

# OWNER'S MANUAL

## SE130 AM / FM DIGITAL TUNER

# **Hafler**<sup>TM</sup>

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## INTRODUCTION

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The Hafler SE130 AM/FM Tuner combines high quality radio and audio circuitry with convenient and flexible operation. The digital tuning system employs a quartz-crystal referenced Phase-Locked-Loop (PLL), and a special combined microprocessor/synthesizer employing proprietary programming.

The basic operation and features of the SE130 are described in simplified form in figure one. Although operation of the tuner is possible by studying this diagram only, complete appreciation of its features and operating modes can only be realized by thoroughly reading this owner's manual.

We have tried to present this additional information in an easy to follow format, mostly in sections corresponding to the numbered call-outs in figure one. We urge you to take the time to read through this material as soon as possible.

## INSTALLATION

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The gloss-black insert on the faceplate of your new tuner has been packaged with a removable protective coating. Please peel off this protective coating following installation.

When cleaning the faceplate, we advise a soft cotton cloth with a non-abrasive cleaner that is safe for Lexan and painted surfaces. **DO NOT** use paper towels or any other coarse material to clean the faceplate as these materials may scratch the faceplate.

The SE130 is shipped with removable end caps on its front panel. Optional rack-mounting ears are available from the factory for mounting the unit in a standard 19" equipment rack.

## **POWER CONNECTIONS**

The SE130 is internally connectable for 110-120 VAC or 220-240 VAC, 50/60 Hz operation. Unless otherwise labelled, all units are wired for domestic US (120 VAC, 60 Hz) line power. Consult the factory for information on alternate connections.

In most audio systems, it will be most convenient to plug the tuner into the preamplifier's switched outlet.

## **AUDIO CONNECTIONS**

A standard RCA phono-type patch cord has been provided for the audio signal connection. Simply connect this cord from the rear panel output jacks to the "tuner" or "radio" input of the preamplifier.

## **ANTENNA CONNECTIONS**

A simple "T" shaped dipole ribbon antenna has been provided for FM reception. Connect its leads to the rear panel terminals marked "FM 300 OHM". For best results, the "arms" of this antenna should be fully extended, and mounted flat against a wall or equipment cabinet.

A "loop" type antenna has been provided for AM reception. As supplied, it is connected to the rear panel terminals marked "AM ANT" and "GND". This antenna is attached at one end by a thumbscrew, and a snap-in hinge at the other end. As this antenna is directional, it will usually be beneficial to remove the thumbscrew and allow the antenna to swing away from the body of the tuner, orienting it for best reception. The antenna may be completely detached for maximum freedom of placement, by carefully prying it loose from the plastic hinge.

The antennas supplied will yield satisfactory reception in most situations. For further information regarding these antennas, as well as alternate antenna types, consult the section "Additional Information".

# OPERATION

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## (1) PRESET CHANNEL KEYS

These keys allow six station frequencies per band to be STORED into memory and RECALLED whenever desired.

STORING may be accomplished by first tuning to the desired station, and then holding the desired Preset Key for approximately 3 seconds. While holding the key, the Channel Number will appear in the display, and the audio output will be muted. The audio will automatically return after three seconds, announcing that the station has been committed to memory.

RECALLING a preset channel requires only briefly pressing the desired preset key. At that time, the channel number will appear in the display.

Stations preset into memory are stored, even in the absence of line power, by an extremely long-life memory back-up battery. The tuner also provides automatic power-up return to the same station tuned at power-down. For more information about the battery, see the section "Additional Information".

## (2) BAND SELECTOR

Repeatedly pressing the BAND key will cycle the tuner through the three available bands: FM1, FM2, and AM. The chosen band will be indicated by one of the three green lights above the key.

By utilizing two FM bands, a total of twelve FM presets are available, using only six preset keys. Therefore, to identify which FM preset has been chosen, both the Channel Number and Band Number must be observed.

When cycling through the bands, the tuner will select the Channel Number last tuned on that band. Therefore, if two people frequently use this tuner, it might be convenient to have each person select a band for his or her favorite

stations. In that manner, when changing "users", simply changing bands will re-select the station last tuned by that user.

### **(3) MANUAL TUNING UP/DOWN**

Briefly pressing either tuning key will cause a tuning change of 0.2 MHz (200 KHz) in the FM mode, or a change of 10 KHz in the AM mode.

HOLDING either tuning key initiates fast tuning, convenient for rapid access to a distant portion of the band. Upon reaching either end of the tuning band, the tuner will "wrap around" to the other end. Therefore, when manually tuning from one extreme end of the band to the other, it may be quicker to tune in the opposite direction. (Example: The tuner is set to 106.3. You wish to manually tune to 90.1. If you press DOWN, you'd have to wait for the tuner to go all the way down the band. If you press UP, the tuner will quickly wrap around to the low end of the band.)

The manual tuning process stops as soon as the key is released, whether a valid station is present or not.

