SOLIDYNE DIGITAL POWER

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HIBRIDOS TELEFONICOS

HL 203-VQ

HL 202

HL202

2, 4 & 6 lines

HL203 VQ

3 lines expansible up to 7 lines

User's manual

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About this manual

What's in the box?

- ✓ *1 Solidyne hybrids model HL202/203-VQ according to correspond..*
- ✓ *1 power cable*
- ✓ *2 supports "L" for rack montage.*
- ✓ *1 link cable (to link units)*
- ✓ *2 RJ-11 telephonic wires*
- ✓ *4 self-adhesive rubber pads*
- ✓ *1 Warranty certificate*
- ✓ *1 user manual*

Please check that all components are okay when you receive the packaging.

About the montage

Solidyne hybrids HL202/HL203-VQ are designed for installation in a standard rack of 19". Require one unit (1U) of vertical clearance. They can also be placed on a table, for which the supports are given for rubber to adhere to the base of the unit.

When mounting the equipment into a rack, always use flat head screws with washers flexible (plastic, rubber, etc.). Be sure to adjust the screws lower and then higher to prevent the weight of the unit to generate a lever arm on the upper corners.

ADVERTENCIAS

 **AC Voltage**	The unit cans wok with 110 or 220 VAC. A voltage switch on the rear panel selects the correspondent voltage. **ALWAYS CHECK THIS SELECTOR BEFORE PLUG IN.**

In order to reduce the risk of electrical shock, do not retire the covers of the cabinet. The internal pieces do not require maintenance of the user. Refer the technical maintenance to qualified personnel.

	El cable provisto con el equipo posee conexión a tierra. No lo reemplace ni use adaptadores. ASEGÚRESE DE CONTAR CON UNA TOMA A TIERRA CONFIABLE.
	The exclamation icon within a triangle that appears in this manual is intended to alert the user to the presence of important instructions on the operation and maintenance (servicing) of the equipment.
	The pencil icon that appears in this manual is to alert the user to the presence of notes, suggestions and examples about the operation.

1 OVERVIEW

The professional telephone hybrids Solidyne includes models HL202, a high quality hybrid that manages two phone lines and allows linking to expand its capacity up to 6 lines; and the HL203-VQ, which incorporates VQR signal processing and Bluetooth link.

Both models supports conferencing between the floor speaker and all phone lines, be they land-line or cell phones.

RJ11 connectors support landlines or cell phones connected by cable, via speaker phone. The detection is automatic.

HL203-VQ supports Bluetooth to pair a cell phone without needing special cables. The use of mobile phones for broadcasting was extended because they produce substantial savings in telephone communications, thanks to corporate plans and promotional rates.

VQR Solidyne technology (Voice Quality Restoration) allows reconstruct the high and low frequencies that are lost in the telephone transmission. The user can adjust the signal level restored from two independent knobs for bass and treble. In addition, VQR has a noise gate allows to obtain values of 70dBA SNR in a telephone transmission. This allows modern radios, aspiring to be digital quality transmission, can provide outdoor sound quality not detract local sound generated at the Studios.

The stylish design of the hybrid HL203-VQ, and its technological advances, makes it an excellent choice for radios that seek differentiated by its technology.

HL203-VQ may be associated with one or two units HL202 to increase the number of lines (5 and 7, respectively). HL-202 HL203-VQ are presented in rack-mount cabinets, 1 unit high.

Main features

HL-202

- **Expansible** to 4 or 6 lines. Up to three units can be linked to obtain a system with 4 or 6 telephonic lines (land line or cellular). All lines are enabled to be in conference.
- **100 % compatible with cell phones:** phone line inputs supports direct connection of cell phones. HL-202 automatically detects to the cell phone and switch the input from mode 2-paths (land lines) to 4-paths (cell phone).
- An **audio compressor** in reception equals the sound level for all lines, as well as originating on phone lines of high or low level.
- **Audio limiter:** The transmission channel to the remote speaker, has a band filter to eliminate frequencies below 250 Hz and above 2.500 Hz, to limit the return of signal. Also, a peak limiter at the filter output increase the perceived loudness at the other end of the line, freeing to the operator from the level controls of the on-air console.
- A **Priority System** reduces the level of the interviewed people (the caller) when the local journalist interrupts them.
- The **operation** is very **simple** and error free, despite its security's logical and automated control circuits.

- A **Recording Output** allows recording the conferences directly from the hybrid. This output is a mix of the audio coming from the phone lines and the hybrid's audio input (audio from studio console).
- **Hold lines cue:** An output brings the audio of all hold lines.

HL203-VQ features:

- **Wireless** link using Blue-tooth.
- VQR **signal processing** to improve the audio quality of the phone calls.
- **Expander-Gate** at the audio output; to reduce the background noise present in most telephonic communications, since the norms for telephony requires dynamic ranges of 40 to 50 dB; while FM broadcasting requires 70 dB.
- Reception VU-meter, needle-type with back light.

Bluetooth

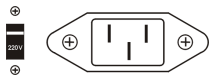
The MB-2400 supports audio transmission and reception using a cell phone linked to the console via Bluetooth. When the console transmits streaming; by landlines or mobile phone connected by "hands free" cable, Bluetooth link can establish a second telephone call that can be sent to the air (Channel 6 sends Bluetooth to program).

