272

FM Processor & Stereo-Gen

Installation & User Guide

May, 2017 - Rev. 1 Firmware

TABLE OF CONTENTS

Section I

INTRODUCTION

Product Description

Inovonics' NOVIA 272 is a comprehensive FM airchain processor that includes the stereo-multiplex generator and a full-function RDS/RBDS encoder compatible with station automation 'playout' systems.

The NOVIA 272 features gain-riding AGC, leveling, parametric EQ, 3-band dynamic range compression, wideband and independent pre-emphasis-protection final limiting, and adjustable composite clipping. Programmable from the front panel or through its cross-platform Web interface, the NOVIA 272 also supports 2-way program streaming and SNMP.

Product Features

Features of the Inovonics NOVIA 272 include:

- Comprehensive audio processing with factory and user presets; internal scheduler allows dayparting

- Accepts analog, AES-digital and streaming program inputs; out-streams source and processed audio for remote monitoring

- Failover feature can switch to an alternate program feed when primary audio is lost

- Easy setup using the OLED screen and jog-wheel navigation of the processor's menu tree

- Full-function Web interface works with any browser

- Self-logging alarms for audio loss; alarm 'tally' for remote indication; alarm also dispatches email or text message alerts

- Accurate front-panel LED metering; all processing functions metered with OLED display and Web interface

Product Specifications

Frequency Response* (processing bypassed):
   Analog in: 50Hz-15kHz, ±0.25dB
   AES Digital in: 20Hz-15kHz, ±0.25dB

Distortion* (processing bypassed):
   Analog in: <0.02% THD
   AES Digital in: <0.002% THD

Signal-To-Noise* (processing bypassed):
   Analog in: >82dB (ref: +24dBu I/O)
   AES Digital in: >120dB (ref: 0dBFS I/O)

* Through an appropriate de-emphasis network

Separation:
   >50dB, 20Hz-15kHz

Program Line Inputs:
   Analog: active-balanced L/R (XLR) accepts line levels from –15dBu to +15dBu; +24dBu clipping
   AES Digital: transformer-balanced (XLR) accepts line levels between –30dBFS and 0dBFS at sampling rates from 32kHz to 96kHz
   IP Streaming: accepts Icecast/SHOUTcast MP3, Ogg and AAC streams

Composite/MPX Output:
   Unbalanced 75-ohm (BNC); 1V p-p to 6V p-p; 6%-12% stereo pilot injection; 3%-8% RDS/RBDS subcarrier injection

Program Signal Latency (Delay):
   3.75ms (typical)

Network Port:
   TCP/IP network connection (RJ45) for remote setup/operation and in/out audio streaming; full SNMP support

GPIO Ports:
   3 GPI, 3 GPO with assignable functions and logic polarity

Headphone Jack:
   3.5mm (TRS) on front panel; low-Z or high-Z headphones

Internal Test Tone Generator:
   20Hz-20kHz; variable frequency and level

Alarms:
   Local GPO closures, browser interface, SNMP and SMS/email alarms for audio loss; maintains daily, weekly, monthly logs

Scheduler:
   Accommodates 'dayparting' with an onboard real-time clock and preset-selection programming

Audio Processing:

AGC: ±15dB capture range; gated with dual-rate 'windowed' operation

Leveling: variable 'syllabic'; 2:1 compression ratio

EQ: 4 cascaded sections of parametric equalization

Bass 'Punch': variable bass-attack enhancement

Compression: 3 bands with selectable crossovers; variable master and individual drive controls; r.m.s./peak 'density' adjustment

Final Peak Control: no-clip feed-forward wideband limiting with independent high frequency protection

Composite Clipping: 0dB-3dB adjustable clipping depth (exclusive of stereo pilot and RDS/RBDS subcarrier)

Processing Presets: 10 factory, 10 user-defined

RDS/RBDS:

Static and dynamic support for artist and song title display in PS and RT fields

Power Requirement:

12VDC at 400mA (2.1mm x 5.5mm coaxial); an inline 'universal' 100/240VAC switchmode power supply is included

Mounting Options:

An optional rack adapter mounts one or two NOVIA or other Inovonics half-rack units in a standard 19-inch 1U rack space

Size and Weight:

1.6"H x 8"W x 6"D; 5 lbs shipping weight

Certifications:

Rear View:

'Under the Hood'

The NOVIA 272 FM airchain processor is very compact with a major utilization of surface-mount (SMD) technology. Some components are 'application-specific' and/or pre-programmed at the factory, but all of them are impossibly tiny. This makes servicing the unit in the field a difficult proposition at best. For these reasons, and also because of the small format of this manual, we have dispensed with schematic diagrams, servicing instructions and a listing of component parts.

Nevertheless, our policy has always been one of 'full disclosure.' We feel that, unless we are doing something deceitful, there should never be a reason to hide information from the user. With a clear conscience, and upon request, we will cheerfully provide additional documentation and divulge all but the very darkest secrets concerning any Inovonics product.

Because it is so small and lightweight, returning the NOVIA 272 for factory servicing is an option that we encourage. Inovonics has never depended on factory repair charges as a significant source of revenue, and we are confident that you will be astonished at how reasonable our rates actually are!

Section II

GETTING STARTED

Unpacking and Inspection

Immediately upon receipt of the NOVIA 272, inspect for possible shipping damage. If damage is found or suspected, notify the carrier at once, and then contact Inovonics.

We recommend that you set aside the original shipping carton in the event that return for Warranty repair is required. Shipping damage sustained as a result of improper packing for return may invalidate the Warranty!

