Emergency
Alert
System

Encoder/Decoder

ENDEC

Model 1822

User's Guide and Reference Manual

Version 1.5
For Use with ENDEC ROM Version 6.1 or Higher

Technical Support:
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Harris Corporation Broadcast Division
3200 Wismann Lane
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For update information & downloadable files:
www.broadcast.harris.com/support/sage

FCC Information:

FCC ID MAX1822

The ENDEC is fully compliant with FCC Part 11.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

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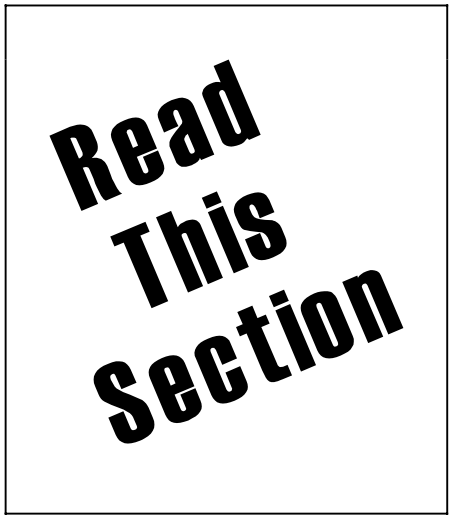
1. Quick Start

This is an update to the original ENDEC manual. See section 16, "What's New" for a description of the recent version 6.1 changes. A mini-manual describing just the most recent changes can be found on the Harris support web site at http://www.broadcast.harris.com/radio/sage.

About this manual:

The ENDEC has been designed to serve many types of users:



- Radio Broadcasters
- TV Broadcasters
- Cable TV Head Ends
- Emergency Services and Public Safety Personnel
- Multi-station Locations
- Heavy Users of EAS
- Light Users of EAS
- LP1/LP2 stations
- Primary Entry Point Stations

As with many manuals, most of the pages are devoted to lengthy descriptions of features that 90% of you won't ever use. Most of the remaining 10% you'll only use once.

With that in mind, the quick start section will excerpt just those instructions that everyone will use at least once. This section is sufficient to get the ENDEC installed on the bench, so you can run a test or two. It also will tell you how to meet the minimum FCC Part 11 requirements. If you read nothing else in this manual, read this. You should read all of it.

You will eventually need to read the detailed sections on hardware and software setup. The Quick Start section assumes you will be entering commands directly at the front panel. See section 7.1, "Hand Control" for information on the hand held remote control.

To put things in perspective, look at the sample procedure sheet at the end of this section. Once the ENDEC is configured with a few options, the procedures your staff needs to know are few. The procedure can be simpler than your current EBS procedures, and the job of relaying the monthly test can be left totally up to the ENDEC.

This version of the manual is aimed primarily at broadcasters, though the concepts are the same for all users.

1.1 What you need to know about EAS

The Emergency Alert System's primary purpose is to allow the President of the United States to gain access, automatically, to the nation's broadcast outlets, to directly speak to the country in times of national disaster. Secondarily, the EAS system can be used by the National Weather Service and State and Local level officials to disseminate other types of emergency information. Your EAS encoder/decoder will receive commands either directly from the source of the emergency information, or from a web of other broadcasters in your area that will relay the information from the primary source.

You must test the equipment on the air at a random time and day of your choice each week. You must receive and relay a test once a month that will probably be issued by one of the primary emergency sources in your area. The ENDEC can be configured by you to send the weekly test with just one button (and a second "I really meant to hit the first button" button). It can also be configured to automatically relay the monthly test and any Presidential messages. To meet the minimum requirements of the FCC, this is all you need to do: send a weekly test, relay the monthly test, and relay the Presidential messages.

You can also configure the ENDEC to relay other types of EAS messages, such as tornado warnings and civil emergency messages.

All EAS message processing is handled by the ENDEC, and it always performs the following basic steps:

1) Detect an EAS message and record the audio portion.
2) Decide whether to put it on the air. The ENDEC may do this automatically, or it may wait for operator input, depending on the options you've selected.
3) Put the alert on the air, by re-generating the EAS digital codes, relaying the recorded audio (which you can replace or delete) and sending the end of alert digital codes.

All of this requires that you:

1) Place the ENDEC (or a remote relay) in the audio chain. TV stations need to have a character generator in the video chain.
2) Hook up receivers or other source of alert data to the ENDEC monitor inputs.
3) Configure your ENDEC with the types of messages you want to relay.

Let's get started.

1.2 Bench Testing

Just a quick note here about bench testing. The ENDEC includes an internal speaker. Make sure the factory installed jumper on the back on the ENDEC between the Speaker Out and Speaker In terminals is installed. If you send an alert, you'll hear it through the internal speaker. All of the ENDEC functions except for relay of a pending message can be bench tested. If you have two ENDECs, you can use one to send a message to the other in a bench test by wiring the Speaker Line Out of one ENDEC to the Monitor 1 In of the other ENDEC, and a second wire from any Audio Common of one ENDEC to an Audio Common on the other ENDEC.

1.3 Hookup

An annotated diagram of the ENDEC front and back panels are provided in section 3. Refer to them if you need additional information. You'll need to:

1) Connect power. Use the supplied 15V 1A power cube.
2) Connect your monitor audio sources to the ENDEC monitor inputs, 0dbm audio level, not to exceed 2Vrms. Sage sells a professional quality multi-channel receiver with excellent sensitivity and selectivity. Connect as many audio sources as you have monitoring requirements to the monitor input terminals on the back panel of the ENDEC (one source per input terminal). By default, Mon1 and Mon2 will be scanned for EAS messages. If you use other monitor inputs, you must select them for scanning as well, use **MENU.CONFIG.SCAN SELECT,** see section 11.43.
3) Put the ENDEC into the audio chain (after you have set the parameters and done some bench testing and familiarization). The point of EAS is that the alert can go on the air automatically, so the ENDEC will need to be able to switch out your program audio and switch in its alert audio. The easiest way to do this is to use the included Main Audio IN and Main Audio Out XLR connectors on the back of the

ENDEC to place the ENDEC between the console and other station audio sources and the transmitter (or STL). The ENDEC is usually placed before any audio processing[1], see Figure 1-1.

4) If you are a TV station, place the character generator in the video chain and connect the ENDEC to the CGEN with a serial cable. Cable pin descriptions are in section 12. Use **MENU.DEVICES.*PORT*.DEVICE TYPE.VDS CGEN** or **MENU.DEVICES.*PORT*.DEVICE TYPE.CODI CGEN**

5) Connect any other options, such as hand held remote controllers or LED signs.

6) Enable the printer with **MENU.CONFIG.PRINTER.YES** and load paper into the printer, as described in section 13.1, "Loading Paper". Paper feeds in to the slot with the coated side down, see the diagrams in section 13.1.

7) Configure the ENDEC software options as discussed below.

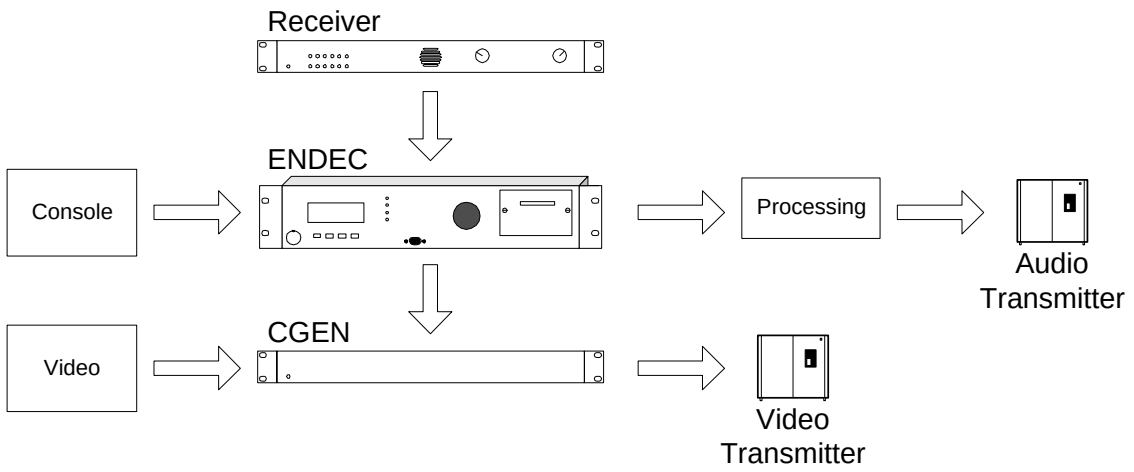


Figure 1-1. Typical ENDEC placement.

1.4 Customizing

Although there are many options in the ENDEC software, you only need to set a few to meet the minimum FCC requirements. These are described in a minimal manner here, see section 3 for complete details.

The first time you power up the ENDEC (and every time until you set a local area), the ENDEC will flash the "Automatic" led. This is an indication that an error message has been stored in the message buffer. Use the MSG soft key to read the errors (scroll the messages with the up and down keys). The error message for first time power up is "Local Area not defined", which is described below.

1.4.1 Menu Basics

First, some menu basics. The four buttons on the front of the ENDEC are used in two ways - as soft keys, and for menu navigation.

[1] We have tested the ENDEC with processing. While it is probably possible to adjust (or mis-adjust) processing so that EAS alert data will not pass through in a way that will be decodable, we had no trouble with processing during testing. The FCC has certain minimum modulation levels in Part 11.

Most of the time, the bottom line of the four line LCD display is used as labels for soft keys, that is, the key directly beneath the soft key label will do what the label says. The label will change depending on what configuration you are performing.

Look at the ENDEC front panel. Once you turn on the ENDEC and it completes the self test, the display looks like this:

```
04/28/96 15:32:14


MENU WEEK       MSG
```

This shows the time of day on the top line (in local, 24 hour format), and soft keys on the bottom line. In this case, there are three keys, the MENU, WEEK, and MSG. The third button to the left does not have a label in this example and is not used. If you push the menu button, you will then see the menu and will use the four buttons as navigation keys.

Once you push the "MENU" soft key, the display changes to this, called the "default screen".

```
04/28/96 15:32:14
   **  go back **
-->*Alert
    Printer Feed
```

In this mode, you use the physical lettering on the ENDEC front panel to identify the keys. To select the menu item pointed to by '-->', press the key labeled "Enter". To move down through the menu list, press the key with the downward pointing arrow head: ▽

Pressing the down key will change the above display into this:

```
04/28/96 15:32:14
   *Alert
--> Printer Feed
    Practice
```

To scroll upwards through the menu, press the key with the upward pointing arrow head. △

To move up one menu level, scroll up until the '-->' points to ** go back** and press enter. You can also press the second button from the left, between ENTER and △.

Navigating menus is a process of selecting the item you want to do next. For example, to change the call sign option, you want to select the configuration sub-menu.

1) Assume the ENDEC display shows the default screen. Press the MENU soft key (the left-most button) to enter the menu. Then press the down key until you see the selection arrow pointing at *Config. Press the Enter key to select it.
2) Next, scroll down through this menu by pressing the down key until the selection arrow pointing at "Call Sign". Press enter to select it.
3) You will be prompted for the Administrators password. The default password is '1111', press the enter key four times.
4) You now see a screen with soft keys, labeled "done" "curs" "up" "down". Use the "Curs" key to move the cursor around. The cursor is the little underline underneath a character in the call sign. The

character above the cursor will be the character changed by the up and down key. Use the up and down key to change the characters in the call sign from "SAGE" to your station identifier[2].

```
04/28/96 15:32:14
Call:SAGE
     -
 done curs  up  down
```

5) Press the "done" soft key to complete the process.

Note: While you are learning menus, it is a good idea to increase the menu time-out time. This is the number of seconds the ENDEC will remain in the menu mode before returning to the default screen. The default is 30 seconds. Use **MENU.CONFIG.MENU TIMEOUT** to change this value.

There are three other useful features in the menu mode.

1. If you hold down a key, that action will repeat. This is handy when moving from on end of a list to the other, or when entering numbers.
2. The second button from the left can be used to go up one menu level, if it does not have a softkey label.
3. If you hold down the two buttons on the right, they will act as an "abort" and will take you to the default screen.

1.4.2 Passwords

The ENDEC uses two passwords, a user level password, called "password", and an administrators password, called "admin". The user password will allow you to originate or relay an alert, the admin password allows you to modify the configuration parameters. A password is from 0 to 8 digits long, the digits are 1, 2, 3, or 4. You are prompted to either "enter password" or "enter admin" and are given four soft keys. Press the numbered key to enter the password. The password unlocks access to the appropriate levels of the menu. Access remains open until you exit the menus and go back to the default screen.

1.4.3 Menu Annotation Format

This manual uses a short hand format to describe the menus. In the call sign setting example above, you moved from the menu level to the config level to the call sign level. In our short hand format this would be abbreviated as **MENU.CONFIG.CALL SIGN.** Menu abbreviations always appear in this font. Another abbreviation would be **MENU.MONITOR SOURCE.MON 3 IN**. This means: press the menu soft key, scroll to "monitor source", press enter, scroll to "mon 3 in", press enter.

1.4.4 Doing the Minimum

You must perform at least the following setups. Each is described in more detail later in this manual. All of the menu abbreviations are in the index.

1) Set the call sign, use **MENU.CONFIG.CALL SIGN**. A detailed example was given above in section 1.4.1.
2) Set your local area. This is the area that your weekly test messages will be sent to. It will also be used as the location list for any filter or header that includes "local area". To start, go to **MENU.PRESETS.LOCAL AREA**. Then:

Select **new** to add a new location[3].

---

[2] The identifier can be any ID, from one to eight characters in length, that serves to identify you. Some State EAS Plans will define what ID you are to use.

[3] Use the **PREV** key to view and delete previous entries.

You are prompted to select a state. Use the **Next** and **Prev** soft keys to scroll through the list of states, US possessions are at the end of the state list. Select a state with **Pick** soft key. The state you select will be remembered during this session.

You are then prompted for a county, island, or other state sub division. Use the **Next** and **Prev** soft keys to scroll through the list of locations. The first choice is "all of" the state or possession, it would be unusual to pick an entire state as your local area. Select the area with the **Pick** soft key.

You are now prompted with **Done**, **Delete**, or **Division**. Use **Delete** if your previous selection was in error. Use **Done** if you do not want to pick a sub division. It would be unusual to use a sub division for your local area.

Use the **Done** soft key again to exit the local area entry mode, or use new to add another location code to your list. Some stations might serve more than one county as its local area. You can also add location codes to specific input filters and output headers, the local area serves only as a short-hand for "my local counties".

3) Enable the printer. To use the printer, select **MENU.CONFIG.PRINTER.YES.**

4) Set the time of Day. Use the **MENU.DATE/TIME** menus. Set the following items.

UTC Offset	The number of hours you must add to the local time to get UTC time, -12 to +12. Always enter this with respect to standard time, not daylight savings time. Some typical values Eastern Standard Time +5 hours Central Standard Time +6 hours Mountain Standard Time +7 hours Pacific Standard Time +8 hours Alaskan Standard Time +9 hours Hawaiian Standard Time +10 hours Locations east of the international date line use negative numbers.
Daylight Enable	If you want the ENDEC to account for daylight savings time, choose YES for this option, otherwise choose no. Most locations will choose YES except for states or areas that do not switch to daylight savings time.
Year, Month, Hour, Minute, Second	Enter the current local time. If you are in daylight savings time, enter that time, otherwise enter standard time.

By default, Mon1 and Mon2 will be scanned for EAS messages. If you use other monitor inputs, you must select them for scanning as well, use **MENU.CONFIG.SCAN SELECT,** see section 11.43.

That is the end of the required configuration changes. Turn the ENDEC off then on to clear the blinking Automatic light.

1.4.5 Sending a Weekly Test

The FCC rules requires you to send a weekly test at a random day and time. You need not send a weekly test in a week where you relayed or originated a monthly test.

To send a weekly test, press the **WEEK** soft key at the opening menu, or the WEEK key on the hand held remote control. Then press the **Proceed** soft key. This will send a weekly test for the location(s) you set in **MENU.PRESETS.LOCAL AREA**. If you define the Manual Override input as "Hold Off", the ENDEC will work with your automation equipment to play the weekly test after the next commercial stop set.

1.4.6 Relaying a Monthly Test

The default filters will automatically relay an incoming Required Monthly Test that includes your local area with a five minute countdown. This means that you can send the message sooner, or let it go automatically five minutes after it came in.

To send the message sooner than the time-out period, press the **pend** soft key at the default screen. The **pend** key will only be present if a message is pending.

To review the written contents of the message, use **PEND.OPT.VIEW** or use the default screen's MSG soft key**.**. To send the message, use **PEND.SEND.** To hear the audio , use **PEND.CUE**. If you have a hand held remote control, you can also use the "play now" key to send the alert, and the "cue" key to hear the audio.

1.4.7 Sample Instruction Sheet

Here is a starting point for a one page guide for station personnel for sending a weekly test and relaying a monthly test. This procedure assumes that the audio and video is in-line so that the ENDEC has full control. If you set the user password length to zero with **MENU.CHANGE PASSWORD.LENGTH**, the password prompt is not given. This simplifies the procedure but adds a risk of unauthorized access. If you write the password in the procedure manual, the point is somewhat moot.

Weekly EAS Test

Our station is required to send a weekly test message using the Emergency Alert System encoder. Once a month, the monthly test is done in place of the weekly test. The weekly schedule is _____.

To send a weekly test:

1. Push the button underneath the word "WEEK" on the ENDEC display screen.
2. Enter the password: 1111
3. You are now given a "Proceed" or "Abort" option. You have 4 minutes to start the weekly test, otherwise the menu will time-out. When the time comes for the weekly test, press the button under "PROCEED".

The Outgoing Alert light will light. When it goes out, the test is complete.

Here is the text of a Monthly Test instruction sheet. Again, if you use the manual override input as a hold off, the ENDEC will hold the monthly test until you want it to go, in either automatic or manual mode. The Decoder Active Relay will close when an alert is pending. These instructions assume you have placed a strobe light (that you supply) across this relay. See section 5.7, Relay Programming, and 4.5, "Relays" for details.

Monthly EAS Test

Our station is required to relay a monthly test message using the Emergency Alert System encoder. Once a month, the monthly test is done in place of the weekly test. The schedule is_____.

To relay a monthly test:

1. The EAS flasher will flash when any EAS message we have chosen to handle is received. Wait until the entire alert is received - the ENDEC will display "P REQUIRED RMT" and a count down timer. If you take no action, the alert will automatically play when this timer reaches zero.
2. If you want to relay the alert sooner, push the button underneath the word "PEND" on the ENDEC display screen.
3. Enter the password: 1111
4. Press the button under "SEND"
5. You are now given a "Proceed" or "Abort" option. You have 4 minutes to start the relay, otherwise the menu will time-out. When the time comes, press the button under "proceed".

The Outgoing Alert light will light. When it goes out, the test is complete.

You may wish to add a step to review the audio before air - press the **cue** soft key before pressing the **send** soft key. You can also replace the audio with your own on-air staff before relaying it, this is described in the main section of the manual.

The instructions for relaying a live message are the same as Monthly Test, though you are more likely to require a review of the incoming audio before relay.

Presidential messages will relay automatically and immediately with no operator intervention.

2. Introduction to EAS

This section describes the Emergency Alert System as mandated by Part 11 of the FCC rules. This section is based on the EAS rules as they existed in early 1996. You should review Part 11, and any updates that may be issued from time to time.

2.1 The National View

The Emergency Alert System is mandated by Congressional order and renewed annually by Presidential decree as a method of providing the President of the United States with a vehicle for reaching the American public in times of grave national emergencies such as nuclear war, impending asteroids or large scale terrorist acts. To date, the Emergency Action Notification Network (EAN) has never been used by any President of the United States and we all hope it never will be. In November 1995 the Federal Communications Commission and the Federal Emergency Management Agency disassembled the EAN which consisted of numerous broadcast and other communications networks linking the White House to broadcasters. The current national EAS system is based on the President getting a message to 33 primary entry point (PEP) broadcast stations which would then disseminate it to state primary stations and then filter through the EAS network. Presently, the PEP network consists of a dial out conference bridge designed to link the 33 stations via telephone line to the White House or wherever the President is. As a broadcaster, you are obliged to carry any Emergency Action Notification (EAN) messages without delay. These messages will last an indeterminate length of time, therefore you need to open the communications channel and have the ability to transmit the digital data and the voice messages that follow for as long a period of time as required. At the conclusion of the national alert an EAT or Emergency Action Termination message will be transmitted closing the channel from the White House to the broadcast stations.

It is contemplated that this network will be tested periodically with a National Periodic Test (NPT) to verify its readiness. There is talk about reestablishing some of the former network links as a backup to the PEP network to reinforce the ability to get the messages to broadcasters if there is severe damage to the public switch telephone network.

Participation at the national level is mandatory for all but Class D non-commercial educational FM stations, and LPTV stations. You may petition the FCC to become a “Non Participating National” station, but you must still receive and broadcast the EAN code, and then leave the air. Class D non-commercial FM stations and LPTV stations do not need to transmit the EAN codes, but they must leave the air. LPTV stations that are television broadcast translator stations only need not comply with part 11.

2.2 Your Local Area

FCC Part 11 mandates that each state must have a State Emergency Communications Committee (SECC) made up of broadcasters, cable operators, the emergency management community and the public. The SECC establishes a statewide EAS plan which must be approved by the Federal Communications Commission. The State plan will detail monitoring requirements, interconnection between emergency management and the broadcasters, and will set protocols and priorities for activating the Emergency Alert System in your area. In most states, Local Areas will be defined within the state which will have their own plans which tie into the State plan. These Local Area plans may be organized on a county or regional basis and are designed for use in limited emergency situations. The operational plans may even define local activation of EAS down to a city or community for very limited emergencies such as hazardous material spills on highways and limited brush fires.

Your responsibility on the local level is voluntary. Good judgment however dictates that broadcasters and cable operators will participate on the local level by transmitting severe weather warnings, hazardous material release details, information about earthquakes and other natural and manmade disasters. It is contemplated that EAS could be activated on the local level by a 911 center, a fire chief, or even a sheriff.

In the future, depending on your operational area plans, it may be possible for mobile vehicles belonging to the police or fire department to activate the EAS and speak directly over the radio, television and cable facilities for severe local emergencies.

2.3 Your responsibilities

As broadcasters and cable operators, you are obliged to follow the rules as stated in FCC Part 11. The only mandatory requirements are that you have installed and made operational equipment capable of receiving and transmitting EAS alerts by January 1, 1997 if you are a broadcaster; and January 1, 1998 for some cable operators. The utilization of this equipment is voluntary except for retransmission of national EAN alerts and the transmission of required weekly and required monthly tests.

The weekly tests will consist of digital data only and can be transmitted anytime of the day or night in weeks when the monthly test is not conducted. The weekly test will have no test script, and no two-tone transmission. The rules say that the weekly test will be done on a random basis at all radio, television and cable facilities as a method of verifying the operation of the equipment and the communications networks.

The monthly tests will be coordinated with all broadcasters in a Local Area. The monthly test may originate, on a rotating basis, at the National Weather Service, state, county and local emergency operating centers and other locations where the EAS network can be activated or it may be activated by the LP-1 station. Broadcasters need only relay the monthly test within 15 minutes of receipt and log the receipt of an incoming monthly test to be in compliance. Monthly tests will be conducted in odd numbered months between 8:30 AM and local sunset and in even numbered months between local sunset and 8:30 AM. Monthly tests consist of a digital header, 8 seconds of two-tone, a voice announcement, and end of message digital data. State and local Communications Committees can set the schedule for the required monthly tests in advance so that these dates can be noted on program logs.

2.4 The EAS Alert Format

The EAS system distributes EAS Alerts. The format of an EAS alert is standardized and is defined by the FCC. The parts of an alert are shown in Figure 2-1.

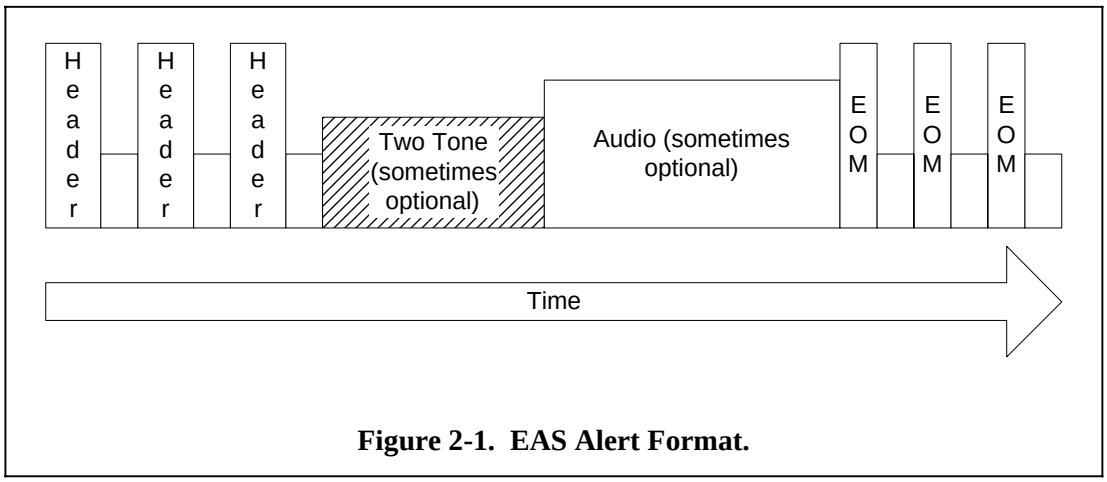


Figure 2-1. EAS Alert Format.

The parts of the Alert are:

Header	FSK (frequency shift keyed) data at 520.83 baud, 2083.3 Hz and 1562.5 Hz tones. The header is sent three times with a second of silence after each one. The header contains encoded data describing the type of alert, and is described further below. Part 11 specifies that the tones must modulate your transmitter at 80% of full channel modulation limits.

Two Tone	The old EBS alert signal, two simultaneous tones at 853 and 960 Hz. Again, Part 11 specifies that at peak modulation levels each tone must modulate the transmitter at no less than 40% (80% combined peak). The Two tone signal is only required for Monthly Tests and National Level messages (EAN and EAT). It is not required for weekly tests.
Audio	An EAS alert may include an audio message, if so, it appears here.
EOM	The End Of Message (EOM) data is sent here, a total of three times, using the same transmission format as the Header.

Each of the three copies of the "header" in the alert is identical, and is made up of the following parts:

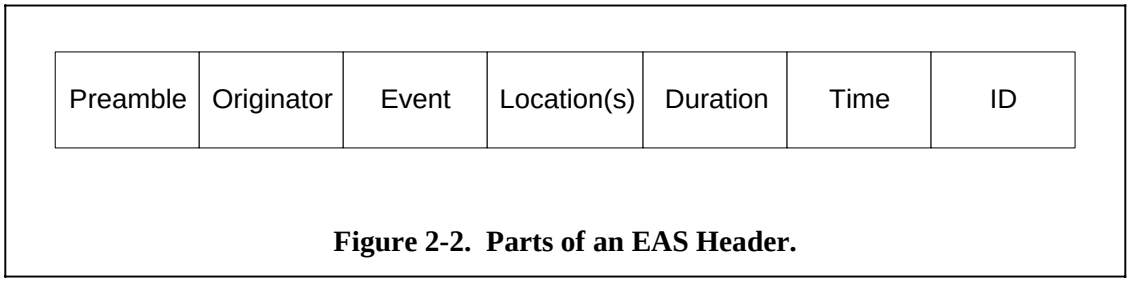


Figure 2-2. Parts of an EAS Header.

