Aerovalley Technologies

CRI-1

COMMERCIAL RADIO INTERFACE

INSTALLATION MANUAL

Issue 1: Revision 3

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Section 1 - Description and Specifications

1.1 Purpose of Equipment

The CRI-1 Commercial Radio Interface is specifically designed to allow the integration of commercial radio equipment into an aircraft audio system. The CRI-1 provides microphone bias, relay keying and sidetone generation. It also provides adjustable microphone and audio outputs that are isolated from airframe ground.

1.2 Features

- All microphone and audio inputs and outputs are transformer isolated – minimises earth loop induced noise. All have a 2kV breakdown voltage.
- May be operated in either a 14VDC or 28VDC electrical system.
- Dual keying relay contacts, (NO-NC-C), provide radio keying, microphone switching etc.
- Pins are allocated on the mating connector for external matching/attenuator network for specific microphone impedance matching requirements (refer to Installation Section).
- Pins allocated to add an external speaker load resistor.
- Accommodates a wide range of radio input levels and impedances.
- 600 and 150ohm outputs up to 0dbm are provided

Notes:
Noise or poor audio quality in the transmit signal of a commercial radio operating in an aircraft is generally due to three main sources:

1. Noise picked up by the microphone – can only be controlled by the quality of the noise cancelling microphone and careful setting of the microphone gain.
2. Ground/earth loop problems in the circuit between the microphone and the radio – when wired correctly the mike input circuitry of the CRI-1 is specifically designed to minimise these problems.
3. Incorrect impedance matching and overdriving the microphone input circuit of the radio – the interface adaptor output should preferably match the AC and DC impedance and output level of the microphone originally fitted to the radio, pins are allocated on the mating connector for external impedance matching / level setting resistors and are generally always required – the installation designer is responsible for the selection of these resistors and to ensure the radio input requirements are met.

1.3 Physical Specifications

Height: 30 mm	(1.18 inches)	
Depth:	71 mm	(2.79 inches)
Width:	115 mm	(4.53 inches)
Weight:	230 g	(0.5 lb)
Mounting:	Bulkhead attachment	

1.4 Environmental Specifications

Temperature:	-40 to +50 Degrees C (operating)
Altitude:	15,000 ft max.
Humidity:	95% non-condensing

1.5 Electrical Specifications

Voltage:	+14VDC or +28VDC (Pin selectable).
Current:	Max. 60mA.

1.6 Interface Specifications

Audio Output:

Level: 3 volts RMS into 50Ω.
Impedance: >50Ω.

Microphone Output:

Level: +8dbm (adjustable).
Impedance: 600Ω and 150Ω
Note: other impedances can be achieved using external resistor networks (Refer to installation section).
Frequency Range: 300Hz to 6kHz.

Section 2 – Installation

2.1 Equipment Required:

The following equipment is required, but not supplied with the CRI -1 Commercial Radio Interface.

Qty 1	Connector DB25S
Qty 25	Socket contact
Qty 1	Connector Hood DB25

2.2 Installation Considerations

2.2.1 Cooling

No direct cooling is required. As with any electronic equipment, overall reliability may be increased if the CRI-1 is installed away from any high heat sources.

2.2.2 Equipment Location

The CRI-1 must be mounted within the pressurised region of the aircraft. Consideration should be given to areas with minimal temperature fluctuations. The CRI-1 should not be installed near devices, such as inverters, which produce strong AC magnetic fields.

2.2.3 Routing of Cables

Care must be taken not to bundle the wiring from the CRI-1 with any wires containing high-energy or sources of electrical noise such as transmitter coax lines, AC power wiring and electric motors. Care must be taken to tie wiring harness clear of aircraft controls and cables.

2.2.4 Cable and Wiring

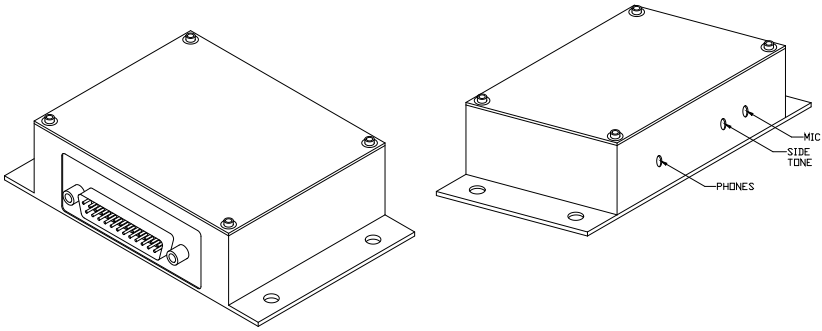
All audio wiring should be at least 24 AWG and power and ground wiring should be at least 22 AWG. The use of Tefzel M27500 (for shielded wiring) and Tefzel M22759/16 (for non-shielded wiring) is recommended, or as specified by OEM or design authority of the installation.

