

# OWNER'S MANUAL

# Hafler™

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## INTRODUCTION

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The Hafler IRIS FM Tuner combines very high quality radio and audio frequency processing, convenient automatic features, and infrared remote-system control.

The tuner employs a quartz-crystal referenced digital tuning system using a Phase-Locked-Loop (PLL) and a microprocessor having a proprietary program.

The basic operation of the IRIS FM Tuner is described in simplified form in Figure 1. Please note that this diagram can give you just enough information to start operating your IRIS Tuner.

Hafler products are designed to be easy to operate for new or occasional users, but also to provide access to many additional features and modes for those who wish to become informed about them.

We all have a tendency to read instruction manuals only if something doesn't work as expected. However, the IRIS Tuner is part of a sophisticated remote control system, designed to enhance listening pleasure and convenience. Therefore, there are hidden features and modes you may never know about or understand, if you do not take the time to read through this manual.

We have tried to provide this additional information in a convenient form, mostly in sections of the manual numbered to correspond to the circled numbers on Figure 1. We strongly suggest that you take the time to read through this information as soon as possible.

## INSTALLATION

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

When cleaning the face-plate, 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 coarse material to clean the face-plate as these materials may scratch the insert.

The IRIS Tuner is shipped with styled end caps on its front panel. Rack-mounting ears are available from the factory for standard 19"-wide racks.

## **POWER CONNECTIONS**

The IRIS Tuner is internally connectable for virtually all AC line power systems. Unless otherwise labelled, all units are wired for 120 volts AC, 50/60 Hz. 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 supplied with your IRIS Tuner. Connect its leads to the rear panel terminal strip marked "300 ohm".

For best results, the "arms" of the antenna should be fully extended, and mounted against a wall or equipment cabinet. For further information about placement of this antenna, as well as guidance concerning alternate antenna types, see the section "Additional Information".

## **REMOTE CONTROL CONNECTIONS**

The following applies only to those audio systems using an IRIS Preamp with the remote option installed.

The IRIS Tuner has two recessed male connectors on the back panel. They are internally connected together to allow the IRIS digital data-bus to "daisy-chain" to other IRIS-compatible accessories.

Connect either end of the supplied ribbon-type umbilical cable to either of the tuner's connectors. Note that both of the cable's connectors are keyed, and therefore fit only one

way. Be sure to insert the plugs fully. Connect the free end of the cable to the single connector on the rear of the IRIS Preamp.

## **OPERATION**

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For now, make sure that the four SPECIAL FUNCTION switches (11-1 4) are in the OUT position.

### **(1-5) PRESET KEYS**

These keys allow five station frequencies to be STORED into memory and recalled whenever desired.

STORING may be accomplished by first tuning to the desired station, and then pressing the STORE key (10), followed by a PRESET key (1-5), to which this station assignment is desired. You may use any order of the presets you choose.

The STORE key is intentionally located away from the PRESET (1-5) keys to minimize the nuisance of accidentally erasing your stored presets.

Recalling a PRESET station requires only pressing the desired PRESET (1-5) key.

Stations preset into memory are stored indefinitely, using a non-volatile memory. No external power or batteries are necessary. The memory unit also provides automatic power-up return to the station tuned at power-down.

### **(6-7) DOWN AND UP KEYS (MANUAL TUNING)**

Pressing either of these causes tuning changes in 50 kHz increments (per keystroke), shown on display (17).

HOLDING either of these causes first a slow "scrolling", followed, after one second, by a fast "scrolling", of tuning frequency.

The tuning process stops as soon as you release either key--whether a station is present or not.

FM stations in North America are assigned only to odd tenths of a megahertz spacing--i.e. every 200 kHz. The

higher tuning resolution is included in your tuner for both European use and to allow for slight intentional off-tuning, which is sometimes useful in unusual reception situations.

## **(9) SCAN KEY (AUTOMATIC TUNING)**

This mode will usually be preferred for locating stations. Pressing SCAN initiates an automatic band-scanning mode which pauses for four seconds on stations, then resumes the SCAN.

## **(8) STOP KEY**

This key terminates the SCANNING mode. To select a desired station during the SCAN mode, press STOP during the four second pause on that station.

Remember--as some other tuners operate differently--you must always press STOP once SCAN has located a station you wish to listen to.

