Radio Direction Finder DDF6001 from Doppler Systems

Rev 1.0
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Hello,

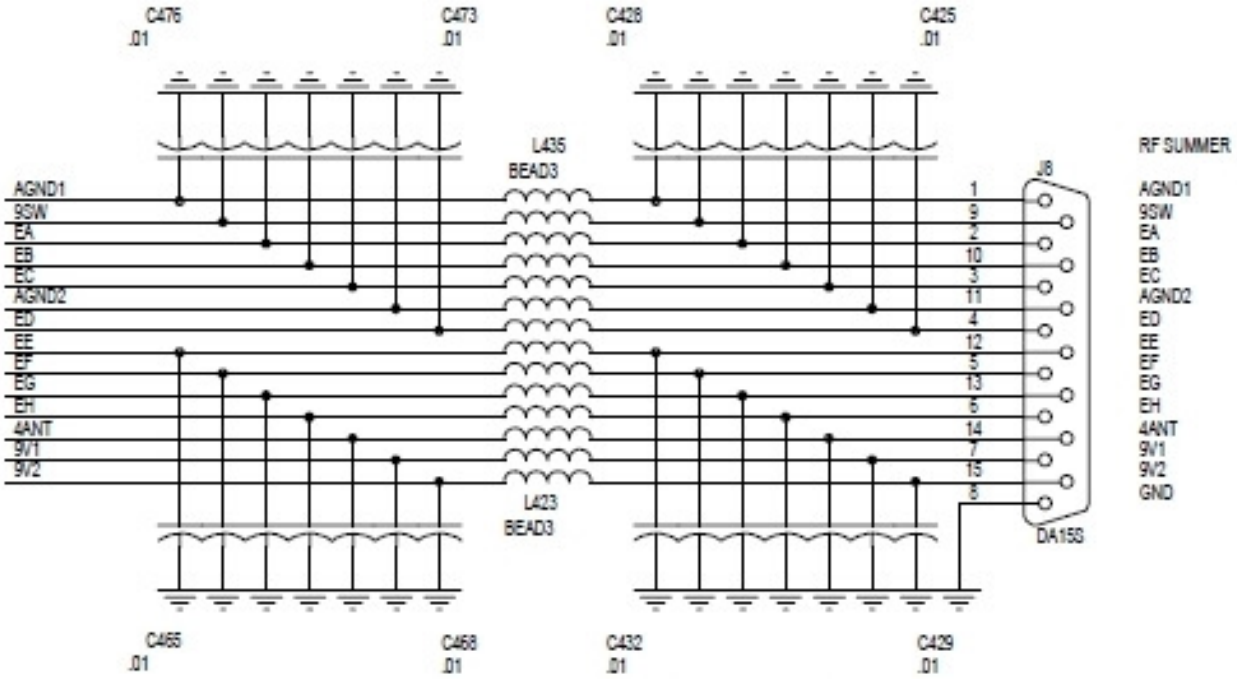
this description is explaining the differences between the Doppler Systems DDF6000 and DDF6001 units.

As can be seen also on the picture of the front panel below they are very similar and also behave identical from the network side of view.

However one major difference is the interface to the RF summing unit and to the antennas. In this respect the DDF6000 and DDF6001 are **NOT** compatible.

Therefore this article is subsequently focusing on the different interface specifications of the respective port J8 (RF summer).

