



### Change Description

#### M7100 800 MHz – RU102917V1 (Data Unit)

The following provides a description of the M7100 800 MHz Data unit, (RU102917V1) and how it differs from the standard M7100 800 MHz, (RU101188V131).

The RU102917V1 model will be used in a conventional data/trunked voice communication system for a transit application. This model has been designed to use an external modulation source with specific characteristics, which are defined later in this document. The vehicular application utilizes the standard M7100 800 MHz (RU101188V131) with an A/D Option board installed. The combination of the standard model plus this A/D Option board results in the RU102917V1 unit.

The RU102917V1 unit will interface with an external device per the following ports:

1. M7100 FDISC Output (ORCC pin 29) – During M7100 Receive Mode
2. M7100 EXTMOD Input (ORCC pin 32) – During M7100 TX Mode

#### Functional Difference (RU102917V1 from the RU101188V131):

The EXTMOD input to the M7100 (RU102917V1) connects through pin 32 on the ORCC (enclosure connector) to an Analog to Digital Converter (ADC). This ADC is controlled by the DSP, which processes the incoming signals and routes to the modulator. The EXTMOD input has been added with this change.

The input circuit to the ADC is band limited with a 10 kHz Low Pass Anti-aliasing Filter and is AC coupled.

The modulation signal source will be external to the M7100 unit. A device external to the M7100 supplies a waveform through the M7100 EXTMOD Input (ORCC pin 32) and is routed through the DSP and out to the modulator, from IC713 in the same method as is done with the RU101188V131. The DSP performs limited filtering to reduce noise.

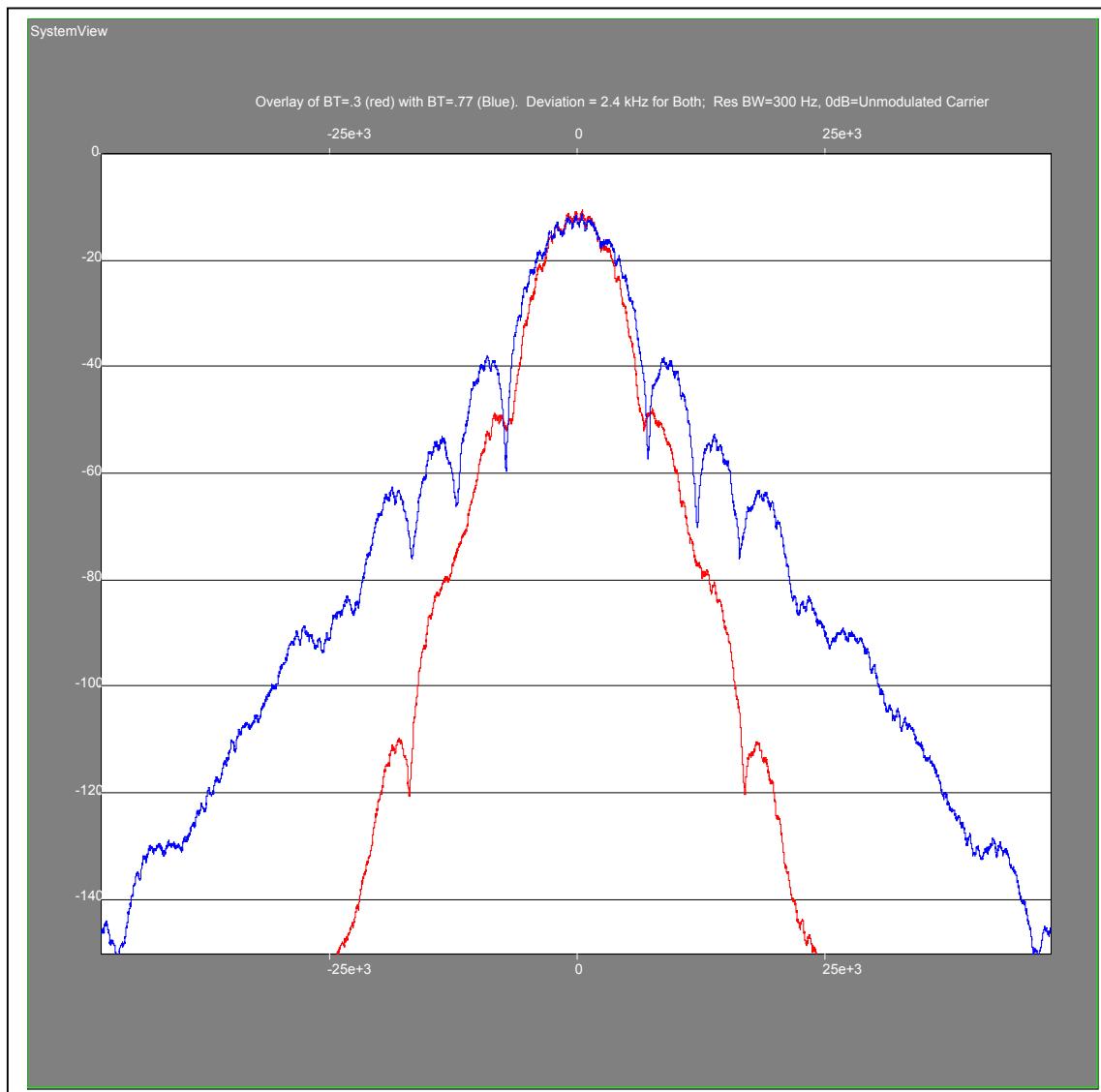
The RU102917V1 model has been designed to be used with an external modulation signal source with the following characteristics: 2-level Gaussian FSK, 9600 bits per second and BT = .3. The deviation will be set for +/- 2.4 kHz peak deviation.



