for the system when UNIX displays 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 equipment:

NOTE: When powering down the MPs, begin with the "Master" and then the "Shadow." After successfully powering down the MPs and FEPs, power down the remaining CRS hardware devices via their respective power switches.

<u>Operators Station</u>	<u>Equipment Room</u>
OMP 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

2.1 DECTalk Card Installation Procedure

NOTE:

Removing and replacing circuit cards must be accomplished in an anti-static work area using approved anti-static procedures.

1. Remove all cabling from 1FEP and 4BKUP, and remove from the equipment rack to the anti-static work area (see attachment **B**, figure A-5).
2. Install the DECTalk cards into slot 4 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. Remove and retain the screws on 1FEP and 4BKUP holding expansion slot cover 4 in place (see attachment **B**, figure A-13).
4. Remove the expansion slot covers.

2.2 DECTalk Card Configuration Procedure

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

NOTE:

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.

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

Module Number	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

NOTE: 3. 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 the two new DECTalk cards with the I/O address: 328. Install the DECTalk cards into slot 4 of 1FEP and 4BKUP. Reinstall the retaining screws.
3. Replace 1FEP and 4BKUP covers using the reverse procedure in section 2.1, step 2.
4. Replace 1FEP and 4BKUP into the CRS rack.

2.3 ASM Card Setup and Installation Procedure

1. Remove the ASA slot 3 cover by removing the two screws.

NOTE: There are five jumpers to be set on each ASM card (see 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 PB1 (mon/playback chan 1)	PB1	DIS (Disable)	PB1	PB	FEP1

2. Take the new ASM card and set the jumpers for slot 3 of the ASA in accordance with table 2.
3. Install the new ASM card into slot 3 of the ASA chassis and tighten the two screws.

2.4 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

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
1FEP DECTalk 5 "J2" Port	ASM PB1 "IN Port"	1-5

2.5 New DECTalk-ASC Audio Cable Installation Procedure

Using write-on cable labels, mark and connect the new DECTalk-ASC audio cables in accordance with table 4.

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

2.6 New Transmitter Audio Output Cable NWRSAME-ACP Interface Cable Installation Procedure

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

NOTE: This completes the hardware modification.

*****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, 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 console screen displays the prompt:

Console Login:

The embedded operating system automatically initializes to a preset 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 OMP 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.

PART 4-CRS LOGIN 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 allow you to type in your assigned login ID and password.

1. Type **admin** (for system administrator) in the *Login ID* field. 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 Test Database ASCII File Loading Procedure

NOTE: 1. The following instructions for loading the CRS test database ASCII assume everything is being done 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 channels 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.

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 4.2, step 2.c, and double click.

NOTE:	<ol style="list-style-type: none">2. The directory selection block has a default directory name of <i>/crs/data/SS</i>, and the file filter block has a default file name of <i>/crs/data/SS/*.ASC</i>. If the desired filename does not appear, it may have copied to the wrong directory in section 4.2, step 2.c. If that is the case, change the default directory name to the directory specified in section 4.2, step 2.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 lowercase, it does not display. Change the filter file name to <i>/crs/data/SS/*.asc</i>, 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.
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 both the "wristwatch" and the "Requesting FEP Switchout" message.
8. Monitor the **FEP1** and **BKUP System Status** icons. Verify the *FEP1* is in the 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 **Maintenance**.
 - b. Click **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 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 **FEP1** and **BKUP System Status** icons and verify the *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 **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 **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 how many channels currently are available, the next available channel 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 the *Mnemonic*.
 - 2) Type **a** and press **Enter** at the program prompt to add the *Mnemonic*.
 - 3) Type **mmmmmm** and press **Enter** (where **mmmmmm** 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) Enter the *Call Sign* in the same manner as the *Mnemonic*, up to a length of 5 characters. The program returns the *Call Sign*.
 - 3) 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 the *Mnemonic* and the *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 verifies a new transmitter is necessary.
- 2) Type **y** and press **Enter**. The program returns the assignment of each channel to its proper processor and slot. A message displays indicating 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 channel is needed. If yes, repeat steps **5a** 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 channels. 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 BUL (buildup live). 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 and 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 screw driver
 - 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 as described in section 7.1.
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 5 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 5. Voltages vs dBm (into 600-ohm load)

dBm	RMS	P-P	dBm	RMS	P-P	dBm	RMS	P-P
10	2.44 0	6.9 3	-4	0.48 0	1.3 5	-17	0.110	0.30 1
9	2.18 3	6.1 7	-5	0.43 0	1.2 0	-18	0.097	0.27 0
8	1.94 6	5.5 0	-6	0.39 0	1.0 3	-19	0.087	0.24 0
7	1.73 4	4.9 0	-7	0.34 5	0.9 6	-20	0.077 5	0.21 5
6	1.54 6	4.3 7	-8	0.30 6	0.8 5	-21	0.690	0.19 4
5	1.37 7	3.8 9	-9	0.27 5	0.7 6	-22	0.061	0.17 0
4	1.22 8	3.4 7	-10	0.24 5	0.6 8	-23	0.054	0.15 2
3	1.09 4	3.0 1	-11	0.21 3	0.6 1	-24	0.048	0.13 5
2	0.97 5	2.7 5	-12	0.19 2	0.5 4	-25	0.043	0.12 0
1	0.86 9	2.4 6	-13	0.17 3	0.4 8	-26	0.039	0.10 8
0	0.77 5	2.1 5	-14	0.15 4	0.4 3	-27	0.034	0.09 6
-1	0.69 0	1.9 4	-15	0.13 8	0.3 8	-28	0.031	0.08 5
-2	0.61 0	1.7 0	-16	0.12 5	0.3 4	-29	0.028	0.07 6
-3	0.54 0	1.5 2				-30	0.024	0.06 8

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. Remember to activate each ASM card output by pushing the respective **Transmitter x** button and then the **Enable** button.