### **(4) SEEK TUNING UP/DOWN**

Pressing either SEEK key will cause the tuner to advance UP or DOWN to the next usable station and stop. Holding the SEEK key has no effect.

### **(5) SCAN TUNING BAND/PRESETS**

Pressing the SCAN BAND key will cause tuning UP to the next usable station, pause for about four seconds, and again UP to the next station, and so on indefinitely. The frequency display will flash while scanning the band. The "wrap-around" feature also operates in this mode.

Pressing the SCAN BAND key a second time (or any other tuning key) will cause the SCAN mode to cease. If the SCAN mode is stopped while the tuning is changing, it will

go back to the previous station found. In this manner, you will not lose a station if you weren't quick enough to stop the process during the four second pause.

Pressing the SCAN PRESETS key causes the tuning to change to the next higher Preset Channel Number, pause for about four seconds, and again to the next preset, and so on indefinitely. The Channel Number display will flash while scanning the presets. The tuner will continue to cycle through all the presets in a given band, but will not transfer to the next band.

Pressing the SCAN PRESETS key a second time (or any other tuning key) will cause the SCAN mode to cease.

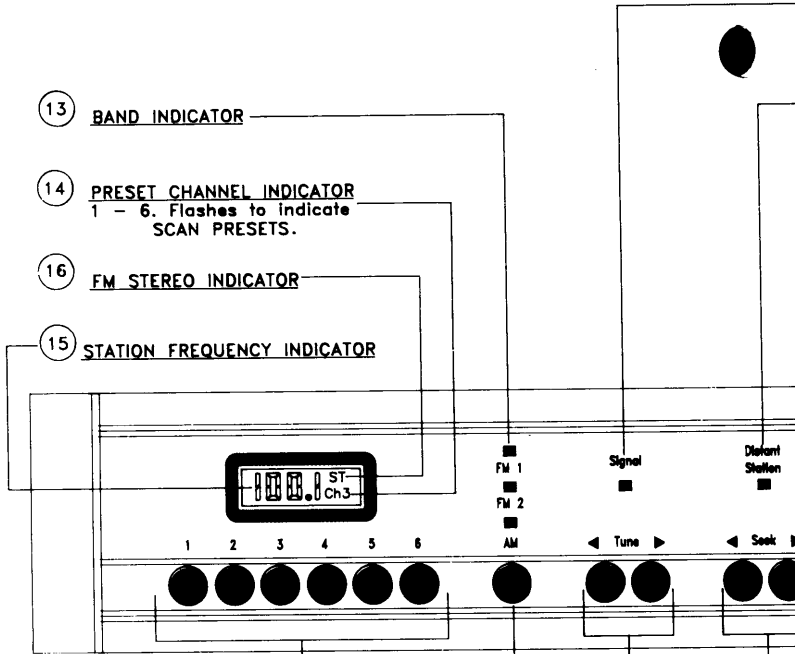
## **(6) MUTE AND (11) DISTANT STATION INDICATOR**

The SE130 has two audio output muting systems. The first system mutes the output upon power on or off, and whenever the tuning is changing, whether it be due to manual or automatic tuning or band changing. This system prevents bursts of noise that are inevitable during these processes, is operational in all modes, and is non-defeatable by the user.

The second system, operational only in the FM mode, decides whether to mute the output based upon the signal strength of the incoming signal. This system is selectable by the user, and is ON when the green MUTE light (10) is lit.

The ON mode of the MUTE system is considered the normal mode, as the tuner usually has the ability to correctly detect clean stations and unmute the audio output.

However, there are some conditions where a very weak station will still have a clean listenable signal. In these situations, when MUTE is ON, but the output is still muted, the DISTANT STATION INDICATOR (RED) will light. This is the tuner's way of telling you that it is stopped on a possible station, but that the station is too weak for normal



- ① **PRESET CHANNEL SELECTORS**  
Hold for three (3) seconds to store.
- ② **BAND SELECTOR**  
Sequences FM1, FM2, AM.
- ③ **MANUAL TUNING UP OR DOWN**  
In .2 MHz increments for FM,  
and 10 KHz increments for AM.
- ④ **SEEK TUNING UP OR DOWN**  
Automatically seeks nearest usable station.

12

SIGNAL STRENGTH INDICATOR  
FM mode only. Color indicates signal.  
See text.

11

DISTANT STATION INDICATOR  
FM mode only. See text.

10

MUTE INDICATOR  
FM mode only. User selectable,  
see text.

9

MONO ONLY INDICATOR  
FM mode only. User selectable,  
see text.

## Hafler SE130

Scan  
Band Presets

Mute Mono

Power

8

POWER  
In = on,  
Out = off.

7

MONO ONLY ON/OFF  
Allows defeat of automatic FM  
stereo switching. See text.

6

MUTE ON/OFF  
Allows defeat of signal strength  
derived muting. See text.