The **DDF6000** uses a **female** 15 pin SUB-D connector:



The signals are as follows:

AGND01, AGND02 and GND = ground

9SW = output signal which controls an attenuator in each channel,
(0V = attenuator off, 9V = attenuator on)

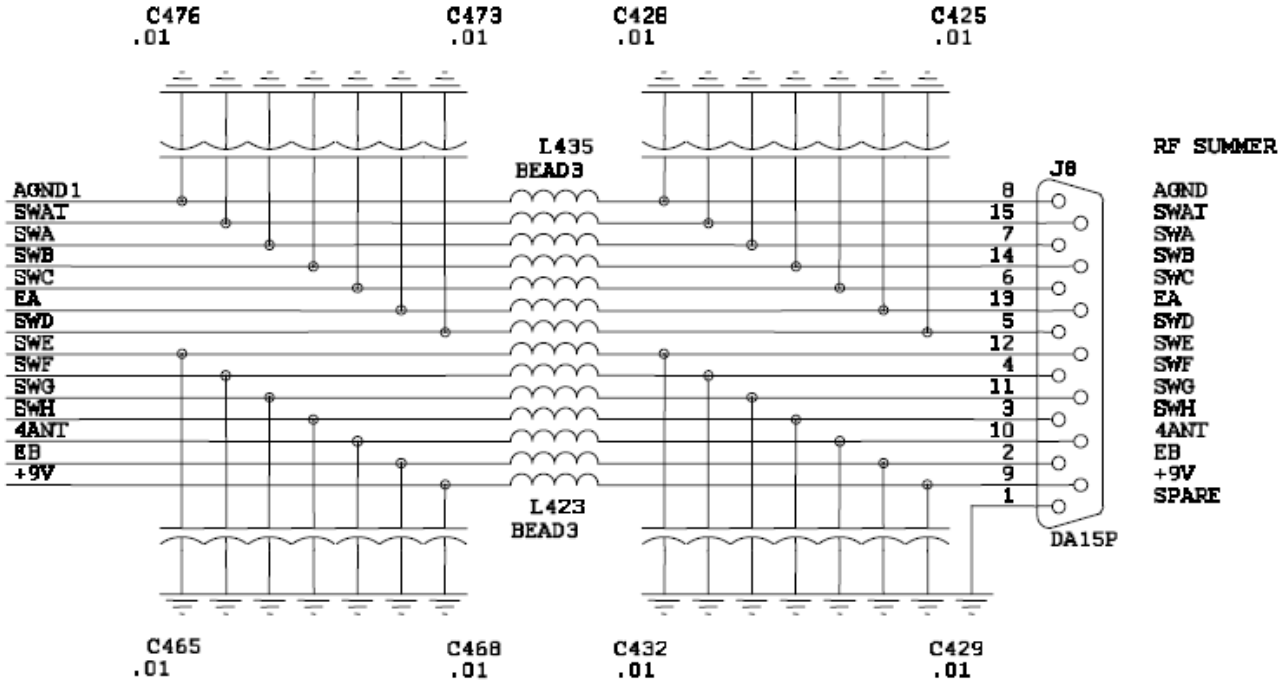
EA-EH = enable signals for each channel A to H, this is not a rectangular digital signal but in order to have a higher performance “soft switching” Doppler based radio direction finder the signal has slopes,
(0V channel enabled, 9V channel disabled)

4ANT = control input to determine whether a 4 antenna array or a 8 antenna array is connected
(open = 4 antenna mode, externally connected to ground = 8 antenna mode)

9V1 = output providing +9V DC supply to the 4 antenna array electronics

9V2 = output providing +9V DC supply (not use for 4 antenna arrays, connect externally to 9V1 when using an 9 antenna array)

The **DDF6001** uses a **male** 15 pin SUB-D connector:



The signals are as follows:

AGND = ground

SWAT = output signal which controls an attenuator in each channel, (0V = attenuator off, 9V = attenuator on) in DDF6001 an additional inverter is built into the RF summer to generate a signal SWATT\ which actually changes the biasing of the used GaAs MMIC amplifier and switches it either on or in a bypass mode (which corresponds to attenuator on)

SWA-SWH = enable signals for each channel A to H, 4 channels A,C,E,G are combined in one unit (Phase A), the other 4 channels B,D,F,H are combined in the other unit (Phase B), most likely (to be confirmed) this is not a rectangular digital signal but in order to have a higher performance “soft switching” Doppler based radio direction finder the signal has slopes, 9V channel enabled, 0V channel disabled