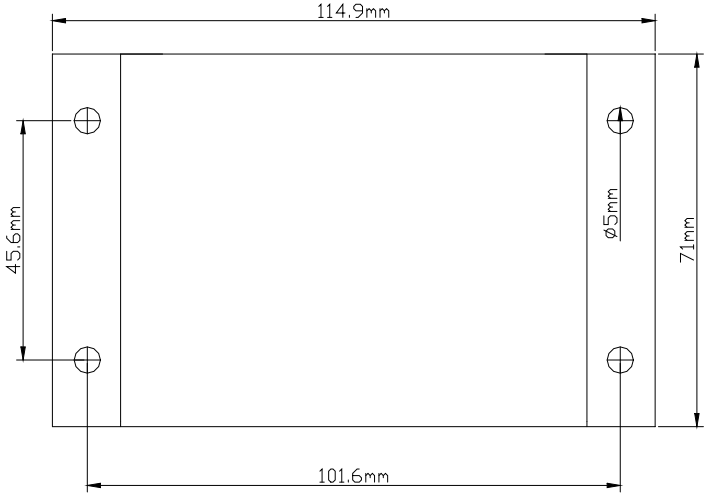
2.2.5 Interconnection

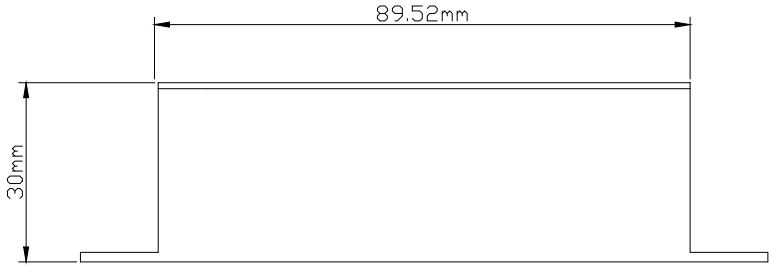
The CRI microphone low line must be grounded at the main audio selector panel or audio junction box for the microphone input / bias circuit to operate correctly.