Warranty Registration

Please complete the Warranty Registration process. Not only does registration assure coverage of the equipment under terms of the Warranty (printed inside the back cover of this manual), but the user is assured of receiving specific service and modification instructions, including software or firmware updates. Register online at:

www.inovonicsbroadcast.com/product-registration

Mounting

The NOVIA 272 is packaged in a compact, half-rack format. We supply stick-on rubber feet so the unit may sit on a desktop or atop an existing piece of rack-mounted equipment, as long as at least 1U of panel space is left open to access the NOVIA 272 front panel.

An optional rack-mount kit is available that can accommodate a single or a pair of Inovonics half-rack products. The kit comes with a blanking panel for unused space, and with a 'daisy-chain' power cable so that two devices may share a single supply.

AC Mains Power

The NOVIA 272 comes with a 'universal' outboard 'brick' type switching power supply that accepts AC mains voltages between 100VAC and 240VAC. The actual power consumed is 400mA at 12 volts DC. A second DC connector on the rear panel of the unit allows the user to 'daisy-chain' two or more units to share a common mains supply, thus cutting down on cord clutter. Do make sure that the total power consumption does not exceed the DC current rating noted on the power supply label.

Radio Frequency Interference (RFI)

Although the NOVIA 272 is designed to work alongside broadcast transmitters, please do practice reasonable care in locating the unit away from *abnormally* high RF fields.

Front-Panel Display and Controls

Left- and right-channel LED bargraph meters monitor the program input and are peak-responding with a floating 'peak hold' above the bouncing display. The panel dB markings should be considered relative as these meters come after the input level control in the signal path.

Display range and meter activity will depend very much on the dynamics of the program material. Heavily compressed music will generally peak (and 'hang') at about –6dB on the meter scale; material with greater dynamic range will show more variation.

The upper green LED to the right of the level display indicates AGC gating. It will be lighted most of the time, going dark only during pauses in speech. The audio loss alarm lights the red LED. The lower green LED indicates that the transmission is in FM-stereo.

The front-panel OLED graphic display screen presents the setup/operate menu tree in an easy-to-read format, and all setup can be done with jog-wheel knob entry. The display does employ a screen saver, so when the screen goes dim or completely dark, simply push the jog-wheel knob or Back button once to bring the screen back to life. No selection or change is made with this wake-up call.

Front-Panel vs. Web Interface Setup

The NOVIA 272 may be set up and operated either by using the front-panel menu and jog-wheel knob, or by using the Web interface. Doubtless you'll find the Web interface faster and easier, but we do advise gaining some familiarity with the front-panel approach. You will need to set up a network connection initially from the front panel.

Having said that, if you are adventurous do feel free to jump-in, set up a network connection and do all your setup over your network. The Web interface is organized so much like the OLED Menu Tree that separate sets of instructions would be redundant. Here in Section II we'll concentrate on front-panel setup. But anything in the Menu Tree can be found in the Web interface pages. Check Section V for matters that are specific to networking the NOVIA 272.

Navigating the Menu Tree

In a nutshell, you *turn* the jog-wheel knob to cycle among and to highlight menu items, and then *push* the knob to select, edit or adjust the highlighted item. To further clarify:

1) If you land on a menu item that requires a text or numerical entry, a text-entry screen appears when you enter that submenu. *Turn* and *push* the knob to select alphanumerics, punctuation, backspace, etc. After text entry, select Save and *push* the knob to commit to entry, or press the Back button next to the knob to cancel the operation.

2) If the submenu has a checkbox or 'radio button,' bracket the option and *push* the knob to toggle it.

3) If the screen shows an adjustment 'slider,' *turn* the knob to bracket the slider, *push* the knob to enable adjustment, and then *turn* it to change the value. Finally, *push* the knob or press the Back button to commit to the adjustment.

You may always press the Back button repeatedly to return to the Main Menu screen.

Input Sources and Program Failover

From the Main Menu, go to Input Sources to select your Primary Source and failover Backup Source(s) for program audio and RDS data.

Under the Primary Source submenu, set your default, first-choice source for program Audio:. This

can be any of the three program inputs: Analog, Digital or Stream.

At the same time, choose the source for the RDS: data that will accompany the program. For an analog or digital input, this will probably be Internal, which includes both the static data programmed into the NOVIA 272, and dynamic data (song artist and title) from your playout system. The Stream option can convert metadata from a streamed program input to the RDS format. Another choice here is None, which turns the RDS encoder off.

Second, and even third, 'failover' Audio: and RDS: choices are set up in a very similar manner. In the example above, an audio loss alarm on the primary Analog program source can be programmed to switch the processor input over to a Digital or Stream input and corresponding RDS source.

Stream Input

Navigate to Setup/Inputs/ Stream Input. Under Stream URL, manually enter the Internet address of the streamed program audio source. When the ☐ Only connect when stream is source box is *not* checked, the NOVIA 272 will connect to a valid stream automatically and remain connected. When the ☒ Only connect when stream is source box *is* checked, as shown above, the unit will connect to the stream either when the stream has been manually selected as the primary input source or 'failover' has switched-over to the stream as the backup source. The Connect button simply forces a reconnection.

Audio Alarms

The Audio Loss alarms for analog, digital and streaming inputs are each programmed independently, but follow the same procedure. As a typical example, we'll program the alarm for the analog input.

From the Main Menu go to Setup/Inputs/Analog Input/Analog Audio Loss.

NOTE: The ☒ Alarm box must be checked for the alarm to function at all. If left unchecked, the alarm will not trigger! There will be no program audio failover, no front-panel or Web interface alarm indication, no 'tally' output, no email or text notifications, no SNMP trap.

Threshold On is the audio level that the program must drop below to trigger an alarm. Moreover, the audio level must stay below this point for the number of seconds programmed into the Time On box. Similarly, Threshold Off is the audio level that the program must come back to, and stay above for Time Off seconds, to reset the alarm.