You should also use STOP to terminate SCANNING before attempting to use the STORE mode--as STORE alone does not terminate the automatic SCANNING mode.

## **ADDITIONAL DETAILS ABOUT THE SCAN MODE**

SCANNING is always up in frequency, unless DOWN is pressed before or during the SCAN.

A DOWN-SCAN may be reverted to UP-SCAN by briefly pressing UP, during the SCAN mode.

After reaching either end of the FM band, the SCAN will resume at the opposite end of the band and begin to re-scan it again.

During the four-second SCAN pauses, pressing SCAN again results in immediate resumption of scanning, in the existing SCAN direction.

Also, during these pauses, briefly pressing the UP or DOWN keys will also result in SCANNING resumption, in the direction keyed. However, holding either of these keys for one second will drop the tuning mode back to manual UP/DOWN format.

Holding SCAN for one second results in a FAST-SCAN mode, which, upon key release, reverts to normal-speed SCAN to the next detected station. During FAST-SCAN the tuning process will hold at the band ends, until you release the SCAN key.

## **(11-14) THE SPECIAL FUNCTION SWITCHES**

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### **(11) DISTANT STATION**

All tuners featuring automatic tuning have circuitry to tell their tuning system when a station is present and tuned correctly—to stop the tuning process properly on a station. You may set the sensitivity of the IRIS STATION DETECTOR circuitry to two different levels.

When the DISTANT STATION switch (11) is OUT, the STATION DETECTOR will typically stop the scanning process only on stations strong enough to provide expected high signal-quality.

Depressing this switch allows much weaker signals to be accepted by the tuner's STATION DETECTOR. The dominant effect is that the tuner will stop on many more stations, when in SCAN mode. Many of these will likely be too weak for your listening taste.

This switch also affects the signal threshold for activating certain panel displays and for audio muting.

Note that depressing this switch does not increase the tuner's front-end sensitivity. This function is already provided by a sophisticated delayed automatic gain control (AGC) system. This switch only allows you to instruct the STATION DETECTOR about the strength and quality of signals you want it to accept—as a “station”.

### **(12) MUTE OFF**

Your tuner has an automatic AUDIO-MUTING system which (dead) mutes the audio output in a number of situations, to provide the most pleasant listening and tuning. Its action is always indicated by the tuner's red MUTE legend (19).

