

# External Sound for NAV using Voice Guide over Volvo speakers.

Where you have replaced RTI Display with NAV in Volvo.

(RTI CD Early model)

(Second Edition)

We will in this document show how you can use original Volvo sound system for the sound from the new NAV which you have replaced the RTI Display with.

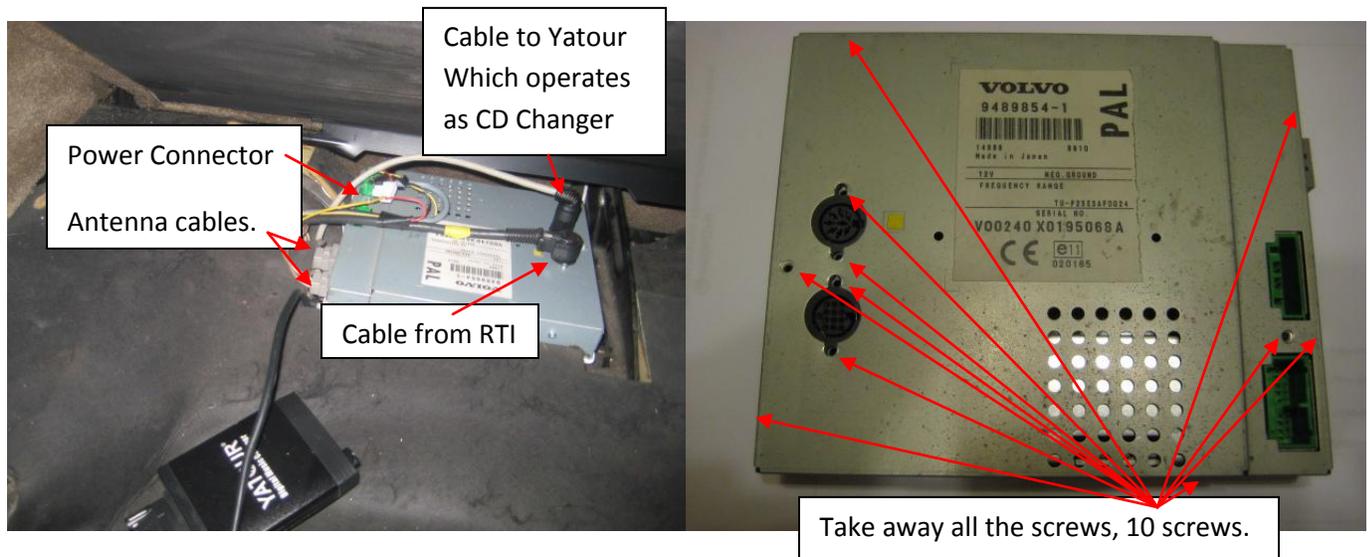
We will use the TV tuner box in the back of the car.

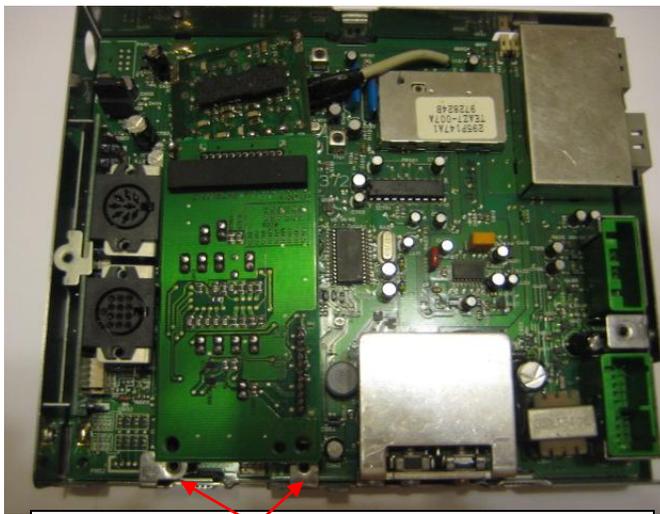
We first have to make some modification to the TV tuner to get the function we want.