The parts are:

Preamble	A sequence of characters lasting about one quarter second, used to synchronize the data stream.
Originator	Describes who originally activated the EAS. Included are Broadcast or Cable, Civil Authorities, the National Weather Service, a Primary Entry Point station, or the national level Emergency Action Notification Network.
Event	Describes why the EAS was activated. The FCC has defined several, mostly weather related events. You can add new events, though they must be coordinated with your state plan. See Table 5-1 in section 5.4 for a list of the pre-defined codes.
Locations	Describes the state or county that the event applies to. About 3300 locations are pre-defined. You can add new locations, though they must be coordinated with your state plan. Up to 31 locations (including all of a state) can be present.
Duration	The length of time that the alert remains valid (starting at the origination time).
Time	The origination time.
ID	Eight characters that identify the sending station. Note that this will be the station that relayed the message to you, and not the station that originated the message.

Depending on the number of locations, one repetition of the header will take one to four seconds to send, or six to sixteen seconds for all three and the pauses.

There are many more subtleties of the EAS system. The ENDEC will handle the technical elements of the protocol and signaling requirements. You should review Part 11 to make sure your station is in compliance with the operational requirements of EAS.

3. Introduction to the ENDEC

3.1 Front Panel

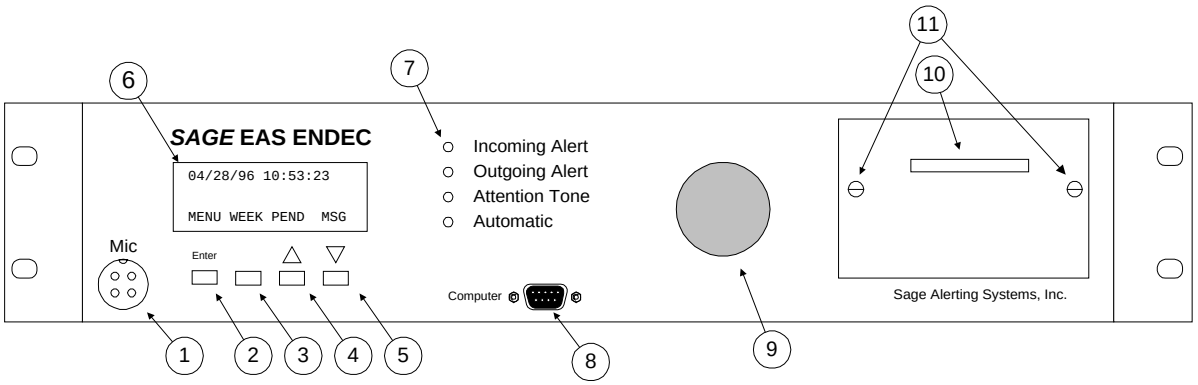


Figure 3-1. ENDEC Front Panel.

Item	Name	Description
1	Mic Jack	For public safety applications, a connector for a push-to-talk microphone. For low level input (15mv - 150mv). See section 4.2, “Audio”, and section 12.4, “Microphone Connector”.
2	Enter Button	Used to select an item in menu navigation, or as a soft key.
3	Soft Key	Used as a soft key button. In menu navigation, will go up one level in the menu.
4	Up Button	Used as a soft key. In menu navigation scrolls up.
5	Down Button	Used as a soft key. In menu navigation scrolls down.
6	4 line by 20 character back lit LCD display	Used for programming the ENDEC and to read the contents of alert messages. The contrast can be adjusted with **MENU.LCD CONTRAST**, see section 11.53.
7	LEDs	• Incoming Alert. Lit when an incoming alert is detected. Stays lit if that alert is selected for relay until the alert is relayed or deleted. • Outgoing Alert. Lit when an alert is being sent. • Attention Tone. Lit when an Attention signal is being received. • Automatic. Lit when the ENDEC is in automatic mode.
8	Serial Port	The “computer” port. It can be assigned to any device, see sections 4.4, “Serial Ports”, and 12 “Connector Descriptions Serial Port Pin Out.” This port is on the front for convenient access if the ENDEC is rack mounted.

Item	Name	Description
9	Internal Speaker	The internal speaker carries alert audio and it can be used to monitor any of the incoming audio channels. It is fed from the back panel “speaker in” terminal - usually jumpered to the speaker out terminal, it can also be routed through the console to allow muting.
10	Paper Slot	Paper from the internal printer exits here. To tear the paper, pull up using the top edge of the slot as a cutting bar.
11	Thumb Screws	To gain access to the printer, remove these screws and pull off the cover plate. See section 13.1, “Loading Paper”.

Table 3-1. Front Panel Descriptions.

3.2 ENDEC Back Panel

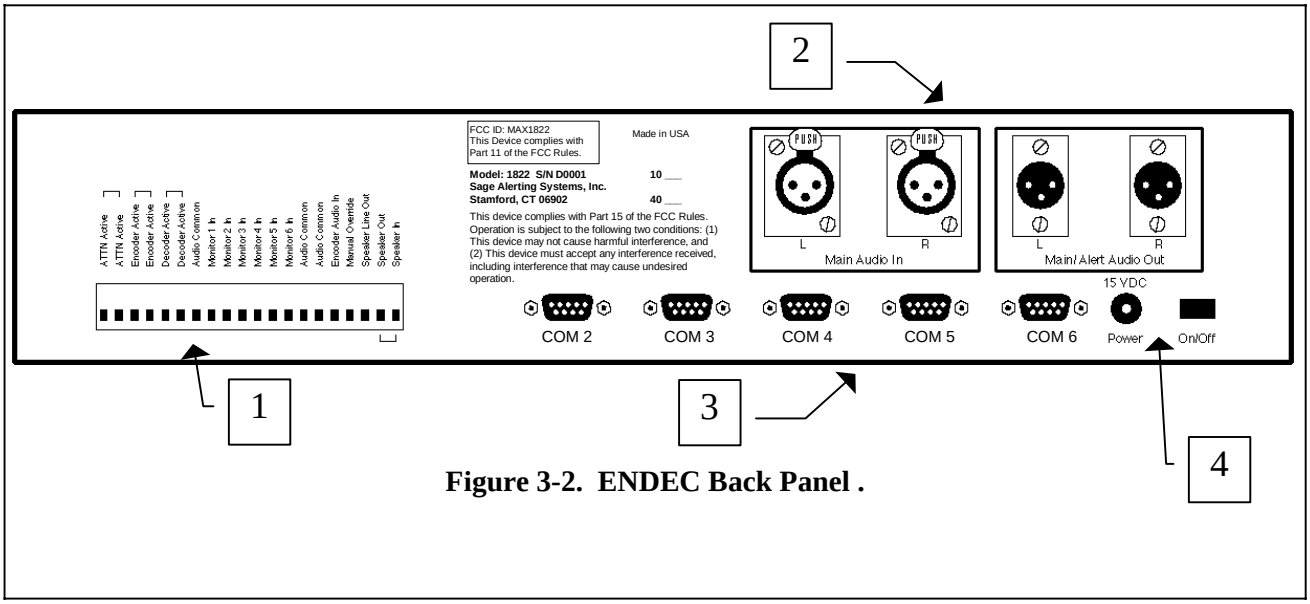


Figure 3-2. ENDEC Back Panel .

Item	Name	Description
1	Terminal Strip	This terminal strip is removable. The signals found here are listed below
1	Attn Active	A relay that opens and closes according to an assigned program, see sections 4.5, “Relays”, and 5.7, “Relay Programming”. The default action is to close when an Attention Signal is being received. When closed, these two terminals are shorted together. See section 4.5, “Relays”.
1	Encoder Active	A relay that opens and closes according to an assigned program, see sections 4.5, “Relays”, and 5.7, “Relay Programming”. The default action is to close when an alert is being sent. When closed, these two terminals are shorted together. See section 4.5, “Relays”.
1	Decoder Active	A relay that opens and closes according to an assigned program, see sections 4.5, “Relays”, and 5.7, “Relay Programming”. The default action is to close when an alert is being received, or is pending. When closed, these two terminals are shorted together. See section 4.5, “Relays”.

Item	Name	Description
1	Audio Common	Grounds for the various unbalanced audio inputs.
1	Monitor In 1 - 6	Unbalanced 600 ohm inputs for alert audio sources ., .75Vrms typical, do not exceed 2Vrms.
1	Encoder Audio In	A high level audio input for locally originated audio.
1	Manual Override	A digital input that can be read by the ENDEC as open (floating) or closed (ground). Used for various options such as alert hold off or sending a Weekly Test.
1	Speaker Line Out	Unbalanced 600 ohm output for alert audio or monitoring the inputs.
1	Speaker Out	Separate unbalanced 600 ohm output, can be used for an external speaker or to feed the internal speaker through Speaker In.
1	Speaker In	The internal speaker, usually fed from Speaker Out. The path is made available on the back panel to allow routing through a console for muting.
2	XLR In and Out	Stereo input and output connectors for station audio. The ENDEC normally passes this through on a hard relay (no audio processing). During an alert, the output is switched to the ENDEC's internal sources.
3	Serial Ports	Five serial ports, COM2 through COM5. See section 4.4, "Serial Ports".
4	Power	Power input and power switch. Use the power cube supplied with the ENDEC, 15v, 1A.

Table 3-2. Back Panel Descriptions.

3.3 Memory - What's Saved and What Isn't

There are four types of storage in the ENDEC. Each type and what it is used for is discussed below.

3.3.1 Permanent Read Only Memory

The ENDEC's software program, and the default list of events, originators, and county (FIPS) codes are stored in 256kx8 EPROM. The events, originators, and county codes can be supplemented or overridden by storing updates into long term storage.

3.3.2 Long Term Storage

All of the configuration parameters, that is, anything set with **MENU.CONFIG**, **MENU.DEVICE**, **MENU.PRESET**, etc.; outgoing templates, incoming filters, incoming and outgoing alert logs, remote control macro keys, and new or modified events, originators, and county codes are stored in an 8k by 8 EEPROM. Items stored here are retained even when power is off. This memory does not require a backup battery and will last at least one hundred years.

3.3.3 Battery Backed Storage

A lithium battery is used to retain the time of day when the power is off. It is also used to retain the list of recently heard alerts. The life of the lithium battery depends on the amount of time the ENDEC is powered off, and on the presence of the Non-Volatile Audio option.

If the Non-Volatile Audio option is present, either 10 or 40 seconds of Audio can be stored and retained when power is off. The installed option is marked on the ID label on the back of the ENDEC, either 10 or 40.

If the battery begins to fade, the time of day may revert to Jan 1, 1995, or the stored audio message will degrade. See section 13.3, “Changing the Battery (time and NV audio)” for information on changing the battery.

3.3.4 Volatile Memory

The two minute long digital audio store is kept in DRAM and will be lost if the ENDEC is turned off.

4. ENDEC Hardware Setup

This section describes how to set up the ENDEC hardware, including the printer, audio inputs and outputs, and serial data inputs and outputs. Not all installations require use of all hardware features.

4.1 Printer

The FCC requires all sent and received alerts to be logged and retained. The ENDEC has an internal printer for this purpose. The ENDEC is shipped without paper. You must install the paper and enable the printer, using the procedures in section 13.1, “Loading Paper”.

4.2 Audio

The ENDEC has the following audio ins and outs:

Main Audio In, Left and Right	Audio from your audio chain is inserted here, and is routed through a hardwired relay that passes your audio in the de-energized state. The ENDEC does not need power to pass your audio through. The ENDEC does not sample, pick off, or affect your audio in any way in the pass-through mode. See Figure 4-2.
Main /Alert Audio Out, Left and Right	The ENDEC passes through whatever audio is on the Main Audio In connectors until an alert occurs. The internal ENDEC audio is then switched to these outputs. The output is balanced, 600 ohms. The ENDEC output is fed to both L and R channels.
Speaker Out	Alert audio is also sent here. Speaker Out can also be used to monitor any of the inputs except Main Audio In. Speaker out is jumpered to Speaker In with an external wire on the main terminal strip. You can provide an external speaker/amplifier, or you can route the Speaker Out to Speaker In through a console mute switch.
Speaker Line Out	A copy of Speaker Out with a separate level control.
Monitor 1 - 6 In	Six monitor inputs are provided. Each is monitored for EAS data. Use these inputs for your monitoring assignments. Any audio source can be used, 600 ohms, unbalanced, use any Audio Common for ground. Any level from 200mv to 2V can be used, though all of the monitor inputs should be at the same level so that the output levels from the stored audio are at the same level. **Warning - do not use amplified speaker level outputs to feed these inputs. Exceeding the 2Vrms level will result in poor audio, exceeding 10Vrms will damage the ENDEC (specifically U33, U34, U52, and U53).**
Encoder Audio In	This input is the same as the monitor inputs except that it is not checked for FSK data. This input is used to provide audio for real-time alert origination, or as an input to record audio in either the two minute volatile store or the 10 or 40 second non-volatile audio store. **Warning - do not use amplified speaker level outputs to feed this input. Exceeding the 2Vrms level will result in poor audio, exceeding 10Vrms will damage the ENDEC (specifically U33, U34, U52, and U53).**
Mic In	This is the only audio input on the front panel. It is meant for use in public safety applications where a push-to-talk radio microphone is more common. Input level can be as low as 16mv for high settings of **MENU.LEVEL.MIC** or as high as 170mv for low settings of **MENU.LEVEL.MIC.** See section **12.4**, “Microphone Connector” for a description of the connector.

Table 4-1. Audio inputs and outputs.

In the normal state, the ENDEC passes audio directly from the input XLR connectors to the output XLR connectors. It also monitors all of the input channels for alert activity. When an alert is heard, the ENDEC stores the audio in the digital recorder. When an alert is originated or relayed, the ENDEC generates the FSK data tones and two tone signals and replays the audio.

The ENDEC is designed to have the audio chain pass through, though you can supply your own remote audio switch and drive the switch with one of the ENDEC programmable relays. Use a relay running the PTT program, section 5.7, Relay Programming.

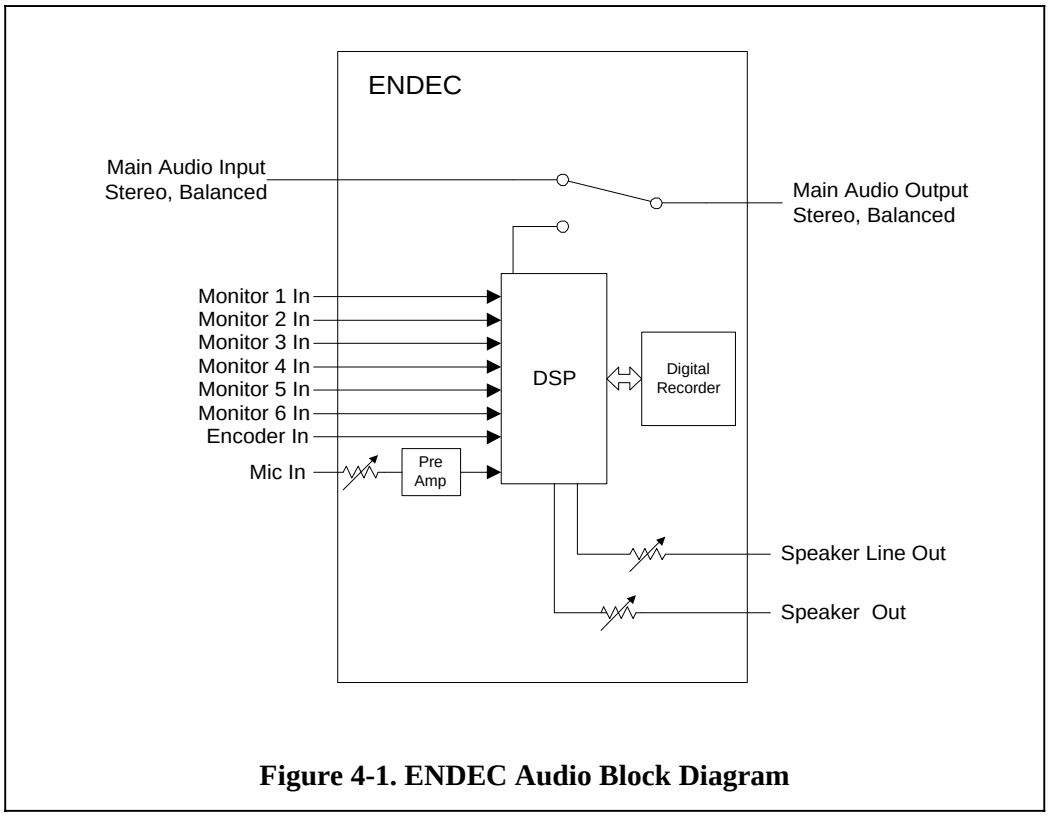


Figure 4-1. ENDEC Audio Block Diagram

During an alert, the alert audio is sent to all audio outputs:

- Speaker Line Out, unbalanced, 600 ohms.
- Speaker Out, unbalanced, 600 ohms
- Main / Alert Audio Out right and left, balanced, 600 ohms.

If you do not want to pass audio through the ENDEC, you may feed your audio switch or console from any of these sources. The Main/Alert Audio out is only active during a live alert. The speaker and speaker line out can be active at any time if the **MENU.MONITOR SOURCE** command has been used to directly monitor any of the inputs. These inputs are also active when an alert is being received or when alert audio is being previewed.

Figure 4-2 shows the wire and pin numbers of the XLR connectors. Both left and right are identical.

Speaker Line Out and Speaker Out are on the long terminal strip. Use any of the audio common terminals as ground.

Speaker Out can be used to drive the internal ENDEC speaker by connecting speaker in and speaker out. This is the factory default. By routing Speaker Out through an external console mute switch, the ENDEC can be used in-studio.

Speaker Out and Speaker Line Out have separate level controls, use the **MENU.LEVELS.SPEAKER** and **MENU.LEVELS.LINE OUT.**menus to adjust.

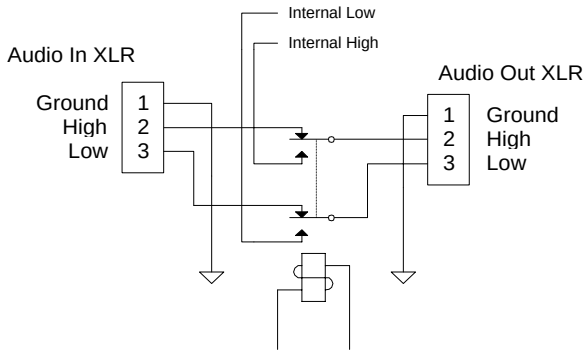


Figure 4-2. Main Audio XLRs, one channel. Left and right are identical.

The XLR output levels are controlled by setting the levels of each element of the alert. Separate level settings are available for the two tone signal, the FSK data, and the digital recorder playback. The high and low tones of the two tone and the data are individually adjustable as "pre-emphasis" should there be any "twist" in the transmission line.

4.3 Audio Levels

Refer to Figure 4-1. All alert audio passes through the ENDECs DSP processing section. The DSP sets the levels for the data, two tone, and digital audio playback. These levels directly drive the XLR audio outputs. The Speaker Out and Speaker Line Out levels use the DSP level as a starting point, and then apply a level to the DSP output. If you use the XLR outputs, set the levels for them first, then adjust speaker out and speaker line out.

To adjust a level, go to **MENU.LEVELS.** General menu access procedures are discussed in the quick start section 1.4.1, Menu Basics. As a review, specific button presses will be given here.

1) Go to the default screen. The easiest way to get there from anywhere in the menu structure is to hold down the last two buttons simultaneously. The default screen looks like this:

```
04/28/96 15:32:14


MENU WEEK       MSG
```

2) Press the button directly under "MENU" (called a soft key).

```
04/28/96 15:32:14
   **  go back **
-->*Alert
    Printer Feed
```

3) Press the down button (∇) repeatedly until the selection arrow (-->) points at "*Levels"

4) Press the enter button.

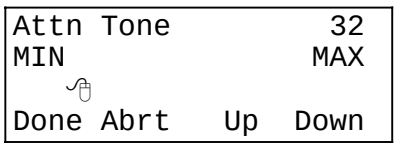
5) Press the down button until the selection arrow points at the level you want to change, for example, "Attn Tone"

6) Press the enter button.

7) If prompted, enter the Admin password. The default password is 1 1 1 1, enter it by pressing the enter key four times.

8) You are asked if you want the XLR relay to close while the level is being set. If you select Yes (by pressing the key under "Yes"), the Main Audio XLR relays will close, routing audio to the left and right output channels. If you route your station audio through the ENDEC this will replace your station audio. Be sure that is what you want to do. The tone being adjusted will also be put on Speaker Out and Speaker Line Out. If you choose NO (by pressing the key under "No") the tone will appear on Speaker Out and Speaker Line Out only.[4]

9) The level setting screen looks like this:



Attn Tone is the level being adjusted. "32" is its current setting. Levels range from zero to some maximum depending on the nature of the level. EEPOT levels such as MIC, Speaker, and Line Out have a maximum of 64. DSP derived settings have a maximum of 127. The number is an arbitrary linear scale, as the actual volts seen at the port depends on the load. The black square ( ) is the scale marker. It shows where in the range of min to max the current setting lies. The marker will move to the right as the setting is made larger.

10) Adjust the level by pressing the Up and Down buttons. Hold down the button to move the level more quickly.

11) To abort without changing the stored level parameter, press the button under Abrt.

12) To exit and store the changed value, press the button under Done.

The levels that can be changed with the level menu are:

Speaker	The level of Speaker Out. Use the Monitor Source menu first to select a source to play while adjusting this level.
Line Out	The level of Speaker Line Out. Use the Monitor Source menu first to select a source to play while adjusting this level.
Mic	The setting of the microphone pre-amp level. The front panel Mic jack is used for public safety applications. Broadcasters will normally use the high level "encoder audio in" line. The microphone is switched to the speaker during this adjustment.
Attn Tone	The aggregate level of the two attention tones. The Part 11 rules state that the attention tone must modulate your transmitter at 80%. Each tone should modulate the transmitter at 40% with no more than a 1dB difference in the level of each tone. Each of the two tones has a separate level adjustment, see Figure 4-3.
Attn Low Tone	The low Attn tone (853 Hz). :
Attn High Tone	The high Attn tone (960 Hz).

[4] Note that the levels seen at Speaker Out and Speaker Line Out are also affected by the setting of the speaker and line out levels.

Data Tone	The data tone level works in a manner similar to the Attn tone (Figure 4-3). The tones are not combined, however, only one tone is on at a time. The individual tone settings can be used to compensate for any twist in the transmission levels. Set the individual tones to achieve the proper balance, then set data tone to get the desired output level.
Data Low Tone	Data low tone, 1562.5 Hz.
Data High Tone	Data high tone, 2083.3 Hz.
Record Mon 1	Sets the level used by codec #1 to record into the digital audio store. The default setting is recommended.
Record Mon 2	Sets the level used by codec #2 to record into the digital audio store. The default setting is recommended.
Playback	Sets the level used for playback of the digital audio store. A single level is used for all input sources. The various monitor inputs should all be at similar levels before they reach the ENDEC. The default level is recommended.
Attn Thresh	To avoid false detects, the DSP attention decoder requires a minimum level for the received Attn signal. If the upstream ATTN signal is at a low level, make the Attn threshold lower. If the ENDEC does not decode the Attn signal, it is unable to filter it out of the stored audio and you will hear it on playback.

Table 4-2. Levels that can be changed with the levels menu.

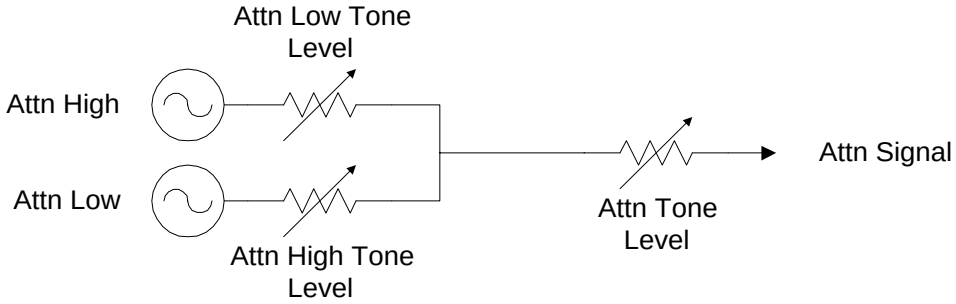


Figure 4-3. DSP-based ATTN signal level adjustments. The Data tone is similar. Individual tones can be adjusted for pre-emphasis.

4.4 Serial Ports

The ENDEC provides six serial ports that can be used for a variety of purposes. Each serial port is wired like an IBM PC 9-pin connector. Pin outs are provided in section 12. The ports run at different baud rates. Two of them can't be set for the two stop bits required by the LED signs. Table 4-3 describes each serial port. Table 4-4 shows which of the supported ENDEC peripherals can run on which port. A complete list of all device types is in section 11.50.

Serial Port	Description
COM 2	Fixed at 9600 baud
COM 3	Variable baud rate, fixed at one stop bit, can't use for LED Sign.
COM 4	Fixed at 1200 baud
COM 5	Fixed at 1200 baud
COM 6	Fixed at 9600 baud
Computer	Variable baud rate, one stop bit, can't use for LED Sign.

Table 4-3. Serial Port Descriptions

Device	Ports
VDS CGEN	Any, VDS baud rate adjustable with internal jumpers.
Chyron CODI	Any, Baud rate adjustable with dip switches on CODI rear panel.
LED Sign	Not Computer or COM 3, any of the others (The LED sign automatically adjusts its baud rate to match the ENDEC).
ENDEC PRO/DJ	Any, use ENDEC PRO/DJ port menu to change baud rate.
Hand Held Remote	Any, change baud rate with procedure in section 7.1, "Hand Control"

Table 4-4. Device and Port pairings.

To assign a device type to a comm port, use **MENU.DEVICES.PORT.DEVICE TYPES**. To change the baud rate of the variable baud rate ports, use **MENU.DEVICES.PORT.BAUD.**

4.5 Relays

The ENDEC contains three relays, available through the back panel terminal strip. These relays are given names that denote their default actions, but each relay can be assigned to any of the available relay options. See section 5.7, Relay Programming, for a description of the programming options.

Each of the relays is configured as normally open. When energized, the relay connects the two inputs of the relay together.

The relays can be used as closures for "ground to activate" control inputs, as shown in Figure 4-5. They can also be used to switch power, as shown in Figure 4-7. Do not exceed the current and power limitations in Figure 4-6.

Contact Ratings	
Max operating current under resistive load	1 A
Max operating voltage	125 VAC, 60 VDC
Max switching capacity under resistive load	62.5 VA, 30 W
Rated load (under resistive load)	0.5A at 125 VAC 1 A at 24 VDC

Figure 4-6. Current and Voltage Limitations for ENDEC relays.

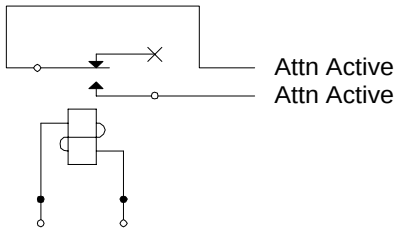


Figure 4-4. Typical ENDEC Relay.

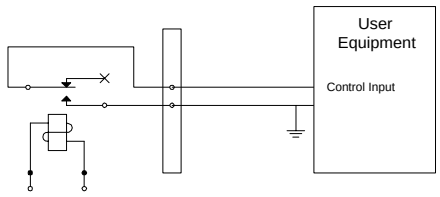


Figure 4-5. As a contact closure for a control input.

