Intercom and Radio Interface for Bose TriPort Tactical Noise Canceling Headset

20 July 2019
Updated 28 February 2021

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Preface

This project has the goal of providing a 2-person intercom, with interconnection to a VHF/UHF FM amateur radio transceiver, to be installed in a Ranger UTV. The intercom provides a driver isolate switch, enabling the passenger audio to be muted from appearing both at the intercom headphone output and at the transceiver microphone input. When the driver isolate switch is not in the isolate position, both the driver and passenger audio is routed to the transceiver microphone.

The intercom supports a single Bose TriPort Tactical Noise Cancelling Headset at the driver position, and a standard aviation headset at the passenger position. Both positions are provided an independent volume control.

Interface wiring to the Bose headset, aviation headset, and the transceiver is through adapter cabling that transforms signals on an 8-pin header to the connector interface required for the headsets and transceiver.

When a Bose TriPort Tactical Noise Cancelling Headset is not available, the intercom can be wired to support two aviation headsets.

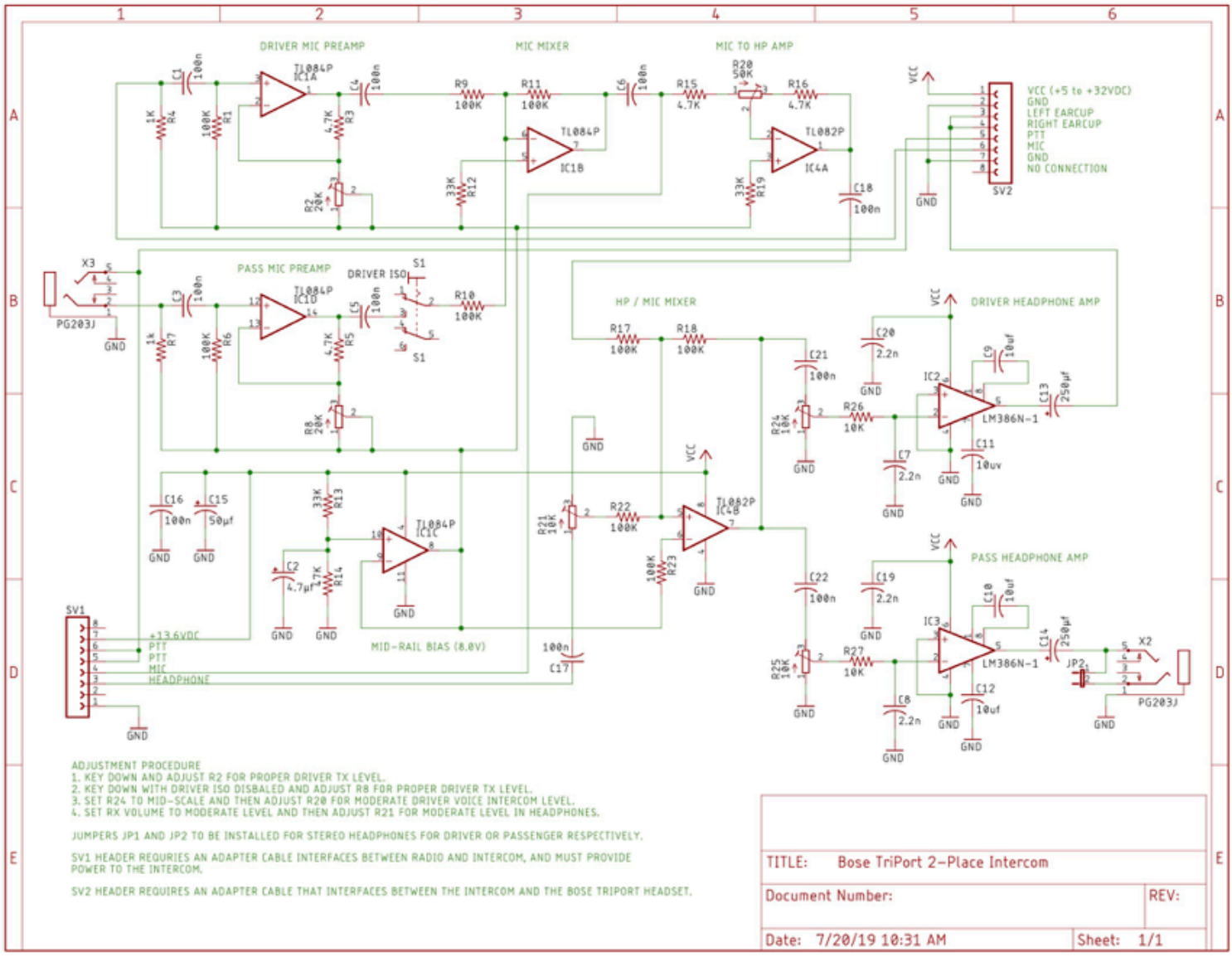
This article is provided as a courtesy. A single prototype was put into service in a UTV, with good results. No support is provided, and no guarantees are offered to those attempting to build this intercom. Caveat Emptor!

Bose TriPort Tactical Noise Cancelling Headset Internal Pin Assignments

The following table shows the pin-out of signals on the internal 8-pin connector within the headset interface box.

WIRE COLOR	DESCRIPTION	INTERNAL J1 CONNECTOR PIN NUMBER	AP-107 PIN NUMBER	8-PIN ROUND CONNECTOR PIN NUMBER
YELLOW	VCC (+5V TO +32V)	1		7
BLACK	GROUND	2		3
BLUE	LEFT HEADPHONE AUDIO	3		5
WHITE	RIGHT HEADPHONE AUDIO	4		
ORANGE	PTT	5		2
RED	MIC AUDIO	6		6
GREEN	MIC GROUND	7		4
NO-WIRE	N.C.	8		
SHIELD	GROUND LUG	N.A.		

