

HA 202/204

VERSION 06

Telephone hybrid

User's manual

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FEATURES

The Solidyne professional hybrid's includes the **HA-202** which can manage 2 phone lines, and the **HA-204** (up to 4 lines).

With HA-204 you can make conferences between a radio journalist and four telephone interviewed people. The five peoples can be in conference on the air.

Both models come assembled with metal cabinets with supports for rack montage (1U of height).

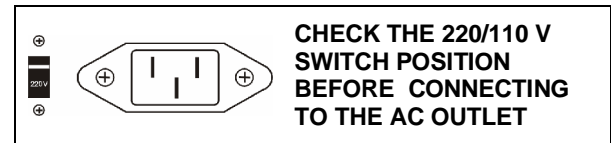
HA-202/204 hybrid's design differences of the conventional hybrids:

- An **audio compressor** in reception equals the sound level for all lines, as well as originating on phone lines of high or low level.
- The transmission level is controlled by an **audio limiter**, increasing the loudness perceived by the telephone interlocutor and freeing to the operator from the level controls of the audio 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 to record 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).
- All phone line inputs **support the direct connection of cell phones**, using an special cable Rj-11 to Plug TRS 3/32" connected to the "free hands" . The inputs automatically change its mode from 2-wires (standard lines) to 4-wires (cell phones).

INSTALLATION & CONECTIONS

POWER SUPPLY

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



On **rear panel** (see Fig.1) there are four pairs of connectors **RJ-11** type (Line-1, Line-2, Line-3, Line-4), where the pone lines and their associated telephones are connected.

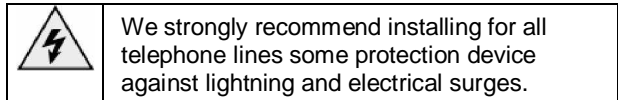
? | HA-202 only have two pairs of RJ-11 connectors (2 lines).

An associated telephone operates normally while the phone lines aren't taken by the hybrid (position OFF).

The hybrid inputs have internal filters for RF rejection effective in AM, FM and UHF bands. Usually you don't need to add additional filters.

CONNECTING THE TELEPHONE LINES & ASSOCIATED TELEPHONES

Phone lines protection



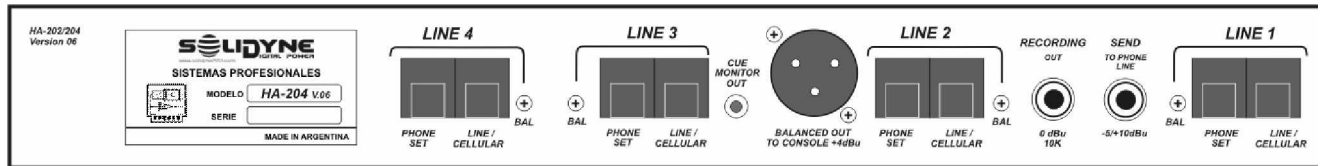
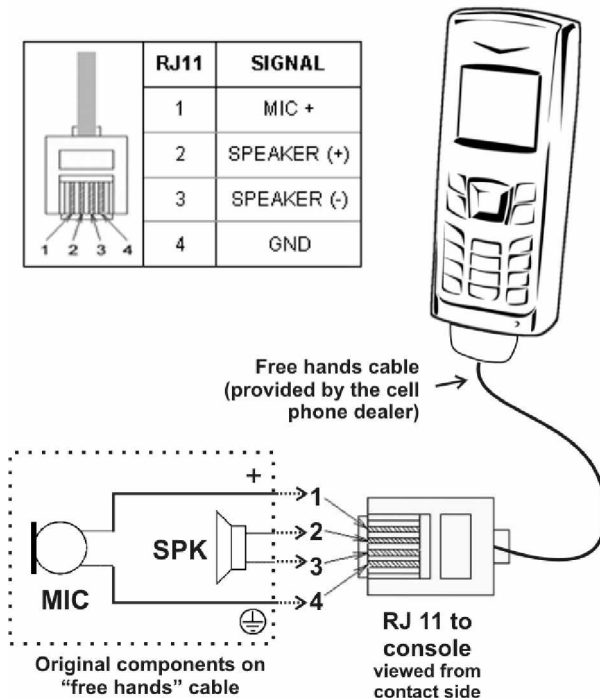