Bluetooth wireless technology allows to connect compatible devices without cables. A Bluetooth connection does not require that the devices be in line of sight, but the devices should be within 10 meters from each other (3 meters maximum recommended for safe operation). Connection can be subject to interference from obstructions such as walls or other electronic devices.

2 INSTALLING

2.1 Power source

The unit is connected directly to the AC outlet, using a standard 3-prong power plug (AC-0106 type) provided with the unit. At the rear panel, there is a 220/110 V switch, which must be manually settled to the correspondent position. The unit have an on/off switch.



CHECK THE **110/220 V** SWITCH BEFORE PLUG TO AC OUTLET.

2.2 Connecting land-lines

On **rear panel** (see Fig.1) there are two pairs of connectors **RJ-11** type (Line-1, Line-2), where the pone lines and their correspondent telephones sets are connected.

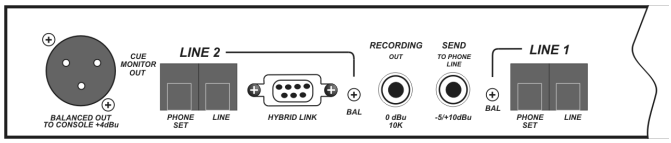


Fig.1 - HL-202, panel trasero, sección conectores

The telephone set operates normally while the phone lines aren't taken by the hybrid (position OFF). The lines can be connected directly to the public phone lines or the PBX of radio station. The private lines deteriorate hybrid rejection, therefore, we recommend connecting the console to public lines directly. The hybrid have internal filters for RF rejection effective in AM, FM and UHF bands. Usually you don't need to add additional filters.

HL202 and 203-VQ have protection against voltage overshoots with SIOV varistors; but still it is advised that the telephone lines have an outer shield connected to a good ground.

2.2.1 HYBRID BALANCE

Balance is adjusted when the local audio from Studios returns from hybrid too high, 'dirtying' the voice on-air. This non-desired effect is produced because some part of the signal sent to the telephone line returns through the hybrid circuit, mixing itself with the original signal.

The hybrid's balance adjusts in factory using standard impedances, but you must adjust it to the impedance of local line. Proceed as following.

- On rear panel, the unit has two rotating presets of 15 turns (BAL), one for each line.
- Using the correspondent telephone set, make a call to an external number (don't use extensions of private central)
- Use a microphone (connected to the console) to send audio to the pone line.
- Send the microphone signal to the hybrid (e.g.: using the SEND bus). If your console allows it, assign the output of hybrid and the headphones to an independent bus (AUD) to don't interrupt the on-air program while this adjustment. If console do not allows this, connect the headphones directly to the balanced output of the hybrid.
- Turns the BAL preset until reach the minimum level on headphones.

Proceed in the same way with the others lines.

2.3 CONNECTING CELL PHONES

2.3.1 Wired cell phones in HL 202 & HL 203-VQ

Both RJ-11 inputs supports cell phones. The cellular connects to the hybrid using the “free hands” connection that the cell phones have. For make this you need an special RJ-11 cable-adapter whose connection will depend on the brand and model of your cell phone. You will need to purchase the “free hands” accessory correspondent to your cell phone and to check the user manual of the unit to make the connection according to the following indications:

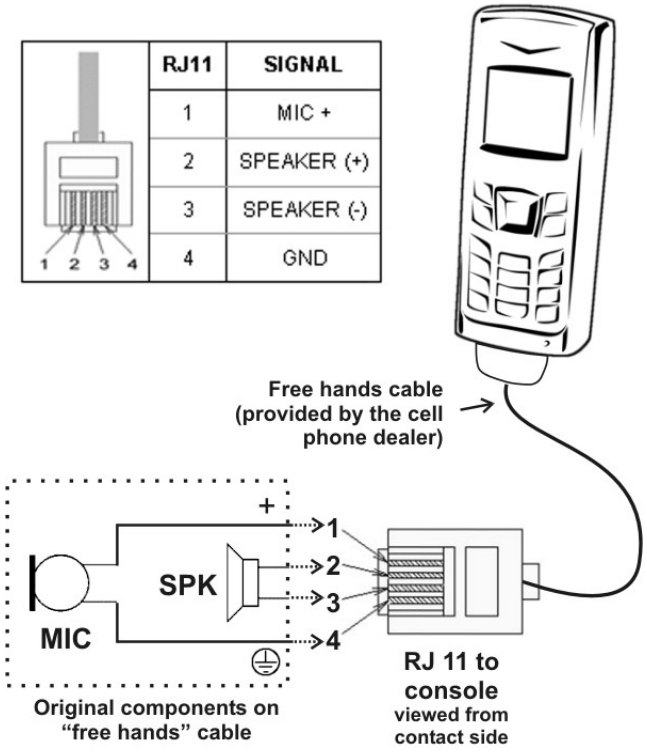


Fig. 2 – Cell phone connected via hands-free connector.

Cell phone connects directly to “LINE/CELLULAR” RJ11. The hybrid automatically detects the cell phone and changes the input mode from 2-paths to 4-paths.

The cell phone transmits through the “free hands” connector the audio signals: microphone and loudspeaker. The HL202/203 receives, via cell phone, the remote audio (that is to say, the audio of who is at the other end of the line). On the other hand, the hybrid sends to the cell phone the audio from the Studios (return signal). Usually the microphone and the loudspeaker

at the cell phone are disconnected when the phone operates in “free hands” mode.