Schematic


DRIVER MIC PREAMP
MIC MIXER
MIC TO HP AMP
PASS MIC PREAMP
DRIVER ISO
HP / MIC MIXER
DRIVER HEADPHONE AMP
PASS HEADPHONE AMP
MID-RAIL BIAS (8.0V)
VCC (+5 to +32VDC)
GND
LEFT EARCUP
RIGHT EARCUP
PTT
MIC
GND
NO CONNECTION
+13.6VDC
PTT
PTT
MIC
HEADPHONE
TL084P
TL082P
LM386N-1
PG203J
ADJUSTMENT PROCEDURE
1. KEY DOWN AND ADJUST R2 FOR PROPER DRIVER TX LEVEL.
2. KEY DOWN WITH DRIVER ISO DISBALED AND ADJUST R8 FOR PROPER DRIVER TX LEVEL.
3. SET R24 TO MID-SCALE AND THEN ADJUST R20 FOR MODERATE DRIVER VOICE INTERCOM LEVEL.
4. SET RX VOLUME TO MODERATE LEVEL AND THEN ADJUST R21 FOR MODERATE LEVEL IN HEADPHONES.
JUMPERS JP1 AND JP2 TO BE INSTALLED FOR STEREO HEADPHONES FOR DRIVER OR PASSENGER RESPECTIVELY.
SV1 HEADER REQURIES AN ADAPTER CABLE INTERFACES BETWEEN RADIO AND INTERCOM, AND MUST PROVIDE POWER TO THE INTERCOM.
SV2 HEADER REQUIRES AN ADAPTER CABLE THAT INTERFACES BETWEEN THE INTERCOM AND THE BOSE TRIPORT HEADSET.
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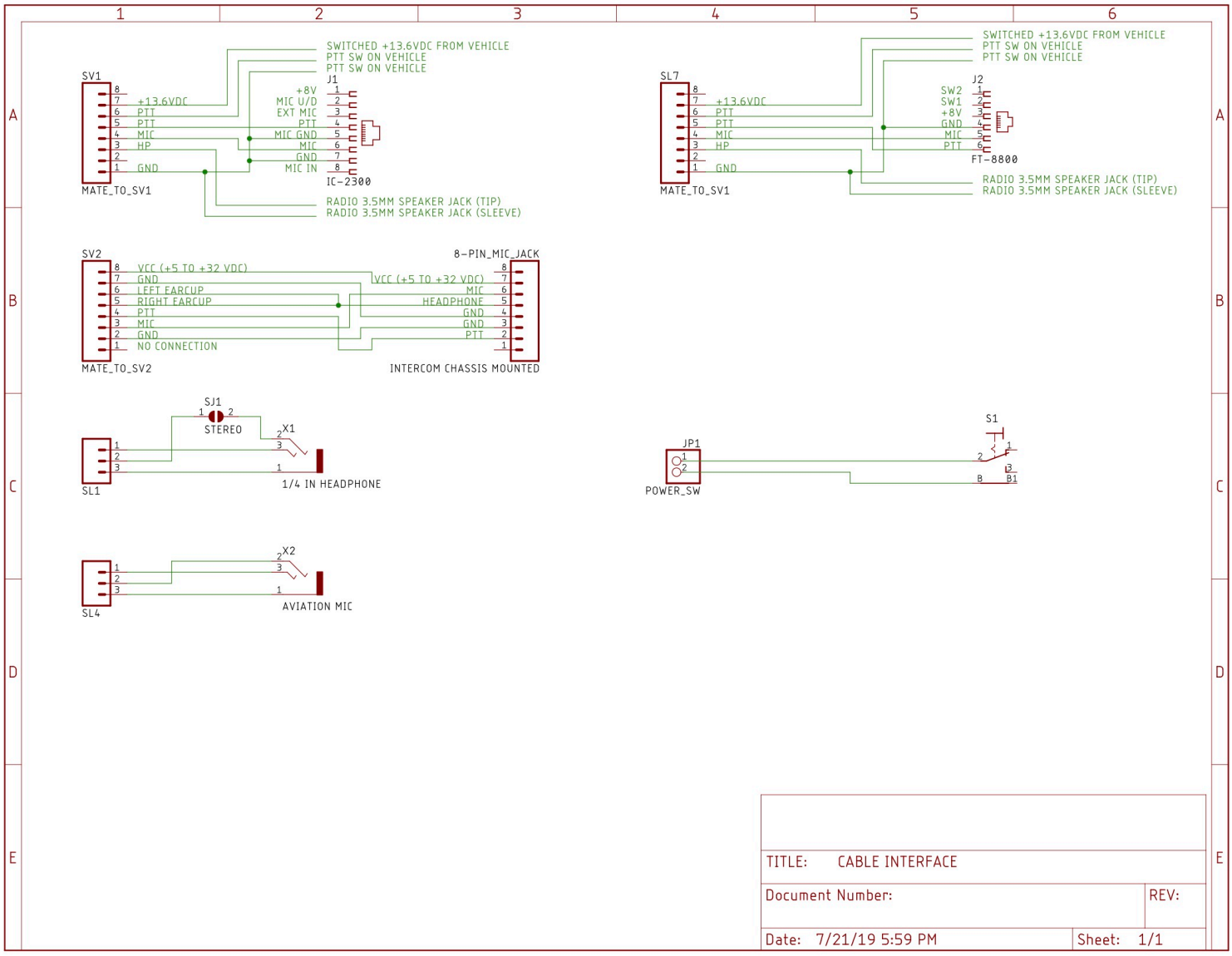
Cable Interfaces