Fig.1 – Rear panel HA-204

CONNECTING CELL PHONES

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

The cellular connects to the hybrid using the “free hands” connection that the cell phones have. For make this you need a special cable RJ-11 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 cellular and to consult the documentation of the unit to make the connection according to the following indications:



Basically, which transmits the cell phone through the “free hands” connector is the audio signal of the cell telephone: microphone and loudspeaker. The HA-202/204 receives,

via cell phone, the remote audio (that is to say, the audio of who is at the other side of the line). On the other hand, the hybrid sends to the cell phone the audio from the studios of the radio (return signal).

Normally, the microphone and the loudspeaker of the cell phone are disconnected while “free hands” connector is used.

AUDIO CONECTIONS

Connection using send and return

If your console has send and return connections for external hybrids (as is the case of the Solidyne consoles) the connections are easy:

- “Output to console” from HA202/204 is connected to “Hybrid’s return” on the console (it’s an input). Take in mind that HA has a **balanced output**.

To connect “Output to console” to a unbalanced input, leave pin 3 unconnected (1=ground; 2=signal).

- The HA input connects to the console’s output “Hybrid’s send”.

? This output is a mix-minus mix, that is to say, gives the PGM mix without the hybrid’s signal (“hybrid’s return is not added).

This way you don’s need to use a channel on the console to send the hybrid on-the-air; since the hybrid’s signal generally is routed through dedicated controls (refers to the user’s manual of your console).

Send and Return connections on Solidyne consoles

If you have a Solidyne console with the original kit of cables (MNG2300), the Master’s cable has the connectors for hybrid’s send and return. In case that

you require to add these cables to the Masters DB25 connector, proceed as follows:

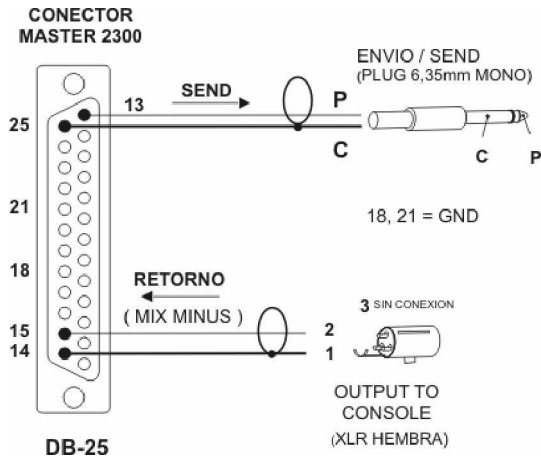


Fig.2 - Send and return connections for Solidyne consoles (series 2300) For details and pin-out descriptions, see the user's manual of the console.

? For other Solidyne consoles and of other marks, consult the user manual about the connection of external hybrid.
If the console has not dedicated send and return connections to external hybrid, the HA202/204 must be connected to a line channel, as is detailed soon.

The external hybrid will be routed to the Hybrid fader on the Master module. Pleaser refers to the user manual for the operation.

Remember that **the built-in two lines hybrid of the 2300 console is operative** at the same time that an external hybrid is connected.

CONNECTION AS RECORDING HYBRID ON THE AIR STUDY

The diagram of the **figure 3** shows how to connect the HA-202/204 to recording the calls without these leave to the air. In this way you can record a telephone interview while, for example, a musical program is on the air.

RECORDING output

The **recording out** send the audio of the telephone lines and the signal that incomes to the hybrid from the console ('Send to phone line' input), allowing recording the conferences including the studio's voice. The output level is fix at 0 dBu/10KOhms.

MONITOR output

This output gives the **audio from the hold lines**, so that the reporter can warn the operator in case that he requires to notify to the air.

Example: in a sport transmission a reporter covers a secondary match, and wants to give report that a goal in that encounter took place. If the operator has the line in "hold", the reporter does not have way to give warning.

For situations like that HA-202/204 provides the output "MONITOR", that gives the audio one of all lines in "hold" (simultaneously). In this way the operator always has audio of the lines in HOLD.