The current level of the program audio shows as a shaded bargraph behind the Threshold On/Off boxes. This makes it easier to set the trip-point mark with reference to the program audio. Of course, no audio will show unless that input is connected. Be sure to set up the backup input source alarm(s) when the program failover feature is used.

Stereo-Gen Setup

Setup of the stereo-generator (European 'stereocoder') is under the Setup/Outputs/Stereo Generator menu.

Under the Pre-Emphasis submenu, select the characteristic for your region. 75µs (75 microseconds) is the standard for the Americas, 50µs for most of the rest of the world.

The Stereo/Mono submenu offers several operating options.

The NOVIA 272 defaults to ⊙ Stereo stereophonic transmission. ⊙ Mono L+R simply switches off the subcarrier and broadcasts the combined left and right program channels in mono. This might be a valid choice when programming is speech-only, as it affords better noise performance in fringe areas. ⊙ Mono L or ⊙ Mono R direct the chosen input channel to both the left and the right processor inputs.

Pilot Injection is adjusted in this same submenu. The normal injection level for the 19kHz stereo pilot tone is 9.0%.

Multiplex Out presents the slider to set the composite/MPX output level of the NOVIA 272 for driving the FM exciter to full modulation. The MPX level is variable between 1Vpp and

6Vpp (peak-to-peak volts), corresponding to 100% modulation.

RDS Encoder setup is the subject of Section IV.

GPIOs

Three rear-panel GPO (General Purpose Output) terminals present alarm "tally" connections for remote indication of program audio loss. The plastic connector body may be unplugged from the chassis to make connection easier and for quick disconnect.

GPOs are programmed from the Setup/Outputs/ General Purpose Outputs menu. The Polarity: of Output: 1, 2 or 3 may be programmed as an Active Ground (the terminal goes to ground for an alarm) or Active Open (the terminal normally sits at ground and opens on an alarm). Type: may be assigned to Analog Audio Loss, Digital Audio Loss or Stream Audio Loss. None inhibits the alarm terminal closure or open. Alarms have the programmable parameters in the discussion starting on Page 10.

Alarm GPO 'tally' outputs are the collectors of NPN transistors that saturate to ground. Up to 100mA may be 'sunk' by each of these outputs to operate relays or LED indicators using an external voltage source up to 24VDC. The negative side of the external power source must be returned to the GND (Ground) terminal on the rear panel; a 10mA current-limited +5V source is provided as a convenience.

GPI terminals serve only one application at present, setting the RDS 'TA' (Travel Advisory) flag.

Under Setup/Inputs/General Purpose Inputs, you may assign General Purpose Input: 1, 2 or 3 to the RDS TA Flag and activate the function either by grounding the designated GPI terminal (Polarity: Active Ground), or by ungrounding the terminal (Polarity: Active Open). The status of the command is shown at the bottom of the menu screen.

NOTE: The GPI port is the only means of activating the RDS TA flag. The TA flag my be 'hoisted' only by stations that qualify at 'TP' (Traffic Program) stations. Please see the additional discussion and warning concerning this function on Page 23.

The Network Port

The rear-panel RJ-45 jack connects with your local network (LAN), and from there through your network router to the Internet. A network connection is required for the Web interface, for 2-way audio streaming and for SNMP functions.

+12VDC Power I/O

Two paralleled 'coaxial' connecters allow 'daisy-chaining' two half-rack units that share a common rack adapter. A short 'pigtail' cable is provided with each rack adapter for power loop-through.

The NOVIA 272 draws 400mA. Check the rating on the label of the power supply to make sure it has capacity for the modules it must support.

These power connectors are not a locking type. A Ty-Wrap® will secure power cables to the plastic anchor above the connectors if this becomes a problem.

Password Protection

You may protect NOVIA 272 settings with a password, which thereafter must be entered before any subsequent changes can be made. Either the same or separate passwords may be assigned to lock out the front-panel and Web interface access.

From the Main Menu, navigate to Admin/Security. Enter either or both boxes to manually enter a password for Front Panel: or Webpages:. Highlight Save and push the knob to set the password in memory. Once the password is saved, the Now Playing screen will be the only menu item available.

Press the Back button to sign-in. You will be prompted to enter the password before any menu can be accessed and any adjustments made. Similarly, the Webpages: password must be entered on a Web-enabled computer or other connected device.

To recover a lost password, you must perform a "hard reset." This deletes not only the passwords, but will also return the NOVIA 272 to factory-default values. *All User settings and presets will be lost!* Initiate a hard reset by holding down the Back button as you power-cycle the unit (disconnect and then reconnect power). Always keep an up-to-date Hardware Profile to back up your settings (see Page 30).

Miscellaneous Administration Menus

The Admin/Display menu offers a Brightness adjustment for the OLED menu screen. We don't recommend a higher setting than the 60% default setting, as it doesn't look that much brighter and may shorten the life of the display.

Timeout sets the interval between the last use of the knob and the screen going ⊠ Dim (dim) or ☐ Dim (dark). You can set this between 5 min and 60 min. Test the screen-saver by holding-down the Back button.

About shows the current Firmware Rev: and Serial #: of your unit, the Ethernet: port status and Uptime:, or how long the NOVIA 272 has been running since power was last applied.

Headphone Monitoring

The front-panel headphone jack will accommodate either low- or high-impedance stereo headphones with a 3.5mm plug. When you plug headphones in, the display automatically opens the Headphone Volume screen where the slider will adjust the listening level. After you set Volume, push the Back button twice to return to the menu you were on. You can also reach the Headphone Volume screen anytime from the Main Menu.

The default Headphones Source: selection is Proc. Out, which is a 'normalized' (flat) output from the processor. Other monitoring options allow you to preview the incoming, unprocessed audio, including the failover source, without putting it on air.