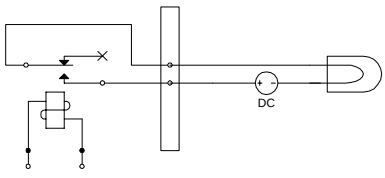


Figure 4-7. As a power switch (see text for limits).

5. ENDEC Software Setup

The ENDEC has many options that will allow you to make the ENDEC fit into your station design and local emergency plan. Every station will use the following commands to customize the ENDEC. Examples are given below, the terse but complete description is in section 11, "ENDEC Command Reference". You can enter these commands using the ENDEC front panel display and buttons, or you can use the ENDECSET program and a Windows PC to edit a configuration file. See section 5.10, ENDECSET program for details.

The road map you will follow in general is:

1) Set the call sign.(Section5.1)
2) Set the time of day. (Section 5.2)
3) Set the your local area location code(s). (Section 5.3)
4) Set output levels. (Section 4.3)
5) (optional) Customize the incoming filters to select the actions you want the ENDEC to take when alerts are received. The ENDEC comes pre-programmed with filters for the alerts you are required to relay, the Presidential Emergency Action Notification (EAN) and Emergency Action Termination (EAT), and the required monthly test (RMT). (Section 5.4)
6) (optional) Pre-build common alerts you might originate. The ENDEC comes pre-programmed with the weekly test, the only message you must originate.(Section 5.5)
7) (optional) Configure any add-ons, such as the hand held remote, a character generator, an LED sign, or the multi-station relay panel. (Section 7)
8) (optional) Configure any of the programmable relays you might want to use. The relays can switch on strobe lights or sounders that you supply, or they can interact with station automation equipment. (section 5.7)
9) (optional) Configure the manual override input if you want to use any of the switchable options such as commercial tally (hold off non-required alerts until the end of a commercial stop set). (Section 11.61)

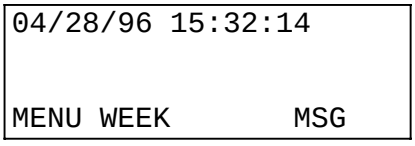
The descriptions below assume that you are unfamiliar with the ENDEC menu structure at the beginning, so the descriptions include almost every button push. Later, the descriptions become more terse.

Note that the hand held remote control can be used to enter menu options just like the ENDEC front panel, see section 7.1.5, "Using the Hand Control for Menus".

5.1 Call Sign

The EAS message format includes an eight character identifier. In many states, the EAS State Plan will specify your ID or a format to follow. If not, you can use the call sign of the sending station or anything else that identifies you.

1) Assume the ENDEC display shows the default screen. If it does not, hold down the two buttons on the right at the same time until the default screen appears. If you have a hand held remote, you can push the <ABORT> button.



2) Press the MENU soft key (the left-most button) to enter the menu. Then push the ∇ or down key until the selection arrow points at *Config. Press the Enter key to select it.

3) Next, scroll down through this menu by pressing the down key until the selection arrow is pointing at "Call Sign". Press enter to select it.
4) You will be prompted for the Administrators password. The default password is '1111', press the enter key four times, or enter your admin password.
5) You now see a screen with soft keys, **"done curs up down**". Use the **curs** key to move the cursor to the right. The cursor is the little underline underneath a character in the call sign. The character above the cursor will be the character changed by the up and down key. Use the **up** and **down** key to change the characters in the call sign from "SAGE" to your station identifier. The cursor will wrap around to the left if you move it eight positions to the right.

```
04/28/96 15:32:14
Call:SAGE
     -
 done curs  up  down
```

5) Press the **done** soft key to complete the process. This will save the modified call sign in the non volatile EEPROM, meaning it is saved across power outages (see section 3.3, "Memory - What's Saved and What Isn't").

5.2 Time

EAS messages are always sent with UTC time, UTC refers to an international standard of time that places 00:00 as midnight at 0 degrees longitude, for our purposes it is functionally equivalent to the old GMT. The ENDEC always displays time as your local time, however. To allow the ENDEC to convert from local time to UTC, you must provide the UTC offset to your location. A table of common offsets is provided below.

The Date and Time are set using the Date/Time sub menu. At the default screen, press the **Menu** soft key (the enter button), then press ∇ (or the hand held remote down button) to scroll to Date/Time. Select each of the following items and set each one. Then scroll through the list of possible settings for each item (usually a number), use the **More** soft key to make the number larger, use the **Less** soft key to make it smaller. When you have adjusted the item to what you want, press the **Done** key to store it in memory.

1) Set the time of Day. Use the **MENU.DATE/TIME** menus. Set the following items.

UTC Offset	The number of hours you must add to the local time to get UTC time, -12 to +12. Always enter this with respect to standard time, not daylight savings time. Some typical values Eastern Standard Time +5 hours Central Standard Time +6 hours Mountain Standard Time +7 hours Pacific Standard Time +8 hours Alaskan Standard Time +9 hours Hawaiian Standard Time +10 hours Locations east of the international date line use negative numbers.
Daylight Enable	If you want the ENDEC to account for daylight savings time, choose YES for this option, otherwise choose no. Most locations will choose YES except for states or areas that do not switch to daylight savings time. The ENDEC will switch from Daylight Savings to Standard time on the last Sunday of October, and to Daylight savings time on the first Sunday in April.
Year, Month, Hour, Minute, Second	Enter the current local time. If you are in daylight savings time, enter that time, otherwise enter standard time.

5.3 Local Area

The ENDEC is pre-programmed with instructions on what to do if a Monthly test is sent for your area, and it is programmed to send a weekly test for your area. All you need to do is tell the ENDEC what your local area is. The ENDEC contains all the state and country location codes (called FIPS codes in Part 11) that were current in early 1996, and supplemented with the NWS marine codes from May 2004. You can add new codes later with the settings upload program called ENDECSET. Building your local area is a process of selecting state/county pairs that describe the area you are assigned to serve. The process of selecting location codes is also used to generate alerts, and to build incoming filters and outgoing headers.

To select your local area, go to **MENU.PRESETS.LOCAL**. This format means that you press the soft key under **menu,** then scroll with the down or ∇ button to presets, press enter, then scroll down to local and hit enter.

Remember, you may be prompted for a password.

You are now presented with

```
04/28/96 15:32:14
Updating Local

 done new  del  prev
```

- **Done** will exit this menu, saving any changes you have made.
- **New** will add a new location code.
- **Del** will delete the location shown on the screen, if any.
- **Prev** will show you the list of locations. If there are no more locations, the display will not change when prev is pressed.

To add a new state/county to the list, press the **new** soft key.

You now see:

```
04/28/96 15:32:14
Select State:
Alabama
 Pick      Next  Prev
```

Push **Next** to scroll through the list of states. You only need to scroll once, unless you serve counties in more than one state. Once you see your state (or US possession, they're at the end of the list), press **Pick.** Assume you picked Arizona.

You now see:

```
04/28/96 15:32:14
All of Arizona

Pick Abrt  Next  Prev
```

- **Pick** will select whatever is shown on the second line, either all of a state, or a county in that state.
- **Abrt** will exit the selection process.
- **Next** will scroll to the next county in the state.
- **Prev** will scroll back to the previous county.

Although your assigned area might be all of a state, this is unlikely. You will probably select a county. If you do select all of a state, however, alerts sent with the local area list will contain the code for all of the state. Alerts that come in will be matched if they are for any county in that state.

Scroll to the county you want and press **Pick** to select it.

You now see soft keys for:

- **Done** - adds this county to the list.
- **Delete** - aborts the addition of this county to the list.
- **Division** - allows you to select a subdivision of the country. Select a subdivision in the same way you selected the county by scrolling though the list of options and pressing **Pick** to select it.

Once you press **Done**, you go back to the Updating Local screen. Select **Done** if you are finished, or **New** to add another location.

5.4 Filtering Incoming Alerts

An EAS alert consists of the following information that you can use to determine steps to take when an alert is received.

Originator Codes	Broadcast or Cable source Civil Authorities National Weather Service Primary Entry Point Emergency Action Notification Network The latter two are the stations that relay messages from the President.
Event Codes	The FCC has defined 53 codes, though you can add more with the settings upload program called ENDECSET. Event codes are listed in Table 5-1.
Location Codes	A list of up to 31 locations. A location is all of a state, a county in a state, or part of a county in a state

The predefined alert types are listed below. If the provided Spanish translation is not suitable for your area, you can use the ENDECSET program to specify a "new" alert with the event code of the alert you want to replace. Enter both the English and the Spanish text.

EAN	an Emergency Action Notification	Una Notificacion de Actos de Emergencia
EAT	an Emergency Action Termination	Una Cancelacion de Actos de Emergencia
NIC	a National Information Center	Centro de Informacion Nacional
NPT	a National Periodic Test	Una Prueba Periodica Nacional
RMT	a Required Monthly Test	Una Prueba Requerida Mensualmente
RWT	a Required Weekly Test	Una Prueba Requerida Semanalmente
TOA	a Tornado Watch	Una Alerta de Tornado
TOR	a Tornado Warning	Una Advertencia de Tornado
SVA	a Severe Thunderstorm Watch	Una Alerta de Tormenta Severa acompanado con truenos
SVR	a Severe Thunderstorm Warning	Una Advertencia de Tormenta Severa acompanado con truenos
SVS	a Severe Weather Statement	Un Informe Meteorologico de Condiciones Severas
SPS	a Special Weather Statement	Un Informe Meteorologico Especial
FFA	a Flash Flood Watch	Una Alerta de Inundacion Repentina
FFW	a Flash Flood Warning	Una Advertenica de Inundacion Repentina

FFS	a Flash Flood Statement	Un Informe de Inundacion Repentina
FLA	a Flood Watch	Una Alerta de Inundaciones
FLW	a Flood Warning	Una Advertencia de Inundaciones
FLS	a Flood Statement	Un Informe de Inundaciones
WSA	a Winter Storm Watch	Una Alerta de Tormenta Invernal
WSW	a Winter Storm Warning	Una Advertencia de Tormenta Invernal
BZW	a Blizzard Warning	Una Advertencia de Vientos Huracanados con Nevada
HWA	a High Wind Watch	Una Alerta de Vientos Fuertes
HWW	a High Wind Warning	Una Advertencia de Vientos Fuertes
HUA	a Hurricane Watch	Una Alerta de Huracan
HUW	a Hurricane Warning	Una Advertencia de Huracan
HLS	a Hurricane Statement	Un Informe de Huracan
TSA	a Tsunami Watch	Una Alerta de Maremoto
TSW	a Tsunami Warning	Una Advertencia de Maremoto
EVI	an Immediate Evacuation	Una Evacuacion Inmediata
CEM	a Civil Emergency Message	Un Mensaje de Emergencia Civil
DMO	a Practice/Demo Warning	Una Advertenica de Practica/Demonstracion
ADR	an Administrative Message	Un Mensaje Administrativo
AVW	an Avalanche Warning	una Advertencia de Avalancha
AVA	an Avalanche Watch	una Vigila de Avalancha
CAE	a Child Abduction Emergency	una Emergencia de Secuestro de Nino
CDW	a Civil Danger Warning	una Advertencia de Peligro Civil
CFA	a Coastal Flood Watch	un Vigila de Inundacion el la Costa
CFW	a Coastal Flood Warning	una Advertencia de Inundacion en la Costa
DSW	a Dust Storm Warning	Advertencia de tempestad de polvo
EQW	an Earthquake Warning	una Advertencia de Terremoto
FRW	a Fire Warning	una Advertencia de Fuego
HMW	a Hazardous Materials Warning	un Advertencia de Materiales Peligrosos
LEW	a Law Enforcement Warning	una Advertencia de Ejecucion de la Ley
LAE	a Local Area Emergency	una Emergencia en el Area Local
NMN	a Network Message Notification	una Notificacion de Mensaje en la red electronica
NUW	a Nuclear Power Plant Warning	un Advertencia en la Planta Nuclear
RHW	a Radiological Hazard Warning	una Advertencia de Peligro Radiologico
SPW	a Shelter in Place Warning	una Advertencia de Lugar de Refugios
SMW	a Special Marine Warning	un Advertencia Especial Marina
TOE	a 911 Telephone Outage Emergency	un 911 Emergencia de Falla Telefonica
TRA	a Tropical Storm Watch	una Vigila de Tormenta Tropical
TRW	a Tropical Storm Warning	una Advertencia de Tromenta Tropical
VOW	a Volcano Warning	un Advertencia Volcanica

Table 5-1. EAS Pre-Defined Event Codes.

For example, an alert might contain the following: National Weather Service, Tornado Warning, and Allegheny County, PA.

You define actions for incoming events by defining a filter. A filter says “If an incoming alert is from this or that originator, and is for this, that, or the other event, and is for any of these locations, then do this”. Or, more precisely, each filter has a list of originators, events, and locations. If the incoming alert’s originator is on the list, AND if the event type is on the list, AND if at least one of the locations is on the list, then the alert matches the filter.

You can build multiple filters to group alerts by the action you want to take. The actions are:

Action Code	Action
Automatic Relay	Relay the alert right away, even while it is still being received.
Timed Relay	Delay for ***N*** minutes, then relay the event. During the delay, you can review the message, kill it or send it right away.
Timed Ignore	Delay for ***N*** minutes, then kill the event. During the delay, you can review the message, kill it or send it right away.
Manual Relay	In automatic mode (see sections 11.15, "MENU.CONFIG.AUTO START" and 11.29, "MENU.CONFIG.MODE") Timed Relay will relay immediately. If you want the "hold" delay to occur even in automatic mode, chose manual relay.
Log Only	Log the event on the printer, then kill it.

Table 5-2. Action Codes.

For example, you might want to have some events that you send right away (in fact, the FCC requires you to do so), such as the Emergency Action Notification. You might also want to immediately forward events like Tornado Warnings.

Some events you'll want to carry but delay slightly so they will fit into your programming, such as a hurricane warning.

Some events you'll never want to automatically place on the air, such as winter storm watch.

Finally some events never go on the air at all, such as a received weekly test.

The ENDEC Filters give you full control over all aspects of alert relay. The ENDEC is pre-programmed with these filters:

Name	Specifications
Required EAN	Originators: Emergency Action Network or Primary Entry Point or PEP: Events: Emergency Action Notification or Emergency Action Termination Locations: ANY Action: Automatic Relay. Priority: 63, ATTN: 8 seconds, Hold: 0 minutes
Required Monthly Test	Originators: Civil Authorities, Broadcast or Cable Events: Required Monthly Test Locations: Your local area (as set with **MENU.PRESETS.LOCAL AREA)**. Action: Timed Relay Priority: 60, ATTN: 8 seconds, Hold: 5 minutes
Required Weekly Test	Originators: Civil Authorities, Broadcast or Cable Events: Required Weekly Test Locations: Your local area (as set with **MENU.PRESETS.LOCAL AREA)**. Action: Log Only Priority: 50
Others	Originators: Any Events: Any Locations: Any Actions: Timed Ignore, Priority: 40, ATTN: 0, Hold: 10 minutes

Table 5-3. Pre-defined Filters.

Use **MENU.PRESETS.INCOMING** to set incoming filters.

You are prompted for each step in building an incoming filter. Each prompt and what to do is discussed below.

Incoming Filter	New: Build a new filter. You are prompted for a filter name. Use the keys in the same way as for setting your station call sign - curs to move the cursor, up and down to select characters. Abrt: Quit this menu Edit: Edit an existing alert. You will be shown the list of existing incoming filters. Use next to scroll to the next filter, del to delete the displayed filter, or edit to edit the existing filter. Once you select a filter to edit, the menu sequence is the same as for "new", except that the existing filter provides the default values.
Originators	Add originator codes to the list of originators to match for this filter. done: Done adding originators to the list. If you press done without adding any originators when first building the filter, the filter will match any originator. new: Add a new originator to the list. Use **next** and **prev** to scroll the list, use **pick** to select. del: Delete the displayed originator from this filter. prev: Go back through the list of originators. Use this key to display an originator to delete from this filter.
Events	Add event codes to the list of events to match for this filter. Use the same keys as for entering originators.
Adding Locations	Add location codes to the list of locations for this filter. done: Done adding locations to the list. If you press done without adding any locations when first building the list, the filter will match any location. new: Add a new location to the list. Locations are added in the same way that locations are added to the local area (see section 5.3 "Local Area". In addition, you can select the **spec** soft key when it appears. You can then select **local** for local area, **all** for all location codes, or **new** to see a list of location codes that you have added with the DOS program. del: Delete the displayed location from this filter. prev: Go back through the list of locations. Use this key to display a location to delete from this filter.
Priority	Each filter has a priority. If an incoming alert matches more than one filter, the filter with the highest priority is selected. Priorities are from 63 to 0, with 63 as the highest priority. Only the EAN/EAT message should be at this priority. If the priority is greater than or equal to 61, the alert can not be aborted while it is being relayed. If the priority equals 60, the alert will not override the manual override commercial tally (holdoff) feature after 15 minutes. It will instead wait until the hold off is released. Use this feature to hold monthly tests if you are a daytime only station.
Select Action	Use the **next**, **prev**, and **pick** soft keys to select an action from the list. Action codes are described earlier in this section, see also Table 5-2, "Action Codes."
Attention Duration	The number of seconds of attention tone that is added to this alert. EAN and the Monthly Test are required to have attention tones. The attention tone that was present on the incoming alert is removed, this parameter defines the length of tone present when your station resends the alert.

Hold Time	The number of minutes that the alert will be held in the timed relay and timed ignore modes.
NV Lead In	Use YES to add the contents of the NV audio buffer in front of the EAS header for any alert selected for relay by this filter. If **MENU.CONFIG.NV AUDIO LEN** is set to 10 or 40, that is, if the non volatile audio option is present and enabled, the NV lead in prompt will appear. You are given three choices, "Pick", "Yes" and "No". The display will show the currently selected setting, to keep it, press the **PICK** softkey, otherwise select **YES** or **NO**. **YES** will play the contents of the non-volatile audio **before** the EAS header data is sent. This is typically used if the contents of the NV audio are "This is a test of the Emergency Alert System", you would select YES for Required Weekly Tests and Required Monthly Tests, and no for everything else.
Crawl Only	If you have a device assigned to a character generator, you are asked this question. You are given three choices, "Pick", "Yes" and "No". The display will show the currently selected setting, to keep it, press the **PICK** softkey, otherwise select **YES** or **NO**. If set to **YES**, the alert will be sent as a video crawl only - no audio or EAS tones will be sent. This option should only be used for non-mandated alerts, that is, do not use it for weekly or monthly test, EAN or EAT alerts.
Save <name>	Press **save** to save the alert, or **abort** to exit the menu without saving. If you need to go back and correct an error, save the filter, then select **MENU.PRESET.INCOMING** and edit this filter.

Table 5-4. Filter Prompts.

5.5 Outgoing Alerts

Outgoing alerts can be built "on the fly" or they can be pre-built and stored. When stored, outgoing events are called templates.

A template can be sent from the **MENU.ALERTS.ORIGINATE ALERT** menu, or it can be sent from the hand held remote control's one-touch keys.

When sending an alert from the **MENU.ALERTS.ORIGINATE ALERT** menu, you can build the alert completely from scratch, or you can use a template to supply defaults. For example, if you wanted to send a thunderstorm warning template, but wanted to add a location, you would select the thunderstorm template and edit it during the preparation process. All three procedures, building a new alert, using a template to build an alert, or building a template are closely related and follow much the same menu sequence.

To build a new alert (sends the alert, does not store it):

Select **MENU.ALERTS.ORIGINATE ALERT**, then select **new.**

To build an alert from an existing template (sends the alert, does not store it):

Select **MENU.ALERTS.ORIGINATE ALERT**, then select **TEMPLATE.** Use the **next** key to scroll the list of pre-built templates, select one with **pick**.

To build a new template (stores the alert, does not send it):

Select **MENU.PRESETS.OUTGOING**, press **new**.

To edit an existing template (stores the alert, does not send it):

Select **MENU.PRESETS.OUTGOING**, press **edit**. Use the **next** key to scroll the list of pre-built templates, select one with **pick**.

Once you have done any of the above, the procedure is the same:

Originator	Select an originator for this alert. pick: Select the displayed originator. abrt: Leave this menu. next: Scroll the list. prev: Scroll the list.
Event	Select an originator for this alert. pick: Select the displayed originator. abrt: Leave this menu. next: Scroll the list. prev: Scroll the list.
ATTN Duration	The length of the attention tone sent, in seconds.
Select Audio	Use **next**, **prev**, and **pick** to select from the list of ENDEC audio sources. See section 5.6.
Adding Locations	Add locations for this alert in the same manner as described above for filters and local area.
NV Lead In	Use YES to add the contents of the NV audio in front of the EAS header of this alert. If **MENU.CONFIG.NV AUDIO LEN** is set to 10 or 40, that is, if the non volatile audio option is present and enabled, the NV lead in prompt will appear. You are given three choices, "Pick", "Yes" and "No". The display will show the currently selected setting, to keep it, press the **PICK** softkey, otherwise select **YES** or **NO**. **YES** will play the contents of the non-volatile audio **before** the EAS header data is sent. This is typically used if the contents of the NV audio are "This is a test of the Emergency Alert System", you would select YES for Required Weekly Tests and Required Monthly Tests, and no for everything else.
Crawl Only	If you have a device assigned to a character generator, you are asked this question. You are given three choices, "Pick", "Yes" and "No". The display will show the currently selected setting, to keep it, press the **PICK** softkey, otherwise select **YES** or **NO**, If set to **YES**, the alert will be sent as a video crawl only - no audio or EAS tones will be sent. This option should only be used for non-mandated alerts, that is, do not use it for weekly or monthly test, EAN or EAT alerts.
Enter One-Touch Key	If you are using a hand held remote, press the macro key you want to assign to this template. This question is only asked when building a template.
Save <name>	Press **save** to save the template, or **abort** to exit the menu without saving. This question is only asked when building a template.
Duration	This question is only asked when preparing an alert for transmission. Use the **more** and **less** soft keys to select from the list of durations. Use **done** to select the displayed duration. The default duration is specified by **MENU.CONFIG.DEFAULT DURATION**.

Table 5-5. Alert Prompts.

If the alert is being prepared for transmission (from **MENU.ALERTS.ORIGINATE ALERT**), you will be given a **proceed** or **abort** choice. Selecting **proceed** will start the alert.

5.6 Audio Sources

You will be prompted to select an audio source when sending an alert or building an outgoing alert template. Here is a list of choices you will be given.

No Audio	No audio will be sent with this alert
Stored Audio	The contents of the stored audio buffer
Microphone	The front panel microphone input
Encoder In	The back panel Encoder In port
Monitor #1	The back panel Monitor #1 port
Monitor #2	The back panel Monitor #2 port
Console	A special case - the alert audio comes from your audio chain, not from the ENDEC. The ENDEC XLR relays close when sending header data, ATTN tones, and EOM data, and open during the audio portion of the alert. The OUT LED will blink during the audio portion of the alert (see section 14.1.2). The CONSOLE PTT relay program can be used to close a relay during the console active part of the alert. See section 5.7.1.
NV Audio	The NV (non volatile) audio buffer

Table 5-6. Audio Sources.

5.7 Relay Programming

The ENDEC contains three relays, available through the back panel terminal strip. These relays are given names that denote their default actions, but each relay can be assigned to any of the available relay program options. These options are described below. See section 4.5, "**Relays**" for a description of the relay hardware. The relays can be used to control lights or sounders to let you know that an alert has come in and is waiting for action, or that an alert is being sent by the ENDEC. The relays can also be used to control the push-to-talk line of a VHF/UHF transmitter for non-broadcast origination sites, or for remotely controlling audio switching. The relays can be used to provide control inputs to station automation equipment, signaling the desire to transmit a message. The automation equipment can signal the ENDEC to proceed by using the manual override input in the "hold off" mode. This combination allows you to run in automatic mode while still avoiding interrupting commercials for non critical EAS events.

The use of the relay programming options can be considered an advanced feature, many stations will not need to use the relays, or will use them in the default modes. The ENDEC is pre-programmed to use the relays to announce the start of an outgoing alert, the receipt of an alert, and the receipt of the two-tone Attention signal. The default use of the relays is described in this table, all of the details of programmable relays are discussed in section 5.7.1, Relay Program Definitions.

Relay	Use	Relay Program
ATTN Active	Closed when the ATTN signal has been present for **MENU.CONFIG.ATTN DECODE** seconds. Opens when ATTN is no longer present.	ATTN DETECT
Encoder Active	Closed when an outgoing alert is being sent, can be used as PTT or to switch an external audio relay. Opens when the alert is finished.	PTT
Decoder Active	Closed when an alert has been received and is now pending.	PENDING

Table 5-7. Default Relay Programs.

5.7.1 Relay Program Definitions

A “relay program” is a sequence of events that can be assigned to a relay. Some relay programs add delays in addition to opening and closing the relay at certain times. Figure 5-1 shows the timing of all the relay programs. Each program in Figure 5-1 is shown as a timeline, moving from left to right.

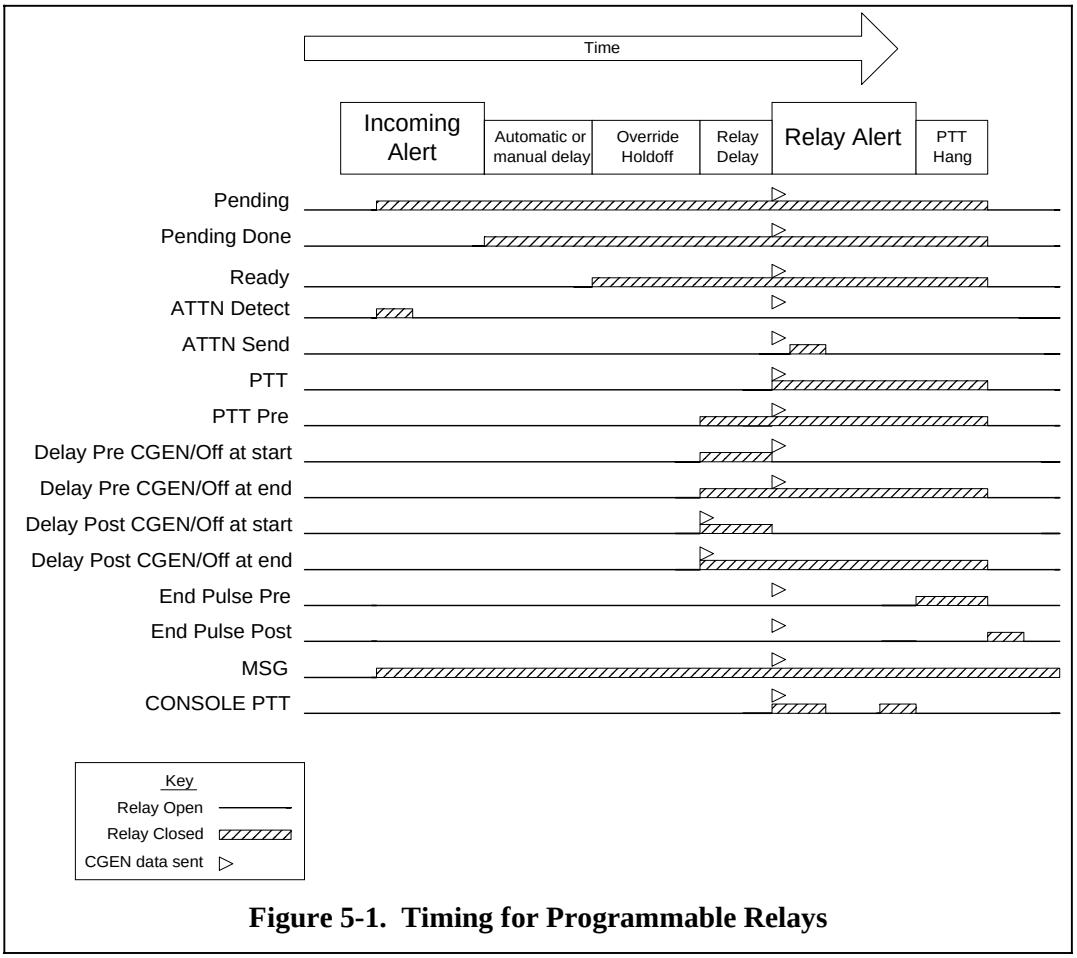


Figure 5-1. Timing for Programmable Relays

The parts of the alert sequence are shown at the top:

Part Name	Description
Incoming Alert	An alert is received on any of the enabled monitor inputs (enable an input with **MENU.CONFIG.SCAN SELECT**). The alert is not recognized until the second copy of the header is received.
Automatic or Manual Delay	Once an incoming alert is completely received, the ENDEC waits in this part of the timeline until the alert is selected for forwarding. This time is zero for EAN/EAT messages, up to 15 minutes for auto forwarded or manually forwarded messages. At the end of this part of the timeline, the alert is ready to go.
Override Hold-off	If selected, the MANUAL OVERRIDE input on the back of the ENDEC can be used to hold off the start of an alert. This is typically used with station automation equipment to avoid interrupting commercials, network news, etc. MANUAL OVERRIDE is ignored for EAN/EAT messages and other message types you select with **MENU.CONFIG.HOLDOFF IGNORE**.