MONITOR output uses a Jack 1/8" which must be connected to a small powered loudspeaker, like the "multimedia" speakers used in computers. Or you can connect this output to an external monitoring input of the air console (see Audicom CUE in Solidyne consoles).

? In the previous example it is assumed that the hybrid is on the air with the main communication, therefore cannot contact to the caller using the monitoring circuit (Talk-back in consoles Solidyne 2300).

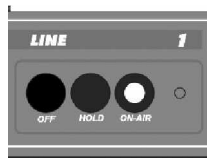
CONNECTION TO OTHER CONSOLES

For this case is assumed that, the console doesn't have send and return connection for external hybrid. The hybrid will be connected to a **line channel** on the console. The connections are showed in the **Fig. 4**

The '**Output to Console**' (balanced XLR, +4dBu) must be connected to a line input on the console, to send the calls on the air (PGM).

To connect "Output to console" to a unbalanced input, leave pin 3 unconnected (1=ground; 2=signal).

'**Send to phone line**' is the hybrid's input, and must be connected to a **secondary bus output** of the console (Aux, Send, Aud, etc.). Never send the program (PGM) output to the hybrid, since it will produce feedback loops when the hybrid is on-air.



BALANCE ADJUSTMENTS

Balance (a.k.a. reject factor) is adjusted when the voice from studio return's is too high, 'soiling' the voice on-air. This non-desired effect is produced because some part of the signal sent to the telephone line comes back through the hybrid's return, mixing itself with the original signal. Reject factor comes adjusted from factory, but if you need to improve it for adapt it to your line impedence, you will must to proceed as is indicated next. On rear panel, the unit has two rotating presets of 15 turns (BAL), one for each line.

- Using the associated telephone, make a call to an external number (don't use extensions of private central)
- Use a microphone to send audio to the pone line.
- Send the mike 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 the hybrid is connected using the console's send & return I/O, probably you must need to adjust the balance, sending a call on the air and listening how the speaker's voice is affected when the hybrid is on-air. Other alternative is: to make the call, send to the hybrid the speaker's voice and to make the listening using a headphone on hybrid's recording out, not being necessary, in this case, to put the hybrid on-air.

- Turns the BAL preset until reach the minimum level on headphones (or the better voice's clarity if you are listening direct and return signals simultaneously).

Proceed in the same way with the others lines.

OPERATION

HA-200 operation is very easy. All controls are located in the front panel:

The buttons allows you to transfer each line to the hybrid (**ON AIR**), hold with waiting signal (**HOLD**), or to transfer the line to the associated phone (**OFF**).

The call will be made using the associated telephone. Once the call is established, press the hybrid's **HOLD** button and then hang the phone. The function HOLD is used to retain a call hanging the phone. In this condition, the person interviewed listens, while is waiting, the on-air programming.

To put on-the-air a call, press the **ON-AIR** button. The audio of the phone line will be

routed to the "output to console" connector, in order to send the communication on-air.

The function **OFF** disconnects the line from the Hybrid, connecting it to the associated telephone.

When the operator does not use a telephone line, the selector will have to be in the position OFF, so the line is connected to the associated telephone. Obviously, if during a call this button is pressed and the telephone is hanged, the communication will lose.

In order to transfer an on-air or hold calling to the associated telephone, hang-up the telephone first and then press OFF.

A LED on each line will indicate the line status. When the line is hold, the LED blinks; when is on-air the LED stays on and when the line isn't used (is assigned to the associated telephone), the LED is off.

Output level

The HA202/204 has an output level control, which controls the "output to console" level. This control allows compensating the output level in case a communication comes with very low level, escaping from the compressor action. A 2-LEDs indicator shows the level of the output signal. The optimal output level is achieved when program peaks lights the red Led.

On the other hand, this control allows to adjust the level on the air when the unit is used with consoles whose hybrid's return doesn't have level controls.