2.3.2 **Bluetooth wireless link** (only models HL203-VQ)

HL203-VQ supports connection of a mobile phone via Bluetooth link. Any phone with Bluetooth can be linked to the HL203-VQ, eliminating dependence on the headset cable, which differs in each cell. Also allows the cell to be located up to 10 meters away from the hybrid. The Bluetooth wireless link provides better audio quality since the signal remains digital from the cell phone to the HL203-VQ.

2.3.2.1 Linking the cell phone with the hybrid

By linking cell phones to the hybrid creates a link between two devices, and allows the phone to remember the unique ID of the HL203-VQ. Do you need to make this only the first time that use the phone. Once the hybrid and the phone are linked, the hybrid automatically connects to these phone when you enables Bluetooth on both devices.

Procedure:

1. **HL203-VQ:** Enables discovery mode. With Bluetooth switched off (LED off) press and hold the button BLUET (5 seconds) until the LED flashes alternating between green

and red, indicating discovery mode. Being in this mode HL203-VQ can be found by the cell phone.

> To enable Bluetooth, press and hold the button BLUET by 2 seconds. Release the button just when LED lights. Led will flash in green slowly, indicating Bluetooth enabled. If you hold BLUET button more that 2 seconds (5 sec approx) Bluetooth changes to “discovery” mode (toggling green and red).

2. **At the cell phone**, search for Bluetooth devices. This procedure varies by brand and model cell, see the user's manual of the phone.
3. When the phone finds the HL203's device, shows the code “BTH-008” on screen. When the phone asks for the password, enter 0000 (default). See your phone's manual for details.
4. HL203's ID is now stored at the cell phone's memory. You don't need to repeat this procedure for this phone. In the front panel of the hybrid, the light will change to green flashing slow, indicating that Bluetooth is active.

> In some cell phones, it is necessary to "connect" the new device found to active it. In others, the new device is activated after being detected.
>
> If there were other systems operating in the Bluetooth studios, we commend turning off Bluetooth on the MB-2400, to repeat the search with the cell and write-down the existing devices. Then turn on Bluetooth in the HL203 and repeat the search. The displayed (BTH-008) will HL203.

2.3.2.2 Re-connections

To reconnect the cell phone before linked, activate the HL203's Bluetooth pressing by 2 seconds the button, and enables Bluetooth at the cell phone (if necessary, some cell phones disables Bluetooth device when turn it off). To make or receive a call, the audio is sent to the hybrid.

2.3.2.3 Adjusting the volume

At the cell phone, Bluetooth volume must be adjusted at maximum level in order to obtain a good reception and to sure the best signal to noise ratio.

This adjusting must be done with a real calling using Bluetooth. Usually, the volume of the phone's speaker is independent of the volume of Bluetooth device. If you change the phone's level without make a Bluetooth calling, you will only be changing the volume for the phone's speaker, not the Bluetooth level. To change the Bluetooth

level, make a call using the hybrid (or a hands free headset) and set the Bluetooth level to the maximum. This setting is stored at the cell phone's memory. If you use another cell phone with the hybrid, you needs to set the Bluetooth level again.

To turn off HL203's Bluetooth, press and hold the Bluetooth button until LED turn off.

2.4 AUDIO CONNECTIONS

2.4.1 Connecting to a console using send/return for external Hybrid

If the on-air console have **send and return** to connect an **external hybrid**, the connection is simple.

- *The output connects to HL-202/203 "Return from external hybrid" console (which is an input). Note that the output of the hybrid is balanced .*

> To connect this output to an unbalanced input, leave unconnected pin 3 (connect only: 1=gnd; 2=signal).

- *HL202/203 input connects to "Send to external hybrid".*

> This outpus is mix-minus , that is to say, is the PGM mix but without the hybrid signal (the input "Return from hybrid"). This avoid feedbacks loops. Note that the live show or studio consoles usually don't have mix-minus outputs. For this cases, see connections in "2.2.4 – Connection to studio consoles..."

2.4.2 Hybrid send & return in consoles Solidyne 2300 series

The 2300 series consoles with master Solidyne 2307 provide connection to send and return hybrid; through a stereo jack ¼" located on the rear panel. In this way the external hybrid is also managed from the hybrid's fader, avoiding having to use input channels for connection of the hybrid.

You can ask Solidyne on purchase of hybrid, the cable to connect to 2300 console. Or you can assemble yourself. The cable will have a stereo plug (TRS 1/4") that connects two shielded cables (shield and one conductor). One cable connects the tip to a mono plug (TS 1/4") and the other one connects the ring to a female XLR. The following table shows the connection.

"External hybrid" connector in consoles 2300 (TRS 1/4")	**HL-202 / 203**	
	Send to phone line (plug mono 1/4")	**Balanced output** (female XLR)
Tip	tip	-
Ring	-	pin 2
Sleeve (GND)	sleeve	pin 1 (pin 3 n/c)

I/O connection to an external hybrid in Solidyne 2300 consoles. Stereo plug brings two cables (Y-cable) (shield and conductor; Belden type). See Figure 5 in page 19.

> For Solidyne consoles of other models, and for consoles of others marks, check the user's manual for send and return conections to external hybrid.
>
> If the console do not have conection Si la consola no tiene conexión para envío/retorno de híbrido externo, el HL-202 deberá conectarse a un canal de línea, como se explica más adelante.