After the first step of modification you can already use the external sound from NAV but only if you set up TV in the radio unit, then also you will have the function as if you had used the RTI bottoms on the steering wheel or remote control as the RTI will go up when you set up TV in the radio and the NAV will automatically start. But in this mode you cannot listen to some radio station or CD Changer or CD, because the RTI are in TV mode, but you will have voice guide sound from NAV.

So this is not enough and we have to be able to make some more modification so the Voice Guide Sound from NAV will override the Radio Channel, CD, Tape, CD Changer, Yatour Unit, IPOD unit and every other equipment you have connected to the Sound system of your Volvo.

The first step is to take out the TV Tuner from the car and take away the cover.



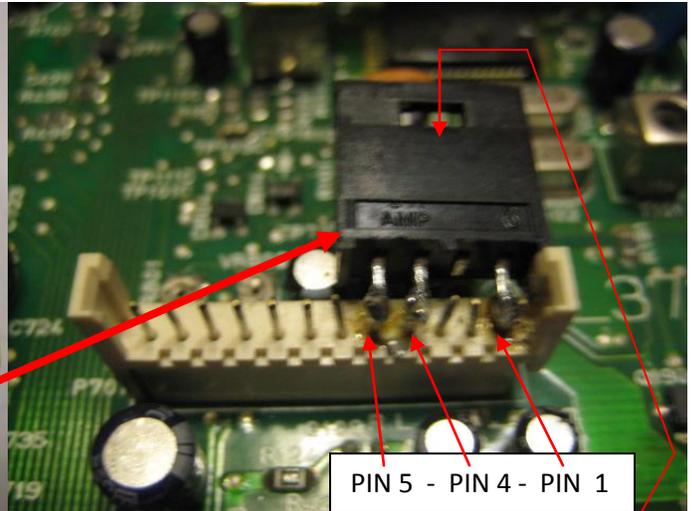
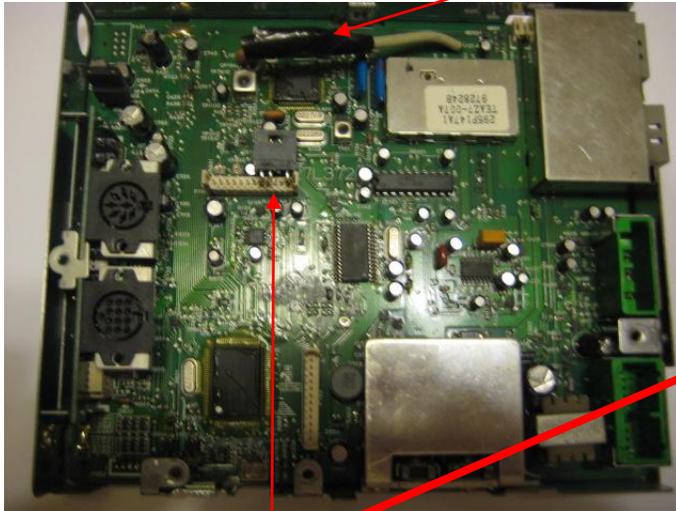


Take away 2 screws and take out the PC Board.



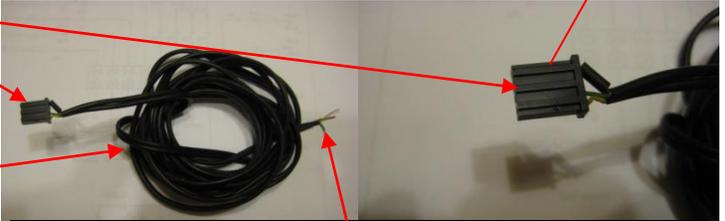
Save the PC Board together with the Display from RTI unit in case of reversing the unit to original.

Now we have the TV unit without AF. As you can see we had an extra PC Board on our unit, some are with and some are without. If you have with just cut the cables from the small PC Board going into the main Board and isolate the ends with some electrical tape.



Then you take a connector and solder it to the connector PIN 1, 4 and 5. PIN 1 is signal ground, PIN 4 and PIN 5 is signal IN Left respective Right Channels. You can use whatever connector you prefer as long as it fits together with the pins in the connector on the main board, but you have to have the female side too as that is to be connected in this connector.