Please see the following modeled plot overlay, which shows spectrum for the new RU102917V1 with BT = .3, as compared to the standard M7100 800 MHz, RU101188V131.

Model characteristics are:

- Overlay of BT=.3 (red, narrow) with BT=.77 (blue, wider)
  - BT = .3 (red) = External Modulation Source to be used with new RU102917V1
  - BT = .77 (blue) = Modulation source used with the original RU101188V131.
- Deviation = 2.4 kHz for both
- Res BW=300 Hz
- 0dB=Unmodulated Carrier
- No phase noise assumed





The following provides graphical illustration of the added board and signal lines:

Figure 1 – Schematic of plug-in board added to standard radio:

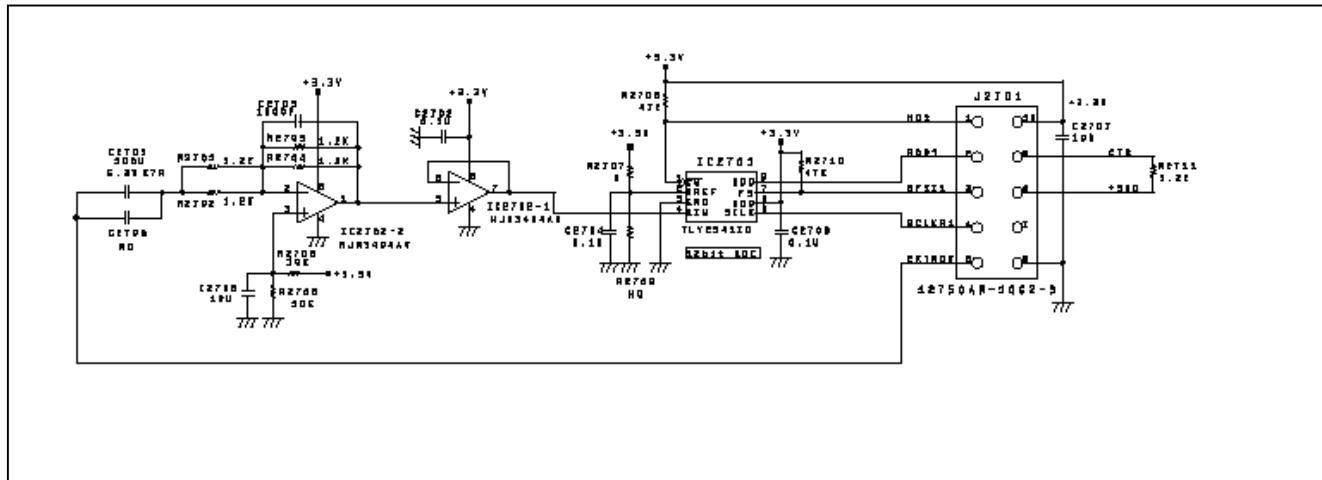


Figure 2 – EXTMOD IN signal from add in board connector to the DSP function block:

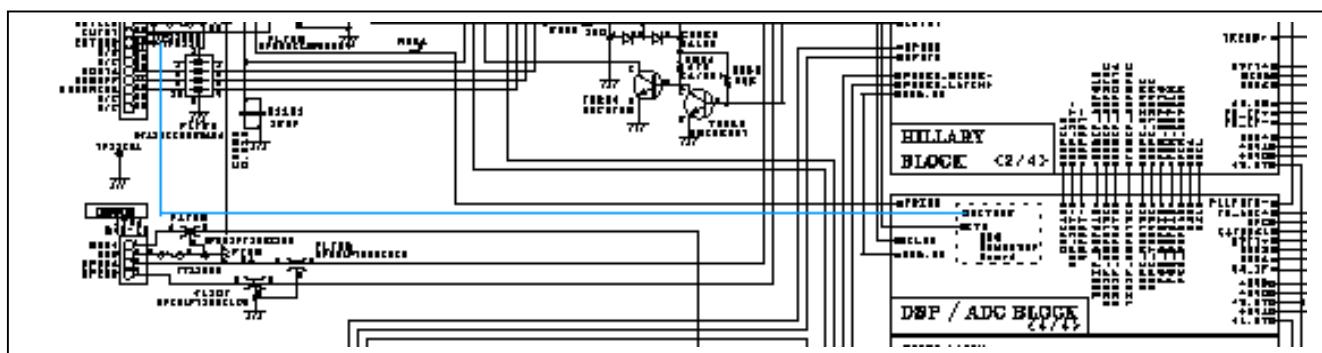




Figure 3 – EXTMOD IN Routing to DSP – A/L Unit Schematic Portion