In the console 2300, external hybrid signal is sent to the hybrid control at Master module. See the manual for the operation console with external hybrid.

Remember that the three-line hybrid built on consoles Solidyne 2300, is kept working when you connect an external hybrid, able to work in conference with internal and external lines (console with serial # ending in "C")

2.4.3 Recording output

The recording output mix the incoming signal from telephone line and the hybrid's local audio ('Send to phone line' input). This enables the recording of conference including the Studios. The output level is fixed (0 dBu / 10Kohms).

2.4.4 Connection to consoles that have no external hybrid I/O *(studio and live show consoles)*

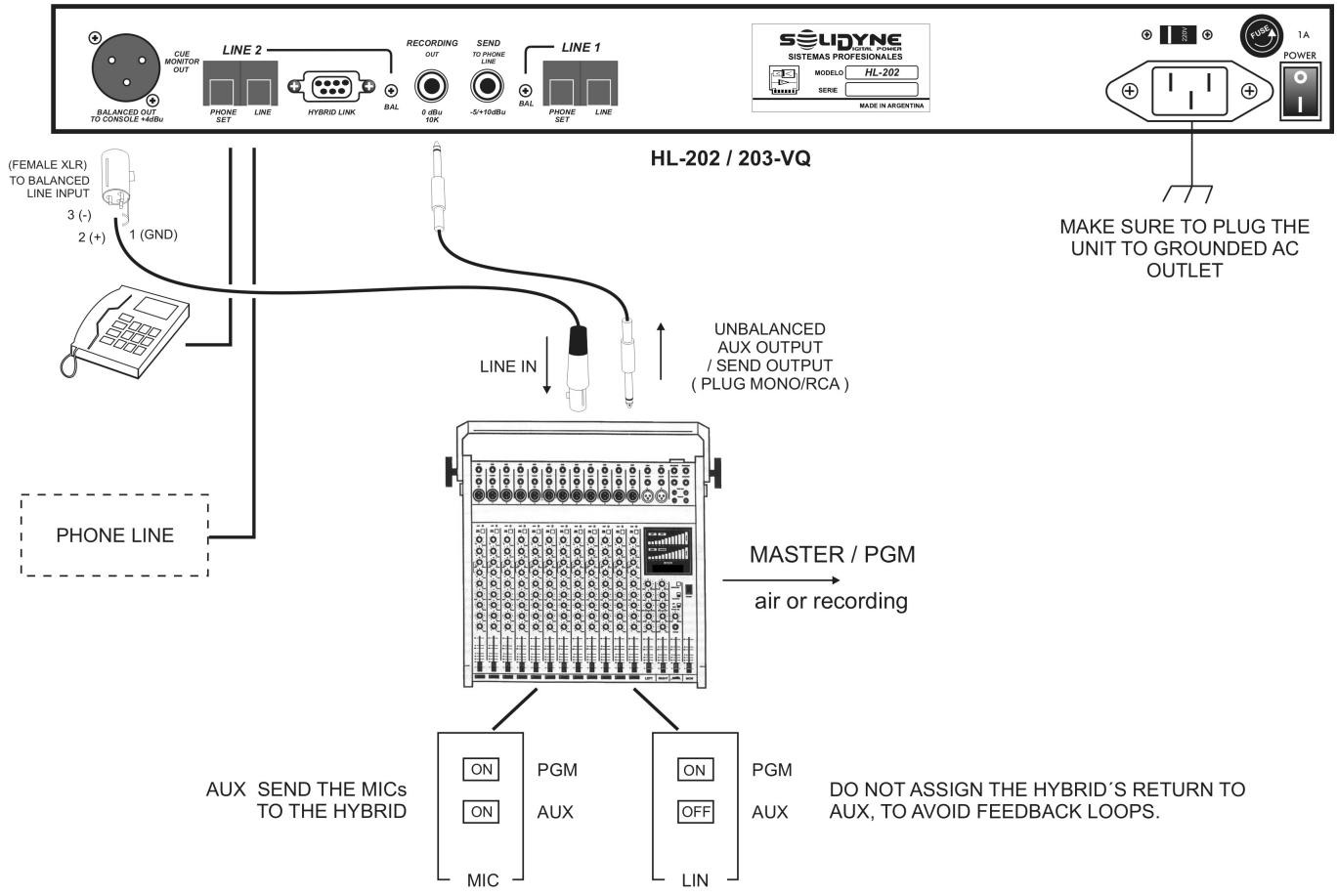
In consoles that have no connection to send and return for external hybrid, the hybrid will connect to a line channel. The output of HL202/203-VQ (Output to console) is balanced XLR. This output must be connected to a balanced line input on the console to send calls to air (PGM)

To connect this output to an unbalanced input, leave pin 3 unconnected (connect only 1=GND; 2=signal).

Send to phone-line is the **audio input** of the hybrid, which receives audio from console and sends it to the phone line. This input is connected to a secondary output of the console, unlike the program output (Aux, Rec, FX, etc.).

Logically, the channel through which the hybrid signal enters, do not be assigned to the mix that is sent to the hybrid (Aux, Rec, FX, etc.), because it will produce a feedback loop.

Never use the program out to send audio to the hybrid, because will cause a feedback loop when the hybrid's channel is sent to the air.



