Signal Processing at RF (SPAR) BAA
Frequently Asked Questions (FAQ)
Updated: 7 March 2016

1) Why is an IP3 goal not specified for linearity in the BAA for TA2?
   A: Further clarification on IP3 will be provided in Table 2 of the SPAR BAA Amendment No. 1, posted to FBO, and the metrics are listed below.

TA 2 Metric (Phase)	1	2	3
IIP3 Measured at Rx Port for Tx Input*	32	40	47
IIP3 Measured at Rx Port for Antenna Input*	17	24	27

2) Do proposers need to provide detailed costing for all subcontractors?
   A: The prime contractor is responsible for compiling and providing, as part of its proposal submission to the Government, subcontractor proposals prepared at the same level of detail as that required by the prime. Note that Rough Orders of Magnitude will not be accepted.
3) The center frequency (Fc) is fixed at 1 GHz. Is the Government interested in a tunable range?
   A: Tunable Fc is not a necessity, but it would be an acceptable feature. The proposed range must include the 1 GHz as specified in the BAA.
4) Is the 30 MHz RF bandwidth specified at the antenna?
   A: Yes.
5) Is equalization algorithm development within the scope of the program?
   A: Yes, as long as it is tied to a particular correlator implementation (TA1) or comms demonstration (TA3).
6) Must path equalization envisioned exist exclusively in the analog domain?
   A: No.
7) Is the power expended in the digital back-end included in the power dissipation metric?
   A: No.
8) Are antenna arrays within the scope of the program?
   A: No.
9) Is amplification outside of the SPAR program scope?
   A: No.
10) Is cancelation of Doppler effects included in the wireless channel consideration?
    A: Doppler effects will be important for certain communication scenarios and should be considered in channel fading mitigation when appropriate.
11) Does the circulator in TA2 need to be symmetric with respect to all three ports?
    A: No.
12) