SAGE ENDEC RECEIVER

Operation Manual

Version 1

This manual covers the operation and features of the Sage ENDEC Receiver.

Product Overview

The Sage ENDEC Receiver is a high-performance, 19-inch, rack-mountable receiver system. It features simultaneous reception of up to six radio signals. The chassis accommodates three modules in any variation. The available modules are, FM/AM, VHF, UHF.

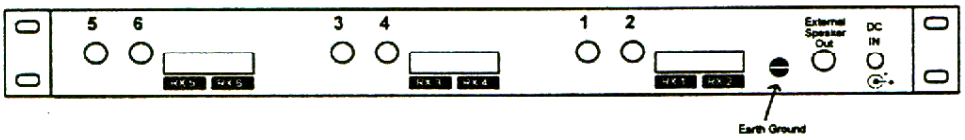
Each receiver module within the ENDEC Receiver Chassis has frequency selector switches mounted on the front of it. Access to the switches is from the front of the unit utilizing a unique slide-out front panel that allows frequency changes without removing the unit from the rack. Antenna, audio, and power connections are at the rear of the unit. Screw terminals are located at the rear of each module, and protrude from the rear of the chassis, allowing connection to the receiver's signals.

Installation

The ENDEC Receiver may be mounted in a standard 19 inch rack cabinet, utilizing the mounting ears on the side of the unit, or it may be operated in a desk-top configuration, with the mounting ears removed.

Rear Panel Functions:

Chassis Back-Side View



DC Power

A UL approved DC wall adapter is supplied with the ENDEC Receiver. Plug it into 110-125VAC wall power, and connect the DC jack into the jack on back of the ENDEC Receiver marked DC IN.

External Speaker

Receive audio will be heard out of the built-in speaker of the ENDEC Receiver. An external speaker may be plugged into the ENDEC Receiver's ¼ inch audio jack, located on the rear of the unit and labeled EXTERNAL SPEAKER OUT. If an external speaker is used, it should be an 8 ohm type. The internal speaker will be disabled when the external speaker is in use.

ENDEC EAS Signals

Normally, the ENDEC Receiver is used for monitoring AM, FM, or NOAA broadcasts for Emergency Alert System (EAS). The output of the ENDEC Receiver is connected to an EAS Decoder with wires from the receiver's terminal block to the EAS ENDEC's terminals. Refer to the manual of the EAS ENDEC for more information on which terminals to connect.

The following signals are present at the rear panel for each receiver:

Audio Output: Audio positive output. 600 ohm unbalance output, adjustable from 200 mV to 2.5 V peak to peak.

Ground: Audio return.

Carrier Detect: Active low with the presence of carrier.

Audio Detect: Active low with the presence of modulated carrier. This signal will tend to turn on and off as the modulation level varies.

ANTENNA

An antenna must be connected to each receiver module. The antenna connections are located at the rear of the chassis and are labeled 1, 2, 3, 4 ,5 and 6. You must determine which type of module is in each of the six positions. The standard factory configuration is FM=1, AM=2, VHF =3. Channels four through six are not used unless additional modules are required.

Connect a suitable antenna to each of the modules in your ENDEC Receiver. The AM and VHF modules require 50 ohm antennas, and the FM module requires a 75 ohm antenna. All antenna connections to the ENDEC Receiver are type BNC connectors.

Although the receiver modules in the ENDEC Receiver are well-shielded, high-quality commercial units, like all radio receivers they have a limit as to the amount of RF energy they can handle. It is best not to locate a receiver's antenna near sources of high RF energy, or the sensitivity of the receiver may be affected. If the ENDEC Receiver's antenna must be located at or near a broadcast transmitter's site, you may have to experiment with positioning the antenna such that it has minimum interference from the site. You may also want to install an RF trap in line with the antenna, to "notch-out" unwanted RF energy to the receiver. For the FM band, a suitable RF trap is manufactured by Winegard, Model #FT-7600. This filter is tunable over the FM broadcast band and offers up to 26 dB of attenuation. Contact Harris Broadcast for additional information on the filter.

The FM receiver contains a Local/Distance switch. In certain instances, the receiver may be overloaded by nearby strong signals. In these cases, the use of the Local/Distance switch may improve the performance. When placing the switch in the Local position, approximately 25 dB of attenuation will be obtained. The Local/Distance switch is mounted on the top right side of the AM/FM module. The Local position is to the left, and the Distance position is to the right. Access this switch by opening the front panel. In most cases, the Distance position will give better performance.