Relay Delay	The “delay pre”, “delay post”, and “PTT Pre” relay programs insert an additional delay that can be used to prepare downstream equipment for the alert. If no relays are programmed with these types, this part of the timeline is zero seconds long.
Relay Alert	The Alert is sent. The Main audio IN/OUT XLR relay is only closed during this part of the timeline.
PTT Hang	If an “end pulse pre” relay program is selected, a delay is added after the end of the alert but before PTT is opened.

Table 5-8. Timeline components.

The relay programs described below have open and close points that are relative to the timeline events described above.

Relay Program Name	**Description**
Pending	A relay assigned to this program is closed from the time an incoming alert is detected and selected for forwarding until that message has been forwarded (or canceled). Only alerts that have been selected for handling (Automatic Relay, Timed Relay, Timed Ignore, Manual Relay) will trigger this relay. Alerts that are not selected, or are Log Only, do not trigger this relay. Use this relay program with a flasher or sounder to tell you that a message has been received.
Pending Done	Same as pending except the relay is not closed until the incoming alert has been completely received. The message audio is not available for review until this point (though the audio was available from the speaker as the message was being received). Use this relay program with a flasher or sounder to tell you that a message has been received.
Ready	An alert is ready to send, either because it has been selected for relay and the time has expired, you have manually started a forward, or you have originated a message. Use this relay program to signal automation that an alert needs to be sent.
ATTN Detect	A relay assigned to this program is closed when an ATTN signal has been detected. The signal must be present for **MENU.CONFIG.ATTN DECODE** seconds before it is detected”. Use this relay program to simulate the old-style EBS mode, see section 8.7, “**Older EBS Equipment**”.
ATTN Send	A relay assigned to this program is closed when the ATTN signal is being transmitted. Use this relay program to simulate the old-style EBS mode, see section 8.7, “**Older EBS Equipment**”.
PTT	A relay assigned to this program is closed while the ENDEC is sending an alert. It opens at the end of the alert, or at the end of the PTT Hang time, if a relay program of type “end pulse pre” is assigned to another relay. Use this relay to key a transmitter for non-broadcast applications, or to switch an external relay if audio is not being run through the ENDEC’s main XLR relays.

Relay Program Name	Description
PTT Pre	Similar to PTT, except that the relay closes before the alert audio starts, that is, the relay closes, and then the start of the alert is delayed until the number of seconds specified is expired. You are prompted to enter the number of seconds to delay when you assign this program type to a relay. Use this relay program if you are switching audio externally, and wish to add a lead-in before the actual start of audio, for example, a sounder for broadcast applications, or DTMF tones for switching of downstream devices in off-air applications.
Delay Pre	Similar to PTT Pre, except that you can specify that the relay opens again at the start of the alert audio or at the end of the alert. You are prompted to enter "end" or "start", and the number of seconds to delay. Use this relay program to trigger an external device that needs to run just before the alert audio starts.
Delay Post	Similar to Delay Pre, except that commands are sent to the character generator before the delay. For all other relay types, the character generator commands are sent at the same time that the alert audio starts. This relay type is used to add a delay after the character generator commands are sent to allow character generators that have a long processing delay to be accommodated.
End Pulse Pre	A relay assigned to this program closes at the end of the Alert audio. The main audio XLR relay opens at the end of the audio, but the PTT program relay (if specified) is extended by the number of seconds specified by this program. The relay closes (and the PTT relay closes) after the number of seconds specified by this program. You are prompted for the number of seconds to delay when you assign the program to a relay. Use this relay if you are switching audio externally, and want to trigger an event to occur after an alert, but before PTT opens.
End Pulse Post	A relay assigned to this program closes when the alert ends, or when PTT closes if it is extended by "end pulse pre". It opens after a specified number of seconds. You are prompted for the number of seconds to delay when you assign the program to a relay. Use this relay if you are switching audio externally, and want to trigger an event to occur after PTT opens.
Console PTT	A relay assigned to this program will close during the part of the alert where the ENDEC is sending data or tones, and open when live audio can be inserted. Used only when an alert's audio source is CONSOLE. See section 5.6.
MSG	A relay assigned to this program will close when a message is printed or added to the LCD MSG buffer, it opens when the MSG buffer is read. Use this relay to signal the operator that a new alert has been received or some action is required.

Table 5-9. Relay Programs.

5.7.2 Assigning Relay Programs

There are three physical relays, named "ATTN Active", "Encoder Active", and "Decoder Active". These names denote the default settings of these relays, and serve to identify the terminals on the terminal strip. Any relay can be assigned any relay program however, and more than one relay can be set to the same program. For example, if you wanted to key two different transmitters, you could assign the PTT relay program to both "Attn Active" and "Encoder Active".

There are also five “virtual” relays. You can assign programs to these relays, named EXT #1 through EXT #5. Even though a physical relay will not click, the action specified will occur. Use this feature if you want the side effect of the “relay” but don’t need an actual contact closure.

Example #1: Assume that you have a character generator with very fancy fonts that needs 15 seconds to prepare the crawl. You can assign “Delay Post” to EXT #1, and specify 15 seconds. This will add a 15 second delay after the character generator commands are sent and before the actual alert starts.

Example #2: Assume you want to add five seconds of dead air after an alert and close a relay during that five seconds. Assign “End Pulse Pre” to “ATTN Active”, “Encoder Active”, or “Decoder Active” and specify 5 seconds.

Example #3. Assume you want to add five seconds of dead air after an alert as in example #2, put you don’t need to have a relay close (maybe you are already using all three). Assign “End Pulse Pre” to an unused virtual relay instead.

To assign programs to relays:

1) Go to **MENU.RELAY**.
2) Scroll to the name of the relay you want, press the **Pick** soft key.
3) Scroll to the name of the program you want to assign to this key. The list will start at the current setting, you may need to move up or down in the list to find the one you want. To select no activity for a relay, select NONE.
4) If you select Delay Pre or Delay Post, you can select when the relay opens, either the START of the alert audio, or the END of the alert. Select the appropriate soft key.
5) If you select Delay Pre, Delay Post, PTT Pre, End Pulse Pre, or End Pulse Post, enter the number of seconds of delay you need, 0 to 60.

5.8 Random Required Weekly Test feature

The ENDEC previously included a “Timed RWT” feature that allowed you to specify a time and day of the week to send a required weekly test (RWT). This was intended to allow you to set up a weekly test one week in advance, but did require weekly interaction with the ENDEC.

The “Random RWT” feature allows a different time for each of the 52 weeks in a year. The ENDEC will fill the table with random times when the feature is enabled, or when **MENU.TIMED RWT.RESET RWT RAND** is used. The day, hour, and minute are settable, seconds are always 0.

You can print all of the times to the internal printer or external serial printer by using **MENU.TIMED RWT.PRINT RWT RAND**. You can view and edit each time by using **MENU.TIMED RWT.EDIT RWT RAND.** The ENDECSET program provides a more convenient way to edit the times.

To enable the random weekly feature, do the following:

1) Enable random weekly test by selecting **MENU.TIMED RWT.ENABLE TIMED RWT.RAND.** If you have not previously enabled random weekly tests, a table of times will be built for you. If the random time for the current week is earlier than one hour from the current time, the alert will be marked as already sent. If you want an alert soon, you will need to edit the current week’s time.
2) View the times by printing them with **MENU.TIMED RWT.PRINT RWT RAND,** or step through the times using **MENU.TIMED RWT.EDIT RWT RAND.**
3) Edit the times as required by local agreements or common sense (avoid Super Bowl Sunday, perhaps). Note on editing: as protection against software or hardware problems that might “hang” the ENDEC software, the ENDEC uses a command timeout. When not sending an alert, if the ENDEC does not return to the "idle state", (the top menu level) within 10 minutes, the ENDEC will reboot. You must

leave the edit menu and return to the top menu level (where "MENU WEEK" is displayed) once each 10 minutes, or the ENDEC will restart, and you will lose the changes you have made.

There are several reasons why you might not see an alert when you expected to, and several protections against an alert occurring unexpectedly. A random RWT will not be sent:

1) if random RWT is not enabled.
2) within 60 seconds of a time change. This allows you to change all parts of the time (year/month/day/hour/min/sec) and correct mistakes.
3) within one hour of the sending of an RWT by any other means. This keeps software errors, hardware errors, or user errors from placing the ENDEC into a mode where it will continually send RWTs (for example, a bad override input with override set to generate weekly tests). For example, if you set the random RWT to occur soon, have it send, then reset the RWT time to again occur soon, the second alert will not be sent. In some cases, the ENDEC can detect that you are trying to setup to send too quickly and will display a error. You can reset this one hour check by using **MENU.TIMED RWT.RWT RESET.**
4) if another alert is pending.
5) if a monthly test was already sent in the same week. A week starts at midnight Sunday local standard time. For daylight savings time months, the week starts at 1:00am Sunday. If an RMT is sent after the start of the week, but before a schedule RWT, it cancels the random RWT for that week.

The random required weekly test commands are detailed in section 11, ENDEC Command Reference.

5.9 Marine Location Codes

In addition to the original state and territories location codes, the ENDEC now as the new "marine" states:

57, Eastern N. Pacific
58, N. Pacific Near AK
59, Central Pacific
61, S. Central Pacific
65, Western Pacific
73, NW N. Atlantic
75, West N. Atlantic
77, Gulf Of Mexico
91, Lake Superior
92, Lake Michigan
93, Lake Huron
94, Lake St. Clair
96, Lake Erie
97, Lake Ontario
98, St. Lawrence River

In addition, all of the "counties" defined by the NWS as of May 2004 (including codes scheduled to be placed in service in July 2004) are included. Some of the names are very long, for example,

> "Atlantic waters, beyond the 100 fathom line E of mouth of Rio Guajataca, S of 19.5N and between 64N and 68W, including the nearshore waters inside of 100 fathom line of the NW coast of Puerto Rico, from Punta Cadena to mouth of Rio Guajataca."

To avoid buffer overflows on the ENDEC, as well as on equipment attached to the ENDEC, a limit of 1000 characters (2000 if both English and Spanish are used) is set. If the length of the decoded alert string exceeds this limit, the numeric FIPS code is used instead of the complete name. For example, most alerts will appear as:

> "The National Weather Service has issued a Tsunami Warning for Caribbean waters of the south coast from Punta Viento to Punta Melones, and outside of 12nm of west coast from Punta Melones to Punta Cadena, east of 68W and N of 17N, Charleston Harbor, Coastal waters from Altamaha Sound to Fernandina Beach, FL out 20 nm, Coastal waters from Cape Fear, NC to Little River Inlet, SC out 20 nm, Coastal waters from Cape Hatteras to Ocracoke Inlet, NC out 20 nm, Coastal waters from Cape Lookout to Surf City, NC out 20 nm, Coastal waters from Currituck Beach Light to Oregon Inlet, NC out 20 nm, Coastal waters from Edisto Beach, SC to Savannah, GA out 20 nm, Coastal waters from Fernandina Beach to St. Augustine, FL out 20 nm, Coastal waters from Little River Inlet to Murrells Inlet, SC out 20 nm, Coastal waters from Murrells Inlet to South Santee River, SC out 20 nm, and Athens, OH beginning at 7:59 pm and ending at 8:59 pm (SAGEREC)"

Very long alerts will appear as :

> "The National Weather Service has issued a Tsunami Warning for (75740) in West N. Atlantic, (75330) in West N. Atlantic, (75450) in West N. Atlantic, (75252) in West N. Atlantic, (75154) in West N. Atlantic, (75158) in West N. Atlantic, (75150) in West N. Atlantic, (75352) in West N. Atlantic, (75452) in West N. Atlantic, (75254) in West N. Atlantic, (75256) in West N. Atlantic, Athens, OH, and Belmont, OH beginning at 7:59 pm and ending at 8:59 pm (SAGEREC)"

The size of the buffer was selected so that the longest combination of non-Marine alerts will always fit. Only a large number of the longest marine codes will be abbreviated as above.

5.10 ENDECSET program

The ENDECSET program can be used to

- Upload and download configuration settings from the ENDEC
- Set the ENDEC Time of day.
- Reboot the ENDEC
- Edit configuration files

ENDECSET provides access to each setting on the ENDEC, including incoming and outgoing filters and headers, custom event and location names, the RWT schedule, etc.

ENDECSET includes item by item help, accessed with the tool.

ENDECSET can be called with a command line /t option to set the ENDEC time, which can keep the ENDEC synced to your station clock.

To use the ENDECSET program, set one of the ENDEC serial ports to the ENDECSET device. Connect a "null modem" serial cable (one that reverses pins 2 and 3) between a serial port on the PC and the selected com port on the ENDEC. If your PC does not have a serial port, you'll need to purchase a USB to serial connector from your local electronics emporium, and connect the null modem cable to that. Use the ENDECSET Direct/Settings menu to select the PC's comm. Port and baud rate. The ENDEC's computer, com2, com3, and com6 are usually 9600 baud, com4 and com5 are 1200 baud.

Using the ENDECSET Direct/Get Settings from ENDEC menu, save the settings from your ENDEC into a file.

Edit the settings as required.

Using the ENDECSET Direct/Put This Settings File to ENDEC menu, send the editing settings to the ENDEC.

Finally, use the ENDECSET Direct/Reboot ENDEC menu to restart the ENDEC.

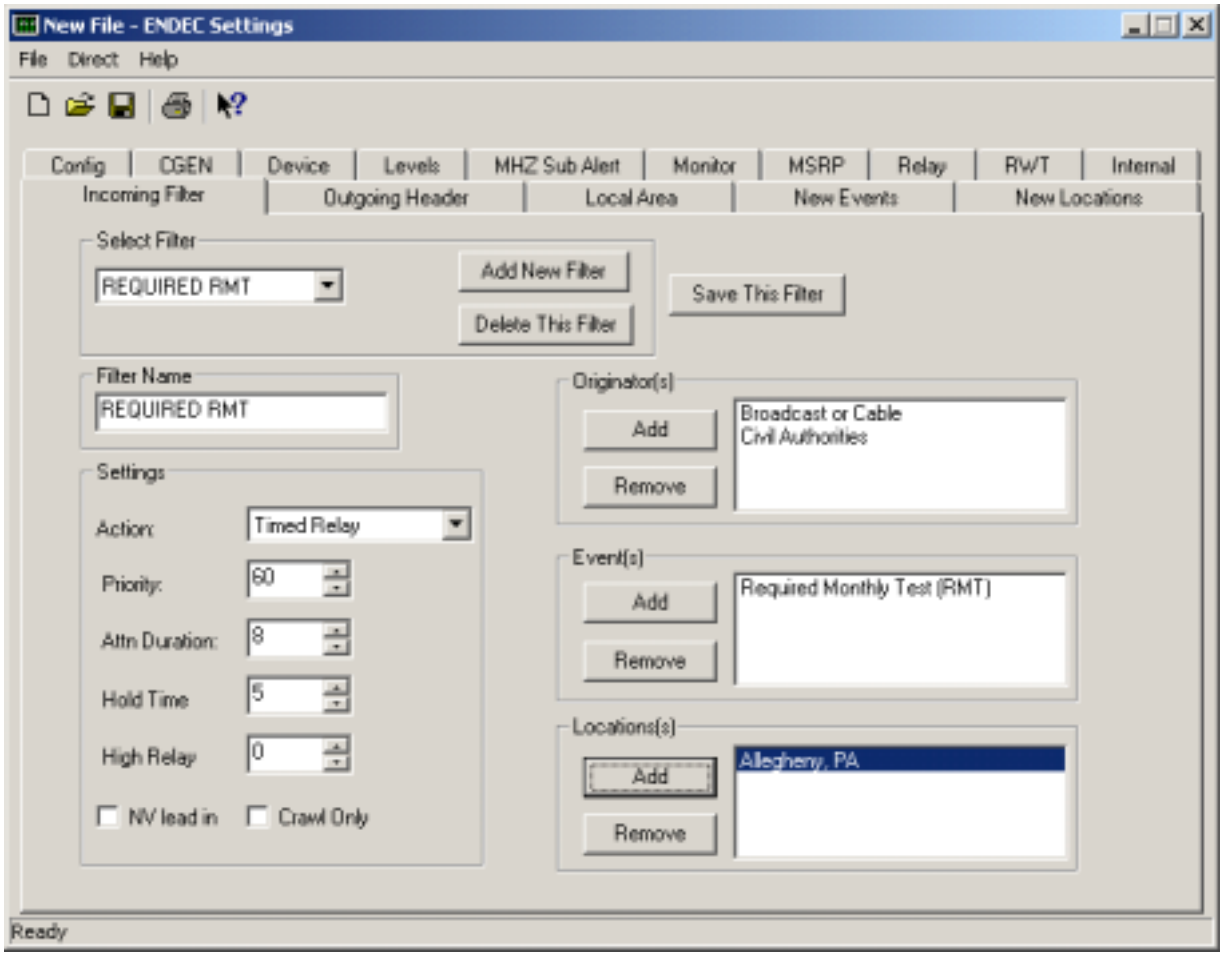


Figure 2. Sample ENDECSET screen

6. Typical Tasks

This section of the manual will tell you how to perform certain common tasks in a "cook book" style. We're going to tell you how to fry an egg, in other words, not all about long chain molecules, coagulation, and the dangers of excessive cholesterol. All of that is in the reference part of the manual section 11, "ENDEC Command Reference"

6.1 Weekly Test

Sending a weekly test is the simplest task to perform. The ENDEC is pre-programmed with a weekly test outgoing header. If you have setup your local area (quick start section 1.4, "Customizing") all you need to do to get started is press either the **week** soft key on the default screen, or the ***WEEKLY TEST*** key on the hand held remote.

If you have a password defined, you'll be asked to enter it. If the password is 1 1 1 1 (the default), press the key under the number "1" on the display, that is, the ENTER button. If the password is 4 4 3 3 1, then press the keys under those numbers, that is, ∇ ∇ Δ Δ Enter.

Finally, if you are ready to go on the air, press the **proceed** soft key. If you are on the wrong plane, press **abort**.

6.2 Relaying an ALERT

Relaying an alert is almost as simple. When an alert has been received, and has been selected for relay (based on the filters that have previously been entered), the Incoming Alert LED on the front panel is lit, the IN led on the hand held remote is lit, and one of the back panel relays may be closed (depending on options you've selected). This might flash a strobe if you have provided one.

The display will also show that an alert is pending by showing these two lines:

```
Length: mm:ss
P Filter Name mm:ss
```

Length is the total number of minutes and seconds that will be taken up by the alert, include the attention tone, if any, the audio, if any, and the data (always present).

The mm:ss on the second line will be counting down.

P is a character than says what will happen to this alert when the count reaches zero and you do nothing in the meantime.

- P means it will be played. (p for play)
- D means it won't (d for delete).
- H means your station automation is delaying the message, usually because a commercial is playing. The count down counts how long until the ENDEC plays the message anyway.

You can do any of the following:

1) Nothing. If it is an important message (as defined by whoever built your filters) it will play when the timer expires. If it is not important, it will quietly expire and not play on the air.
2) Listen to the audio that came in with the alert if you missed it the first time. Press **pend** then press **cue.** On the hand held remote, press ***cue.***
3) Send it. To send the alert before the countdown hits zero, press **pend** then press **send**, then press **proceed** (or **abort** to cancel).

4) You can also get fancy and kill the message without playing it, or replace the audio with your own (either recorded or live), or take audio from another source. See section 11.8, "**MENU.ALERTS.SEND PENDING**" for details. The **pend** soft key will take you to the same menu that **MENU.ALERTS.SEND PENDING** describes.

6.3 Originating an Alert

This is a somewhat lengthier recipe. Our assumption is that most broadcasters will be relaying alerts that have originated elsewhere, therefore you won't be asked to originate an alert very often. If you are, you can place the common alerts into named outgoing templates, or you can assign them to one-touch buttons on the hand held remote control. If you find that you are acting as a emergency operations center (or you are an emergency operations center), ask your distributor about the "ENDEC PRO" software package, which can handle thousands of pre-stored alerts and canned alert audio files.

6.3.1 Originating with templates

With a little pre-planning, you will have a template already built for most of the alert types you'll be asked to build on the fly. In this section, we'll assume that this has already been done.

Sending an alert, then, is a simple matter of selecting the proper template. Templates are a description of an alert, its type (tornado, evacuation, etc.) and its location or locations. Templates are given names by you of up to 12 characters. You can be descriptive with the name, or simply use it as something to look up in a procedure book. For example, your book could have:

Template Name	Description
Tornado #1	Tornado Warning for Allegheny and Washington
Tornado #2	Tornado Warning for Allegheny
Tornado #3	Tornado Warning for Washington

Clearly, if you regularly issue your own alerts for combinations of 17 different counties, your book could be unwieldy. Again, your probably won't be doing this, and if you are, ENDEC PRO is what you want. Let's assume that you have a small number of possible alerts, and you've built templates for all of them.

The best case is if you have a hand held remote control. It has 22 keys (including shifted keys) that can be assigned to templates. One key push starts the process.

Originating with hand held remote:

1) Press the one-touch button for the alert you want to send. You don't have to be at the default menu level, though if a question such as "proceed or abort" is being asked you will get an error beep.
2) You will be asked to set the duration of the alert. The display shows hours:minutes. Press **more** to increase and **less** to decrease.[5] Press **done** when done adjusting the duration. The default duration is specified by **MENU.CONFIG.DEFAULT DURATION**.
3) Press **Proceed** to go on the air, or press **abort**. You will have four minutes to decide[6]. All other menu options except proceed/abort time out sooner. See section 9.4, "Controlling Other Stations" if your configuration includes a multi-station relay panel.

[5] Part 11, the FCC EAS rules, specify 15 minute intervals for times less than one hour, and half hour intervals above that. The display will only show you legal values.

[6] All other menu options except proceed/abort time out sooner, set by menu.config.menu timeout.

Originating from the front panel

1) Go to **MENU.ALERTS.ORIGINATE ALERT**.
2) Press **Template**
3) Scroll through the list with the **next** soft key.
4) Select a template with **pick**
5) Press **no**.
6) You will be asked to set the duration of the alert. The display shows hours:minutes. Press **more** to increase and **less** to decrease.[7] Press **done** with done adjusting the duration. The default duration is specified by **MENU.CONFIG.DEFAULT DURATION**.
7) Press **Proceed** to go on the air, or press **abort**. You will have four minutes to decide[8]. All other menu options except proceed/abort time out sooner. . See section 9.4, "Controlling Other Stations" if your configuration includes a multi-station relay panel.

6.4 Viewing, Reprinting, Sending Old Alerts

The ENDEC stores the EAS information from the previous 47 alerts that are sent or received from your ENDEC. You can access this list to reprint messages lost if your thermal or external printer ran out of paper. You can also use it to resend an alert that the ENDEC thinks was sent, but that didn't make it on to the air due to misconfiguration of your audio path from the ENDEC.

To see the list of old alerts go to **MENU.ALERTS.VIEW ALERT LOG**. You will see:

```
entry 1 of 47
RMT sent at
01/09/98 06:59:44
Done Opt   Next Prev
```

Use **Next** and **Prev** to scroll through the list of alerts. Use **Done** to exit this function. To print an alert or resend it, pick options (**Opt**).

```
entry 1 of 47
RMT sent at
01/09/98 06:59:44
Done View   Send
```

Use **View** to see the text of the alert. Use the view menu's **Print** soft key to send the text to the printer.

Use **Send** to send the alert. You will be asked if you really want to send an old alert. You will be asked to select an audio source. The ENDEC only stores the most recently heard audio. If you try to send an alert from a week ago, you will probably not get the audio you want. To be sure you are getting the proper audio, use **MENU.ALERTS.PREVIEW AUDIO** or the hand held remote's **CUE** button before going to the alert log menu.

To actually send the alert, use the **proceed** soft key when it is displayed.

---

[7] Part 11, the FCC EAS rules, specify 15 minute intervals for times less than one hour, and half hour intervals above that. The display will only show you legal values.

[8] All other menu options except proceed/abort time out sooner, set by menu.config.menu timeout.

6.5 Killing a Pending Alert

In general, in the ENDEC, to "abort" is to stop doing what you are doing, or quite this menu to go up a level. If you are in the middle of the send pending alert menu, for example, and use the abort soft key, you leave the menu. The alert stays in the pending condition, though. Just because you aborted the pending menu doesn't mean the you have deleted the alert. If it is on timed relay, it will be sent.

Sometimes, you want to make sure that a pending alert is not sent. To do this, you must KILL it. To kill an alert, go to **MENU.ALERTS.SEND PENDING** or use the hand held remote's **PLAY NOW** key.. The soft key choices will be `Send Done Opt Kill.` Use the KILL softkey. You will be asked if you want to delete the alert. Use the DELETE key to delete (kill) the alert. Use abort to leave the menu. If you have a multi station relay panel, use the STN soft key to kill the alert for stations other than your one.

If you have a hand held remote control, and an alert is pending, and you press the red ABORT key, you will be taken to the KILL menu.

Important:

If you have started an alert, you must use the **abort** soft key or the hand held remote's **ABORT** button, and then let the ENDEC stop the alert. It will finish any heard in progress, not send the spoken audio, and then send the end of message data. You must allow the end of message data to be sent.

Once you have started an alert, stations that are listening to your station will being to process the alert. If you panic and turn off the ENDEC, or turn the audio off at the console, the stations listening to yours will not hear your ENDEC's "end of message" data. If they heard the start of the alert, they will wait for two minutes before timing out. If they are unattended stations, they will then relay the alert with two minutes of audio - whatever audio you sent after you turned of your ENDEC, placing your audio on their air.

6.6 Playing Incoming Alert audio as it is Received

The ENDEC will play incoming alert audio on its internal speaker and speaker line out port if you select ALERTS as your monitor source. Use **MENU.MONITOR SOURCE.ALERTS**. The speaker will mute again after the alert is received.