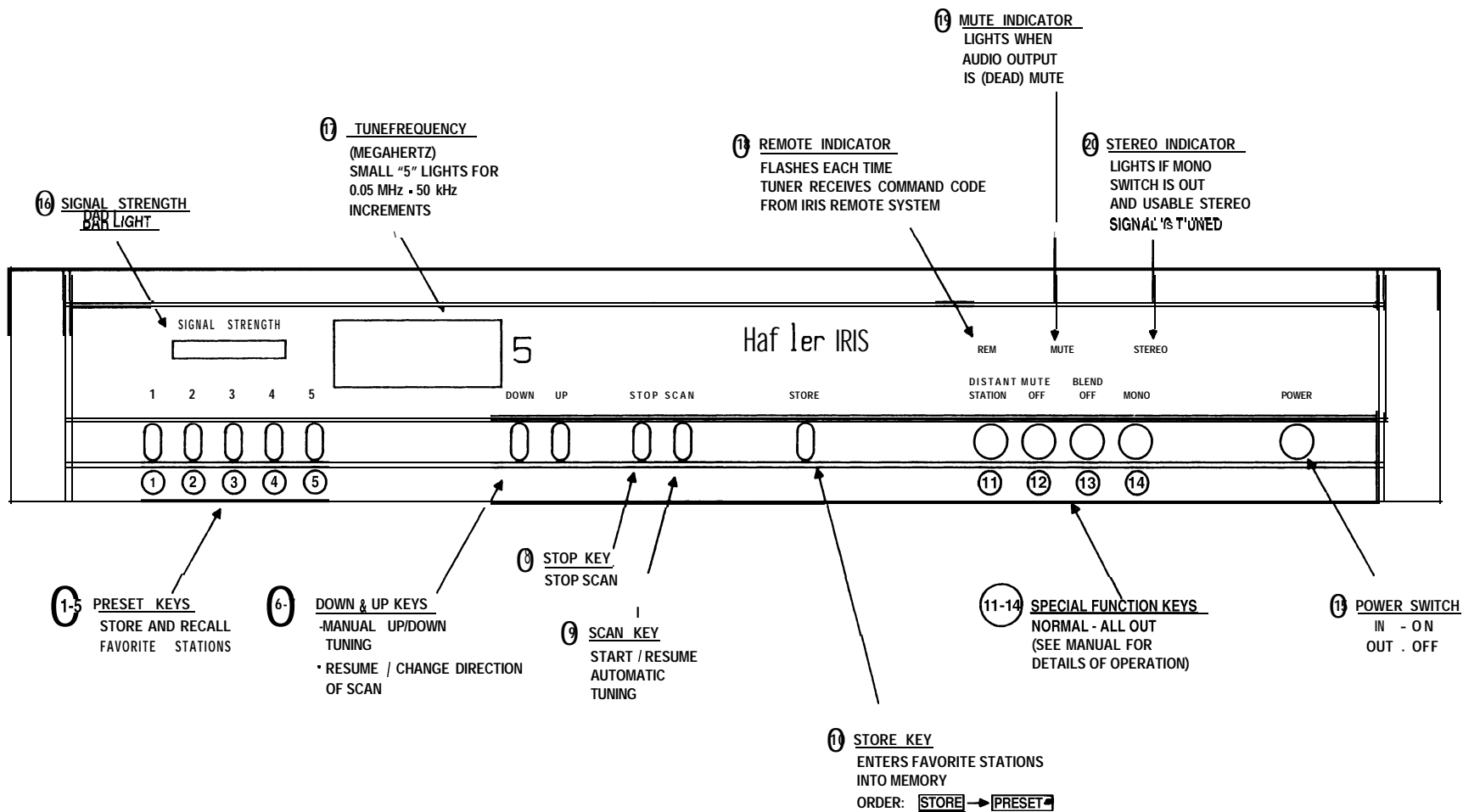


Figure One

During PRESET, SCAN and FAST MANUAL tuning modes, muting is always activated by digital signals from the tuning system. Muting is also commanded by the IRIS remote control system, as explained later.

For "DXing", i.e. searching for extremely distant stations, you may elect to de-activate the AUDIO-MUTING system, for SLOW MANUAL station "searching".

Depressing the MUTE OFF switch **(12)** allows your tuner to reproduce all detected audio signals regardless of signal strength or quality. You will now hear everything--very weak stations, noise, mis-tuned stations etc.--except during PRESET, SCAN or FAST MANUAL tuning, as discussed above.

When MUTE OFF is depressed, you can hear stations too weak to activate the STATION DETECTOR logic, even when in its most sensitive mode-(DISTANT STATION switch in). When signals are this weak, the SIGNAL-STRENGTH BAR LIGHT (16), and the STEREO LIGHT **(20)** are intentionally blanked--to avoid display presentations which are erratic, deceptive and annoying.

### **(13) BLEND OFF**

The depression of the BLEND OFF switch **(13)** de-activates an automatic noise-reduction circuit which progressively "blends" the stereo channels when the FM signal falls to insufficient levels to achieve acceptable quieting in the maximum-separation stereophonic mode.

This characteristic of stereo reception is related to two factors. First, stereo transmissions carry more information than mono transmissions. Second, this additional separation information is carried on a high frequency subcarrier modulating the basic FM signal at frequencies well above the audio band.

This subcarrier separation information is far more susceptible to noise intrusion on weak signals than the basic monaural (Left + Right) signal carried at audio (modulating) frequencies.

Thus, as signal strength falls to levels unable to maintain acceptable signal-to-noise ratio in full-separation stereo format, it is desirable and common practice to progressively blend the two stereo channels together, only as much as



needed, to cancel the noise deriving from the separation information, carried totally on the subcarrier.

In nearly all cases, such progressive channel blending, applied only on weak signals, results in a far more listenable overall situation. The IRIS noise-reduction circuit has no effect on stronger signals, thus we have configured the BLEND OFF switch **(13)** so that its normal OUT position results in this system being "armed"--ready to act on a temporary signal fade--but taking no action on signals strong enough for quality stereo reception.