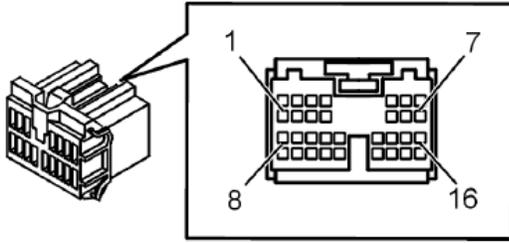
Cable coming from NAV Voice Guide Sound



This was the first part and now you have the opportunity to get sound out from NAV but only in TV mode.

This end will be connected to NAV (Voice Guide Sound out) in the dash board where the RTI unit is. The cable has to be placed under the carpet from the back of the car to the front.

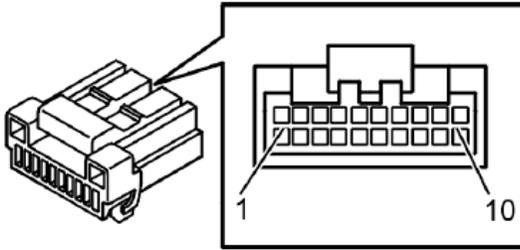
### TV receiver (to RTI control module)



Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#).

TV receiver terminals M1-M16 correspond to terminals #25-#40 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
M1	#25	Video signal, TV	Analogue signal	1 V p-p +/- 0.2 V
M2	#26	Synchronizing signal, TV	Digital signal	0-5 V
M3	#27	-	-	-
M4	#28	-	-	-
M5	#29	-	-	-
M6	#30	-	-	-
M7	#31	30 supply	Ubat	-
M8	#32	Signal ground, TV signals	Ulow	-
M9	#33	Screen ground, TV signals	Ulow	-
M10	#34	-	-	-
M11	#35	-	-	-
M12	#36	-	-	-
M13	#37	Signal, remote control TV	Digital signal	33.3 kHz carrier wave when the remote control is pressed
M14	#38	-	-	-
M15	#39	Ground (Measured to battery negative terminal)	Ulow	-
M16	#40	-	-	-

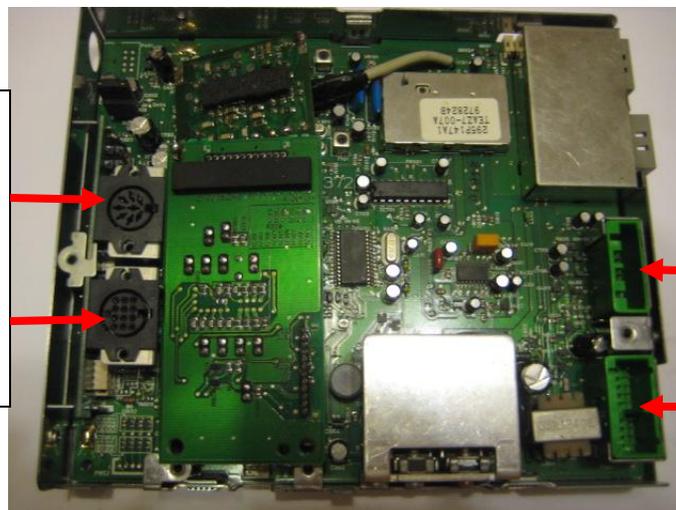


### TV receiver (to reverse camera and video)

Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#) .

TV receiver terminals N1-N10 correspond to #47-#56 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
N1	#47	-	-	-
N2	#48	Power supply, rear camera	Ubat	-
N3	#49	Video signal, rear camera	-	-
N4	#50	Video signal ground, rear camera	Ulow	-
N5	#51	Video signal	-	-
N6	#52	Signal ground, video signals	Ulow	-
N7	#53	Left audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
N8	#54	Right audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
N9	#55	signal ground, audio	Ulow	-
N10	#56	-	-	-



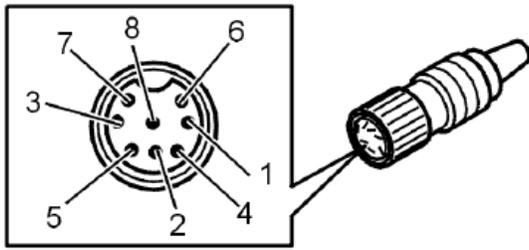
Connector  
To RTI control module  
To CD Changer, Yatour etc.