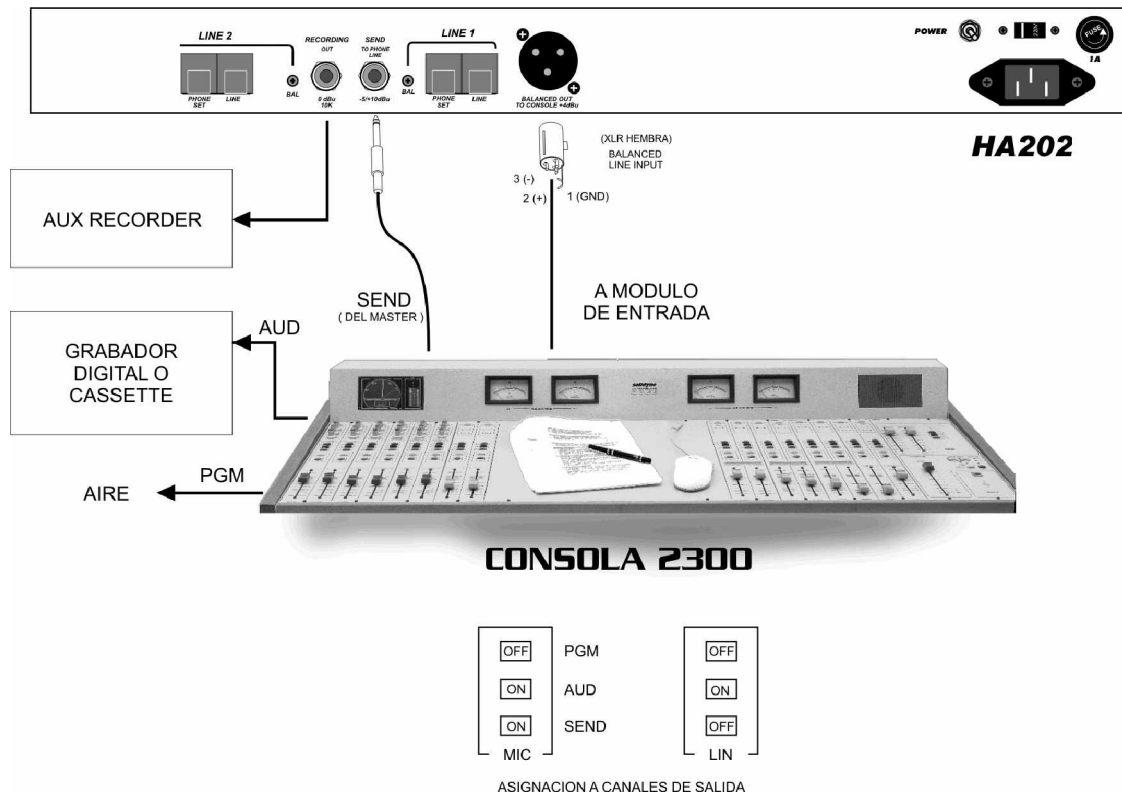


Fig.3 - Connection as Recording Hybrid on the Air Study

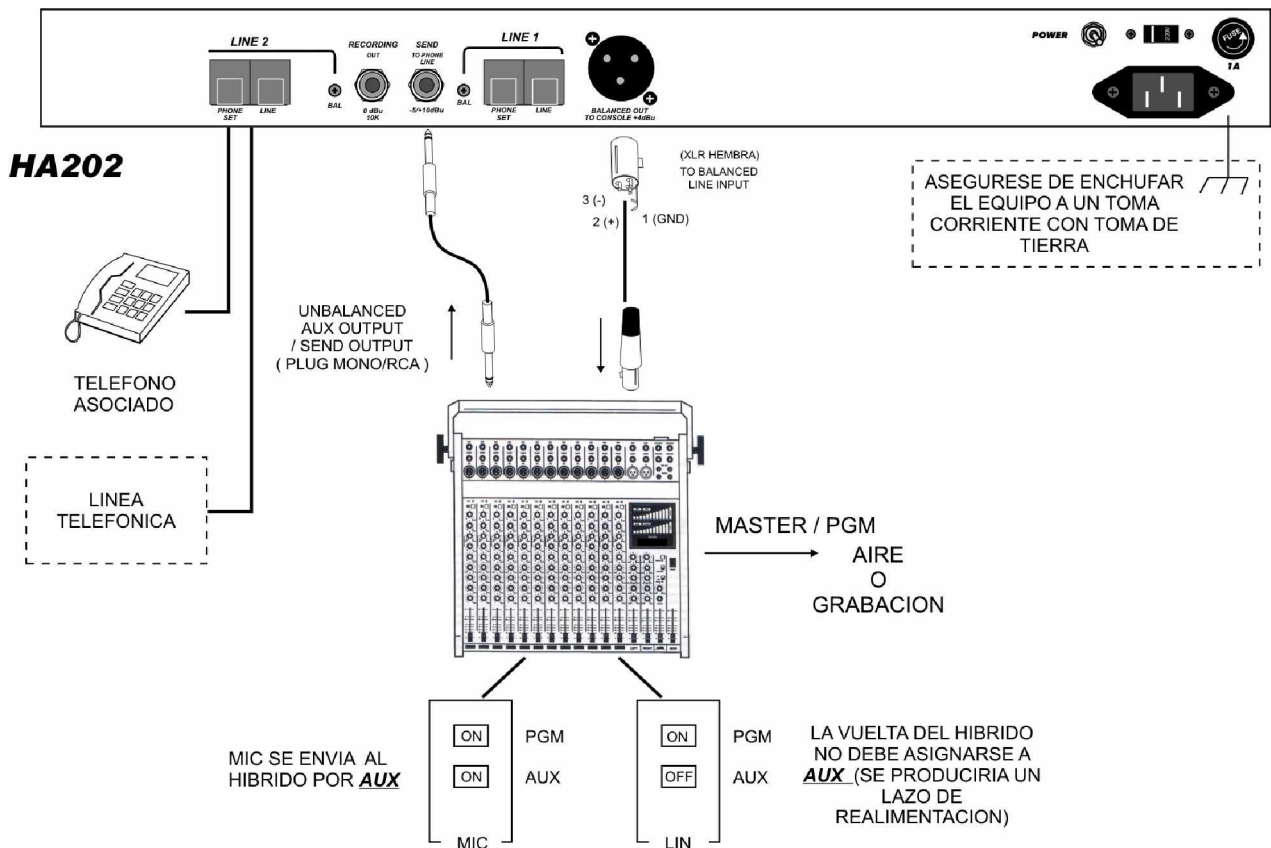


Fig.4 - Connection to consoles of others marks

TECHNICAL DATA

TECNOLOGY

Active hybrid, with automatic level for send and return, self-adjusted by audio limiter and AGC. Balanced telephone lines, floating isolated with niquel-ferrite transformers.

Up to 4 phone lines in conference (HA-204) with automatic controlled gain between lines.

AGC CONTROLL

Output to console with fixed level, independent from the telephone line. Controlled by AGC an audio limiter. A variation of level of 20 dB on the telephone line produces on the "output to console" a variation smaller than 3dB.

PRIORITY SYSTEM

The speaker has priority to interrupt to the interlocutor. When he talks, produces an attenuation of 15 dB on the incoming audio.

SEND CHANNEL FILTERS

Filters to limit the bandwidth on the send to TF (400/2200 Hz), to eliminate distortion due to the return.

INPUT LEVEL

The unit has an audio limiter to operate with input levels from -5dBu to +4dBu.

LEVEL OF SEND TO TELEPHONE LINE (TF)

- 5 dBm +/- 2 dB, measured over the telephone line
Output to console: balanced. Adjustable from the front panel +4/+8 dBu

HIBRID RESPONSE

300 - 3.000 Hz +/- 0.5 dB IMPEDANCE: 600 Ohms/ 10 K for Send and Return

GAIN

Self-adjusted between 12 and 30dB according to the level on the telephone line.

HARMONIC DISTORTION

Less than 0,2 % output to console @ 1 KHz

NOISE LEVEL

S/N bigger than 70 dBA, tested with artificial line of 2 Km

HIRBID REJECT

Bigger than 40 dB for a send level of +4dBu @ 1 KHz. Tested with artificial line of 2 Km

REJECT ADJUSTMENT

Preset (15 turns), independent for each line. It adjusts only when installs.

LINES ISOLATION

Independent, balanced and floating by transformer. Isolation: 250 V / CA

POWER SUPPLY

220 / 115 V, 50/60 Hz. 5 VA

DIMENTIONS

19" Rack montage / 1U