

# Univox checklist for troubleshooting loop installations

## 1. Procedure to verify function of Loop Driver

- a) Disconnect the loop amplifier from all connections except the power cord.
- b) Connect an **external** signal source like an MP3 player. Adjust and verify that the input level activates the input LED at program peaks.
- c) Turn the loop output level control to mid-setting.
- d) While looking at the loop output LED, briefly (<1sec) short-circuit the loop output (connector's outer two screws). If the loop output LED activates simultaneously, the amplifier's function is verified. On SLS amplifiers, repeat the procedure for both outputs.

## 2. Procedure to verify proper function of loop conductor(s)

- a) Verify that all loop conductors are isolated from any other loop conductors or safety ground with resistance measurements.
- b) Verify that the resistance in each loop conductor is in the region of 0.3-2 Ohm. Note that some resistance meters have a decreased resolution for low Ohm values.

## 3. Procedure to verify signal input function and loop sound quality

- a) Set loop output current to minimum setting. Connect a loop conductor (for SLS systems connect one loop at the time).
- b) Connect an **external** isolated signal source to the loop amplifier, like an mp3 player. Adjust and verify that the input level activates the input indicator (LED) at program peaks. Verify that your signal source's output level corresponds with the input connector's sensitivity setting to avoid risk of distortion/clipping.
- c) Adjust the loop output current level to approximately IEC standard (400mA/m for the highest peaks) by slowly adjusting the loop current control. If a field strength meter isn't available, adjust the output current until output LED activates.
- d) Verify the sound quality by a listen device or via the loop monitor on the amplifier. Verify that there is no severe distortion.
- e) Connect the **present** in house signal source. Adjust and verify that the input level activates the input LED at program peaks.
- f) Verify the sound quality by a listen device or via the loop monitor. Verify that there is no distortion. On any observed faults, the signal source connection should be verified. Basic input signal issues like hum and feedback (self-oscillation) is typically solved with ground isolators.
- g) For SLS-systems, repeat paragraphs c) to f) separately for both Master and Slave loops.
- h) Repeat the whole procedure separately for all other connected inputs. Leave already checked and verified sources connected.

#### 4. Procedure to verify self-oscillation (magnetic feedback) immunity

The input AGC will increase the gain when input signals are silent or muted. This could cause system feedback and increased noise after typically 30-60 seconds (this is especially true using microphones but also for electrical signal sources). Therefore it is vital to adjust the input sensitivity for program peaks, as an unnecessary high input sensitivity setting will increase feedback and noise risks. The actual commissioned installation with the used gain and output setting should be checked according to the following procedure.

- a) Keep all signal sources silent. Microphones should be activated, but with no acoustical input.
- b) Any feedback issues will activate the input or/and the loop output indicators within 30-60 seconds after the inputs are silent. This indicates a coupling between input signals and output loop wires which has to be investigated and corrected.
- c) The general recommendation is to avoid long and closely parallel cabling between input and loop wires. A properly balanced input connection and high line levels will reduce the risk of feedback considerably. This is particularly important for perimeter loops. Common example: electric guitars together with field strength overspill on the stage might cause a feedback issue. A SLS-system (a 2-layer balanced loop system with average total field strength close to zero and highly reduced overspill) reduces the feedback risk even further.
- d) Find the potential feedback threshold by slowly increasing the overall gain (input and output controls) until feedback starts. It is recommended to start with the output loop current and thereafter the input sensitivity. If the input level set is close to the feedback threshold, the technical staff responsible for the system should be advised.