For best AM reception, you should electrically ground the chassis of the ENDEC Receiver to a good earth ground. A screw is provided on the rear of the ENDEC Receiver chassis for connecting the chassis to ground.

Recommended antennas: These are general recommendations for typical antennas found to work in normal environments. However, the operator must keep in mind that other antenna configurations may be necessary, depending on the sensitivity of the site. A distant monitoring assignment and the presence of strong local stations may affect the desired antenna configuration. Contact your Harris distributor for additional antenna recommendations.

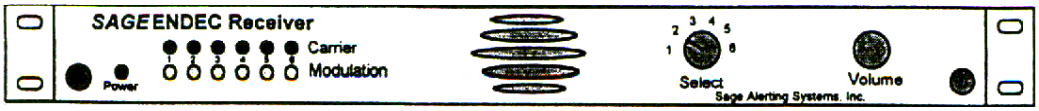
AM: A long length of wire (approximately 30 feet is sufficient) coiled around a non-conductive cylinder is generally acceptable for AM reception. Insure that the antenna is not exposed to an area where lighting damage is possible.

FM: A simple 300 ohm dipole antenna, like one supplied with most home stereo units with a 75 - 300 ohm transformer, is suitable for most applications. A fixed or telescoping whip-type antenna is also sufficient.

VHF: A 50 ohm whip or telescoping antenna is acceptable for most environments.

UHF: A 50 ohm whip or telescoping antenna is acceptable for most environments.

Front Panel Functions:



Power LED: Illuminated when DC power is applied

Carrier Detect LED's: Six LED's indicate the presence of a carrier on each module in use. In the standard configuration, only diodes 1 through 3 are active.

Modulation LED's: Six LED's indicate the presence of audio modulation on each module. The LED will blink with the receive signal's audio modulation. Low audio levels will cause the LED's to blink only with the peaks in the signal. In the standard configuration, only diodes 1 through 3 are active.

Select: Selects audio to be monitored by the internal or external speaker. This does not affect the audio outputs at the rear panel.

Volume: Controls audio volume to either the internal speaker or the external speaker.

Operation

There may be from 1-6 receivers within the ENDEC Receiver chassis. The standard configuration is 3 receivers; an AM broadcast, an FM broadcast, and a VHF NOAA weather receiver. The standard configuration has the FM band as position #1, AM band as position #2 and VHF band as position #3. The connections on the rear panel as well as the audio select switch and LED's follow this numbering scheme.

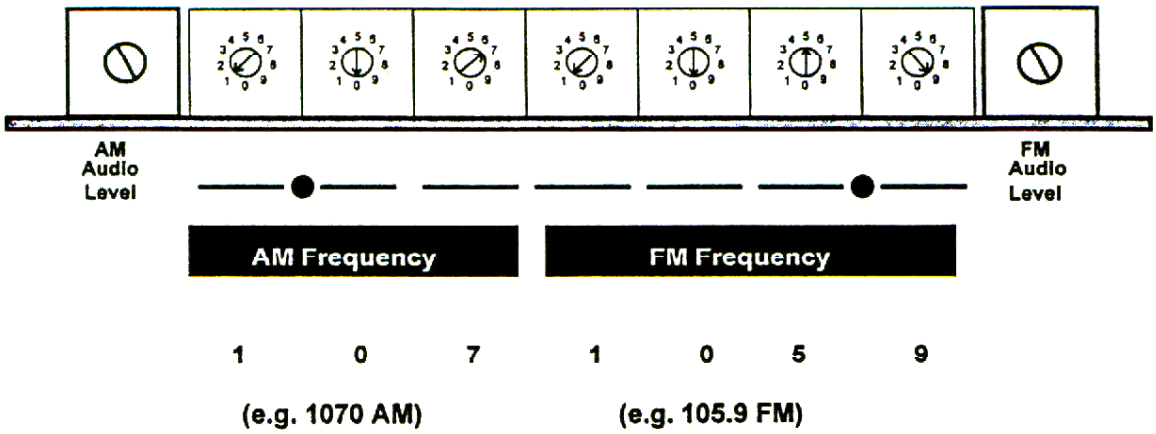
Before operating the unit, the receive frequency of the receivers in the ENDEC Receiver chassis must be set. The frequencies are set by first sliding the front panel of the chassis out from the unit, exposing the frequency select switches. The frequency select switches are adjusted with a small screwdriver, after the front panel has been slid out.

Setting the frequency of the AM/FM broadcast receiver.