7. ENDEC Peripherals

7.1 Hand Control (RC-1)

The hand held remote control is required if multiple stations are using a single ENDEC (unless all stations are controlled from a single point). The hand held remote control will also make the ENDEC easier to use by providing additional single-key commands. Note: if the serial number on your ENDEC is 3340 or less, you will need to make the change in your hand control specified in section 7.1.4, "Modifying model RC-1 for use with +5v ENDECs."

The Hand Control is powered from the serial port ACC POWER line (pin 9). This pin is enabled with a jumper. See section 12.2, "Accessory Power" for details.

7.1.1 RS-232 Hookup

The default baud rate of the RC-1 is 9600 baud. You can attach it to any of the 9600 baud serial ports (Computer, COM2, COM3, COM6) using the provided serial cable. You can attach it to COM4 or COM5 by changing the hand control's baud rate to 1200 using the procedure in section 7.1.3, "Changing the RC-1 Default Parameters".

7.1.2 ENDEC Setup

You must assign a device type of "Hand Control" to the serial port you want to use for each RC-1. Use the following menu choices:

MENU.DEVICE.*PORT*.TYPE.HAND CONTROL

For "port" use the serial port you need, computer, com1, com2, etc.

If the RC-1 is not attached to the port before you assign a type, or if you ever power up the RC-1 after the ENDEC is started, the RC-1 won't be "in sync" with the ENDEC. On the RC-1 (or the front panel) press the ENTER key. This will refresh the display. Press "UP" followed by "ENTER" to return to the default menu.

7.1.3 Changing the RC-1 Default Parameters

You can change the RC-1 contrast and baud rate by the following procedure.

1) Disconnect the RC-1 from power by removing the RJ-11 jack at the base of the unit.
2) Hold down any RC-1 button.
3) Continue to hold any button and apply power by re-inserting the RJ-11 jack. The RC-1 displays its firmware version, and then displays “contrast”.
4) Using the UP and DOWN Buttons, adjust the contrast. You must press and release the button multiple times to see a change.
5) Once the display is at a contrast you like, press the OPTION key. This will save the settings, even if the power is removed.
6) The display now shows the baud rate. To change it, use the up and down keys. Choose 1200 or 9600.
7) Use the OPTION key to save the setting.
8) The display now shows “DF: 8n1”. This is the only correct setting. If you accidentally shift from this setting, use the UP and DOWN keys to go though the options until you return to “DF: 8n1”. Use the OPTION key to save the setting. The RC-1 is now ready for use.

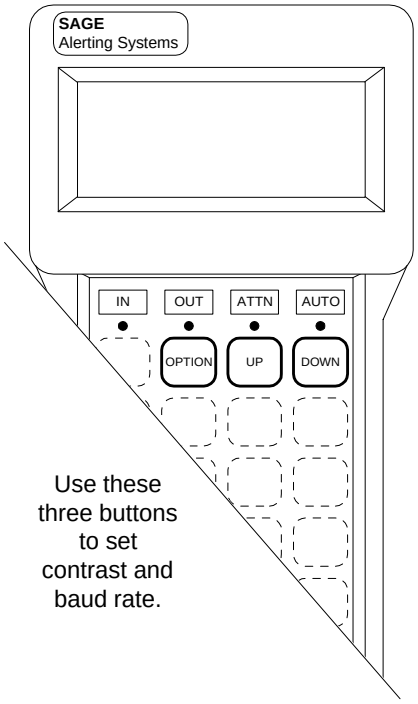


Figure 7-1. Power-on Setup Keys.

7.1.4 Modifying model RC-1 for use with +5v ENDECs.

To modify a hand control for use with an ENDEC with +5v on its ACC POWER pin (Serial number 3340 or less), do the following:

1) Remove the back panel of the hand control by removing all four screws.
2) Remove the three terminal 5v regulator.
3) Solder a wire jumper at position “K” (just above the regulator).
4) Reassemble the case.

7.1.5 Using the Hand Control for Menus

Figure 7-2 shows the keys on the hand control that are used with menus. Circle 1 shows the LCD display. This is the same size as the LCD display on the ENDEC. Circle 2 shows the keys that serve the same purpose as the four buttons on the ENDEC front panel. Circle 3 shows the relationship between the LCD screen soft key labels and the buttons they label.

Use the LCD display and these four keys just as you would at the ENDEC front panel.

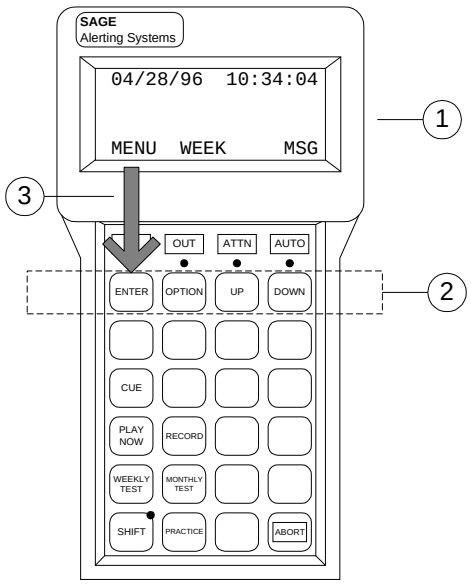


Figure 7-2. Hand Control Menu Keys.

7.1.6 Using the Hand Control One-touch buttons

The Hand Control contains a number of useful buttons that can select ENDEC functions with less steps than the menu system. These commands are pre-printed on the keypad, and are described below.

Key	Function
Abort	Abort the operation in progress. This can be either a menu item or an active alert. Note that the ENDEC will always send the End of Message data, even if an alert is aborted. This will keep you from locking up stations downstream until they time out. Relayed EAN messages can not be aborted.
Cue	Plays the contents of the digital audio store. Used to preview audio before it is retransmitted.
Monthly Test	Sends the template named “RMT”. There is no default RMT template, you must build one if you want to use this feature.
Play Now	Starts a pending alert, that is, one that has been received and is ready for retransmission.
Practice	Enters the practice mode. See section 11.62.
Record	Records from the input selected by **MENU.CONFIG.DEFAULT REC** into the digital audio store. This key is used to replace audio from a received message with local audio before it is rebroadcast.
Shift	The shift key is a toggle, meaning that you enter the shift mode by pressing, then releasing the shift key - don’t hold it down. The red LED in the shift key lights to show that the next key you press with be “shifted”. The shift is released after the next key press.
Shift-Cue	Plays the contents of the non-volatile audio store.
Shift-Record	Records from the input selected by **MENU.CONFIG.DEFAULT REC** into the non-volatile digital audio store.
Weekly Test	Sends the template named “RWT”, contains a weekly test by default.

7.1.7 Using the Macro Buttons

Any key that is not pre-printed can be used as a “macro” button. When an outgoing template is built, you can assign a “one-touch” key to the header. Pressing the “macro” button will send that pre-built header. To assign a one touch key, press the designed key when prompted with “Enter One-Touch Key or Done”.

To send an alert, press the one-touch key. You will be prompted for the user password (if the user password length is greater that zero), and then you will be prompted for the duration. Adjust the duration with the up/down keys and press the **done** soft key. The default duration is specified by **MENU.CONFIG.DEFAULT DURATION**. Then press the **proceed** key to send the alert. . See section 9.4, “Controlling Other Stations” if your configuration includes a multi-station relay panel.

Each macro button can be used twice, shifted and unshifted.

7.2 LED Sign

The ENDEC supports both Beta-Bright and Alpha LED “marquee” type signs. The text of received and transmitted alerts are display on the sign, in green for tests, yellow for watches, and red for warnings and EAN messages.

To configure a sign on the ENDEC, Use **MENU.DEVICES.*PORT*.DEVICE TYPE.LED SIGN**. The LED sign includes a serial cable/RJ-11 to DB-9 interface.

There are two additional options for LED signs:

menu.config.led sign mode	Sets display mode - horizontal crawl, vertical crawl. See section 11.25.
menu.config.led sign sound	The LED sign will beep when an alert arrives - it can be disabled with this command. See 11.26.

7.3 VDS Character Generator

The information provided below on the VDS840EAS refers to the use of the VDS840EAS by broadcast TV stations only. Use by cable systems is covered in the MHz Sub-Alert Manual[9].

The VDS840EAS character generator from Video Data Systems can be used to provide the required alert information crawl. The crawl is placed at the top of the screen as suggested by Part 11.

To use the VDS840EAS, simply connect a serial cable between any ENDEC serial port and the VDS serial 1 port. You need a 9-pin male on one end and a 9-pin female on the other end, wired as a null modem (2 and 3 reversed).

ENDEC Pin (male)	Use (ENDEC Point of View)	VDS 840 Pin (female)
2	RxD (input)	3
3	TxD (output)	2
5	Ground	5

The VDS factory default is 9600 baud, use the ENDEC COM2, COM3, or COM6 ports, or change the VDS baud rate jumpers to 1200 and use COM4 or COM5; 9600 baud is recommended. Assign the serial port to the VDS device with **MENU.DEVICES.*PORT*.DEVICE TYPE.VDS CGEN.**

[9] Cable systems can have two devices sharing the character generator, the ENDEC commonly uses serial port #2 rather than #1 as discussed here, and it uses a relay for access arbitration.

The alert text will crawl with white characters on a background strip that is green for tests, yellow for watches, and red for warnings or EAN/EAT. The color strip and text is keyed over video.

7.4 Chyron CODI Character Generator

The ENDEC can use the Chyron CODI to provide the required alert information crawl. The crawl is placed at the top of the screen as suggested by Part 11. The ENDEC will directly support the CODI with a crawl, no additional hardware or software is required. Third party software is available to provide enhanced display features, in this case a PC between the ENDEC and the CODI is required. This section assumes that you will directly connect the ENDEC to the CODI.

Use the serial cable provided with the CODI. You need a cable with a male DB-9 on one end and a female DB-9 on the other, and pins 2,3, and 5 straight through.

The CODI rear panel factory switch settings are used, except for baud rate. Change the baud rate to 9600. The version of the CODI current in 1996 uses 1, 2, and 3 down. Use a unit address of 0-0. All other dip switches should be down.

Use the ENDEC COM2, COM3, or COM6 ports, or change the CODI baud rate jumpers to 1200 and use COM4 or COM5; 9600 baud is recommended.

Assign the serial port to the CODI device with **MENU.DEVICES.*PORT*.DEVICE TYPE.CODI CGEN.**

The alert text will crawl with white characters on a background strip that is green for tests, yellow for watches, and red for warnings or EAN/EAT. The color strip and text is keyed over video.

Use **MENU.CONFIG.CODI MODE** to select between two display modes, fancy and plain. Fancy modifies the color strip with shading to give a 3D effect.

7.5 Monitor Radio Receivers

The ENDEC supports several audio input points on the rear panel (section 4.2), Monitor In 1 - 6, and Encoder Audio in.. Levels should be 0.75 to 2Vrms at these inputs. **Warning - do not use amplified speaker level outputs to feed these inputs. Exceeding the 2Vrms level will result in poor audio, exceeding 10Vrms will damage the ENDEC (specifically U33, U34, U52, and U53).**

7.6 Modem Access

The ENDEC supports access via modem. The ENDEC DJ Lite program allows you to retrieve the alert log, get and put the ENDECs parameter settings file, and set the time of day, for a single ENDEC. The ENDEC DJ program allows full remote control of the ENDEC, including remote access to the front panel commands, sending or forwarding alerts, and automatic log retrieval for any number of ENDECs.

You will need two modems, of course, one on the ENDEC side, and one on the computer running ENDEC DJ. The ENDEC supports a Hayes Accura 56k compatible modem. Similar modems should also work, though be sure to use a modem with an internal processor. Do not use a "win modem" for the ENDEC, as this type of modem depends on a PC to perform most of the modem's functions.

You may use any "AT" command set modem on the PC side.

To enable the use of the modem, assign a modem "device" to one of the ENDEC's comm ports. See the ENDEC Manual, **MENU.DEVICES** command. Use the "modem" device. You will also need to assign a password for modem use, see the description of the **MENU.CHANGE PRO PASS** command below.

Be aware that the ENDEC can provide accessory power on pin 9 (see the ENDEC Manual, "Accessory Power" in the "Connector Descriptions" chapter. Do not use a cable with pin 9 connected when interfacing the ENDEC to a modem.

It is beyond the scope of this document to provide details on connecting specific types of modems to the ENDEC. The following general comments apply.

The ENDEC uses this initialization string: ATV1&D0S0=0&K0. The ENDEC will answer the modem on the first ring, do not attempt to share a phone line with another device or voice user.

The ENDEC expects only a “three wire” interface – RxD, TxD, and ground. Some modems will want to see DTR. If your modem does not have an “ignore DTR” switch, you will need to build a connector that loops the modem’s DSR to its DTR.

The ENDEC’s “COM3” port (and only the COM3 port) can provide a DTR signal on pin 4.

Further information is provided in the ENDEC DJ documentation.

8. Interfacing with other Devices

8.1 Raw EAS input and output

The “encoder” device can be used to send and receive raw EAS messages. The protocol is the same as that specified in Part 11 for the synchronous EAS data, except that the line format is async, one stop bit. The sync characters are expected on input, and are sent on output.

The encoder device sends a copy of all bytes that are sent by the ENDEC, that is, when the ENDEC sends an alert. If you sent data to the encoder device, the ENDEC will interpret it in the same manner as it interprets FSK data received on an audio port. If the data triggers an alert, the ENDEC uses the Encoder Audio In port for the audio portion of the message.

The following text is a sample of the output of the encoder device. The ‘+’ character is actually the EAS sync byte, 0xAB.

```
++++++++++++++++ZCZC-EAS-RWT-006013+0015-1020624-SAGE     -
++++++++++++++++ZCZC-EAS-RWT-006013+0015-1020624-SAGE     -
++++++++++++++++ZCZC-EAS-RWT-006013+0015-1020624-SAGE     -
++++++++++++++++NNNN++++++++++++++++NNNN++++++++++++++++NNNN
```

Use **MENU.DEVICES.PORT.DEVICE TYPE.ENCODER** to set an encoder device.

The “decoder” device will show the state of the EAS decoder at the time a message is received or sent.

The general format is:

<*type*>:<zczc string>

<expanded text>

Type is

local:	An alert is being sent by the ENDEC.
match:	An alert has been heard by the ENDEC and it matches an input filter.
nomatch:	An alert has been heard by the ENDEC and it does not match any filter.
dup:	This alert has already been heard.

For example:

```
local:ZCZC-EAS-RWT-006013+0015-1020638-SAGE     -
A Broadcast station or cable system has issued a Required Weekly Test for Contra
 Costa, CA beginning at 02:38 am and ending at 02:53 am (SAGE)
```

Use **MENU.DEVICES.*PORT*.DEVICE TYPE.DECODER** to set an encoder device.

8.2 Serial Printer

The ENDEC will print a copy of everything that it sends to the local thermal printer to an external serial printer. Use **MENU.DEVICES.*PORT*.DEVICE TYPE.SERIAL PRINTER** to set an encoder device. The serial printer will print even if the thermal printer is turned off with **MENU.CONFIG.PRINTER.NO**.

See section 12.1 for the ENDEC serial pin out, and consult your printer manual to determine your cable requirements. When connecting the ENDEC to a PC as a serial data capture device, you will typically use a “null modem” cable, as the pinout for a PC and the ENDEC are identical. A DB-9 null modem cable will connect pin 2 to 3, 3 to 2, and 5 to 5.

8.3 Alert Text Output (Generic Character Generator)

The ENDEC offers an output format suitable for use with devices that want to format alert data for display. The most common use is for character generators other than those directly supported by the ENDEC (vds840 and Chyron CODI). The format is :

<STX><sev><text><ETX>

Where:

STX	0x02
sev	The severity of the alert. For the VDS and Chyron character generators, and the ENDEC LED signs, the severity is used to set the color of the message. '1' - 0x31 is most severe (tornado warning, EAN, etc.) '2' - 0x32 is less severe (tornado watch, etc.) '3' - 0x33 is not severe (weekly test, etc.)
text	The expanded text of the message, length is dependent on the number of location codes in the alert, the length could be 2000 characters if both English and Spanish output is selected.
ETX	0x03

The following is a hex dump sample of the output of the GENERIC CGEN device:

```
00000000  02 33 41 20 42 72 6f 61  64 63 61 73 74 20 73 74   .3A Broadcast st
00000010  61 74 69 6f 6e 20 6f 72  20 63 61 62 6c 65 20 73   ation or cable s
00000020  79 73 74 65 6d 20 68 61  73 20 69 73 73 75 65 64   ystem has issued
00000030  20 61 20 52 65 71 75 69  72 65 64 20 57 65 65 6b    a Required Week
00000040  6c 79 20 54 65 73 74 20  66 6f 72 20 43 6c 61 72   ly Test for Clar
00000050  6b 2c 20 4e 56 2c 20 48  75 6d 62 6f 6c 64 74 2c   k, NV, Humboldt,
00000060  20 4e 56 2c 20 61 6e 64  20 57 61 73 68 69 6e 67    NV, and Washing
00000070  74 6f 6e 2c 20 44 43 20  62 65 67 69 6e 6e 69 6e   ton, DC beginnin
00000080  67 20 61 74 20 30 32 3a  33 34 20 70 6d 20 61 6e   g at 02:34 pm an
00000090  64 20 65 6e 64 69 6e 67  20 61 74 20 30 32 3a 34   d ending at 02:4
000000a0  39 20 70 6d 20 28 53 41  47 45 29 03               9 pm (SAGE).
```

Use **MENU.DEVICES.*PORT*.DEVICE TYPE.GENERIC CGEN** to set this device.

8.4 News Room Software

Some stations have news room software, or other wire service software, that watches a serial data stream for certain tokens. When these tokens are seen, the data is switched to certain terminals, or placed in files, or other action is taken. To make it easy to interface the ENDEC with this type of software, use the NEWS FEED device. Use **MENU.DEVICES.*PORT*.DEVICE TYPE.NEWS FEED** to set this device. When set, the ENDEC will send alert and other status messages to this device. Each messages starts with <ENDECSTART> and ends with <ENDECEND>, for example:

```
<ENDECSTART>
Local Alert sent at 02/07/97 22:52:55
The National Weather Service has issued a Severe Thunderstorm
Watch for Aleutian Islands, AK beginning at 10:52 pm and ending
at 11:07 pm (SAGE)
ZCZC-WXR-SVA-002010+0015-0390352-SAGE  -
<ENDECEND>
<ENDECSTART>
Alert Received at 02/07/97 22:53:14 on monitor #1
Matched Filter REQUIRED RMT
A Broadcast station or cable system has issued a Required Monthly
```

```
Test for Autauga, AL and Barbour, AL beginning at 10:52 pm and
ending at 11:07 pm (SAGE)
ZCZC-EAS-RMT-001001-001005+0015-0390352-SAGE    -
<ENDECEND>
```

8.5 Commercial Tally

If you want to run the ENDEC in automatic mode, but don't want low priority messages to interrupt commercials, the ENDEC has a "commercial tally" feature. If you can close (or open) a relay during the time when you don't want an alert to interrupt programming the ENDEC's manual override Hold Off feature can be used.

Use **MENU.OVERRIDE USE.HOLD OFF** to set this mode. Use **MENU.OVERRIDE USE.ACTIVE POLARITY** to set the active state (open or close). Wire the relay on your automation equipment to connect the manual override input to an audio common when the relay is closed, and to float manual override when your relay is open.

If Hold Off is set, and active polarity is Closed, the ENDEC will hold alerts it wants to send while your relay is closed. It will send the alert when your relay is open.

The maximum hold off time is 15 minutes. Hold off node is entered after the incoming filter's time has expired. EAN/EAT alerts (the Presidential level) ignore manual override. You can also set other alert types, such as Tornado Warnings, to ignore manual override by setting their filter priority higher than **MENU.CONFIG.MIN OVERRIDE PRIO**.

A two step hold off process can also be initiated by the ENDEC. If your automation equipment can schedule an interrupt, the ENDEC can close a relay to signal that an alert is pending. See the pending relay program described in section 5.7, Relay Programming.

8.6 Daylight Only Stations

Stations that operate during day hours only are required to retain Required Monthly Tests that arrive overnight, and relay them in the morning A special version of the hold off feature, called **Hold Off Night** can be used. Use **MENU.OVERRIDE USE.HOLD OFF NIGHT** to set this mode. When the override is asserted, monthly test messages will be held without regard to the 15 minute limit.

8.7 Older EBS Equipment

The ENDEC may be used to replace old EBS equipment in some cases. Old EBS equipment closed a relay when the EBS two-tone signal was received. The ENDEC can be set to close one of the three relays when the two tone signal is received. Normally, this occurs after channel scanning has been stopped by the receipt of the EAS data tones.

The ENDEC will also close a relay if the two-tone signal is heard stand-alone, but only if just two channels are selected for scanning. Any two may be selected, but only a total of two may be selected.

The two-tone signal must be received for the number of seconds specified in **MENU.CONFIG.ATTN DECODE**. Set a relay to the "ATTN Detect" program with **MENU.RELAY**. See section 5.7, Relay Programming, for information on programming relays.

9. Controlling Multiple Stations

A single ENDEC can control several other stations by using one or two Multi Station Relay Panels (MSRP). Each relay panel has four independently switchable relays. You can configure these with the ENDEC software option **MSRP.ASSIGN MSRP RELAY** as either stereo pairs or as independent monaural input/outputs. You can also assign more than two relays to a station, if, for example, you want to also switch a secondary audio channel.

Two MSRPs can be daisy-chained to provide up to eight relays which can be assigned to a total of four stations.

A station, as used here, is a collection of peripherals:

- A control device, either the front panel or the RC-1 remote control
- One or more MSRP relays or the ENDEC XLR relays
- Possibly a character generator or LED sign

When the control device for a station initiates an alert, only the peripherals associated with that station will trigger (though the operator has the option of also triggering other stations).

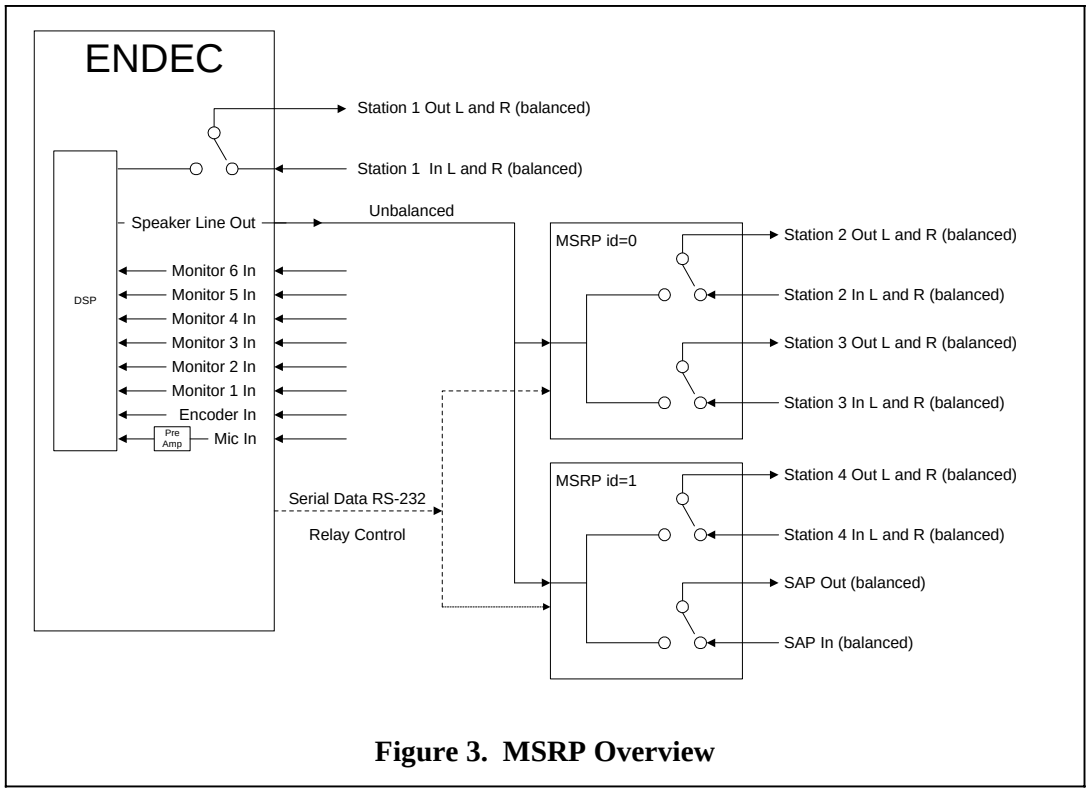


Figure 3. MSRP Overview

The MSRP hardware setup is described in the MSRP installation guide that comes with the MSRP hardware.

9.1 Station Numbers and Names

The ENDEC supports four "stations", meaning a collection that can be separately triggered by an alert. In this section of the manual, stations will refer to the ENDEC object called a station. "Transmitter" will refer to your radio or TV station. The number of transmitters supported by the four ENDEC stations is up to you, and is mainly determined by the number of MSRP relays you assign to each station.

Station number 1 always owns the internal ENDEC XLR relays. It may also own one or more MSRP relays. You can not assign the XLR relays to other stations. Only station 1 will be triggered by the manual override input when it is used as a trigger for a Weekly Test (section 11.61).

You assign MSRP relays to stations by using the **MSRP.ASSIGN MSRP RELAY** menu. The back panel of the MSRP labels the relays like this: 1L, 1R, 2L, 2R. Each relay can be separately switched. If a second MSRP is used, the ENDEC will refer to its relays as 3L, 3R, 4L, 4R.

By default, the MSRP relays are assign to stations like this:

Relay Name	Station
1L	2
1R	2
2L	3
2R	3
3L	4
3R	4
4L	0
4R	0

This means that station 1 controls the internal ENDEC XLR relays. Station 2 controls the first pair of MSRP relays, station 3 the second. If a second MSRP is present, station 4 controls the first pair and the second pair is unused.

Assume you have a TV transmitter with a SAP channel (station 1), an FM transmitter (station 2), and a mono AM transmitter (station 3), all controlled from a single ENDEC. You can support these with a single ENDEC and one MSRP, with relay assignments like this:

Relay Name	Station	Use
XLR L	1 (fixed)	TV Main Channel Left
XLR R	1 (fixed)	TV Main Channel Right
1L	2	FM Main Channel Left
1R	2	FM Main Channel Right
2L	3	AM Main Channel
2R	1	TV SAP Channel

In this example, you would assign the character generator to station 1 with **MENU.DEVICES.*PORT*.STATION**.

9.2 Configuring the ENDEC for MSRP Use

To configure your ENDEC for use with an MSRP you will need to do at least the following:

1) Assign a comm port to the RELAY device, for example, **DEVICES.COM4.DEVICE TYPE.RELAY.** Use either of the two 1200 baud ports, COM4 or COM5. Refer to the MSRP Installation Manual for information on daisy-chaining two MSRPs.

2) Assign a comm port to the hand held remote control for each station. See the “ENDEC Peripherals” section of the ENDEC manual for hookup information. Note that if you use more than two remote

controls powered from the ENDEC accessory power, you'll need a heavy-duty ENDEC power cube. Set the station parameter to the station number controlled by that remote.

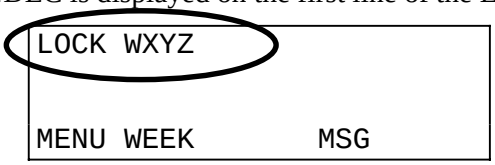
3) Set the call sign for each station using the **MENU.MSRP.STATION N.CALL SIGN** menu.