EA = enables block A of 4 ports (Phase A), EA=0V Phase A disabled, EA=9V Phase A enabled

4ANT = control input to determine whether a 4 antenna array or a 8 antenna array is connected (open = 4 antenna mode, externally connected to ground = 8 antenna mode)

EB = enables block B of 4 ports (Phase B), EB=0V Phase B disabled, EB=9V Phase B enabled

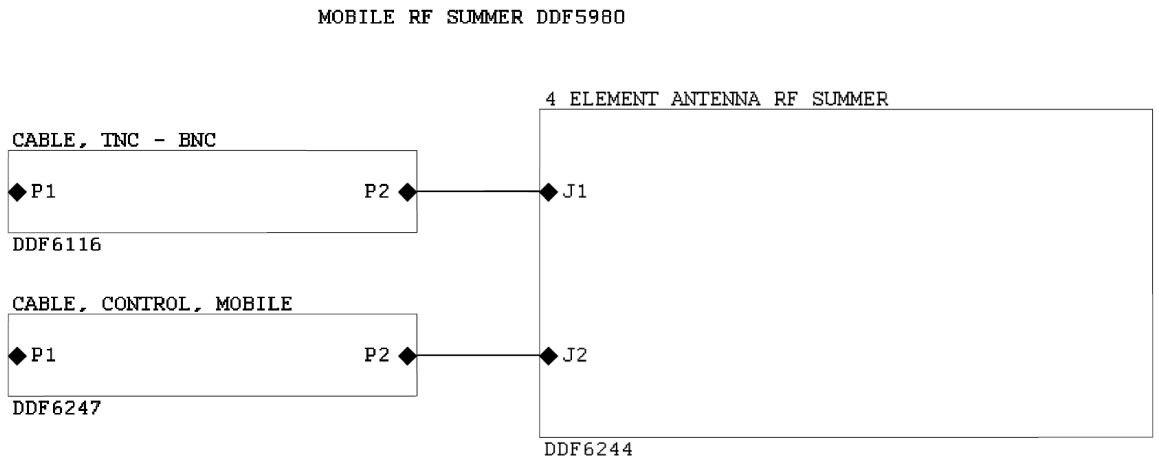
+9V = output providing +9V DC supply

SPARE = not used but blocked with a capacitor to ground

The summing circuits of DDF6000 and DDF6001 are quite different. The description of the DDF6000 unit can be found on another article previously posted.

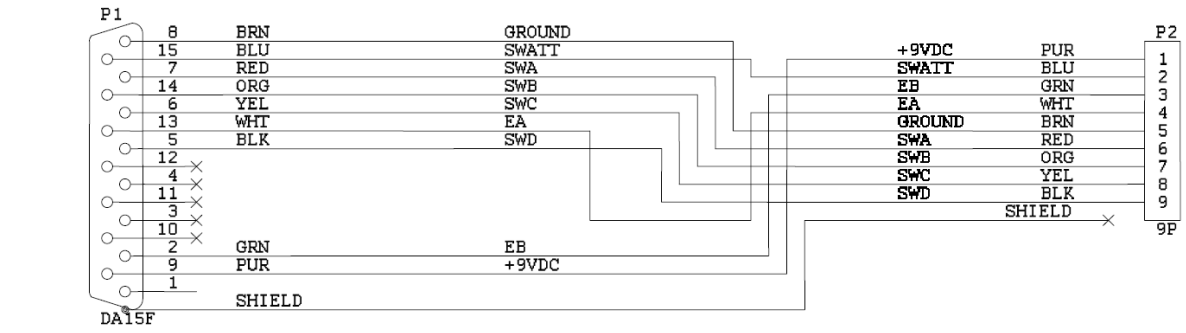
For the **DDF6001** there are two families of RF summers available: one family is intend to be used at stationary setups and supports an array of 8 antennas, the other family is mostly intended for mobile setups and supports an array of 4 antennas. Both are connected to the above mentioned port J8 (RF summer).