The frequency adjustment dial is accessed by opening the front panel. To open the front panel, loosen the two thumb screws located on each end of the front panel, carefully slide the front panel forward, and allow it to swing down. The AM receiver frequency is dialed into the AM/FM module using the left three switches. The AM frequency is in 10kHz increments. For example, the frequencies 660kHz to 1600kHz are dialed in as 066 through 160 on the switches.

The FM receiver frequency is dialed into the AM/FM module using the right 4 switches. The FM frequency is in 100kHz increments. In other words, the frequencies 87.1MHz through 106.9MHz are dialed in as 0871 through 1069.

AM/FM Module Controls

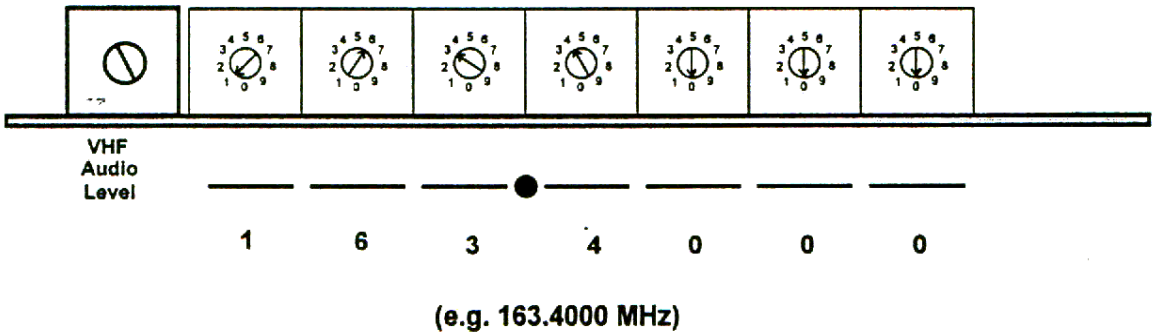


The audio line output level can be adjusted with the Audio Level controls on the front side of the receiver module. The factory setting for the audio output level is 2V peak-to-peak.

Setting the Frequency of the VHF and UHF Receiver

The VHF and UHF receiver's frequency is dialed into the module using the seven switches on the front of the module. The frequency is in 500 Hz increments.

Frequency Controls



Specifications

AM Receiver

Frequency range	530 kHz- 1710 kHz
Channels step size	10 kHz
Audio frequency response	200 - 3400 kHz +/- 3 dB
Sensitivity	10 for most for a 20 dB S/N
THD	<3% with 33% @ 1mV modulation
Selectivity	>45 dB at +/- 20 kHz
Image rejection	>35 dB
IF rejection	>35 dB
AGC	>45 dB

FM Receiver

Frequency range	87.9 MHz - 107.9 MHz
Channels step size	100 kHz
Audio frequency response	50 Hz 12,000 Hz +/- 1 dB
Sensitivity	2 uV for a 26 dB S/N
THD	<2%
Selectivity (+/- 400 kHz)	>65 dB
IF rejection	>65 dB
Image rejection	>60 dB

VHF Receiver

Frequency range	154 MHz - 164 MHz
PLL Step Size	10 kHz, 12.5 kHz, 15 kHz
Sensitivity	.35 uV for 12 dB SINAD
THD	<3%
Selectivity	>55 dB
IF Rejection	>65 dB
Image Rejection	>65 dB
Operating Temperature (all receivers)	0- 50° C

NOAA Weather Channels: 162.550 MHz, 162.400 MHz, 162.475 MHz, 162.425 MHz, 162.450 MHz, 162.500 MHz, 162.525 MHz

Sage Receiver Limited Warranty & Service Information
US Warranty Only

Warranty service for this unit will be administered by Harris Corporation 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, Richmond, IN, 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 in the unlikely event that your unit 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. Call Harris at 317-962-8596 for a Return Authorization (RA) number.

4. Pack the unit in its original carton or a reasonable substitute. Put the packaged unit in another box for shipping. Print the RA number clearly under the address. NOTE: The Receiver is subject to damage if poorly packaged. Shipping damage may affect your warranty.

5. Include with your unit a return shipping address (we cannot ship to a P.O. Box), a copy of your purchase receipt, a daytime phone number, and the description of the problem

6. Ship the unit FREIGHT PREPAID to

Harris Broadcast Division
3712 National Road West
Richmond, Indiana 47374

Attention: Service Department - Sage Receiver RA#:

PLEASE NOTE: All returns must have a valid RA number.