2.4.5 CUE output

This output present the audio signal of HOLD lines, in order to the journalist can notice to the operator when needed airing. This is the case of a sports transmission in which a reporter covering a secondary match, wants to report that there was a goal in that game. If the operator has that line Hold, the reporter has no way of giving notice, as the hybrid is in the air with the main relate, so communication can not be established by the Talkback circuit.

To resolve this situation HL-202/203 has a "MONITOR" output, which present audio from all HOLD lines. Thus the operator is continually listening the Hold lines.

The output "MONITOR" uses a 1/8” jack to connect to a small powered speaker, such as those used in computers, or an external monitoring input on the console (External (Audicom) CUE in Solidyne consoles).

In addition to the audio of the lines in Hold, is normal to hear an audio remnant of on-air lines.
When HL202 units are connected in cascade, CUE outputs remains independent. Each unit presents its CUE audio output, correspondent to lines connected to that hybrid. If you have only one monitor speaker for all lines, you can connect CUE outputs in parallel.

2.5 Expand the number of lines

The connector HYBRID LINK allows to link up to three HL202/203 units to expand the number of lines. The possibilities are:

2 x HL202	4 lines
3 x HL202	6 lines
HL203VQ + HL202	5 lines (one Bluetooth) with VQR audio processing.
HL203VQ + 2 HL202	7 lines (one Bluetooth) with VQR audio processing.

Figure 4 (next page) shows the connection cable for two and three units, using male **DB-9** at both ends.
Figure 5 (page19) shows the connection of **2 HL-202** units. Audio connections can be made over any unit. Both units presents simultaneously the audio signal at XLR connector; and both receives audio frem console, no matter to witch unit the signal enters (Send to phone line). Therefore we recommend to **connect the audio to the same unit**. When connects a HL203 and HL202, audio connections are made over HL203.

You can make conferences between any lines, or between all lines (land lines and cell phones).

CUE outputs are independent in each hybrid. Each CUE output gives audio of the lines plugged to this unit.

All units can be connected to the AC outlet.

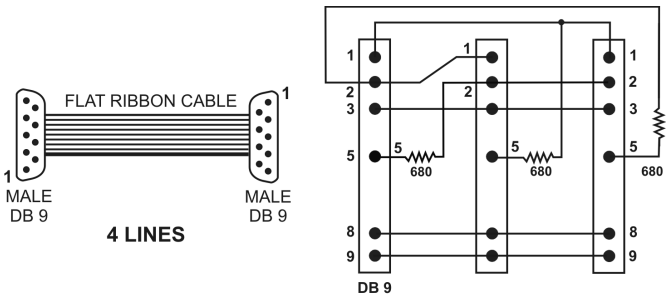


Figura 4 (cable link)

The cable for link two hybrids is included from factory.

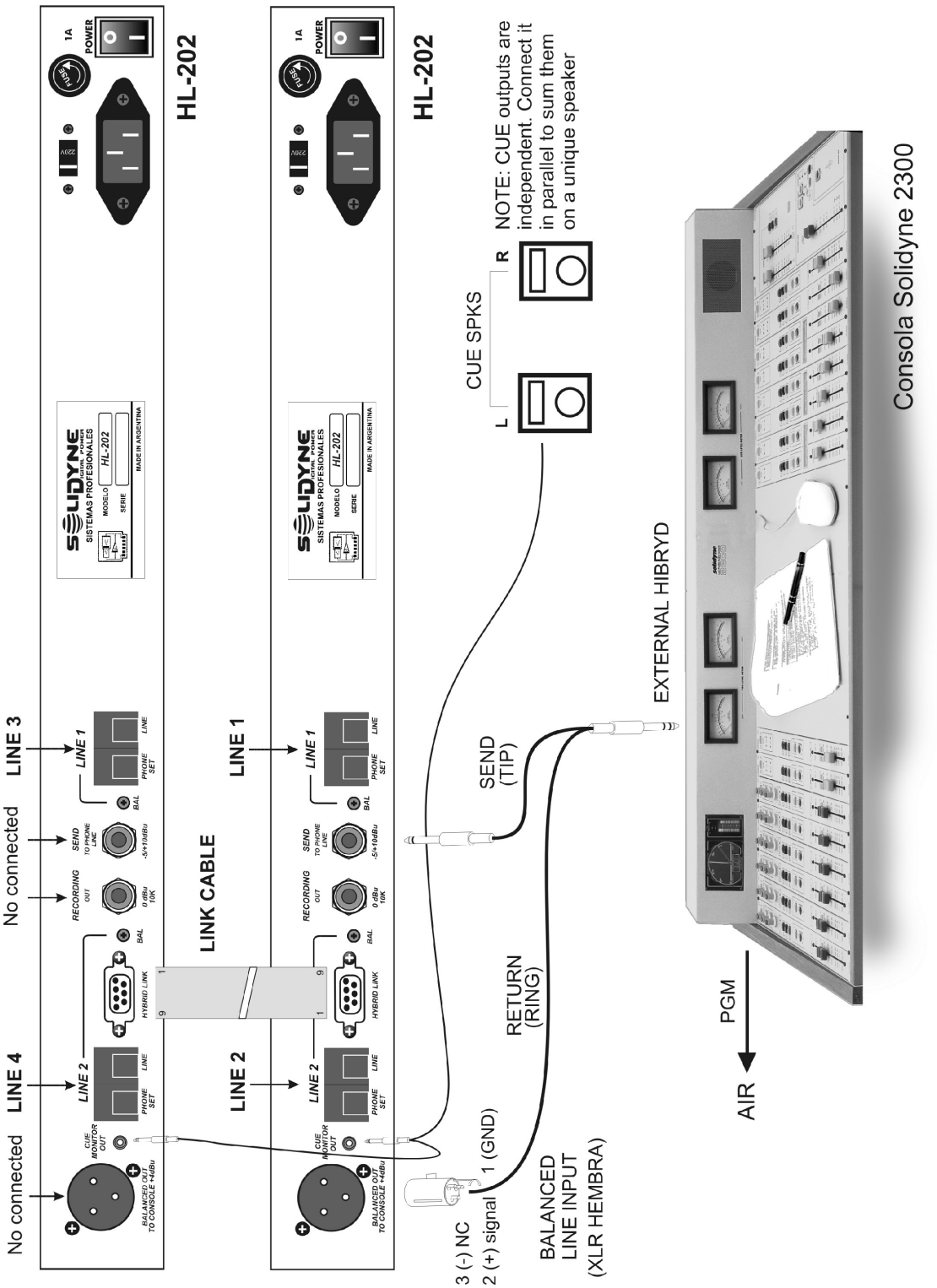
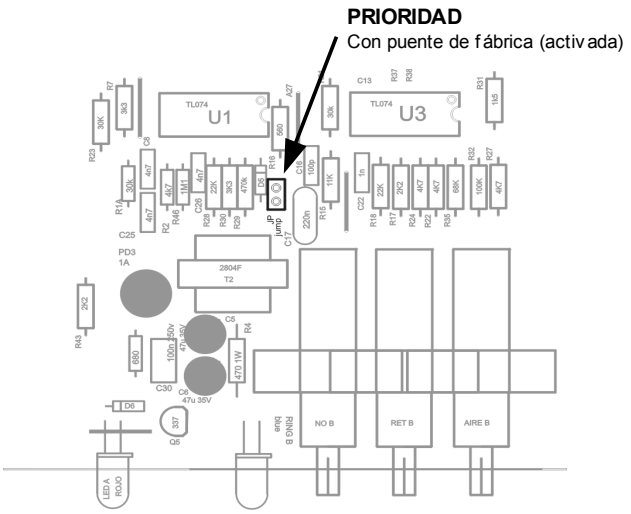


