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Foreword

Almost anyone making RDS development and testing takes a note that there's no suitable low cost FM modulator available on the market with small output power, wideband modulation input and stable frequency.

It has been discovered that – with some limitations – commercially available mp3 transmitters can provide the same functionality, without need of any modifications.

The solution described has been successfully tested with PIRA32 and MicroRDS on Belkin Tunecast II transmitter (made before 2011). It should work with any other similar transmitter that is based on BH1415F chip.

The solution cannot be applied to device based on Silicon Labs chip (SI47xx).



Important notes:

The solution does not provide broadcast quality results (as no BH1415F based transmitter does). Originally the BH1415F chip does not allow emitting RDS at all!

The transmitter provides audio inputs only; we will use them for RDS signal injection. Internal limiter and stereo encoder causes considerable reduction of RDS signal quality injected that way. Pilot and RDS synchronization is omitted. Due to poor quality of the integrated stereo encoder there's a strong 3rd pilot harmonic at 57 kHz, interfering with the RDS signal. Thus the performance is given in advance and some limitations apply. To avoid erratic RDS reception the FM deviation caused by RDS signal must be 4 kHz or more (see appropriate signal levels, pp = peak to peak).

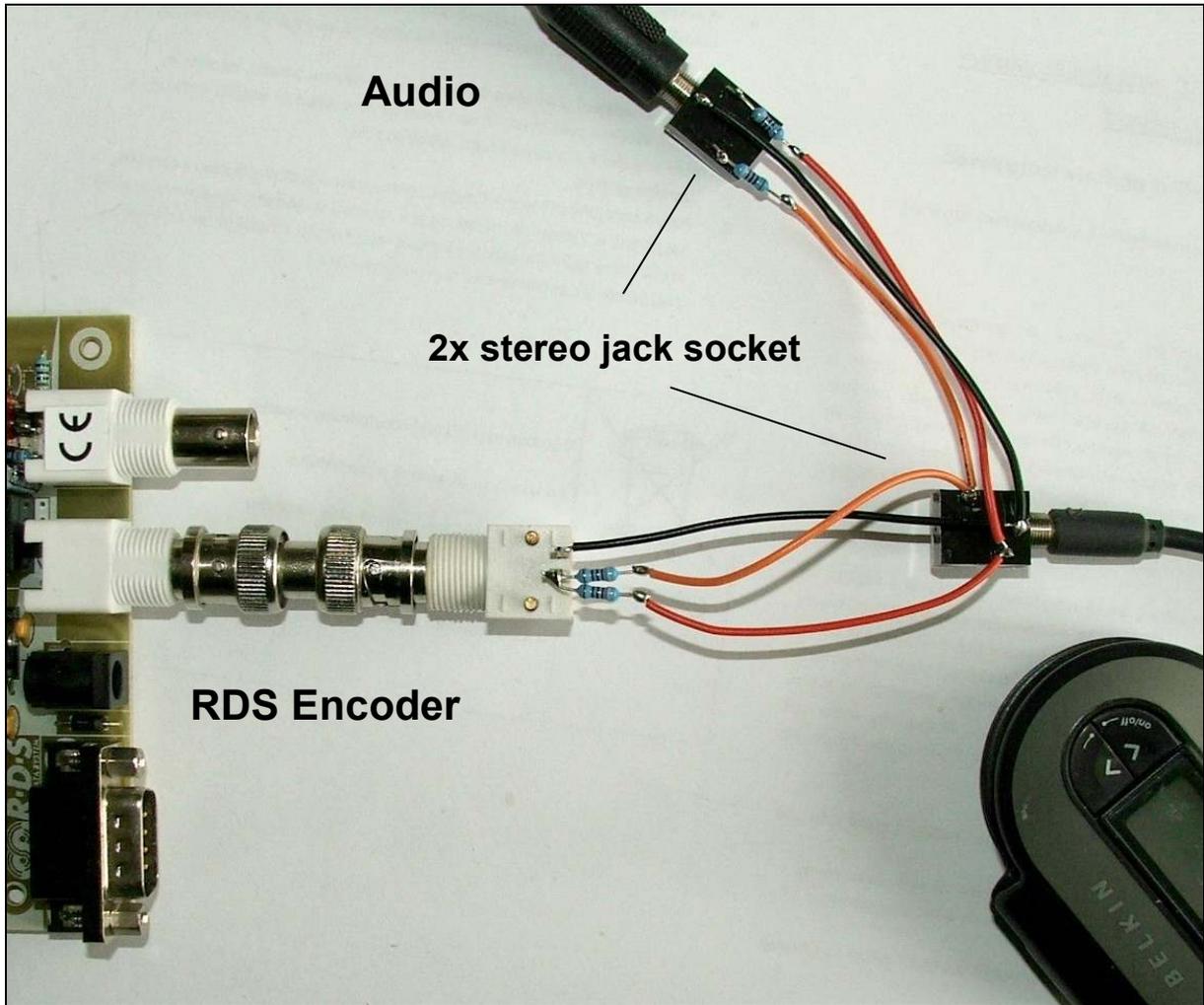
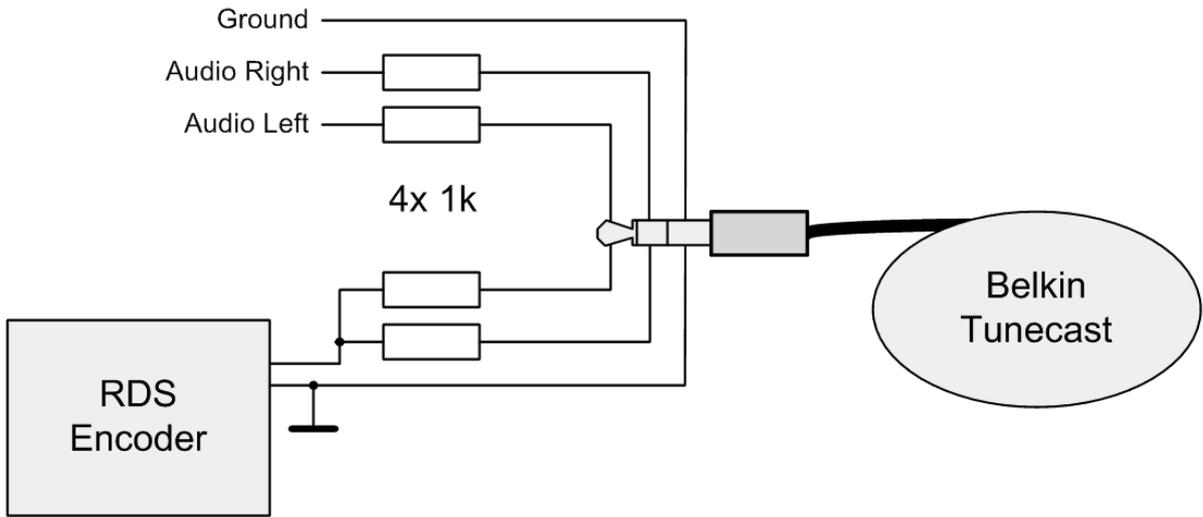
Variant 1 - Broadcasting both RDS and audio signal

Feed the RDS to both audio channels and feed audio to both audio channels using sum resistors. Their value is about **1 k Ω** . It is important to use only low audio levels to avoid internal limiter action.

The **audio level** from the player should not exceed **200 mV pp** in each channel, resulting in 50 kHz total peak FM deviation.

The **RDS level** on the RDS encoder should be set to about **150 mV pp** (1/10 of the max. level).

Continue on next page >



Variant 2 - Emitting RDS only

Feed the RDS signal to **both** audio channels Right and Left. On the RDS encoder set the **RDS level** to a value of about **50 to 100 mV pp** (less than 1/10 of the max. level).