Section III

PROCESSOR SETUP

All adjustments discussed here appear under Processor in the Main Menu.

Metering

Meters gives an overall picture of audio processing action. The Web interface gives a 2-color display that additionally provides audio level and gain reduction annotation. The two examples here reflect the same program, but not quite at the same moment.
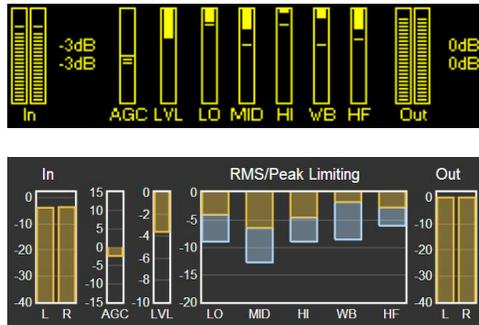
Processing Presets

The NOVIA 272 comes with ten factory-programmed processing presets and ten empty registers where you can save your own, customized ones. We recommend that you start with one of 'ours' and nurse it into 'yours,' something that sounds best for your programming and market demographics.

In this contrived example, 'Bob,' the station's P.D., has developed his own version of our factory (F) Country preset, and has renamed it Country-2 (Bob's). All processing parameters are saved in each preset, and presets are saved along with all other user settings when you download a Hardware Profile backup (see Page 30).

Creating presets is easy. After you have nursed-in just the right sound for your station, scroll to the top of the Presets menu to Save Preset. Push the knob and, as instructed,

Name Your Preset. Finish with a Save. You'll find your new preset at the bottom of the list.

To delete a custom preset, scroll to the bottom of the list and select Delete. Navigate the flashing X to the preset to delete and push the knob. Factory presets cannot be deleted.

Setting Input Levels

Adjust the appropriate Input Level under Setup/Inputs/… (whichever input: Analog, Digital or Stream applies).

Setting the level of the program source involves matching the dynamics of the incoming program audio to those of the 'gain-riding,' slow-AGC function. It's best to use program audio for this rather than tones. With moderately processed off-air feeds and contemporary music releases, program peaks should consistently reach –3dB on the front-panel LED meters. Heavily processed music may need to be backed-down so peaks don't go above –6dB. Material with a wide dynamic range may occasionally reach 0dB. For a definitive measurement, go to Setup/Processor/Meters and check AGC meter action. The aim is to keep this meter hovering right around 0dB (center-scale) most of the time.

AGC

AGC is a slow, wideband 'gain-riding' function that presents subsequent processing stages with a uniform level based on both the peak and the average content of the audio program. AGC is 'gated' to prevent 'gain runaway' during silent periods.

The front-panel AGC indicator lights when the gate is open. The AGC designation below the OLED and Web interface meters is at normal brightness under this condition. The LED goes off and AGC grays-out during pauses in the program.

AGC is 'windowed' as well. This means that when AGC gain drifts outside its ±5dB 'sweet spot,' accelerated 'makeup gain' brings it back inside more quickly.

AGC is enabled ⊠ AGC by default, but may be turned off for classical or jazz music to preserve *pianissimo* passages.

Leveling

The AGC feeds a 2:1 compressor that has 'syllabic' response (like a 'VU' meter) to program dynamics. It gives gentle, unobtrusive dynamic range compression that actually makes very little difference in program loudness. Leveling decreases the overall long-term dynamic range of music programming without 'pumping,' and can normalize dialog among several speakers in a roundtable discussion. Think of leveling as a fast, ungated AGC.

With Leveling Drive turned all the way down to 0dB, this stage is essentially out of the circuit and seldom gives any meter action. Increased Leveling will 'collapse' fades at the end of songs, and extraneous noise in the studio may be more noticeable in the background during pauses in speech.

Equalization

The NOVIA 272 has a four-section parametric equalizer that can offer quite a lot of control over 'sonic signature.'

Parametric EQ is not as well-known in the broadcast environment as it is in the recording studio. This type of EQ affords variable gain or loss at a selected frequency, not unlike a single section of the more common graphic equalizer. Not only are frequency and gain adjustable here, but the 'Q' (bandwidth) at the selected frequency may also be varied. Lower 'Q' (wider bandwidth) values are most useful for program equalization. Sharp peaks or nulls are usually reserved for fixing dedicated-channel problems, ahead of the final mix, with specific instruments, voices or room resonances.

To illustrate the overall effect of the 4-section equalizer 'bank,' the frequency and gain of each section are graphically presented on the front-panel and Web interface menu screens, and the overall, combined effect of the four sections is plotted as a graph.

Each section is programmed independently for frequency, 'Q' and gain. The illustration at the top of the next page shows this from front-panel and Web interface perspectives. The ubiquitous bass boost is centered at 30Hz with a low 'Q' of 0.4. The next EQ point reduces 'tubbiness' at 300Hz by a couple of dB. A bit of a 'presence lift' at 1.5kHz aids speech articulation, and a few dB of 'sparkle' at the tippy-top rounds out this profile.
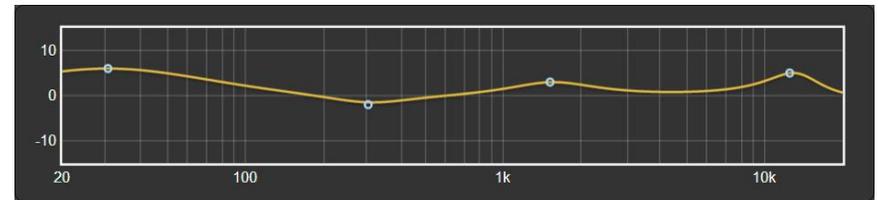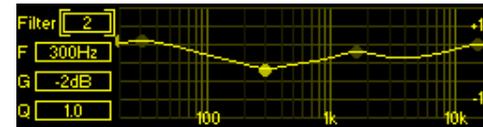
If you are not familiar with parametric EQ, do spend some time listening to various samples of representative program material as you put the EQ bank through its paces. Unlike the more intuitive graphic equalizer, a parametric takes some getting used to.