Fig.5 – Connection diagram for 4 lines with a Solidyne 2300-XL on-air console

2.6 Priority system

The hybrid priority's system attenuates the audio incoming from the telephone line when the speaker speaks Studios. This is done for two reasons:

- To give priority to the speaker in a debate, when they talk to both at once, the speaker is on the caller.
- To improve the audio quality of the local voice, attenuating the signal fails to reject the hybrid (in no analog hybrid the rejection of sent signal is at all).



Be careful not to use background music at high level if the priority circuit is enabled, as the background music will cause the attenuation of the audio incoming from telephone line.

In conventional interviews and dialogues, the action of priority system is natural and **is not detected by the listener**. However, in some specific applications such as music competitions in which the listener must guess the song title, by priority attenuation can cause an undesirable effect by reducing the audio level of the phone line.

In these cases the priority can be disabled by removing an internal jumper. Remove the top cover of the hybrid and remove the jumper shown above. Once the priority is disabled, the level of the phone line is fixed.

3 OPERATION

3.1 Managing phone lines

A button system allows each phone line taken from the hybrid **(ON-AIR)** retained with on-air audio **(HOLD)** or transfer it to a telephone set **(OFF)**.

The call is generated from an associated phone. But it can be received with your partner or directly from the Hybrid, as a blue LED (ring) flashes indicating incoming call.

The HOLD function is used to, once made (or received) the call, take the phone line from the hybrid, allowing the caller to listen, while waiting, the on-air signal.

In order to air the call, press AIR and open the corresponding channel on the console.

The function OFF, disconnect the telephone line from hybrid and connecting to the phone set. When the operator does not use a telephone line, the switch must be OFF, so that the line was connected to the phone set.

To receive a call line will be OFF, so that the call rings on the phone.

If the phone is hung and you press OFF during a call, you will lose communication. To transfer the line is on the air to the phone, you must pick up it first and then press OFF.

In each line a LED indicates if the line is on hold (LED flashing) on the air (LED on) or assigned to the phone set (LED off).

3.2 Using Bluetooth (only HL203-VQ)

The Bluetooth stage start up by pressing and holding down BLUET until the LED glows green (2 sec. approx.). After releasing the button the green led flashes slowly. The cell phone must be switched on and less than 30 feet away.

Previously, HL203 should be linked to cell phone. This is done only once, as explained in "2.3.2 - Bluetooth connection.

To avoid interference from other systems is desirable that the distance between the cell and the HL203 is always minimum.

3.2.1 Receive a calling

While the cell phone is in Bluetooth mode, you can answer an incoming call from the hybrid with a short touch of the button BLUET (Bluetooth must be turned on, green light flashing slowly), or can answer directly from the cell phone, as explained below.

While receiving the call, Bluetooth generates a signal ring (a musical ring) that you hear in the CUE monitor speaker (CUE HOLD output). Ensure that ON-AIR button is not pressed (to avoid that it go on-air).