4) Set **MENU.MSRP.STATION N.ENABLE** to yes for each defined station.

9.3 Controlling an Individual Station

Once the MSRP section of the ENDEC has been set up as described above, each remote control will by default control only its station (as set by the **MENU.DEVICES.P*ORT*.STATION** parameter for that remote control). The ENDEC front panel always controls station 1.

If a button is pressed on any remote control, or the front panel, the ENDEC becomes locked for use by only the control input (with the exception of the PRESET button, described later). The station that controls the ENDEC is displayed on the first line of the LCD display for all other stations, for example:

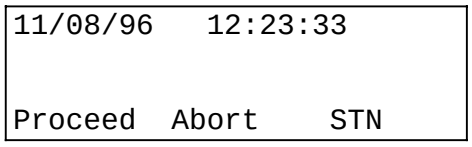


The station in control (in this example, WXYZ) continues to see the time displayed on the first line. The call sign displayed for each station is set by **MENU.MSRP.STATION N.CALL SIGN**.

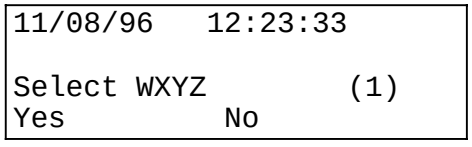
By default, alerts originated or relayed from a remote control will only affect its station. For example, if the week button or week soft key is pressed on the remote control for station two, only the relays for station two are closed during the alert.

9.4 Controlling Other Stations

The operator can add other stations to any alert by using the STN soft key. For example, assume the WEEK key has been pressed. If an MSRP is present, the display will look like this:



Press the STN key to get a list of stations to send this alert to:



Press Yes to add this station to the list to send to. If a station has already played the alert, it will not play the alert a second time. The station number is displayed in parentheses after the station call sign to differentiate between stations if the same call is used for more than one station.

9.5 MSRP Automatic Operation

Received alerts work in the same way in an MSRP configuration as they do in the single-station configuration. If the alert matches a filter that is Timed Ignore or Timed Relay, the alert is displayed as

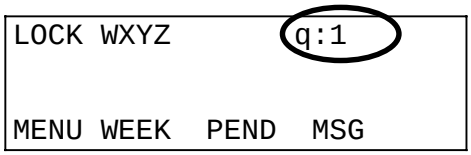
pending on the display, and the countdown is shown. If a Timed Relay alert times out, it will be sent on all stations with **MENU.MSRP.STATION N.ENABLE** set to yes. A Timed Ignore alert is deleted when the hold time expires.

While an alert is in the pending state, each operator can elect to send the alert on his or her transmitter by using the play now button or the PEND soft key.

To send the alert:

Press the PEND or Play Now button. If this is the first remote control to do so, the ENDEC will go into the pending alert menu. If the ENDEC is already locked by another station, the LOCK message will be displayed.

If the ENDEC is locked, press the PRESET button. This will place this station in a queue waiting to access the ENDEC. Your position in the queue will be displayed on the LCD display:



The q:n shows your position in the queue, 1 meaning you are next (one station is in front of you and is controlling the ENDEC), 2 means two stations are in front (one waiting, one controlling), etc.

If you are in control, proceed through the pending menu in the normal manner. If you are queued for access, the remote control's LEDs will flash and a "you may proceed" message appears in the display. Press the PEND soft key or the play now button to continue. You can relay the alert with the **SEND** menu, or you can review the text with the **OPT.VIEW** menu, preview the audio with the **CUE** menu, or stop a timed relay message from playing on your station with the **OPT.DEL** menu.

9.6 Unattended Operation

The ENDEC relays an incoming alert based in part on whether the ENDEC is in Automatic or Manual mode. To review the concepts:

Automatic mode: The **CONFIG.MODE** parameter is set to auto, or **CONFIG.MODE** is set to timed and the time of day is in the automatic range.

Manual mode: The config.mode parameter is set to manual, or **CONFIG.MODE** is set to timed and the time of day is NOT in the automatic range.

Incoming alert action	*When relayed if Automatic*	*When relayed if Manual*
Automatic Relay	Immediate	Immediate
Timed Relay	Immediate	When hold time expires
Timed Ignore	Discarded Immediately	Discarded after hold time expires
Manual	Discarded when hold time expires	Discarded when hold time expires
Log Only	Never Relayed	Never Relayed

In an MSRP configuration, **MENU.CONFIG.MODE** is an override for all stations. If **MENU.CONFIG.MODE** is set to manual, then **MENU.MSRP.STATION N.MODE** will control each station. The action for each station is the same as the above table with the following exception: If the incoming alert action is Timed Relay, and config.mode is manual, and **MENU.MSRP.STATION N.MODE** is auto, the alert is not immediately relayed. It is instead held until the hold time expires. This is to allow a manual station to pick the time it will send an alert, rather than having to wait until the alert is sent on the unattended stations first. When the manual station does send its alert, **MENU.MSRP.STATION N.MODE** AUTO stations will trigger along with the manual station.

10. Cable TV Options

The ENDEC supports the MHz Sub-Alert to provide EAS to cable operators. Information on the Sub Alert system is provided by MHz. The ENDEC commands that are specific to cable are described in this section.

10.1 Non-Volatile Audio Storage

When configured with the "Cable TV" option, the ENDEC has either 10 seconds or 40 seconds of non-volatile audio storage in addition to the standard two minutes of volatile storage. Non-volatile audio is audio that is retained even when the power is off. See section 3.3 for a description of ENDEC memory.

This audio is normally used to announce a "tune to" channel as part of the all-channel audio interrupt. It can also be used as a lead-in "sounder" for broadcast stations. See section 11.31, **MENU.CONFIG.NV LEAD-IN** for details.

10.2 MHz Sub Alert

For cable operation, you will need to follow the basic customization procedures. You'll need to:

- Set the time of day (**MENU.DATE/TIME)**
- Set the "call sign", in your case, the cable system name (**MENU.CONFIG.CALL SIGN**)
- Set incoming filters for any messages you want to automatically forward. (**MENU.PRESETS.INCOMING**)
- Set the desired mode of operation (**MENU.MHZ SUB-ALERT.ENABLE)**, described below.
- Set a character generator device to a serial port (**MENU.DEVICES)**
- Set the presence of non-volatile audio storage memory (**MENU.CONFIG.NV AUDIO LEN)**

The commands to customize cable operation are discussed below. These commands adjust the basic cable alert time line, which is shown in Figure 10-1. The parts of the time line are:

Attention Signal	The second Attention Signal is required for some types of alerts, and is optional for others. This Attention Signal is part of the FCC requirements. The first Attention Signal period is optional. It's length is controlled by **MENU.MHZ SUB-ALERT.ATTN DURATION** and can be zero.
Tune To Audio	The contents of the non-volatile audio store are played at this time. This audio is recorded by you using any of the audio inputs. This audio is retained across power failures. The audio can be repeated any number of times, set by **MENU.MHZ SUB-ALERT.TUNE TO REP.**
EAS Header	The standard EAS header is repeated three times and is always present.
EAS Audio	The audio that came in with the message that is being relayed was stored in the two minute audio store. It is relayed once at this time, and a variable number of times at the end of the alert.
EAS EOM	The EAS end of message data is sent three times, and is always present.
EAS Audio Repeat	The EAS audio is replayed the number of times specified in **MENU.MHZ SUB-ALERT.REPEATS**. It can be zero.

Several operations occur during the timeline. The decoder active and encoder active relays are pre-empted for use by the sub-alert, any definitions for these relays specified in menu.relay are ignored. Settings for the ATTN Active relay and the virtual relays are used. See section 5.7, Relay Programming, for information.

The relationship between the Sub Alert timeline and the Main ENDEC timeline of Figure 5-1 is shown in Figure 10-1.

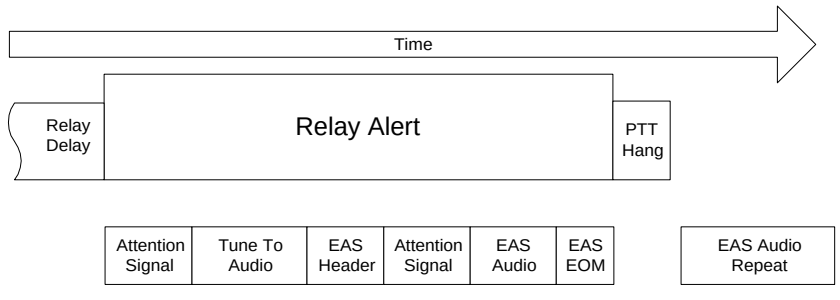


Figure 10-1. Relationship of the sub-alert timeline to the main alert timeline.

The Sub Alert specific commands are described below.

10.2.1 MENU.MHZ SUB-ALERT.ATTN DURATION

Sets the length, in seconds of the first attention signal. This signal normally occurs during the "all channel" portion of the alert.

10.2.2 MENU.MHZ SUB-ALERT.MHZ ENABLE

The three Sub Alert modes are selected with this option. The menu choices are 1, 2, 3, and NONE. Mode 1 is used when the alert details channel is also a cgen channel run by the VDS 830EAS. The page queue is maintained, and the crawl is restored after the alert. Mode 2 is used when the details channel is shared with a normal video channel by a VDS 830EAS. Normal video is replaced with a fixed page and an EAS crawl during the alert, and is restored afterwards. Mode 3 is used when the details channel is shared with a normal video channel by a VDS 840EAS. In this case, the alert crawl is keyed over the video channel.

To disable MHz mode, choose NONE.

10.2.3 MENU.MHZ SUB-ALERT.REPEATS

This specifies the number of times the alert audio will repeat after the end of the formal EAS alert (EAS Audio repeat in the timeline of Figure 10-1). This number can be zero.

10.3 MENU.MHZ SUB-ALERT.RWT MODE

Selects the action when a required weekly test is sent. **Details** sends the alert on the details channel only. **All** Channel send the alert on all channels but does not send audio during the all channel portion. **Normal** treats a required weekly test as if it were any other type of alert.

10.3.1 MENU.MHZ SUB-ALERT.TUNE TO CHAN

During the Tune To portion of the timeline, either a page specified by the user, or a page built by the ENDEC is displayed, as specified by **MENU.MHZ SUB-ALERT.USER PAGE**. If the ENDEC page is used, the text includes "Tune to channel XX for an emergency message". This option specifies XX.

10.3.2 MENU.MHZ SUB-ALERT.TUNE TO REP

Specifies the number of times the non-volatile audio message plays. It can be zero. You record this audio, it usually contains a script such as “Tune to channel xx for an emergency message”.

10.3.3 MENU.MHZ SUB-ALERT.USER PAGE

You are given a choice of “yes” or “no”. If yes, page 98 is displayed during the “tune to” portion of the timeline.

11. ENDEC Command Reference

11.1 MENU.ALERTS.CLEAR ALERT LOG

This command will clear the history log of old alerts. The last 47 alerts are saved in non-volatile RAM where they can be re-issued with **MENU.ALERTS.VIEW ALERT LOG**.

11.2 MENU.ALERTS.CLEAR LED SIGN

This command will clear the LED sign of any message. Use to clear a long duration alert that is no longer interesting.

11.3 MENU.ALERTS.ORIGINATE ALERT

Used to build an alert "on the fly", that is, in real-time. The alert can be built totally from scratch, or you can modify an existing outgoing template. A template contains an originator and event code, a list of locations, and other parameters for the alert, such as audio source. See section 6.3, "Originating an Alert" for details.

11.4 MENU.ALERTS.PREVIEW AUDIO

Hand held remote control key: ***cue***.

This command will play the contents of the digital recorder, if any. The digital recorder contains the last received alert audio, or the last recorded local audio. You can record local audio with **MENU.ALERTS.RECORD AUDIO** or the ***record*** hand held remote key. The number of seconds remaining in the playback is shown on the display.

11.5 MENU.ALERTS.PREVIEW NVAUDIO

Hand held remote control key: ***shift-cue***.

This command will play the contents of the non-volatile audio store, if any. The non-volatile audio store is loaded with the **MENU.ALERTS.NVRECORD AUDIO** or the ***shift-record*** hand held remote button. The number of seconds remaining in the playback is shown on the display.

11.6 MENU.ALERTS.RECORD AUDIO

Hand held remote control key: ***record***.

This command will record audio from any of the audio inputs (except the Main Audio XLR, which is pass-through audio only). Audio stored in this way will be played as the alert audio whenever the audio type for an alert is "stored audio".

To record:

1. Go to **MENU.ALERTS.RECORD AUDIO.**
2. At the "Select Source:" prompt, scroll with **next** or **prev** to the input you want, usually "encoder in" or "microphone". Press **pick** to select. Note: The hand held remote ***record*** key does not ask for a source. The intent is to simplify the interface as it is likely that the remote location will use a fixed input. The audio input for use with the ***record*** key is set with **MENU.CONFIG.DEFAULT REC.**. A user at the remote control can still set the record source by using the menu keys and selecting **MENU.ALERTS.RECORD AUDIO**.

3. Use the **start** soft key, or the microphone push-to-talk button to start recording from the selected source.
4. The display will count down to the end of the digital recorder storage, 120 seconds.
5. To end recording, press the **end** soft key, or release the microphone push-to-talk. Recording will automatically stop at the end of 120 seconds.

To erase the contents of the audio recorder:

1. Go to **MENU.ALERTS.RECORD AUDIO.**
2. Select any audio source.
3. Use the **erase** soft key to delete stored audio.

Audio stored in the audio recorder is lost across a power cycle.

11.7 MENU.ALERTS.RECORD NVAUDIO

Hand held remote control key: ***shift-record***.

This command will record audio from any of the audio inputs (except the Main Audio XLR, which is pass-through audio only). Audio stored in this way can will be played as "tune to" audio for cable TV applications (see section 10.2, "MHz Sub Alert"). It can also be used as a lead-in sounder before an alert, see section 11.31, "**MENU.CONFIG.NV LEAD-IN**"

To record:

1. Go to **MENU.ALERTS.RECORD NVAUDIO.**
2. At the "Select Source:" prompt, scroll with **next** or **prev** to the input you want, usually "encoder in" or "microphone". Press **pick** to select. Note: The hand held remote ***shift-record*** key does not ask for a source. The intent is to simplify the interface as it is likely that the remote location will use a fixed input. The audio input for use with the ***shift-record*** key is set with **MENU.CONFIG.DEFAULT REC.**. A user at the remote control can still set the record source by using the menu keys and selecting **MENU.ALERTS.RECORD NVAUDIO**.
3. Use the **start** soft key, or the microphone push-to-talk button to start recording from the selected source.
4. The display will count down to the end of the non-volatile digital recorder storage, 10 or 40 seconds (as selected by **MENU.CONFIG.NV AUDIO LEN**).
5. To end recording, press the **end** soft key, or release the microphone push-to-talk. Recording will automatically stop at the end of the non-volatile audio store (as set by **MENU.CONFIG.NV AUDIO LEN).**

To erase the contents of the non-volatile audio recorder:

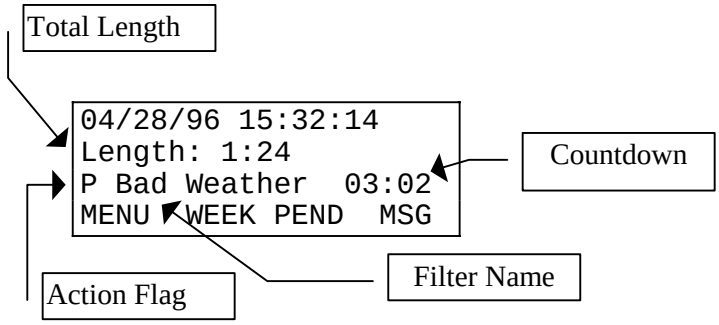
1. Go to **MENU.ALERTS.RECORD NVAUDIO.**
2. Select any audio source.
3. Use the **erase** soft key to delete stored audio.

Audio stored in the non-volatile audio recorder is retained across a power cycle.

11.8 MENU.ALERTS.SEND PENDING

Hand held remote control key: ***playnow***.

Use this command to send a pending alert. If an alert is pending, the default screen will show the name of the filter, a type marker, and a count down timer.



Total Length	The total time, in minutes and seconds, that this alert will take in air-time, that is, main relay close to main relay open.
Countdown	Time in minutes and seconds until the alert will auto play or auto kill.
Filter Name	The name of the filter that matched this alert. A filter is a named group of events, originators, and locations. Each incoming alert is matched against the user specified or default filters, the highest priority filter that matches has precedence. In this example, a user-supplied filter called bad weather (probably containing tornado warning, severe weather statement, etc.) has matched the alert.
Action Flag	P = pending, will play when countdown expires. D = delete, will delete when countdown expires H = hold off, hold off input is held active. Countdown is the time until the alert is sent regardless of the state of the holdoff line.

When the PEND soft key is pressed, the next screen display depends on how far the received alert has progressed. If the alert is not yet complete, the menu line will contain:

```
04/28/96 15:32:14

Not done receiving
OK       MUTE
```

Press the OK soft key to return to the main menu. Press the MUTE soft key to mute the speaker. The speaker may be playing the incoming alert, if **MENU.MONITOR SOURCE.ALERTS** has been set.

If the alert has been completely received, the following menu options are shown:

Send	Sends the pending alert. (see below)
Done	Leave this menu level
Opt	Options menu: Done: Leave this menu. View: Show the text for this alert. Audio: Select an alternate audio source Cue: Delete this pending alert (don't relay it).
Kill	Kills this alert

If you press the **Send** soft key, the following options are shown:

Proceed	Press this soft key to immediately send the alert.
Abort	Press the soft key to halt the send process. The alert remains pending - you must KILL it to delete it from the pending queue.
STN	If you have a multi station relay panel configured, this soft key is shown. Press to select, by call sign, the list of stations you want to send this alert to.

11.9 MENU.ALERTS.VIEW ALERT LOG

The command will display the contents of the old alert log. The ENDEC stores the last 88 alerts sent or received in non-volatile RAM. The time and type of the alert sent or received is displayed along with the following soft keys. The most recent alert is shown first.

Done	Exit this menu.
Opt	Shows options, see below.
Next	Show next oldest alert
Prev	Show previous (newer) alert

The soft keys shown by the Opt choice are:

Done	Exit this menu.
View	Shows the text of the alert, along with the monitor it was received on, or the station(s) it was sent on.
Send	Resends the alert. You will be prompted to make sure you want to resend an old alert, and prompted for the audio source. **IMPORTANT**: The ENDEC only stores the most recent incoming audio. If you resend an old alert, make sure you do not send wrong audio. You can use the send feature to resend an alert that did not successfully transmit - usually caused by the ENDEC being manually switched out of the audio chain.

11.10 MENU.CHANGE ADMIN

The administrators password is changed with this command. The admin password is used for all configuration commands. You are prompted for the existing password, then the length of the new password. You are then prompted to enter the new password. Press the soft key under the numbers, 1, 2, 3, or 4, in the sequence you want. For example, to set the password to 12443, set the length to five and press 1, 2, 4, 4, and 3 in that order. While you can set the admin length to zero, this is not recommended.

The last step in the process is to re-enter the admin password, to make sure you and the ENDEC agree on what it is. If you forget the admin password, you must use the procedure in section 14.3, "Resetting the passwords" to restore the password to the default, 1111.

11.11 MENU.CHANGE PASSWORD

The user's password is changed with this command. The user password is used to send alerts, relay alerts, replace audio, and feed paper through the printer.

You are prompted for the admin password, then the length of the new user password. You are then prompted to enter the new user password. Press the soft key under the numbers, 1, 2, 3, or 4, in the sequence you want. For example, to set the password to 12443, set the length to five and press 1, 2, 4, 4, and 3 in that order. You can set the password length to zero.

The last step in the process is to re-enter the user password, to make sure you and the ENDEC agree on what it is. If you forget the user password, you can reset it as long as you know the admin password.

11.12 MENU.CHANGE PRO PASS

This command changes the current password used for access by the ENDEC PRO and ENDEC DJ software programs. This affects both the "PRO" device and the "MODEM" device.

It is not possible to display the current password. Each time the **MENU.CHANGE PRO PASS** command is used, the password is randomized. You can modify the password using the softkeys.

```
07/01/02 11:06:25
Pro Pass:=WoaZwE3h

Done curs  up  down
```

Use the **curs** key to move the edit cursor – the underline shows which character is being edited. Use the **up** and **down** keys to change the character. Upper and lower case can be used as well as digits and special characters. The password must be 8 characters long.

This password and the ENDEC DJ or ENDEC PRO password for this ENDEC must match exactly. In versions of ENDEC DJ/PRO that support multiple ENDECs, a password for each ENDEC must be entered.

As always, password security is up to the user. Select a non-obvious password (not your company name), use upper and lower case and at least one special character. The space and backslash "\" characters can not be used.

11.13 MENU.CONFIG.ALLOW BUILD EAN

Only a few broadcasters will ever originate alerts with EAN or PEP originators, or EAN and EAT event codes. Set this option to yes to allow building these alerts. The default is no. There are various federal penalties for the improper use of these restricted codes, refer to the Part 11 rules for details.

11.14 MENU.CONFIG.ATTN DURATION

Not Used.

11.15 MENU.CONFIG.AUTO START

This menu selects the time (hour or minute) each day that the station is in automatic mode. In automatic mode, filters that have a "timed ignore" action are immediately ignored. Filters that have a "timed relay" action are relayed immediately.

This menu allows you to select:

None	No auto start time.
Hour	Auto start hour
Min	Auto start minute.

The default is none.

To enable the auto start feature, you must select **MENU.CONFIG.MODE.TIMED**.

11.16 MENU.CONFIG.AUTO STOP.

The auto stop function selects the time at which the automatic mode is ended each day. Refer to 11.15, "**MENU.CONFIG.AUTO START**" for details. The default is none.

11.17 MENU.CONFIG.CALL SIGN

The call sign field is placed in EAS alerts sent by this station, in the "LLLLLLLL" field (as defined in Part 11). You can enter from one to eight characters, either upper case letters, 0 through 9, '(', ')' or the '\' character. On the LCD display, the '\' appears as '¥'. The default is "SAGE".

11.18 MENU.CONFIG.CODI CRAWL SPEED

This selects the speed at which the crawl moves on a Chyron Codi, 1 is fastest, 9 is slowest. The default is 2.

11.19 MENU.CONFIG.CODI MODE

This selects the display mode used by the ENDEC when displaying a crawl on the Chyron Codi. "Plain" crawls the text on a simple color bar. "Fancy" crawls the text on a bar with a 3d effect. The default is plain.

11.20 MENU.CONFIG.CRAWL REPS

This selects the minimum number of times the crawl appears for an alert. The crawl will crawl for as long as the audio plays, and will finish a repetition that was in progress when the audio finished. If the number of repetitions was not at least "crawl reps", more crawls are added.

11.21 MENU.CONFIG.CRAWL RWT

If Yes, a Required Weekly Test will generate a video crawl. If no, it won't.

11.22 MENU.CONFIG.DEFAULT DURATION

Selects the default duration for outgoing alerts (hh:mm). This is useful for alerts initiated with a one-touch remote control button. The default is one hour (01:00).

11.23 MENU.CONFIG.DEFAULT REC

Selects the default audio source for the hand held controller's "record" key. Use the **Next** and **Prev** soft keys to select from the list of choices (monitor inputs, encoder audio in, and microphone in), use **Pick** to select. The default is encoder in.

11.24 MENU.CONFIG.LANGUAGE

The ENDEC will display the EAS alert information on the LED display, the video character generator crawl, and other places the text is displayed, using the language selected. The choices are English, Spanish[10], or Both. If Spanish is selected, the printer outputs will also contain English for logging purposes. The default is English.

11.25 MENU.CONFIG.LED SIGN MODE

The LED sign has several presentation modes. They are selected by using the **up** and **down** keys to scroll through the following list of mode identifiers, and using the **done** key to make a selection.

Mode	Action
a	Message travels left to right.
b	Message remains stationary.
c	Message remains stationary and flashes.
e	Message rolls up.
f	Message rolls down

Other modes are possible but are not useful for this application. The default is "a".

11.26 MENU.CONFIG.LED SIGN SOUND

The LED sign contains a beeper that is triggered when new text is displayed. Use "yes" to enable, "no" to disable. The display will beep once for test messages, three times for watches, and six times for warnings or EAN messages. The default is yes.

11.27 MENU.CONFIG.LED SIGN TIME

If set to YES, displays the time in mm/dd/yy hh:mm format on all LED displays when they are otherwise idle. This is meant as a mechanism to check the operation of the LED sign. The default is yes.

[10] Spanish translations provided by Robyn Baigorria and Carlos Duarte.

11.28 MENU.CONFIG.MENU TIMEOUT

If you are in a menu, but stop pushing buttons for this number of seconds, the ENDEC will abort the current function and return to the default screen. The exception is the "proceed or abort" menu used as the final step in sending an alert - this menu always waits four minutes. Use the **more** and **less** soft keys to adjust the number of seconds, use **done** to select and exit the menu. The default is 30.

11.29 MENU.CONFIG.MODE

Selects one of the following modes:

Manual	The "timed ignore" and "timed relay" action types in filters work as specified, that is, an alert is delayed for the number of minutes specified in the filter's hold time parameter before action is taken.
Auto	The "timed ignore" and "timed relay" action types act as if hold time was 0, meaning the action occurs immediately.
Timed	Auto mode starts and stops based on time of day, as specified in **MENU.CONFIG.AUTO START** and **MENU.CONFIG.AUTO STOP**.

The default is manual. This is the same command as **MENU.MODE.**

11.30 MENU.CONFIG.NV AUDIO LEN

Sets the length of the non-volatile audio store. Select "10" for the 10 second option, "40" for the 40 second option, and "NONE" for none. The default is none. Non-volatile audio is an option that is normally only present on cable-ready ENDECs, though it can be ordered on any ENDEC.

11.31 MENU.CONFIG.NV LEAD-IN

This option allows the non-volatile audio store to be used as a lead-in to the audio portion of an EAS alert. Select "pre" to play the contents of the non-volatile audio before the EAS data header portion of the alert. Select "post" to play the audio after the EAS data header portion of the alert. As this will add audio to the actual alert audio, it should be used for special purposes only, not to add a "sounder". Select "none" to disable this feature. The default is none.

11.32 MENU.CONFIG.NWS HUNT TIME

The ENDEC detects two types of tones and "removes" them from the audio storage - the EAS Attention Signal (the Two Tone Signal), an the NWS attention signal (1050 Hz tone). The ENDEC does this by first noticing that one of the signals is present. If so, the digital recorder is "rewound" and is restarted after the tone ends.

The ENDEC can not start a relay of an alert until it has determined that the tone will not be present. Part 11 specifies the maximum delay time for Two Tone signal and the ENDEC waits for that amount of time. The NWS does not specify a maximum delay for the 1050 Hz tone. At some NWS locations, the insertion of the 1050 Hz tone is a manual step, and the delay can be 10 seconds or more. The **MENU.CONFIG.NWS HUNT TIME** parameter sets the maximum delay time for the 1050 Hz tone detector.

The ENDEC will wait until the end of NWS hunt time before it will assume that a 1050 Hz tone has not been sent. Setting this parameter too short will cause the 1050 Hz tone to be present in relayed audio if the NOAA site has a long delay between the header and the tone. Setting the parameter too

long will cause delays in forwarding real-time alerts (such as tornado warnings) if the alert source is not the NWS. The default is 20 seconds.