Multiband Processing

The multiband processing section of the NOVIA 272 provides both r.m.s. compression and peak limiting in three frequency bands. Some multiband setup controls spill-over from the Multiband header into Limiting to keep each menu from getting too cluttered.

Crossovers

Crossovers are the frequencies that divide the audio spectrum into the three processing bands. Filter skirts are second-order functions offering subtle differences from one selection to the next. 'Bass' frequencies are generally considered those below 100Hz, so choose the low crossover to best fit your programming. A high crossover of 2kHz complements the US 75-microsecond FM pre-emphasis characteristic. 3kHz matches the European 50μs curve, but may give a better-balanced midrange with 75μs pre-emphasis.

'Master' and Band Drives

Adjust 'master' Drive to the triband section under Limiting/Triband Drive & RMS/Peak. This also is where you'll find the RMS/Peak slider that establishes the ratio of r.m.s. to peak limiting in the three bands. r.m.s G/R (gain reduction) is shown by the solid or yellow portion of the LO/MID/HI G/R meters, and peak limiting by the floating segment or blue portion of the bar.

Drive and RMS/Peak will have greatest effect over how 'busy' the program sounds. Multiband processing action fills voids in the program spectrum. r.m.s. control (0 to –10) will give a smoother sound and peak-based control (0 to +10) a greater spectral density.

Under Multiband/Band Drive, independent sliders at the input to each band yield a certain degree of static equalization, plus an ability to normalize compression and limiting among the three bands.

Band Uncoupling

With most program material, the mid band contains the most energy and is thus considered the 'master' band of the multiband section. Band Uncoupling allows slaving the action of the low and high bands to that of the mid band. When fully coupled (0% Uncoupling), mid-band G/R will also reduce gain in the slaved bands, acting more like a single-band processor. The slaved bands will still be able to reduce gain beyond the midband G/R level as needed, but will not release to a value less than the G/R level established by the mid band. Advance Uncoupling to get a 'busier' multiband sound.

Bass Punch

This is a bass-enhancement feature that accentuates the initial impact of drums or the pluck of a bass guitar string. This is a dynamic function and will have no effect on sustained bass material. Bass Punch bypasses the multiband section, so its action will not be evident in multiband metering.

Limiting

In addition to the Triband Drive and RMS/Peak adjustments above, the Limiting submenu has a few more user controls found under Final Limiter.

WB Release

WB Release establishes a dual release function and will have the greatest effect over perceived loudness in the broadcast program.

The time-averaged value of final limiting establishes a release 'platform.' Program peaks quickly release to this plat-form, which itself then releases at a slower rate. WB Release sets the platform level with respect to peak gain reduction. The platform is the solid or yellow portion of WB metering; fast peak release is seen as the hovering segment or blue section of the display. A default value of '0' is a safe compromise between 'smooth' (–10) and 'loud' (+10). Your station programming and personal preference will dictate a proper setting for your purposes.

HF Limiting and Clipping

FM broadcasting is a transmission system that employs complementary pre-emphasis and de-emphasis, requiring an independent high-frequency limiter to avoid carrier over-modulation. The NOVIA 272 uses both HF limiting and distortion-cancelled HF clipping to meet this requirement.

HF Lim-Clip covers the range between full limiting (–10) to mostly-clipping (+10) with '0' as the default compromise. Full HF limiting can sound somewhat dull. But even with distortion-reduction techniques, HF clipping can put an 'edge' on vocals and other familiar sounds. Be sure to listen to a representative sample of your programming before settling on an adjustment here.

Composite Clipping

A modest increase in 'modulation efficiency' may be gained through judicious clipping of the composite multiplex waveform. This is of course performed before adding the 19kHz stereo pilot and any subcarriers to the baseband signal.

MPX Clipping is adjustable between 0dB and 3dB. Clipping on the order of 1dB is nearly always safe from a sonic and spectrum-clutter standpoint. The effect of composite clipping will not be heard in the headphone output.

Dayparting

NOTE: The daypart scheduler relies on at least an initial network connection to sync with Internet time, and with the proper time zone and other options selected. See the notes on timekeeping on Page 28.

As many as 20 'dayparts' (changes in a station's programming) may be scheduled by this built-in feature of the NOVIA 272. Audio processing presets may be called-up for

scheduled deviations in the station's format during the broadcast day. A station might deviate from jazz music to a big-band segment, for example, or from music to regularly scheduled talk programming or take a 5-minute satellite-delivered news feed on the hour.

From the Processor/Day-part menu, enter a processing Preset that you have selected for the scheduled programming segment. You may select one or more Days of the week that the segment will air, and the Hour and Min (minute) it begins, AM or PM. In this example, the station airs a religious roundtable discussion on Sunday at 11:00AM. A second daypart, to return to the station's music format, will have been set for noon.

Once a programmed daypart begins, it will continue indefinitely. This makes it important to set up your 'normal' processing as a daypart as well, programming the scheduler to switch back when the other daypart ends.

Processor Bypass

The ⊠ Bypass mode simply removes the entire audio processing function from the program signal path.

Test Oscillator

Engaging the Test Oscillator disconnects program audio from the input of the audio processing section and allows you to feed this point with a tone. Default is ⊙ Off, of course, but the oscillator tone may be fed to the left ⊙ L only or right ⊙ R only channels independently, or to both ⊙ L+R program channels.