Connector  
To reverse camera and video)  
To RTI Control module

## TV receiver (to RTI control module)

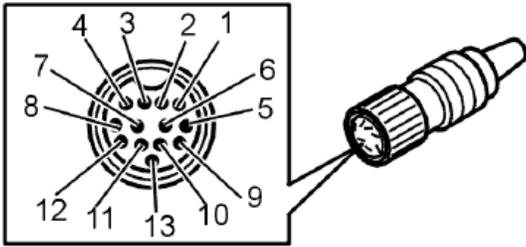
Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#).

TV receiver terminals O1-O8 correspond to terminals #16-#23 on the breakout box.



Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
O1	#16	Clock signal to TV receiver	Digital signal	Melbus protocol
O2	#17	Signal ground, sound	Ulow	-
O3	#18	15 supply	Ubat	-
O4	#19	Data signal to TV receiver	Digital signal	Melbus protocol
O5	#20	Busy signal to TV receiver	Digital signal	Melbus protocol
O6	#21	Left audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
O7	#22	Right audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
O8	#23	Voice guide channel	Alternating current when there is sound to the loudspeaker (during voice guidance)	-
H		Screen ground, cable to audio unit	Ulow	-

## TV receiver (to CD player)

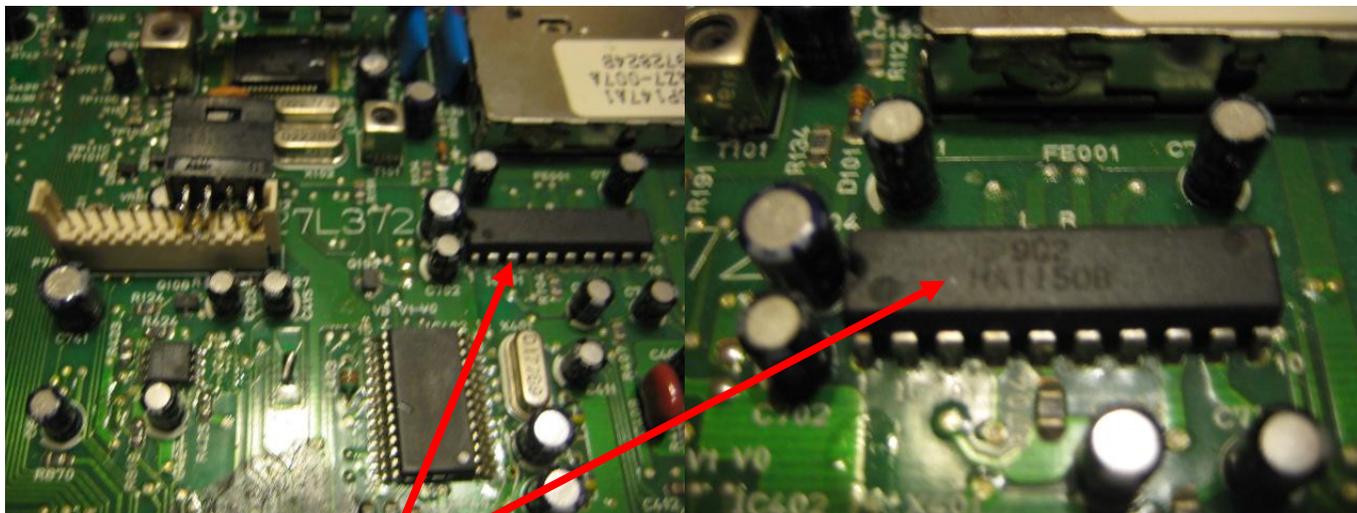


Before taking any readings, see [Connecting the breakout box and checking the ground terminal](#) .

TV receiver terminals P1-P13 correspond to terminals #1-#13 on the breakout box.