The delay is used only for channels identified as NWS channels with **MENU.CONFIG.NWS SELECT**.

11.33 MENU.CONFIG.NWS PRACTICE

The NWS sometimes sends an undefined location code, "999000". To remove this code from the expanded text of the message, select "no", to show it, select yes. The default is no.

11.34 MENU.CONFIG.NWS SELECT

The ENDEC will remove the 1050Hz warning tone used by NOAA stations for weather alerts. If you want the tone to be removed, select the monitor channel with the **next** soft key, then select **yes**. This feature is available only on odd-numbered monitor channels, if you have an NWS monitoring assignment, feed its audio to an odd-numbered monitor input.

11.35 MENU.CONFIG.OLD SCAN METHOD

Version 6.1 improves the method the ENDEC uses to scan the monitor in audio channels for alerts. This command can be used to revert to the old method by selecting YES. The default NO should be used unless otherwise instructed by ENDEC technical support.

11.36 MENU.CONFIG.ORIGINATOR

Sets the default originator, used when building new alerts or outgoing templates. The default is "broadcast or cable". The PEP and EAN choices are only available if **MENU.CONFIG.ALLOW BUILD EAN** is set to yes.

11.37 MENU.CONFIG.PRINT ALL ALERTS

Select **YES** to print all incoming alerts to the thermal printer. Select **NO** to print only FCC required events: Incoming RWT, RMT, EAN, EAT, and any message you originate or relay.

11.38 MENU.CONFIG.PRINT ZCZC

Select **YES** to print the EAS text string (ZCZC, etc.) along with the translated text of the alert.

11.39 MENU.CONFIG.PRINTER

Select yes to enable the thermal printer. The default is no.

11.40 MENU.CONFIG.PRO EXTRA STAT

When set to YES, enables sending of additional status information for use by the ENDEC Logger program.

11.41 MENU.CONFIG.PRO READ ONLY

If set to YES, this option disallows input from the ENDEC PRO device. The result is that ENDEC Pro, ENDEC DJ, and ENDEC Logger will receive status information only, but can not be used to remotely control the ENDEC. This adds an additional layer of protection when accessing the ENDEC via a LAN.

11.42 MENU.CONFIG.PROCESSOR LEAD

If you have trouble reaching the necessary output levels for the EAS header data portion of the alert due to your audio processing, you can specify a lead-in tone. This tone will play for the number of seconds specified by this option, and can serve to reduce compression and increase the modulation. The default is zero.

11.43 MENU.CONFIG.SCAN SELECT

This option selects the channels that are scanned for EAS alerts. Select a monitor input with **next,** then select **yes** to scan, or **no** to ignore.

11.44 MENU.CONFIG.STRICT TIME

All EAS alerts contain a start time and a duration for messages. If strict time is **yes,** messages that have expired are ignored. If **no,** messages are eligible for retransmission even if they appear to be expired. This feature is provided to compensate for stations or alert originators that allow their station time to drift substantially away from the actual time of day. The default is no in versions less than 5.30, yes in 5.30 and higher.

11.45 MENU.CONFIG.UNKNOWN FIPS

This option specifies what to do if an unknown FIPS code appears in an incoming alert. If **no,** unknown locations are not shown in the expanded text of the alert. If **yes**, unknown locations print as a number. The default is no.

11.46 MENU.CONFIG.VDS RELAY ON

The VDS character generator contains a relay. In the open position, video is passed through on a wire, that is, the signal is not terminated in the CG, and is not modified by the CG. In the closed position, the video is terminated in the CG. On loss of power, the relay opens.

In versions of the ENDEC software prior to 5.88, the relay is left open except when the ENDEC wants to place a crawl on the screen. At that time, the relay is closed. This can add a glitch in the video stream. Some stations prefer this to having the video terminated in the CG.

With 5.88, the **MENU.CONFIG.VDS RELAY ON** menu allows you to specify that the relay is closed at all times. The ENDEC issues a close command to the CG when the ENDEC is powered up. This option allows the ENDEC to run a crawl without causing a glitch in the video signal.

If **MENU.CONFIG.VDS RELAY ON** is **yes**, the relay is left on (closed) at all times (terminated and no glitch). If **no**, the relay is normally in the open state (not terminated and glitch), is closed for crawls, and is then opened again.

The default is NO.

11.47 MENU.DATE/TIME

This menu is used to enter the date and time. See section 5.2, “Time” for details.

11.48 MENU.DEVICES.PORT

The **MENU.DEVICES** menu has six port sub menus, one for each serial port. The ports correspond to the serial ports and are named to match the label on the ENDEC enclosure. COMPUTER is on the front, the others are on the back. The lower sub menus are:

- Baud - select the baud rate for the computer port and com3, the others are fixed rate
- Device type - select the device type
- Station - select which station the device belongs two in an MSPR configuration (see section 9)

Details are below.

11.49 MENU.DEVICES.*PORT*.BAUD

The baud rate for the computer and com3 ports can be set, the other ports are fixed rate, see section 4.4. The choices are 1200, 2400, or 9600. The DOS software allows you to also specify 4800 baud.

11.50 MENU.DEVICES.PORT.DEVICE TYPE

Use this menu to assign devices to serial ports. Select a serial port, then select device type. Use the up and down buttons to scroll the list of devices. The device types are:

CODI CGEN	Chyron CODI character generator. See section 7.4, “Chyron CODI Character Generator”.
CONSOLE	Obsolete.
Decoder	EAS message output. See section 8.1, “Raw EAS input and output”.
ENDECSET	The ENDECSET program interface device. Select this device and attach a PC to the port to use the ENDECSET parameter save/restore program.
Encoder	EAS message input and output. See section 8.1, “Raw EAS input and output”.
ENDEC PRO	Used for the ENDEC PRO and ENDEC DJ products. These products provide a point and click interface for sending and relaying alerts.
GENERIC CGEN	Generic alert text output. See section 8.3, “Alert Text Output (Generic Character Generator)”
Hand Control	Hand held remote control. See section 7.1, “Hand Control”.
LED SIGN	LED marquee sign. See section 7.2, “LED Sign”. Not valid for computer or com3 ports.
Modem	Use when using a modem to connect to ENDEC DJ or PRO

News Feed	Used for newsroom software that can parse serial data and route text to files or screens. All messages that are normally printed to the serial printer or the internal thermal printer are sent to this device. All messages are prefaced by <ENDECSTART> and followed by <ENDECEND>, allowing software to find the start and end of each alert in the data stream. See section 8.4.
None	Use None to disable the device.
RECON	Use for the Statmon RECON program
Serial Printer	Serial printer output. See section 8.2, “Serial Printer”.
Sony	Not used for Broadcast Applications.
STAR-8	The STAR-8 Character Generator
VDS CGEN	VDS840EAS Character Generator. See section 7.3, “VDS Character Generator”
VDS MC	VDS Multi-Channel character generator.

You may assign the same device type to more than more serial port, except for the “ENDECSET,” “MODEM”, and “ENDEC PRO” types. The default for each serial port is “none”.

11.51 MENU.DEVICES.*PORT*.STATION

Sets the station number for this device if a multi-station relay panel is configured. See section 9.1 for details.

11.52 MENU.DEVICES.SHOW

Shows the current device type of all ports.

11.53 MENU.LCD CONTRAST

Adjust the front panel LCD display contrast. Use the **up** and **down** soft keys to adjust the viewing angle. The LCD display on the hand held remote is adjust using a different procedure, see section 7.1.3, “Changing the RC-1 Default Parameters”.

11.54 MENU.LEVELS

This menu is used to set the various output and record levels on the ENDEC. See section 4.3, “Audio Levels” for a tutorial on setting audio levels.

11.55 MENU.MODE

Selects one of the following modes:

Manual	The “timed ignore” and “timed relay” action types in filters work as specified, that is, an alert is delayed for the number of minutes specified in the filter’s hold time parameter before action is taken.
Auto	The “timed ignore” and “timed relay” action types act as if hold time was 0, meaning the action occurs immediately.
Timed	Auto mode starts and stops based on time of day, as specified in **MENU.CONFIG.AUTO START** and **MENU.CONFIG.AUTO STOP**.

The default is manual. This is the same command as **MENU.CONFIG.MODE**.

11.56 MENU.MONITOR SOURCE.

Use this menu to route audio from the selected source to the speaker out and speaker line out outputs. This can be used to listen to the monitor inputs, or to set an audio source for use with the **MENU.LEVELS** menu.

All of the choices refer to actual audio inputs or onboard sources except for **ALERTS**. If monitor source is set to alerts, the ENDEC will play alert audio live as it is received. The audio can be muted with the PEND and then MUTE soft keys (see section 11.8).

The choices for monitor source are listed below.

Monitor Source	Description
Alerts	Live alert audio as it is received.
Attn Tone	High and Low tone together
Attn Tone High	High tone only
Attn Tone Low	Low tone only
Data Tone	Active data tone
Data Tone High	High tone
Data Tone Low	Low tone
ENC AUD IN	Back Panel input
MIC IN	Front Panel input
MON 1 IN	Back Panel input
MON 2 IN	Back Panel input
MON 3 IN	Back Panel input
MON 4 IN	Back Panel input
MON 5 IN	Back Panel input
MON 6 IN	Back Panel input
None	No Audio
Playback	Contents of digital audio recorder

11.57 MENU.MSRP.ASSIGN MSRP RELAY

The eight MSRP relays can be assigned to any of the four stations, numbered 1 to 4. Assigning a relay to station 0 disables the relay. See section 9.1 for details.

11.58 MENU.MSRP.STATION N.CALL SIGN

Sets the call sign for this MSRP station. It is used in the "LOCK" message to show which remote control is running the ENDEC.

If this station is the only station sending an alert, this call sign is placed in the EAS LLLLLLLL field, and this call is displayed on the LED signs and character generator crawls. If more than one station is sending at the same time, the **MENU.CONFIG.CALL SIGN** call is used. For MSRP configurations, a generic group name should be used for **MENU.CONFIG.CALL SIGN.**

11.59 MENU.MSRP.STATION N.ENABLE

If enable is set to yes, the MSRP entries for this station are used, meaning the station will have automatic alerts sent on it, and the station is presented as a choice to select for manual relay or origination. EAN alerts, however, will throw all MSRP relays that have a non-zero station number set in **MENU.MSRP.ASSIGN MSRP RELAY**, even if the enable parameter for that station is set to no.

11.60 MENU.MSRP.STATION N.MODE

Sets the automatic/manual option for this station. See section 9.6 for details.

11.61 MENU.OVERRIDE USE

This menu defines the use of the manual override input on the ENDEC rear panel. The following choices are available.

Hold off	Holds a pending alert, for example, during a commercial. See section 8.5, "Commercial Tally" for a description of the hold off feature.
Hold off night	Works like hold off, except retains Required Monthly Test alerts overnight, use for day only stations. See section 8.6.
None	Don't use manual override.
Send RWT	Sends the contents of the RWT template when the manual override input is asserted. This template contains a required weekly test by default. Only one RWT per hour can be triggered by the manual override input, to avoid problems that could be caused by a faulty triggering mechanism. The one-hour check can be reset by using **MENU.TIMED RWT.RWT RESET**.

11.62 MENU.PRACTICE

This command is also available on the hand held remote control on the practice button (bottom row). The remote control button will toggle in and out of practice mode. The menu command gives you a

YES or NO choice. If the ENDEC is in practice mode, the INCOMING ALERT and the AUTOMATIC LEDs will flash, reminding you that practice mode is in effect.

The practice mode will let you practice sending an alert without actually putting the alert on the air (though see the warning below). Practice mode only affects what happens when you send an alert. Any changes you make to parameters while in practice mode **ARE** stored and **DO** take effect.

Warning: The audio from the practice alert is sent on both the speaker out and the speaker line out audio ports. If you are feeding a live line from these ports, you will send audio to it. The content of this audio is indistinguishable from a real alert. If you use the practice mode and live output lines, you should gate the output with one of the relays running the PTT program. This relay will not close in practice mode.

Also, if you have the speaker line out connected to a monitor input of a second ENDEC, that ENDEC will treat the alert as a live alert and relay it. If the second ENDEC is connected to a transmitter, the alert will get out.

When sending an alert in practice mode:

- The character generator is not activated.
- The LED sign is not activated.
- None of the relays, including the multi-station relay panel, are toggled. Relay program side effects (see section 5.7.2), such as extra delays, do occur, however.

You can end practice mode by pressing the PRACTICE button on the remote, or by selecting NO on the **MENU.PRACTICE** menu. Practice mode will automatically end:

- After 30 seconds, unless you are in the process of sending a practice alert.
- After any attempt to send a practice alert, whether you complete the process or you abort.
- If any incoming message is received.

The Incoming Alert and ATTN LEDs will stop flashing when practice mode is ended.

11.63 MENU.PRESETS.INCOMING

Use this menu to build or edit filters. Filters describe incoming alerts and actions to take if such an alert is heard. See section 5.4, “Filtering Incoming Alerts” for a tutorial.

11.64 MENU.PRESETS.LOCAL AREA

Use this menu to build or edit your local area. See section 5.3, “Local Area” for a tutorial.

11.65 MENU.PRESETS.OUTGOING

Use this menu to build or edit outgoing templates. See section 5.5, “Outgoing Alerts” for a tutorial.

11.66 MENU.PRINTER FEED

If the printer is selected with **MENU.CONFIG.PRINTER.YES**, this command will feed paper. It is used to load paper into the thermal printer, or to bring the last printed line out of the ENDEC paper path.

11.67 MENU.RELAY

This menu allows you to assign "relay programs" to the ENDEC back panel relays. Relays programs are described section 5.7, Relay Programming.

11.68 MENU.TEST.PRINTER TEST

Sends a test string to the printer. The printer must be enabled with **MENU.CONFIG.PRINTER.YES**.

11.69 MENU.TEST.REBOOT

This command will restart the ENDEC.

11.70 MENU.TEST.RESET BLINK ERROR

This command will reset the blinking LEDs. LEDs blink for any of the reasons show in section 14.1.

11.71 MENU.TEST.SELF TEST

Runs the self test and plays the test tones through the speaker. Does not key the main XLR relay. See section 14.5 for a description of the self test procedure.

11.72 MENU.TEST.VDS CGEN VERSION

Display the version string returned from any connected VDS character generators. This command also serves as a method of testing connectivity to the character generators.

11.73 MENU.TIMED RWT.EDIT RWT RAND

This command allows you to edit each week's time. The display shows:

```
07/01/02 10:35:12
Week Starts 07/07/02
RWT at 07/09 10:12
Done Edit Next Prev
```

This shows the starting day for the week, and the date within that week that the alert is scheduled for. If the week is the current week, and the alert has already been sent (or has been cancelled by a preceding monthly test), an "S" will appear after the "RWT at" line.

Next will step through the following weeks, **Prev** will move backwards. **Edit** will allow a change to that weeks scheduled RWT with the following display:

```
07/01/02 10:35:21
Edit RWT Time
RWT at 07/09 10:12
Done Hour More Less
```

The **Done** softkey will exit the edit menu, storing any changes you have made.

The **Hour** key shows size of the step changed with each press of the more/less keys. When **Hour** is showing, **More** and **Less** adds or subtracts one hour on each press. Press the Hour key to select **Day**s or **Min**utes. For example, to change the alert from July 9 to July 10, press **More** 24 times to

add 24 hours to the time, or press **Hour** until it reads **Day**, then press **More** once to advance the time by one day. You can press and hold the more/less keys to rapidly add/remove time.

11.74 MENU.TIMED RWT.ENABLE TIMED RWT

Controls the automatic transmission of the required weekly test alert. The contents of the RWT template are sent byt the ENDEC at times controlled by the settings of the "timed RWT" menu items.

Choices for **MENU.TIMED RWT.ENABLE TIMED RWT** are:

- Off – no automatic transmission of RWT.
- Fixed - Permits the automatic transmission of the required weekly test at the time specified by "RWT Day of Week", "RWT Hour", and "RWT Minute". Automatic transmission is triggered when the time is reached, and will occur at the next time the ENDEC is in the top menu level and no other alert is pending. This feature can be used to preset a time for the next RWT. The FCC requires weekly tests at random days and times, this feature should not be used as the only means of sending an RWT. Alert occurs on station 1 only. The outgoing header named "RWT" is sent.
- Rand – Selects the "random weekly test" mode.

The default is **Off**.

11.75 MENU.TIMED RWT.PRINT RWT RAND

Print all 52 weekly RWT times to the internal printer (if enabled) or any external serial printers.

11.76 MENU.TIMED RWT.RESET RWT RAND

Assigns a new random time for each of the next 52 weeks. This may or may not generate a RWT for the current week – an alert will be generated only if the random time is more than one hour in the future.

11.77 MENU.TIMED RWT.RWT DAY OF WEEK

Selects the time, in concert with "RWT Day of Week", and "RWT Hour" that the station sends the outgoing header named "RWT", which would normally contain a required weekly test.

To enable this feature, you must set **MENU.TIMED RWT.ENABLE TIMED RWT** to **yes**. Days are numbers, starting with Sunday=0.

11.78 MENU.TIMED RWT.RWT HOUR

Selects the time, in concert with "RWT Day of Week", and "RWT Minute" that the station sends the outgoing header named "RWT", which would normally contain a required weekly test.

To enable this feature, you must set **MENU.TIMED RWT.ENABLE TIMED RWT** to **yes**.

11.79 MENU.TIMED RWT.RWT MINUTE

Selects the time, in concert with "RWT Day of Week", and "RWT Hour" that the station sends the outgoing header named "RWT", which would normally contain a required weekly test.

To enable this feature, you must set **MENU.TIMED RWT.ENABLE TIMED RWT** to **yes**.

11.80 MENU.TIMED RWT.RWT RESET

The ENDEC contains protection software for the automated RWT features (timed RWT and manual override-initiated RWT) that allows only one RWT to be sent each hour. The reset the hour timer during testing, use this menu.

12. Connector Descriptions

12.1 Serial Port Pin Out

The ENDEC's serial ports are wired the same as a standard PC or laptop. Each connector is male, and has at least the following pins connected:

Pin	Use
2	RxD (input)
3	TxD (output)
5	Ground
9	Accessory Power. This pin provides +8v[11]. See section 12.2 for details.

In addition to the above, COM 3 has the following additional pins:

Pin	Use
1	DCD (input)
4	DTR (output)
7	RTS (output)
8	CTS (input)

None of these pins are used for any current application and their state is undefined.

To connect a PC to the ENDEC (for use with the DOS parameter save/restore software, ENDEC PRO, or other functions) use a "null modem" cable, that is, swap pins 2 and 3.

12.2 Accessory Power

Each ENDEC serial port provides regulated power on pin 9. Some ENDECs (serial numbers 3340 or less) provide +5v, most ENDECs provide +8v. This is intended as the power source for the hand held remote control, though it can be used for any purpose.

If you are using the standard ENDEC 15 volt/1 amp power supply, do not source more than 150ma from the accessory power pin. If you are using more than two hand held remote controls, you will need to power the third and fourth remotes from a 9V power cube.

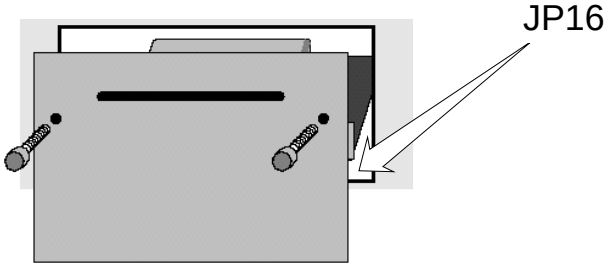


Figure 12-1. Location of Accessory Power Enable Jumper JP16.

The factory default is no power on the ACC PWR pins. To enable these pins, place a jumper on JP16. JP16 is accessible through the printer cover plate, see Figure 12-1 and Figure 12-2. Remove the plate as if you were changing paper. Lift the printer slider plate up (rather than pulling it forward). JP16 is underneath the metal cup that holds the paper, near its right hand edge.

[11] Some ENDECs provide +5v on this pin.

12.3 Hand Controller Cable

The RC-1 comes with a DB-9 to RJ-11 adapter. The pin out of the adapter is shown below.

RJ-11 Adapter Pin	DB-9 Pin	Use (ENDEC Point of view)
1	5	Ground
2	9	Acc Power[12]
3	-	nc
4	2	RS-232 Receive
5	-	nc
6	3	RS-232 Transmit

The adapter is connected to the RC-1 with a modular six-wire line cord that reverses the pins from one end to the other. Use only the cord that comes with the RC-1 or a replacement that reverses, such as Radio Shack Cat No. 279-422. Use of an improper cord can damage the RC-1 and the ENDEC.

The pin out of the RC-1 Hand Held Remote Control RJ-11 jack is shown below.

Hand Control RJ-11 Pin	Signal Name (RC-1 point of view)
1	RS-232 Receive
3	RS-232 Transmit
5	8V @ 80ma
6	Ground

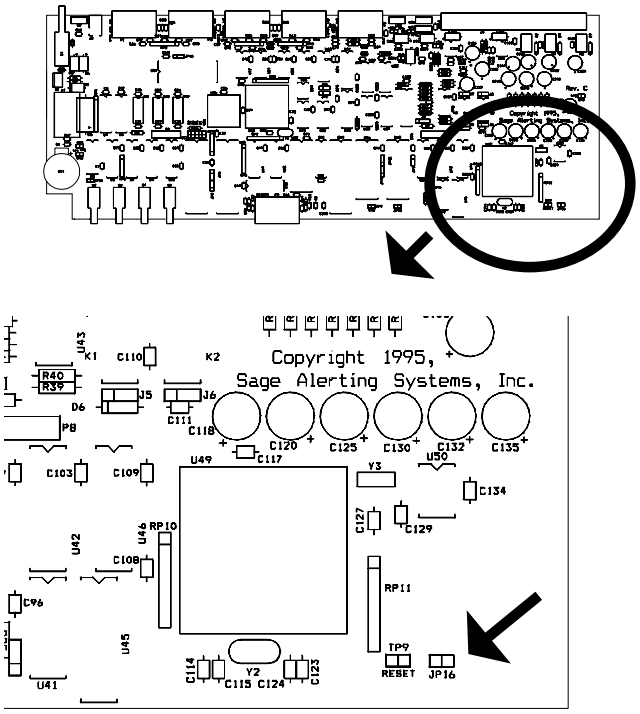


Figure 12-2. Location of JP16.

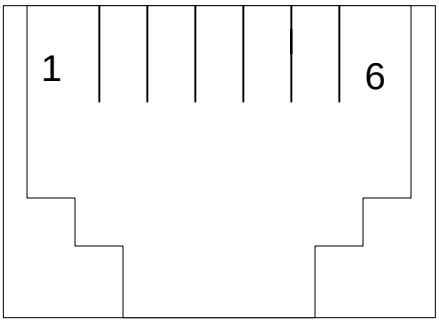


Figure 12-3. Modular Jack Pin Numbers.

[12] Install a jumper on the ENDEC main PCB at location JP16 (accessible by removing the printer cover plate). See section 12.2

12.4 Microphone Connector

The ENDEC front panel microphone connector is meant for use in public safety applications. Broadcasters will typically make use of the high level Encoder Audio In input on the back panel.

The microphone input is amplified, the gain is controlled by **MENU.LEVELS.MIC.** The microphone input is designed for use with a low-impedance (~200 ohms) dynamic microphone providing at least 20 mV into a 1K load at 100 microbars sound pressure, (e.g., Shure 527B or equal).

ENDEC MIC connector Pin.	Signal Name
1	Push-To-Talk
2	Audio In
3	Ground
4	Ground

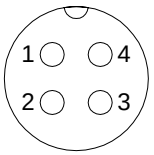


Figure 12-4. ENDEC Mic Connector (Front View).

13. Maintenance

13.1 Loading Paper

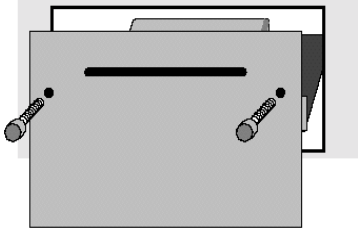


Figure 13-1. Remove Printer Cover Plate.

1) If the printer is not already enabled (the factory default is disabled) you must select the printer with **MENU.CONFIG.PRINTER.YES**. See section 1.4.1, "Menu Basics" for details on using the ENDEC menus. The keystrokes you'll need for this task are:
    - ENTER to select **MENU**
    - Down Arrow to scroll to **CONFIG**
    - ENTER to select **CONFIG**
    - Down Arrow to scroll to **PRINTER**
    - ENTER to select **PRINTER**
    - You may be asked for the administrator's password at this point. The default password is "1111" and is entered by pressing the ENTER key fours times.
    - ENTER to select **YES**

This will enable the printer.

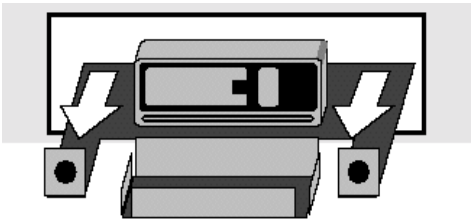


Figure 13-2. Slide Printer Support Plate Forward.

2) Remove the printer cover plate by removing the two thumb screws and pulling the plate straight forward. See Figure 13-1.

3) Slide the printer assembly forward so that it comes part way out of the main ENDEC enclosure. The printer slider is captive and can not be removed. See Figure 13-2.

4) Remove any old paper. DO NOT pull paper backwards out of the printer. Tear off the remaining portion of the roll (in any) and feed it through using **MENU.PRINTER FEED**[13].

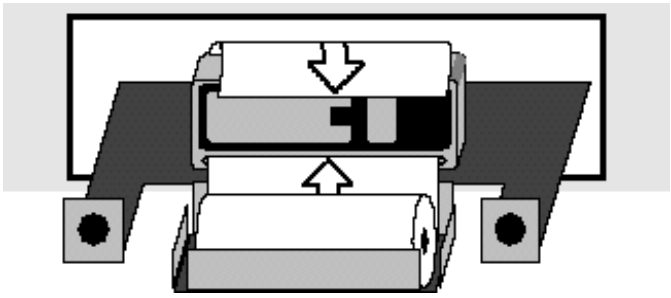


Figure 13-3. Paper Path.

5) Feed a new roll of paper into the slot at the bottom of the printer module as shown in Figure 13-3. The coated side of the paper is on the bottom as it feeds into the bottom slot. Use **MENU.PRINTER FEED** to feed paper into the printer. Keep a slight pressure inward on the paper until it catches. Do not fold the paper, keep the leading edge flat and straight. Allow two or three inches of paper to feed out of the top of the printer. You may need to push **MENU.PRINTER FEED** more than once.

[13] This format means you push the "MENU" softkey (leftmost button), scroll with the down arrow to "Printer Feed" and select it with the ENTER (leftmost).

6) You can use the printer test in the test menu to print a test message. If no printing appears, you may have the paper upside down, check Figure 13-3 again.

7) Reinstall the printer cover plate. You will need to feed the leading edge of the paper into the paper slot attached to the back of the cover plate. You may need to feed paper from the printer to make this easier. Use **MENU.PRINTER FEED**. Do not pull the paper by hand.