The Frequency and the Level of the tone are both adjustable from this menu. A Level setting of −10dB is equivalent to a console 'zero-VU' level and will center the gain-riding AGC function. Depending on the processor setup, you may see little or no meter action with a tone, as subsequent stages respond primarily to program peaks.

Section IV

THE RDS ENCODER

Navigate to Setup/Outputs/Stereo Generator/RDS Encoder.

Subcarrier Injection

The RDS subcarrier is enabled, or not, in Input Sources under the Main Menu (see Page 9). Set RDS to None to disable the RDS subcarrier under Primary Source or Backup Source 1 or 2.

The RDS Injection submenu accesses the Injection slider, which sets the percentage injection of the RDS subcarrier with respect to total carrier modulation. The default value is 5%.

Static RDS Data Entry

RDS Data is a data-entry field for the 'Internal' fixed RDS messaging.

A PI hex value should always be entered. This is essentially the station's 'digital address,' used by some consumer radios to auto-tune to a station's translator(s).

Similarly, PTY identifies the station's format. Radios use this to search-out and tune-to a listener's program preferences.

PS, the Program Service Name, can be either a static, 8-character station ID: LIVE 105, or a slogan or promo up to 128 characters (including spaces). Messages exceeding 8 characters will automatically parse and scroll across the faceplate of any RDS receiver: BOSS-FM, ON THE AIR EVERYWHERE.

The same applies to RT, or Radio Text, which is a 64-character scrolling message that can be read on some radios. This usually lists the station's Website and phone number, or promotes an upcoming event.

Housekeeping 'flags' include M/S, identifying the program as Music or Speech, TP (discussed next) and DI to denote Stereo or Mono programming.

TP and the TA Flag

A station that carries road condition and traffic congestion alerts as part of their scheduled programming can make use of a unique RDS function. It comes with caveats, however.

Identifying your station as a TP (Traffic Program) station entitles you to raise the TA (Traffic Alert) 'flag' as propriety demands. This action has the ability to re-tune certain (mostly top-end) car radios from whatever station they are receiving (or even when listening to a CD or MP3) to *your* station so that the listener can be apprised of vital traffic info. This is a feature of the RDS system that is easily abused, as you can always sneak in a program promo after your announcement of a bridge closure or whatever. Moreover, the TA flag stays 'up' as long as the GPI terminal on the rear panel of the NOVIA 272 remains activated (see Page 12), thus you can easily see why listeners could quickly become irate over improper use of this feature. PLEASE, if you are going to use this function, do so responsibly.
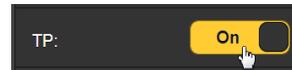
Options

RDS Options include RDS/RBDS selection. RDS is the world-wide standard; RBDS is used primarily in the Americas.

⊠ Send time group broadcasts the date and local time, using the Internet as a time standard and updating the clock on consumer radios.

Scrolling Speed

PS Scroll Speed sets the scrolling rate of a PS message consisting of more than the eight static characters that would be displayed on a consumer radio. A midway setting of 5 is usually safe, but scrolling the PS message too fast can display gibberish on some radios.

Alternative Frequencies

In the AF List, checkmark ✓ the frequency of any and all translators that rebroadcast the same programming as your main signal. Be sure to enter the frequency of your main

signal as well. Radios use this information for ensuring the best reception as a mobile listener encounters varying signal conditions.

Stream to RDS

Stream to RDS reformats the incoming Internet stream metadata to the outgoing RDS messaging protocol. In the Stream DPS example here, we have interspersed text entered into the boxes on the left with incoming stream metadata from categories in the boxes on the right. In this example, the RDS PS field will scroll:

The stream Name follows the first text block, the stream Genre follows the second. The third text block with None (no metadata) stands alone. You program Stream Radio Text in exactly the same manner.

The PS field can accept up to 128 characters/spaces; the NOVIA 272 'parses' this information to scroll across the radio faceplate. The RT field is limited to 64 characters/spaces.

Telnet

Telnet allows data incoming from the Web to update RDS PS and Radio Text fields 'on the fly.' Conceivably the station automation playout system could send dynamic data to the NOVIA 272 for scrolling artist and title.

Station automation connects using the IP and port address of the NOVIA 272. The default port is 10001. You must check the ⊠ Enable box under Telnet.

The incoming data syntax for scrolling PS requires a preamble of DPS= followed by artist and title and concluded with an Enter (CR) ASCII symbol. Here's an example:

DPS=Staying Alive by the Bee Gees↵

The same goes for Radio Text, except the preamble is TEXT=. For example:

TEXT=BOSS-FM Plays your requests: 1-800-555-1212↵

To put the same information into both fields, the preamble is DPSTEXT= .

Section V

NETWORKING THE NOVIA 272

Section II stressed setup of the NOVIA 272 using front-panel 'knob and button' data entry. As soon as you have a network connection, feel free to 'graduate' to Web interface operation. Although the OLED Menu Tree will continue to be referenced here, the Web interface menu is nearly identical, quite intuitive, and much faster.

The Web Interface

The 'responsive' design of the NOVIA 272 Web interface provides an optimal viewing experience across a wide range of devices. A minimum of resizing, panning and scrolling is required between desktop computer monitors, tablets and mobile phones.

DHCP IP Assignment

With the rear-panel LAN PORT connected to your network, navigate from the Main Menu to Setup/Network/IP Settings. Here you may select: ◉ DHCP to have your router automatically assign an IP address to the NOVIA 272. A DHCP connection will populate the fields on the right-hand side of the screen automatically.

Manual IP Setup

For any of several reasons you may need to set the IP address of the NOVIA 272 manually. Select ◉ Static IP, and then bracket the various network options shown on the right to enter the proper decimal-delineated numbers. Use Backspace to make corrections and, when finished, Save the new entry. Consult a competent IT professional if you need help with this.