Here are descriptions for a 4 antenna setup. First the description of the necessary interconnections:



The DDF6244 4-Element RF Summer Assembly is most likely exactly one half of the DDF6223 8-Element RF Summer Assembly which is described later in this document.

This is the description of the DDF6247 Mobile Control Cable which connects the main unit to the RF Summer Assembly:

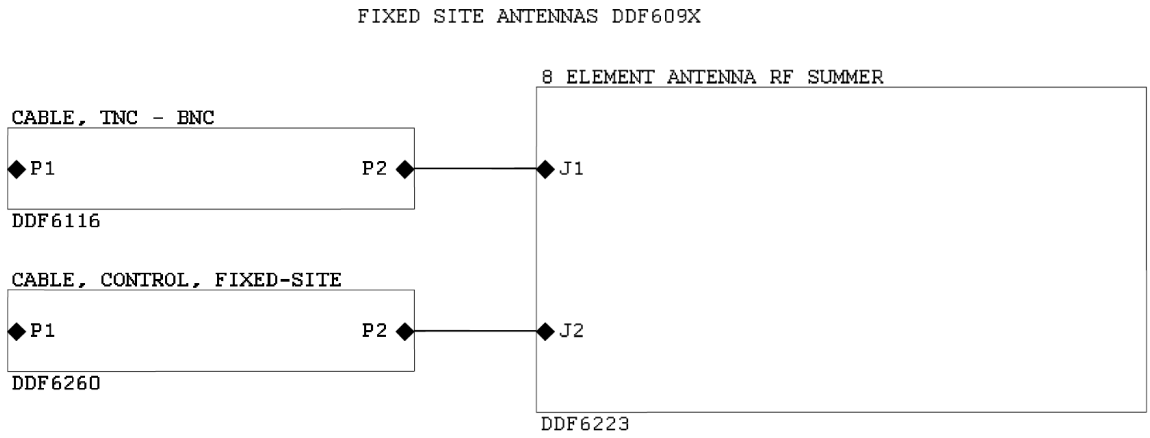


777-RRA-15F Plug
17-RRD1-F01-100 Contacts
17-1657-15 Backshell

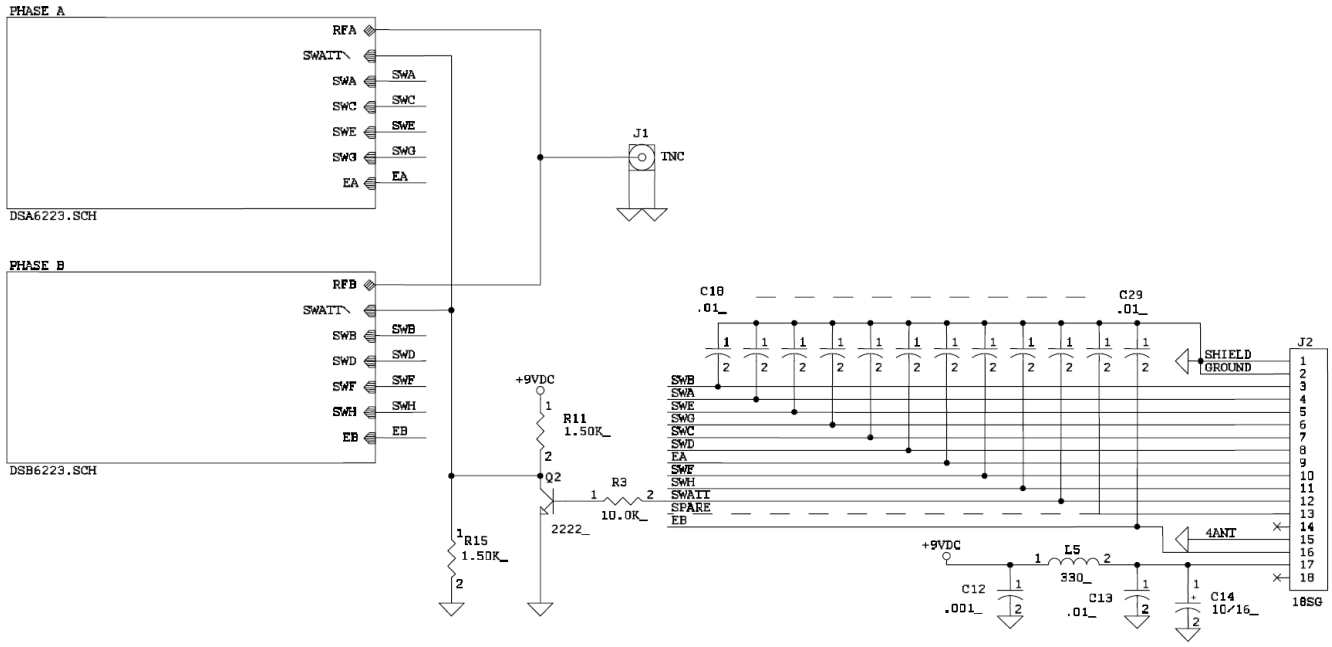
5928-CL
9 COND #24

3-280-9PG-321
CABLE END SOCKET

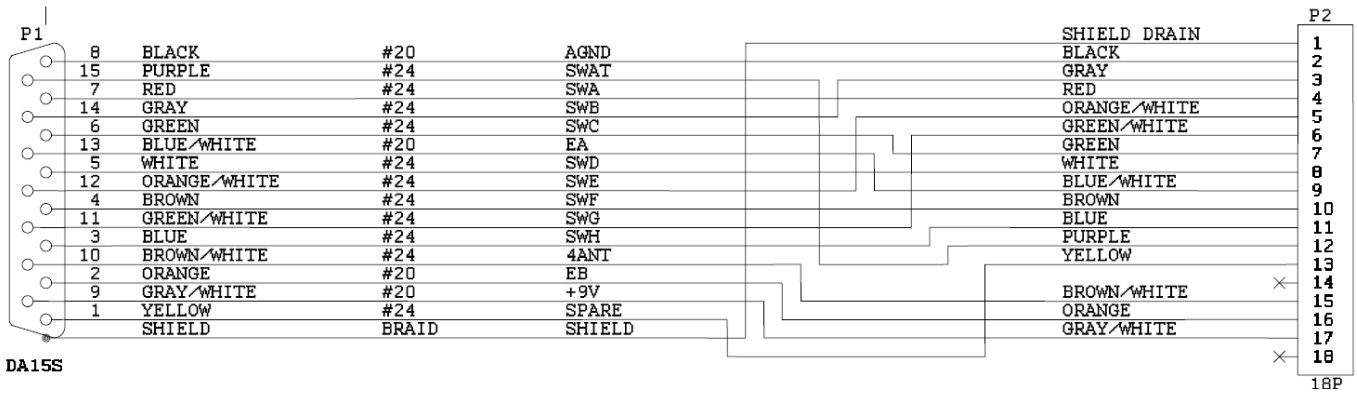
Here are descriptions for an 8 antenna setup. First the description of the necessary interconnections:



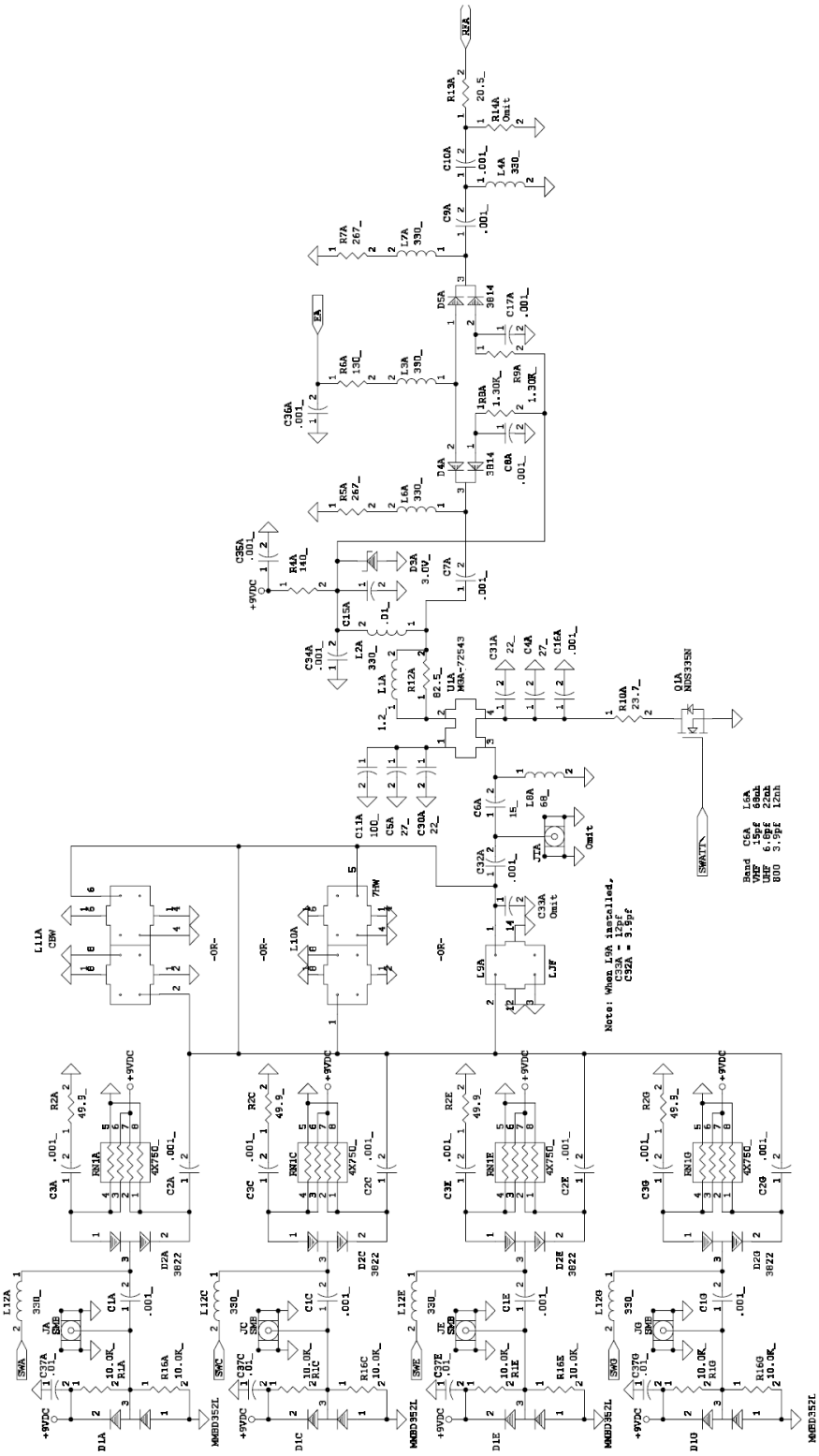
Here is the DDF6223 8-Element RF Summer Assembly



Here is the description of the DDF6260 Fixed Site Control Cable which connects the main unit to the RF summer assembly:



Finally here is the schematic for the two units DSA6223.SCH and DSB6223.SCH inside the unit DDF6223:



I always appreciate feedback and suggestions for improvements. Please send them to the Email address below.

Best regards

Matthias DD1US

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