Usually the incoming call is not sent directly on the air, but you need to speak with the caller. The following describes how to work with Bluetooth phones in various situations.

a) Using a console Solidyne 2300 series

The consoles Solidyne 2300 series have private communication circuit that operates with any external hybrid connected to the console. When a calling incomes to the hybrid, even via a mobile connected via Bluetooth, the operator uses the talk-back microphone of the console, and the CUE speaker (or headphones) to talk to who's calling. The Hybrid ON-AIR fader must be in the CUE position. Then at the end the private conversation, the operator move the hybrid fader to the HOLD position to maintain signal retained with air return.

But when there is a call on the air and a second calling enters to the Bluetooth cell-phone, the talk-back circuit of 2300 console can not be used because it is disconnected when the first call is on the air (see manual Solidyne 2300). To answer and talk with the cell phone, while another line is on the air, proceed as detailed below. The same procedure applies to the use Bluetooth with conventional consoles.

b) Using consoles without external hybrid connection (or a Solidyne 2300 with a call on the air) There are two cases:

- When the console does not have a dedicated communication channel (talk-back microphone assigned to the hybrid) and the Bluetooth cell phone receives a call.
- When the talk-back channel is not available to have another call on the air (Solidyne 2300 with a call on the air).

When using land lines associated with a telephone set, lets you resume the call at any time to talk in private, even when other lines on the air.

The telephone set connects at rear panel, to the output labeled "Telephone Set".

While in the case of mobile phones connected via Bluetooth is not "associated phone set" connected to the line, can be operated similarly.

In order to operate comfortably is recommended to verify, when choosing a cell phone, which possessed the call option to switch between the Bluetooth device and phone. The following procedure may differ slightly between different brands of phones, so we advise to consult the manual.

Initial condition:

- Cell phone linked with HL203.
- Bluetooth enabled in HL203.

Procedure:

- When the phone rings, you can answer the call directly from the hybrid pressing 'Bluet', to put the call on hold (AIR button out) or send it directly to air (AIR button pressed).

  But if you wants to talk in private with the caller, you needs to return the call to the cell phone. In our example this is done taking the call with the phone, then accessing the *Options* menu and selecting the item like *"Use the phone"* Usually it's the first option in the main menu, then you just needs to press twice on button 'Menu' to have the call on the mobile.
- To transfer the calling to HL203, press "menu" in the cell phone (Option: → Use hands-free).

3.2.2 Calling on the air and calling in hold

The hybrid always send audio return to the cell phone, with independence of on-air button.

- When **on-air** button is released, you listen to who's calling through 'Hold cue' output, but not on the air (signal is not send to “Balanced Out”).
- When **on-air** is pressed, the cell phone audio is send to the console. In this condition, the calling is not listened at “Hold CUE”.

The function answer & ends a calling from BUETH button may not be abble with some cell phones.

Many phones implement "call back" from the Bluetooth device. In that case, pressing BLUET in the hybrid phone will contact the last number dialed. Check the phone manual.

3.2.3 End a call

You can ends the calling by pressing BLUET in the hybrid; or from the cell phone. Before you must quit the call from the air because when Bluetooth ends the calling, generates a "beep". If the hybrid is on the air, this “beep” is heard on the air.

3.2.4 Power off Bluetooth

Press and hold the BLUETH button until the LED flashing in red and stay off.

3.3 Output level

The unit has an output level control, acting on "Output to Console". This control allows to compensate the level for a communication that reaches very attenuated.

HL203-VQ model has a needle type VU meter, which shows the console output level. It is important to maintain the appropriate level to excite the VQR stage correctly. The optimum working level is 0 VU, with the needle in the red zone only during short peaks.

When operates with **Bluetooth**, rememmber to check that the **volume of cell phone be at maximum.**

3.3 VOICE QUALITY RESTORATION (VQR)

(only models HL203-VQ)

Solidyne **VQR** (Voice Quality Restoration) is a type of audio processing that allows improving the audio quality of a telephone communication. This technique bases on the reconstruction of the spectrum lost due the transmission.

As you know, the bandwidth transmitted through a telephone line reduces approximately to 300 Hz – 3.000 Hz, because this is the range of the human voice. Therefore, the components of low and high frequency, presents in the original signal, are lost in the transmission. These components, although are not important for the understanding of the words, ARE VERY IMPORTANT FOR THE AUDIO QUALITY, because they give “weightiness” and “presence” to the voice. System VQR really reconstructs the bass of the voice, reaching the frequencies of up to 50 Hertz, being able also reconstructing component of high frequency to recreate the highs that are of extreme importance to obtain the presence sensation.

In addition, stage VQR has a third control to improve to the dynamic range, obtaining values of up to 70 dBA in a telephone transmission.

This processing is applicable as much to calls by terrestrial lines, like a calls made through the mobile telephony. Although the reconstruction reaches to callings made using the internal microphones of the cellular or the fixed telephones, the best results are obtained using a portable audio console and dynamic microphones of good quality.

For details on VQR, you can consult the information available in the section “Technical Documentation” on our Web site.

3.6.1 Using the VQR

The VQR processing can be enabled or bypassed pressing the VQR button on the front panel.

The user adjusts the amount of processed signal using the knobs “Low band” and “Hi Band”. Both controls even have an ample rank of work, making possible the processing in telephone signals whose bandwidth is very restricted.

Low band

Manages the level of lows added to the original signal. With the fader closed there is no reconstruction for low frequencies.