Assigning a Hostname

Setup/Network/Hostname lets you assign a unique name to a particular NOVIA 272 to identify it on the network. The factory-default name is NOVIA272. You might change this to differentiate one processor from another on a common network.

Use the knob to assign a new name and Save the name when finished. Although Hostnames must be entered in all-capital letters, you don't have to use all-caps when addressing the processor. Under the Windows® operating system, bring up the NOVIA 272 with a Web browser that's on the same network simply by typing the Hostname and a forward-slash into the browser address bar as shown here. Non-Windows browsers will require entering the entire IP address of the unit.
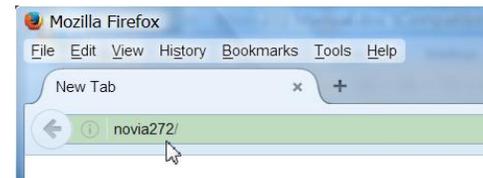
Remote Listening

Click the loudspeaker icon at the top of the screen to listen to the audio program through your browser. The 128 box to the left of the icon sets the audio monitor streaming rate. 128kbps is default, but you can drop this to 64kbps or even 32kbps if your network connection is very slow. The box marked Processor, a bit more to the left, selects the source you are actually listening to. The processor output is the default, but you can listen to the incoming 'raw' (unprocessed) program sources without changing or interrupting the on-air program.
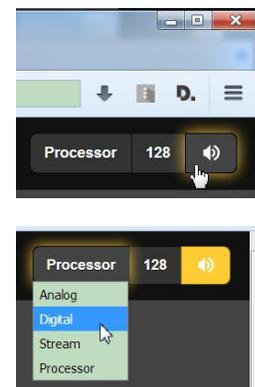

Remote Access

To address your NOVIA 272 from outside your LAN (from the Internet) the unit must have a static IP address. If your router makes DHCP assignments for other equipment on the network, simply assign the NOVIA 272 a static IP that is outside the router's DHCP range. Use the router's Help utility for this.

You also need to open a specific port on the network router. From the router's Port Forwarding utility, you will be able to enter your static IP address for the NOVIA 272, followed by a colon and a port number. The port number may be any number in the range indicated by the router. If your Internet Service Provider (ISP) assigns you a static IP address, then it is a simple matter to address the NOVIA 272 from anywhere. Just type the IP address and port number into your browser as shown here.

But if your ISP issues you a *dynamic* IP, which is most often the case, then you must utilize the services of an IP-forwarding provider.

Dynamic DNS

It would be impossible to address equipment behind a dynamic IP address if it were not for IP-forwarding providers available on the Internet. Their service, either free or at a very modest charge, allows the NOVIA 272 to keep that provider apprised of its reassigned IP address each time your ISP reassigns it. The IP-forwarding provider intercepts data attempting to connect with your unit and converts the IP address to the updated one.

There are three popular forwarding service providers. You may find that their basic forwarding service (all you really need) is free of charge, but advanced features may command a nominal annual fee. All services require registration on the appropriate Website.

From the Main Menu, navigate to Setup/Network/Dynamic DNS. Disabled is the default Mode: selection, but here you may choose among the three popular providers. Write down these provider names and do an Internet inquiry for each to learn more about their services and to register with whichever one seems best suited to your needs.
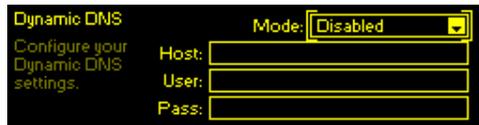
The DNS provider will issue you a Hostname, Username and Password. Enter these into each of the three fields. Your screen will look similar to this example when finished.
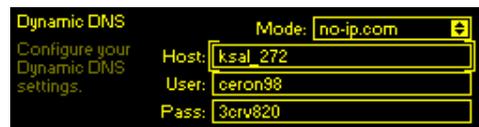
Timekeeping

The internal daypart scheduler and time stamps for alarm notification and logging require setting the built-in real time clock (RTC) to an Internet time standard.

Under the Setup/Network/Time/Time Zone & DST, use the Time Zone slider to select your local zone with respect to UTC. If you have already established an Internet connection, today's date and the local time will appear at the bottom of the screen. ⊠ Auto DST is the default setting for Daylight Saving time. Force DST by checking the ⊠ DST box, or uncheck both boxes to ignore DST completely.

An accurate, default Internet Time Server has been pre-programmed into the NOVIA 272 at the factory. You may change this if there is a reason to do so.

SNMP

SNMP (Simple Network Management Protocol) allows other TCP/UDP/IP equipment on the same Local Area Network (LAN) to communicate directly with the NOVIA 272, and for the unit itself to initiate an alarm to other equipment on the network. Setup instructions here are abbreviated; please consult other literature for an explanation of SNMP terms and protocols.

Under Setup/Network/SNMP/Mode & Communities, the default Mode: setting is Disabled. Reset this to Read Only to allow the NOVIA 272 to be interrogated by the SNMP Manager, or set Mode: to Read & Write so that the SNMP Manager can send commands to the NOVIA 272.

Communities are actually passwords for security purposes. SNMP Ports have typical settings that may be changed as required. 'Traps' are SNMP alarms initiated by the NOVIA 272. Enter the local network IP addresses of associated SNMP equipment under Trap Destinations so that they can receive alarms.

A MIB file is a small text file required by the SNMP Manager. Using the Web interface SNMP menu, click: Download MIB to save this file in the usual Windows way. The MIB file is in plain text with a .mib extention that may be read with Windows Notepad.

Network Status

Setup/Network/Status brings up a screen that gives full particulars of the network connection. This screen is useful for troubleshooting or for verifying connection parameters.