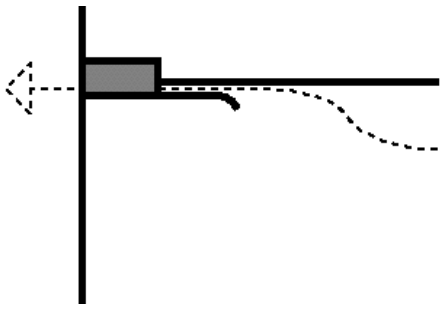
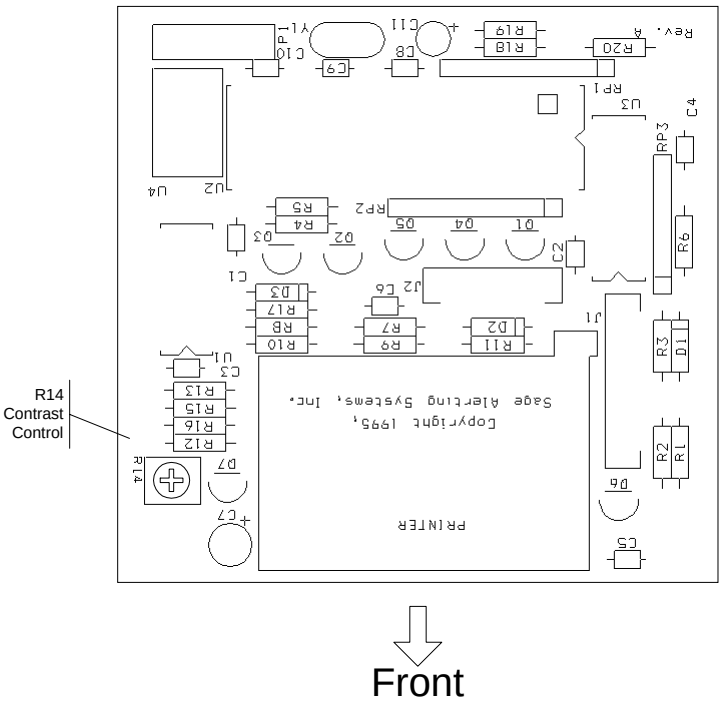


Figure 13-4. Paper guide and front panel.

13.2 Adjusting printer contrast (light/dark)

To adjust the internal thermal printer contrast, that is, to make the text lighter or darker, adjust R14 on the printer PCB. This variable resistor is on the front left edge of the printer PCB and is accessible when the printer slider plate is pulled out as if you were changing paper:



1) Remove the printer cover plate by removing the two thumb screws and pulling the plate straight forward. See Figure 13-1.

2) Slide the printer assembly forward so that it comes part way out of the main ENDEC enclosure. The printer slider is captive and can not be removed. See Figure 13-2.

3) Adjust R14. If you use **MENU.TEST.PRINTER TEST** to cause the printer to print, remember that 20 blank lines are printed at the end of the test - only adjust R14 during the first part of the printer test message (seven lines).

13.3 Changing the Battery (time and NV audio)

A lithium battery is used to provide backup power for the time of day clock, the list of previously heard alerts and the 10 or 40 second non-volatile audio storage (see section 3.3.3, “Battery Backed Storage”). Follow this procedure to replace the battery.

1) Remove power from the ENDEC.
2) Open the top of the ENDEC by removing all six screws.
3) Remove the old battery. Take care to not short the battery against JP14.
4) Replace the battery with a similar type, CR2330, 3V.
5) Replace the ENDEC cover and power.
6) The time of day will need to be set. The contents of the non-volatile audio storage (if any) will need to be re-recorded. Use **MENU.ALERTS.RECORD NVAUDIO** or **shift-record** on the hand held remote control.

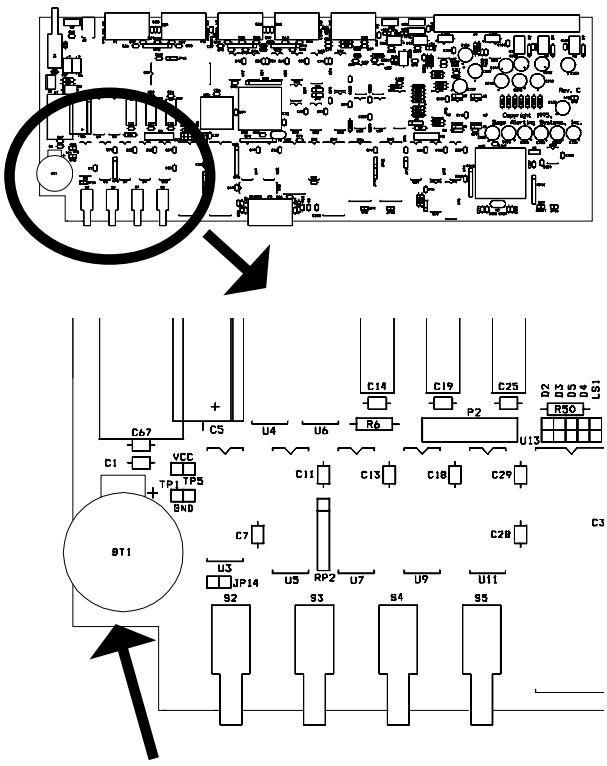


Figure 13-5. Location of the Backup Battery.

14. Troubleshooting

14.1 Blink Errors

If an error occurs in the ENDEC that requires operator action, one or more of the front panel and remote control LEDs will blink. To turn off the blink, correct the problem and reboot the ENDEC, or use the **TEST.RESET BLINK ERROR** menu. Here is a list of all "blink" conditions:

14.1.1 Incoming Alert (IN) LED Only

If the Incoming Alert LED is blinking, there has been an error with the ENDEC's self test. The error message is in the MSG buffer, press the MSG softkey to read it. Power cycle the ENDEC, if the problem recurs, call for service.

14.1.2 Outgoing Alert (OUT) LED Only

This is not an error condition. If the audio source for an alert is "console", the OUT LED will blink during the audio portion of an alert. The ENDEC has dropped out of line and the station audio chain has been restored, that is, the operator should talk now.

14.1.3 Automatic (AUTO) LED

If the auto LED is blinking, an error message is in the MSG buffer, press the MSG softkey to ready it. Messages and causes are:

Time is not set	The internal clock calendar chip has lost battery backup or was otherwise reset, or the time has been set less than 1996 or greater than 2094. Fix the time and reboot the ENDEC[14].
Used ROM defaults, EEPROM corrupted	EEPROM Corrupted. The saved parameters have been corrupted. The EEPROM chip does not need battery backup, this error is caused by a hardware problem or voltage spike. The default parameter settings have been restored - you will need to setup the ENDEC again, or download saved parameters using the DOS software.
EEPROM D area bad - hardware problem	Hardware Failure, the EEPROM can not be written. Call for service.
CGEN *com port* did not respond.	The VDS character generator on the named COM port did not respond to commands. This is usually a problem with the cable or the CG. Check the cables, check power to the CG. You can test the access to the CG by using the **TEST.VDS CGEN VERSION** menu. If a version is returned, the setup is OK, if "no response" is shown on the ENDEC display, the ENDEC and CG are not exchanging data.
Printer Jam	The Printer has jammed, or its fuse has blown. Once you clear the jam, you must cycle power on the ENDEC to re-enable the printer. Rebooting with test.reboot is not sufficient.
No Local Area	You must define a local area using the **MENU.PRESETS.LOCAL AREA**

[14] To reboot the ENDEC, either cycle the power, or use the **MENU.TEST.REBOOT** menu.

	menu.
Validate Error	An EAS header generated by the ENDEC did not pass the check for legal EAS messages. This is an internal software error.
EEPROM-D Corrupted	This message may also be followed by diagnostic information such as “end tag missing” The EEPROM is not formatted correctly - voltage spike or software problem. Call for service
Write Checksum Free	The EEPROM has a hardware failure, call for service.
Checksum error in active alert table.	Software error or voltage spike. If it recurs, call for service.

14.1.4 Automatic (AUTO) and Incoming Alert (IN) LEDs

This is not an error, the ENDEC is in practice mode. The next alert sent will not close the XLR relays.

14.1.5 All LEDs Blinking

The EAN and/or EAT event codes are not present in any of your filters. You MUST have a filter for EAN and EAT to remain legal under Part 11. Add the filter. It should have EAN and EAT for events, and EAN and PEP for originators.

14.2 Common Problems

Here is a list of common problems that may save you a call to the service center.

ENDEC seems dead.	• The LCD backlight is wired almost directly to the main power input. If the backlight is not on (it should be bright yellowish/green) suspect the power input (plugged in, right power cube, power switch on) • The backlight is on but shows one or two rows of black squares, the ENDEC CPU is not running. Call for service.
NWS 1050hz tone not removed.	• You must select which channels you want to scan for 1050hz tone. Use **MENU.CONFIG.NWS SELECT** (Section 11.34**)**. Note that the ENDEC can remove 1050 • h Hz tones from only one channel at a time. In the unlikely event that you have two NWS assignments, and both are alerting simultaneously, you may get tone on the 2nd channel. NWS tones are removed from odd-numbed monitor channels only, assign your NWS inputs to odd numbers channels (monitor in 1, 3, 5).
Alerts not received from a particular monitor input.	• The green terminal strip must be completely inserted in the back of the ENDEC. • The monitor input must be selected for scanning, see **MONITOR.CONFIG.SCAN SELECT**. • If the input is selected, the audio levels may not be high enough for error-free decoding.

The thermal printer does not print.	• The printer must be selected with menu.config.printer • The paper must be inserted so that the coated side is next to the print head. See section 13.1, “Loading Paper”.
The time display is incorrect.	• If the time is not retained across power off, the clock battery is low. See section 13.3, “Changing the Battery (time and NV audio)”.
The ENDEC resets while I’m entering commands.	• The ENDEC contains a watchdog timer that will reset the ENDEC if it does not seem to be operating normally. If the ENDEC does not return to the highest menu level (the default screen) for ten minutes, and it is not sending a long alert such as an EAN, the ENDEC assumes that it is in a loop and resets. Thus, if you are in a lower level menu for more than ten minutes, the ENDEC will reset. This is normal. To increase the watchdog time, use the ENDECSET software program to set internal.softdog to a larger value.

14.3 Resetting the passwords

If you forget the user password but remember the administrator’s password,, you can select a new user password using the **MENU.CHANGE PASSWORD** command.

If you forget the admin password, you must reset it using the following procedure. This procedure intentionally requires physical access to the inside of the ENDEC enclosure.

1) Remove power from the ENDEC.
2) Open the top of the ENDEC by removing all six screws.
3) Place a jumper on JP14. A jumper has been provided and is on one of the JP14 pins.
4) Apply power. If the jumper has been applied, all of the LEDs will flash momentarily as soon as power us applied.
5) Remove power.
6) Remove jumper JP14. Leave the jumper on just one pin for later use.
7) Both the user and the admin password have now been reset to 1111. Apply power and change the passwords to the desired values with the **MENU.CHANGE PASSWORD** and **MENU.CHANGE ADMIN** menus.

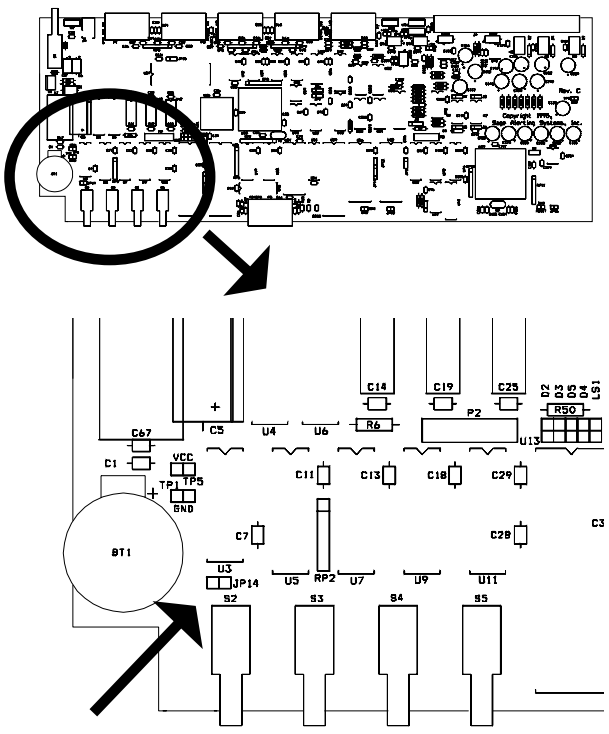


Figure 14-1. Location of the factory reset jumper.

14.4 Resetting parameters to factory defaults

This procedure can be used if the ENDEC appears to be non-functional, either no LCD display or a frozen LCD display. As this procedure will also reset the passwords to the factory default, it also requires physical access to the inside of the ENDEC enclosure. You do not need this procedure if the self test fails but you can access the menus. The self test does not depend on any user settable parameters, a self test failure is most probably a hardware fault.

1) Remove power from the ENDEC
2) Open the top of the ENDEC by removing all six screws.
3) Place a jumper on JP14. A jumper has been provided and is on one of the JP14 pins.
4) Hold in the ENTER button and the DOWN Arrow and UP Arrow button. You must use the ENDEC front panel buttons, you can not use a hand held control button.
5) Apply power. If the jumper has been applied, all of the LEDs will flash momentarily as soon as power is applied. If the LEDs do not flash, your ENDEC needs to be repaired. Likewise, if you continue to get no display, or a frozen display after using this procedure, your ENDEC needs service.
6) Remove power.
7) Remove jumper JP14. Leave the jumper on just one pin for later use.
8) All stored parameters have now been reset. You must reset all of your customizations as if you had just received your ENDEC. You can use the DOS parameter save/restore program to reload your parameters if you had previously saved them.

14.5 Self Test

The ENDEC performs a self test each time it is powered on. During the first part of the self test, each front panel LED is blinked, from top to bottom, then all are blinked at the same time. The self test then routes audio from the output sections internally back to the input sections, using the attention tones and the FSK data tone as test signals. The ENDEC also routes the audio through the digital audio recorder. This tests the record/playback mechanism. Only the volatile section of the digital record is tested so that the non-volatile section is undisturbed.

If the self test fails, the Incoming Alert LED will blink, and the failed test is stored in the message buffer.

When the self test runs at power up, the speaker output is muted. When it runs from the **MENU.TEST.SELF TEST** menu, the speaker is not muted so that you can hear the tone.

There are no adjustments you can make to correct a problem that causes the self test to fail. Call for service if the self test fails.

15. Menu Trees

The ENDEC menu structure is shown below, in the order that it appears on the ENDEC display. Use it to help find settings. The last column shows the ENDECSET settings tab that the option appears on.

Highest Level	Lower Level	Lower Level	Lowest Level	ENDECSET Page
Alerts				N/A
	Originate Alert			N/A
	Relay CCC Alert			N/A
	Send Pending			N/A
	Record Audio			N/A
	Preview Audio			N/A
	Record NVAudio			N/A
	Preview NVAudio			N/A
	View Alert Log			N/A
	Clear LED Sign			N/A
	Clear Alert Log			N/A
Printer Feed				N/A
Practice				N/A
Mode				Config
Presets				
	Incoming			Incoming Filter
	Outgoing			Outgoing Header
	Local Area			Local Area
Config				
	ATTN Duration			Config
	Auto Start			Config
		None		Config
		Hour		Config
		Min		Config
	Auto Stop			Config
		None		Config
		Hour		Config
		Min		Config
	Call Sign			Config
	Codi Mode			CGEN
	Codi Crawl Speed			CGEN
	Crawl Reps			CGEN
	Crawl RWT			CGEN
	Default Duration			Config
	Default REC			Config
	Language			CGEN
	LED Sign Mode			Config
	LED Sign Sound			Config
	LED Sign Time			Config
	Menu Timeout			Config
	Mode			Config
	NWS Hunt Time			Config
	NWS Practice			Config
	NWS Select			Monitor
	NV Audio Len			MHz Sub Alert
	NV Lead-in			MHz Sub Alert

Highest Level	Lower Level	Lower Level	Lowest Level	ENDECSET Page
	Old Scan Method			Config
	Originator			Config
	Printer			Config
	Print All Alerts			Config
	Print ZCZC			Config
	Pro Extra Stat			Config
	Pro Read Only			Config
	Processor Lead			Config
	Scan Select			Monitor
	Status on Console			*Obsolete*
	Strict Time			Config
	VDS Relay On			CGEN
	Unknown FIPS			Config
	Allow Build EAN			N/A
Relay				Relay
MSRP				MSRP
	Station 1			MSRP
		Mode		MSRP
		Call Sign		MSRP
		Enable		MSRP
	Station 2			MSRP
		Mode		MSRP
		Call Sign		MSRP
		Enable		MSRP
	Station 3			MSRP
		Mode		MSRP
		Call Sign		MSRP
		Enable		MSRP
	Station 4			MSRP
		Mode		MSRP
		Call Sign		MSRP
		Enable		MSRP
	Assign MSRP relay			MSRP
Override Use				Config
	None			Config
	Send RWT			Config
	Hold off			Config
	Hold off night			Config
	Active Polarity			Config
Devices				Device
	Show			Device
	Computer			Device
		Device Type		Device
			NONE	Device
			Hand Control	Device
			VDS CGEN	Device
			CODI CGEN	Device
			GENERIC CGEN	Device
			Console	Device
			ENDECSET	Device
			Relay	Device
			ENDEC PRO	Device
			Serial Printer	Device

Highest Level	Lower Level	Lower Level	Lowest Level	ENDECSET Page
			Decoder	Device
			Encoder	Device
			News Feed	Device
			VDS-MC	Device
			VDS-MCSA	Device
			Modem	Device
			SmartSwitch	Device
			STAR-8	Device
			Recon	Device
		Baud Rate		Device
		Station Number		Device
	COM2			Device
		Device Type		Device
			NONE	Device
			Hand Control	Device
			VDS CGEN	Device
			CODI CGEN	Device
			GENERIC CGEN	Device
			LED Sign	Device
			Console	Device
			ENDECSET	Device
			ENDEC PRO	Device
			Serial Printer	Device
			Decoder	Device
			Encoder	Device
			News Feed	Device
			VDS-MC	Device
			VDS-MCSA	Device
			Modem	Device
			SmartSwitch	Device
			STAR-8	Device
			Recon	Device
		Station Number		Device
	COM3			Device
		Device Type		Device
			NONE	Device
			Hand Control	Device
			VDS CGEN	Device
			CODI CGEN	Device
			GENERIC CGEN	Device
			Console	Device
			ENDECSET	Device
			Relay	Device
			ENDEC PRO	Device
			Serial Printer	Device
			Decoder	Device
			Encoder	Device
			News Feed	Device
			VDS-MC	Device
			VDS-MCSA	Device
			Modem	Device
			SmartSwitch	Device
			STAR-8	Device

Highest Level	Lower Level	Lower Level	Lowest Level	ENDECSET Page
			Recon	Device
		Baud Rate		Device
		Station Number		Device
	COM4			Device
		Device Type		Device
			NONE	Device
			Hand Control	Device
			VDS CGEN	Device
			CODI CGEN	Device
			GENERIC CGEN	Device
			LED Sign	Device
			Console	Device
			ENDECSET	Device
			Relay	Device
			ENDEC PRO	Device
			Serial Printer	Device
			Decoder	Device
			Encoder	Device
			News Feed	Device
			VDS-MC	Device
			Modem	Device
			SmartSwitch	Device
			STAR-8	Device
			Recon	Device
		Station Number		Device
	COM5			Device
		Device Type		Device
			NONE	Device
			Hand Control	Device
			VDS CGEN	Device
			CODI CGEN	Device
			GENERIC CGEN	Device
			LED Sign	Device
			Console	Device
			ENDECSET	Device
			Relay	Device
			ENDEC PRO	Device
			Serial Printer	Device
			Decoder	Device
			Encoder	Device
			News Feed	Device
			VDS-MC	Device
			Modem	Device
			SmartSwitch	Device
			STAR-8	Device
			Recon	Device
		Station Number		Device
	COM6			Device
		Device Type		Device
			NONE	Device
			Hand Control	Device
			VDS CGEN	Device
			CODI CGEN	Device

Highest Level	Lower Level	Lower Level	Lowest Level	ENDECSET Page
			GENERIC CGEN	Device
			LED Sign	Device
			Console	Device
			ENDECSET	Device
			ENDEC PRO	Device
			Serial Printer	Device
			Decoder	Device
			Encoder	Device
			News Feed	Device
			VDS-MC	Device
			VDS-MCSA	Device
			Modem	Device
			SmartSwitch	Device
			STAR-8	Device
			Recon	Device
		Station Number		Device
Monitor Source				Monitor
	Alerts			Monitor
	None			Monitor
	ENC AUD IN			Monitor
	MON 1 IN			Monitor
	MON 2 IN			Monitor
	MON 3 IN			Monitor
	MON 4 IN			Monitor
	MON 5 IN			Monitor
	MON 6 IN			Monitor
	MIC IN			Monitor
	Playback			Monitor
	Attn Tone			Monitor
	Attn Tone Low			Monitor
	Attn Tone High			Monitor
	Data Tone			Monitor
	Data Tone Low			Monitor
	Data Tone High			Monitor
Levels				Levels
	Speaker			Levels
	Line Out			Levels
	MIC			Levels
	Attn Tone			Levels
	Attn Low Tone			Levels
	Attn High Tone			Levels
	Data Tone			Levels
	Data Low Tone			Levels
	Data High Tone			Levels
	Record Mon 1			Levels
	Record Mon 2			Levels
	Playback			Levels
	ATTN Thresh			Levels
MHz Sub-Alert				MHz Sub-Alert
	MHz Enable			MHz Sub-Alert
	User Page			MHz Sub-Alert
	Tune to Chan			MHz Sub-Alert
	ATTN Duration			MHz Sub-Alert

Highest Level	Lower Level	Lower Level	Lowest Level	ENDECSET Page
	Repeats			MHz Sub-Alert
	Tune to Rep			MHz Sub-Alert
	RWT MODE			MHz Sub-Alert
	End Repeats Now			N/A
Date/Time				Direct/Set ENDEC Time
	UTC Offset			Config
	Daylight Enable			Config
	Year			Direct/Set ENDEC Time
	Month			Direct/Set ENDEC Time
	Day			Direct/Set ENDEC Time
	Hour			Direct/Set ENDEC Time
	Min			Direct/Set ENDEC Time
	Sec			Direct/Set ENDEC Time
Timed RWT				
	Enable Timed RWT			RWT
	Reset RWT Rand			N/A
	Edit RWT Rand			RWT
	Print RWT Rand			N/A
	RWT Reset			N/A
	RWT Day of Week			RWT
	RWT Hour			RWT
	RWT Minute			RWT
LCD Contrast				Levels
Change Password				Config
Change Admin				Config
Change Pro Pass				N/A
Test				
	Self Test			N/A
	Printer Test			N/A
	VDS CGEN Version			N/A
	Reset Blink Error			N/A
	Reboot			Direct/Reboot ENDEC

16. What's New

This manual applies to version 6.1 and higher.

16.1 Version release history

The previous version of the manual (1.4) included changes from version 5.27 (the first release of the ENDEC) to version 5.88 (the previous standard broadcast release). Version 5.111 was released to the cable industry, and ENDEC DJ/PRO users, and new ENDECS. Updates mainly involved changes unique to those users. Version 5.124 included new Event codes and support for modem access. As most users will be upgrading from 5.88 to 6.1, this section discusses major changes that were added since 5.88.

16.2 New Features and Improvements

- All of the new items specified by the April 2002 FCC Report and Order are included in this release. This includes the new event codes (including the AMBER alert), new subdivision names, and the new marine location FIPS codes. The 400+ marine codes from the NWS that were current in May 2004 are included. See section 5.9, Marine Location Codes, for more information.
- The ENDECSET program provides a Windows GUI interface for configuring the ENDEC. See section 5.10, ENDECSET program for details.
- Two-tone alert signal and NWS 1050 Hz signal detection is improved. Momentary dropouts caused by noise or switching would occasionally result in the tone being included in the ENDEC's stored audio buffer in previous versions.
- Random Weekly Test feature. The ENDEC can now store dates for weekly tests for the next 52 weeks. The dates/times are chosen randomly, but can be modified by the user. When this mode is enabled via **MENU.TIMED RWT.ENABLE TIMED RWT.RAND**, a weekly test will automatically be sent at the specified time. An RWT will be cancelled if a monthly test was previously sent in the same week, as allowed by Part 11. See section 5.8, Random Required Weekly Test feature, for further information.
- The ENDEC now supports access via a telephone modem. Access to the ENDEC via the modem requires ENDEC DJ, ENDEC Pro, or ENDEC Logger. The "lite" version of the software allows retrieval of the alert log from a single ENDEC, the full version allows automatic retrieval of logs from many ENDECs as well as complete control of all ENDEC functions, including a software remote front panel, upload/download of all ENDEC settings, and time of day updates. A new password feature has been added for modem access. Use of the modem is more fully described in the DJ, PRO, or Logger documentation.
- New config options have been added, **MENU.CONFIG.PRO READ ONLY** restricts pro/dj users from controlling the ENDEC remotely, **MENU.CONFIG.PRO EXTRA STAT** sends advanced logging information for the new log capture program.
- Two new device types are supported, the STAR8 character generator, and the Statmon RECON remote monitoring tool.

The following minor changes have also been made. These are not discussed further.

- The crawl message for voluntary alerts in the MegaHertz mode for the VDS-MC device has been changed to:
  "<complete eas message> .Tune to channel xx for the audio portion of this emergency message".
- The MegaHertz SmartSwitch device is now supported on all ENDEC COM ports (it was previously only on 9600 baud ports).

- The number of alerts that can be logged in memory (**MENU.ALERTS.VIEW ALERT LOG**) was increased from 47 to 88.

16.3 New Menu Items

MENU.CHANGE PRO PASS
MENU.CONFIG.OLD SCAN METHOD
MENU.CONFIG.PRO READ ONLY
MENU.CONFIG.PRO EXTRA STAT
MENU.TIMED RWT.EDIT RWT RAND
MENU.TIMED RWT.PRINT RWT RAND
MENU.TIMED RWT.RESET RWT RAND

These commands are discussed in section 11, ENDEC Command Reference

16.4 New options

Fixed and Rand options for **MENU.TIMED RWT.ENABLE TIMED RWT**

16.5 New Devices

Modem
Recon
Star-8

ENDECSET replaces DOS.

17. Warranty

Sage Endec Limited Warranty & Service Information

US Warranty Only

Warranty service for this unit will be administered by Harris Corporation Broadcast Division in accordance with the following warranty statement.

Sage warrants to the original purchaser that this product and the components thereof, will be free from defects in workmanship and materials for a period of one year from the date of purchase. Sage will, without charge, repair or replace, at its option, defective product or component parts upon prepaid delivery to the service department of Harris in Quincy, IL., accompanied by proof of purchase date in the form of a valid sales receipt.

This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alteration or repairs. This warranty is void if the serial number is altered, defaced, or removed.

Neither Sage or Harris shall be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may also have other rights which vary from state to state.

The following information is provided for the unlikely event your unit requires service and must be returned for service.

1. Be sure the unit is the cause of the problem. Check to make sure the unit has power supplied, all cables are connected correctly and the cables themselves are in working condition.
2. If you find the unit to be at fault, write down a description of the problem including how and when the problem occurs.
3. Pack the unit in its original carton or a reasonable substitute. Put the packaged unit in another box for shipping. NOTE: The ENDEC is subject to damage if poorly packaged. Shipping damage may affect your warranty.
4. Include with your unit: billing infromation, return shipping address (We can not ship to a P.O. box), a copy of your purchase receipt, a daytime phone number, and the description of the problem.
5. Ship the unit FREIGHT PREPAID to:

   Harris Broadcast Division
   3200 Wismann Lane
   Quincy, IL 62301
   Attention: Repair Department - Sage ENDEC

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