The level of reconstruction, or amount of low frequencies that is possible to add to the signal, depends on the audio quality of the telephone line (all communications don’t transmit the same bandwidth) and the telephone or microphone used at the other end. Obviously, same results are not obtained using the small microphone of a cellular telephone or a microphone of good quality with a portable console. at least quality has the transmission (smaller bandwidth) smaller will be the action of VQR processing.

Make sure to listen to the processing in the main monitors of the control room, to avoid an excessive reinforcement of lows in the processed signal; that can take place if you are monitoring the communication using small headphones or loudspeakers of bad quality.

Hi band

It controls the level of high frequencies added to the original audio coming from the telephone line. With the fader closed the high processing deactivates.

The action of this control is much more critical that the Low Band, since an excess of highs processing will generate an “artificial” sound; and in extreme case “crashed high” sound can take place, that will be annoying to the listener.

On the other hand, consider that an A.M. radio can require more emphasis in high frequency than a FM; to obtain a well-known improvement on the air; therefore the control Hi Band has an ample rank of action.

The reconstruction level -or amount of highs added to the signal- depends on the quality of the transmission. This stage will be affected, mainly, if the line has much background noise.

REMEMBER

- The optimal level of work is obtained when the indicator MID BAND lights with the signal peaks. Lower audio levels can affect the behavior of the VQR processing.

NOISE Control (expander)

This control is used to reduce the background noise present in the phone line. It acts only during the silences in the conversation, attenuating the level of the signal to suppress the noise. This is quick action gate reason why its effect is imperceptible with normal levels of noise, not affecting the word.

The NOISE fader acts changing the threshold of the expander/gate. When background noise is under this threshold the expander/gate works attenuating the noise.

Closing the fader the expander/gate is turned off. When opening the fader increases the threshold, that is to say, the signal level below which the expander/gate goes off. The action of the expander/gate is showed in the display by the NOISE CONTROL indicator.

How use this control

Increase the threshold raising the NOISE fader until eliminating the background noise. An insufficient level will do that the noise remains, although reduced. An excessive level will cause that the audio appears “intermittent”.

Next some important tips to take in mind when use this control:

- If the background noise in the communication is very high, will be always over the maximum threshold (fader at top) with which the expander/gate will not work correctly.
- Consider that the expander/gate releases whenever the audio signal is below the threshold. If the background noise is very variable in level (noise from a street, for example), it agrees not to use the NOISE CONTROL to avoid that during the pauses it activates and deactivates generating an intermittent background sound. In these cases it is preferred to leave the ambient noise.
- Also can happen that the background noise is very notorious (a strong humming or buzz) and although the gate can attenuate it during the pauses, the effect “appearance” and “disappearance” of the noise is more annoying than the own noise, due to a psychoacoustic phenomenon according to which the ear “is accustomed” to the floor of constant noise when concentrating the attention in the word.

According to these advice, the good criterion of the operator will determine when it will make use of the noise gate and in which cases it will prefer not to use it.

4 TECHNICAL SPECIFICATIONS

TECHNOLOGY	Active Hybrid with send and return gain, auto-adjusted by audio limiter and AGC. Balanced telephone lines floating with ground isolation by Nickel-Ferrite transformers. **VQR System** to improve the audio quality of telephone lines (HL203-VQ).
AGC OUTPUT LEVEL	Constant level to console, independent from line level due to the action of the internal AGC. A 15 dB phone level change causes less than 3 dB change at the Output Output level control on the front panel. Nominal level +4 dBu, variable between -60/+8 dBu **Priority:** The speaker at the Studios have priority over the caller, causing an attenuation fo 12 dB on the incoming call.
TELEPHONIC INPUTS	**HL202:** 2 lines in conference with croosed gain. The 2 inputs for land lines or wired cell phone, are isolated and floating with transformer. **HL203-VQ:** Adds a third line through a cell linked by Bluetooth to avoid physical connections and allow up to 10 meters away. The cell phone can be operated from HL203, receiving calls.
AUDIO SEND FILTERS	Band-Pass filters in send channel, limits response to 400 – 2.200 Hz to eliminate on-air sound coloration.
INPUT LEVEL	Audio limiter to operate with signals from -5 to + 8 dBu.
OUTPUT TO CONSOLE	Nominal + 4 dBm balanced 600 ohms or hi Z Adjustable level with needle Vumeter. Symetric output with XLR-3 connector.
SEND TO PHONE LINE	0 dBm +/- 1 dB, measured over 2 KM artificial phone line
FEQUENCY RESPONCE	250 - 3.400 Hz +/- 1 dB (VQR off) **VQR on (HL203)**: improve the spectrum between 50 – 12.000 Hz
GAIN	Adjustable until 30 dB
HARMONIC DISTORTION	Lower than 0,2 % at the console output at 1 kHz
NIVEL DE RUIDO	S/R better than 75 dBA, measured over 2 KM artificial phone line, with VQR. Better than 60 dBA without VQR
HYBRID REJECTION	Better than 40 dB @ send of +4dBu at 1 Khz. Measured over 2 KM artificial phone line.
BALANCE	15 wheels preset for each line.
OVERLOAD SAFETY	Protection against overshoots with varistors SIOV (Siemens). Resist discharge capacitor charged to 2,000 V in laboratory tests
LINES ISOLATION	Independents inputs, balanced and floating with transformer Isolation 250 V/CA
ALIMENTACION	220/115 V, 50/60 Hz with manual switch. 10 VA
DIMENSIONS	19" Rack mounting 1 U height