Section 3 – Installation Procedures

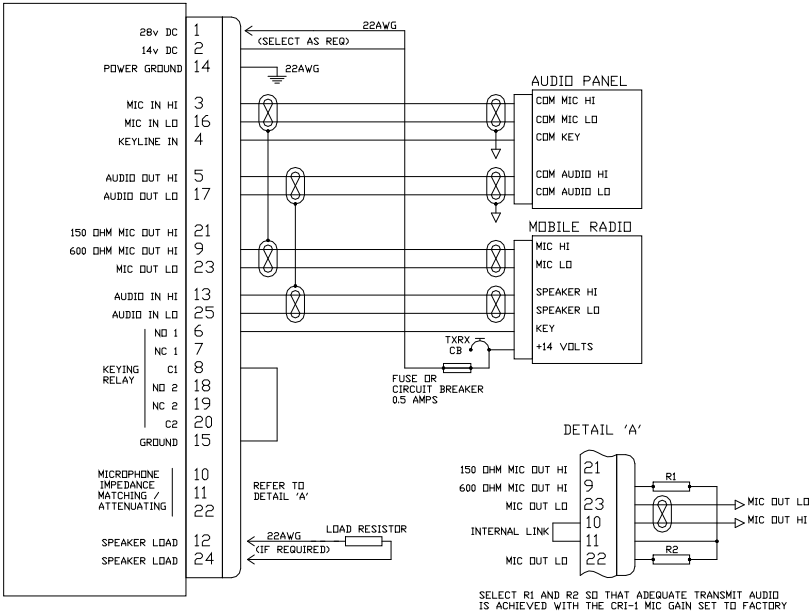
3.1 CRI-1 Outline Drawing



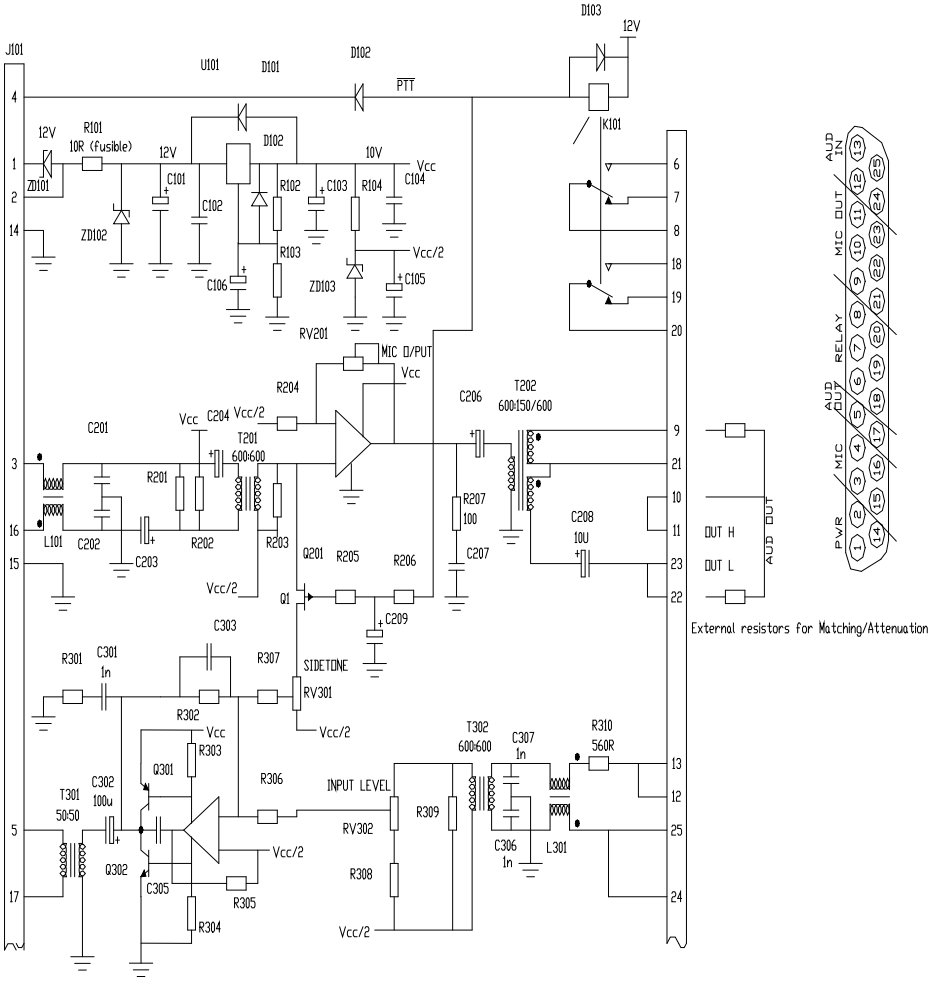




3.2 Interconnect Drawing



3.3 Internal Schematic



Note: This equipment has been assessed and approved for interfacing of commercial (non-operationally required) radio equipment to the aircrafts audio system.
Interfacing of standard aircraft (operational) radio systems is not approved.

The installer must establish compliance with the design rule specified in the certification basis of the aircraft and the installation requirements pertaining to the regulatory authority for the country of registration, for the aircraft.

Section 4 – Post Installation Checks

Prior to connecting the CRI-1 unit to the mating connector, ensure that there is power on either pin1 or pin 2 as applicable, and ground on Pin 14 on the aircraft connector. Ensure that there is continuity of less than 0.5 ohms between pin 14 and airframe ground.

Operate the Radio Transceiver interfaced to the CRI-1 and adjust Sidetone, Audio RX level and Microphone gain, as required to ensure satisfactory operation of the Radio Transceiver. After satisfactory operation place the dust cover/designator label over holes. Alternatively the Microphone gain may be matched externally, as shown in Detail 'A' above.

Section 5 - Certification Basis and Eligibility

The APMA-818550 CRI-1 Commercial Radio Interface unit was originally certified in conjunction with CASA STC ASA096SY.

Installation into other aircraft must comply with regulatory requirements of the country of registration, for the aircraft.

Section 6– Instructions for Continuing Airworthiness

There are no periodic continuing maintenance requirements for the model CRI-1 interface unit.