5

SCAN TUNING: BAND OR PRESETS  
Continuous scan/pause sequence of  
entire band or presets. Press again to stop



unmuting. Pressing the MUTE key will unmute the audio output, enabling the user to hear whatever signal is there.

The status of the user selectable MUTE system is preserved through power up/down cycles by the memory back-up system.

## **(7) MONO**

The SE130 has the ability to detect FM stations broadcasting in STEREO, and automatically switches on it's multiplex decoder. Stereo decoding is indicated by the "ST" visible in the display.

The background noise level of a stereo broadcast increases as signal strength decreases. The tuner has the ability to detect low signal strength and automatically reduce, on a variable basis, stereo separation to reduce this background noise.

There are situations, particularly when a weak signal strength fluctuates, that it is best to force the tuner into a MONO mode. This is accomplished by pressing the MONO key, indicated by the RED MONO light (9).

MONO OFF is considered the normal mode, so a RED light has been provided to remind the user to return to automatic stereo when listening under normal conditions.

The status of the user selectable MONO-only mode is preserved through power up/down cycles by the memory back-up system.

## **(9) SIGNAL STRENGTH INDICATOR**

This indicator changes color according to signal strength, in the FM mode only. It will glow red for no station present, begin to turn orange and then yellow for medium strength stations, and green for full strength stations.

This indicator is especially useful for orienting an antenna for maximum signal strength, as well as being fun to watch to see what color it will produce.

## **ADDITIONAL INFORMATION**

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### **MEMORY BACK-UP BATTERY**

The SE130 contains a memory back-up battery to preserve station presets, last station tuned, and user selectable operating modes. The battery employed is an extremely long-life, 3.6 volt lithium cell. Under normal operating conditions, this battery can be expected to last more than 10 years.

An indication of a discharged battery will be a loss of memory whenever the power is switched off. No attempt should be made to recharge this battery. The battery is soldered into place, and should be replaced by qualified personnel. Consult the factory for a replacement.

### **FM Antenna**

The ribbon dipole antenna supplied will offer excellent reception in most situations. To maximize the reception potential of this antenna, a few guidelines should be followed:

- fully extend the "arms" of the dipole
- mount the antenna as high as possible
- mount the antenna away from large metal structures
- orient the antenna perpendicular to the direction of the radio station's transmitter.

Some experimentation will be necessary in less than optimum reception areas, or where reception of a distant station is desired. Often, an adjustment of a foot or so in antenna position can affect reception noticeably.

A number of alternate indoor antennas are available, from traditional "rabbit ears", to antennas designed specifically for high quality FM reception. Although these units offer little or no advantage over the ribbon dipole in terms of gain or directivity, they are typically table mounted, offering greater flexibility in placement and mobility.

For the ultimate in FM reception, especially in difficult reception areas, an outdoor antenna is recommended. There are two basic types of "poor" reception conditions. Urban areas may be characterized by strong signals, but those signals can be interfered with by reflections from tall structures. Rural areas may be characterized by weak signals from distant stations.

There are many types of outdoor antennas. Some may be optimized for directionality, while others may be optimized for high gain. It is best to seek local advice for analysis of your specific reception conditions.

In addition to the 300 ohm FM antenna terminals, a standard "F" type 75 ohm coaxial antenna connector has been provided. The use of this input, using coaxial cable, is recommended for outdoor use, to minimize noise interference. This input should also be used for connections to FM cable services. Again, seek local advice for choosing a cable type for your application.

## **AM Antenna**

The loop antenna supplied will offer excellent reception in most situations. It is a directional antenna, requiring orientation perpendicular to the radio station's transmitter. Because of its directional behavior, it will offer the quietest (least background noise) signal on high to medium strength stations, compared to a straight wire antenna.

However, the loop antenna is not the most sensitive, and therefore may not satisfactorily receive medium to weak stations, especially in automatic tuning modes. For maximum sensitivity, a straight wire (as long as practical) should be connected to the "AM ANT" terminal. This type of antenna is relatively non-directional, and will not yield the best signal-to-noise ratio, but will allow reception of the largest number of stations.

## FACTORY SERVICE & LIMITED WARRANTY

If you encounter any difficulty or have any questions concerning your SE130 Tuner, please call our Customer Service Department weekdays, 8 am to 3:30 pm, Mountain Standard Time, at 602-967-3565.

Before returning any unit to the factory for service, please call us. All units being returned (regardless of warranty status) must receive a Return Authorization (RA) Number. In addition, we can offer trouble-shooting assistance that may often simplify or even eliminate the need for factory service.

The Hafler SE130 Tuner is warranted for three years from date of purchase, including parts, labor, and return shipping costs from the factory to the owner within the Continental USA.

It is the owner's responsibility to pay shipping (preferably UPS) to the factory: collect shipments will not be accepted. Units under warranty should be accompanied by a copy of a dated Bill Of Sale. Use the original carton and all packing material, and be sure to include a return address, and a brief description of the difficulty, including whether it is intermittent.

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