## **(14) MONO**

The MONO switch is provided to allow forcing reception to stay in MONO mode. It is rarely used, as the stereo FM multiplex decoder operation automatically switches to MONO mode if the incoming FM signal is not in stereo. The MONO mode can sometimes improve reception of a very distant or fluctuating station--i.e. when "DXing" etc.

The green STEREO legend **(20)** lights only when the MONO switch is OUT and when the detected FM multiplex subcarrier (19 kHz pilot frequency) is sufficiently strong to activate the multiplex decoder's stereo circuitry.

## **REMOTE CONTROL**

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You should re-read the remote section of the IRIS PREAMPLIFIER manual in conjunction with the following additional information.

## **HANDSHAKE SYSTEM**

The umbilical connection established allows a very convenient "HANDSHAKE" operation between the two units. In simple terms, your IRIS Tuner tells your IRIS Preamp that it is connected and powered. This tells the Preamp, when Tuner is selected, to automatically "transfer" the remote's top eight (multi-legend) keys to perform TUNER command functions.

The Preamp also tells the Tuner it can drop its audio muting, and the associated red MUTE legend (19).

(This “handshake” muting of IRIS Tuner by IRIS Preamplifier, when the Tuner is de-selected, is employed to guarantee that the “on” Tuner cannot “crosstalk” into the audio of your other selected Preamplifier sources--thus allowing you to leave the Tuner powered for maximum remote convenience.)

## KEY OPERATION

All of the KEY functions of the Tuner panel which are convenient from remote operation are available from the 8 remote KEYS.

STORE is left as mainframe only for maximum memory security of station presets.

The UP function is not used, as full MANUAL UP/DOWN operation is not remotized--and SCAN is always UP, unless, as on the mainframe, DOWN is commanded before or during a scan.

To remotely turn a DOWN-SCAN back into an UP-SCAN, key in STOP, then re-key SCAN.

You will be pleased to find that the order of keys on the IRIS remote is identical to those on the IRIS tuner, and the basic key operations from remote essentially duplicate the Tuner mainframe operations.

During all remote commands which the Tuner accepts, the green REMote legend **(18)** flashes brightly in sync with the Preamplifier's red MUTE legend.

## CLEAR KEY

The CLR (CLear) key on the remote transmitter causes a **3-4** second period of Tuner audio muting with the associated Tuner red MUTE legend **(19)** lighting.

During this period, the HANDSHAKE mode is interrupted, so that you may de-select Tuner and make another input selection for the Preamplifier. If you make no alternate selection in this period, the Tuner is retained as input source, and will un-mute at the end of the CLR period. If you re-select Tuner during the CLR period, the CLR period is quickly terminated.

## RECORD SECURITY

As explained in the “remote” section of the IRIS Preamplifier Manual, if RECORD SECURITY is in effect (either RECORD switch is in on the IRIS Preamplifier), the Tuner will refuse all IRIS remote commands, including CLR. The Preamplifier's red MUTE legend will remind you of this by its distinctive interrupted-flashing mode.

## ADDITIONAL INFORMATION

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As described in the section “Antenna Connections”, the IRIS Tuner is supplied with a ribbon dipole antenna that will provide adequate reception in most situations. To maximize the reception potential of this simple 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 the 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 conditions, 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.

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 competent local advice for analysis of your specific reception condition.

In addition to the **300** Ohm terminal strip, a standard 75 Ohm coaxial antenna input has been provided. The use of this input, using coaxial shielded cable, is recommended for outdoor use, to minimize noise interference. Again, seek local advice for choosing a cable type for your application.

The IRIS Tuner is supplied with a 75 usec de-emphasis time constant, for compatibility with North American broadcast standards. For countries employing a 50 usec time constant, the tuner may be simply modified. Consult the factory for details.

The umbilical cable supplied for remote control connection is 24" long. Should your installation require a longer cable, consult the factory for availability.

## **IN CASE OF DIFFICULTY**

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If you encounter any difficulty or have any questions concerning your IRIS Tuner, please call our Technical Service Department weekdays, 8 am to 4 pm Mountain Standard time, at 602-967-3565.

Should you have any doubts as to whether the tuner is malfunctioning and requires service, please call us before sending in for repair.

The Hafler IRIS Tuner is warranted for 3 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.