Alarm Notifications

The audio-loss alarm setup description begins on Page 10. Page 12 details rear-panel alarm 'tallies.'

You must first program the NOVIA 272 to send mail under the Setup/Email Preferences menu. You need to set up an actual SMTP email account, following guidelines set by the mail provider you choose.

NOTE: As of initial product release, some email servers may not support SMTP mail dispatch from the NOVIA 272. This situation is in a state of flux at present. The TLS1.2 standard is supported, STARTTLS is not. A simple and free Gmail account would be a good choice if your in-house mail system fails to send mail due to this issue.

Under SMTP Server, enter the provided outgoing mail SMTP Server info (e.g. smtp.gmail.com), the specified Port: number and whether or not to ⊠ Use SSL.

Under Sender, From: is the 'friendly' name that will identify the NOVIA 272 to the email or SMS/text recipient. User: is the full email address of the unit, and Pass: is the password you've assigned to the account.

Next enter email recipients separately under the Setup/Email Preferences/Recipients menu. Use Recipients/Select: fields 1. through 10., entering up to ten separate email addresses.

Then from the Main Menu open Alarms & Notifications/Email Notifications. In the top box you can pull-up any recipient from the list you've created, and select ✓ which alarm or alarms sends an email alert to that person. From that same list you may also send that same person a complete log of all alarms. Scroll down and check ✓ your preference of a Daily, Weekly or Monthly Alarm Log.

Use the Send Test Email utility to ensure that the NOVIA 272 is set up to send mail properly to all recipients.

The Alarm Log

Under Setup/Alarm Log Settings you'll find a Status: notation of how close the log is to its maximum capacity, about 2000 events. Enter the Email When: box and set a number for an alert. A setting of 10% equates to about 200 log entries.

The Alarm Log continues to accumulate entries, but you may manually clear it at any time. Under Alarm Log Settings, go to Clear Log at the bottom of the screen. Bracket and select the box, and when prompted push the knob again to delete all alarm history. The NOVIA 272 Web interface provides means of downloading the alarm log for study and analysis if desired.

Backup: The Hardware Profile

The entire NOVIA 272 setup, which includes input source choices, levels, factory and user processing presets, alarm notification preferences and SNMP options… all may be saved to your computer as a small text file. A Hardware Profile is useful for restoring a previous processor setup or for 'cloning' a second unit for backup service.

On the Admin Webpage, click: Download Hardware Profile to save the profile to your system.

Your browser and version of Windows may ask whether to Open or Save the file. Click the Save button and the file will be saved to a Downloads folder, and from there may be moved to a convenient location. Other browsers may ask you directly to specify a 'Save as:' location. The file carries a default name of 272settings.ini.

Upload a Hardware Profile backup file to the NOVIA 272 by clicking Select Hardware Profile…. Navigate to the folder where you saved the file and double-click it. The filename, File: 272settings.ini, should replace Select Hardware Profile… on your screen. At that point, simply click Upload Hardware Profile.

NOTE: Uploading a Hardware Profile reboots the NOVIA 272. After the reboot, an information screen pops up to remind you of important operating procedures and to guide you through any rough spots that might have surfaced dur-

ing reboot. Restoring factory default settings is another option.

Firmware Updates

It's an easy matter to upload NOVIA 272 firmware updates to the unit when we issue them.

NOTE: Make sure that your Hardware Profile is up-to-date. A firmware update could affect some user settings.

Updates are distributed as small .bin files that may be downloaded to your computer Desktop or placed in any convenient folder. From the Firmware Update utility at the bottom of the Admin screen, click Select Firmware File… and then navigate to the downloaded file and double-click it. This will transfer the file name to the updater. Finally, click Update Firmware to complete the process.

(Blank Page)

INOVONICS WARRANTY

I TERMS OF SALE: Inovonics products are sold with an understanding of "full satisfaction"; that is, full credit or refund will be issued for products sold as new if returned to the point of purchase within 30 days following their receipt, provided that they are returned complete, and in "as received" condition.

II CONDITIONS OF WARRANTY: The following terms apply unless amended *in writing* by Inovonics, Inc.

A. Register the Warranty online at www.inovonicsbroadcast.com, within 10 days of delivery.

B. The Warranty applies only to products sold "as new." It is extended only to the original end-user and may not be transferred or assigned without prior written approval by Inovonics.

C. The Warranty does not apply to damage caused by misuse, abuse, accident or neglect. This Warranty is voided by unauthorized attempts at repair or modification, or if the serial identification tag has been removed or altered.

III TERMS OF WARRANTY: Inovonics, Inc. products are warranted to be free from defects in materials and workmanship.

A. Any discrepancies noted within THREE YEARS of the date of delivery will be repaired free of charge, or the equipment will be replaced with a new or remanufactured product at Inovonics' option.

B. Parts and labor for factory repair required after the three-year Warranty period will be billed at prevailing prices and rates.

IV RETURN OF GOODS FOR FACTORY REPAIR:

A. Equipment will not be accepted for Warranty or other repair without a Return Authorization (RA) number issued by Inovonics prior to its return. An RA number may be obtained by calling the factory. The number should be prominently marked on the outside of the shipping carton.

B. Equipment must be shipped prepaid to Inovonics. Shipping charges will be reimbursed for valid Warranty claims. Damage sustained as a result of improper packing for return to the factory is not covered under terms of the Warranty and may occasion additional charges.

Revised May, 2017
INOVONICS, INC.
☎ +(831) 458-0552

INOVONICS
BROADCAST

5805 Highway 9 • Felton, CA 95018 USA
Tel: (831) 458-0552 • Fax: (831) 458-0554
—— www.**inovonicsbroadcast**.com ——
Serving the broadcast industry since 1972