Control module terminal	Breakout box terminal	Signal type	Ignition on	Other
P1	#1	signal ground	Ulow	-
P2	#2	Left audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
P3	#3	-	-	-
P4	#4	Right audio channel	Alternating current when there is sound to the loudspeaker	150 mV rms +/- 38 mV (1 kHz 30% mod)
P5	#5	-	-	-
P6	#6	Voice guide channel	Alternating current when there is sound to the loudspeaker (during voice guidance)	-
P7	#7	-	-	-
P8	#8	-	-	-
P9	#9	-	-	-
P10	#10	15 supply	Ubat	-
P11	#11	Busy signal to TV receiver	Digital signal	Melbus protocol
P12	#12	Clock signal to TV receiver	Digital signal	Melbus protocol
P13	#13	Data signal to TV receiver	Digital signal	Melbus protocol
H		Screen ground, cable to TV receiver	Ulow	-

## Second Part



On the main board of the TV tuner there is an IC which is a Three Video Input, Three 2 channels Audio Input and Two Output circuits. The IC are HA11508 an Audio-Video Switch from Hitachi. This IC we will make some modification to and we will use the NAV and a small special made electronic we will make to set the switches the way we want without using Melbus Protocol and some other sophisticated programmable IC to communicate with it. This we will look into and publish as soon as we have solved it so everybody have a chance to make this modification without any special programming tools.

The Pdf file with schema over HA11508 can be found at our web site for download:

[www.nasab.com/Volvo/datasheet-HA11508.pdf](http://www.nasab.com/Volvo/datasheet-HA11508.pdf)

This IC will even be of interest for those who try to connect some Video, Back camera etc. You can with some small electronic get it to serve your purpose. To get it to work another or your way you have to make some electronic between Pin 6, 8 and 10. This pin is control and mute pins and Volvo has put these to 0V. And we think they are operated from Melbus, but you can cut in the pc board the connection to pin 6 and 8 easily and let those 2 control signal together with the signal from Melbus be connected with some special electronic you make, by this you would have the opportunity to control this switch together with Melbus for setting up back camera or video without depend on the Melbus. But you do have to have knowledge of electronic and how to do it. But that we will take in another project.

We will also mention that this modification for the 4.3 inch RTI display to NAV can also be adapted for the wider Volvo Display as the mechanical parts are the same in the RTI Display and you can use a wider NAV, maybe with Video in, if so, maybe you should not take out the AF PC board from the Tuner, but solder the new small connector directly on the PC board contact and use the other connector on the

right side from the power connector to connect your Video or Back Camera. Then you can use this IC to setup the switches. But as we said it will be in another project.

For the time being we will use the TV mode.

Link to **Replacement of RTI Display Unit to NAV in Volvo (RTI CD Early model):**

<http://www.nasab.com/Volvo/NAV%20for%20RTI%20Volvo.pdf>

Tuesday, March 18, 2014

To use the IC switch for voice guide we have discovered without Melbus Protocol it will not work as long as we would try to use the over ride mode of the original NAV for sound, and this over ride is not in the TV tuner, only back camera, Video is operated in this IC switch, we have to go to the central unit of the RTI in the trunk to see if we can solve this for the NAV voice guide.

But we have been testing the TV mode and it works as follows.

If you start the RTI with the Navigation mode then you will not have the sound from the NAV in the speakers before you shift to TV in the radio module. If you then change on the radio to CD Changer or Radio or whatever the sound will shift to what the radio are showing, but you lose the NAV voice guide information. But the navigation is still working. Every time you want to listen to the voice guide you have to tune back the radio module to TV. If you start the RTI in TV mode, the NAV will start and you will have the NAV voice guide sound in the speakers. But as soon as you turn the radio to CD, CD Changer, Radio or whatever it will shut down the RTI and the NAV.

We also have discovered you have some background sound in the speakers because of the TV tuner. This sound is the sound you get on a normal TV old PAL system when you did not have any station locked. In Swedish we call it "Brus" sounds like "SSSSHHHHH". We have also discovered there is some high frequency from the NAV in the background. We will try to find out how we can get rid of this by some filter. Else the equipment works very well, no problem at all so far. Except you have to tune the radio to TV for the sound from NAV voice guide.

Updates:

We got rid of the high frequency and the other back ground sound which we had in the speakers when we had sound from NAV true the TV tuner when we made a 0,75mm cable between the ground (0V) on our special NAV/RTI Electronic PC Board 4-900054 to the metal chassis on the RTI unit.

We will be back as soon as we have some more news on this topic.

**Nasab International Corporation**

Special Machines/Electronic Department.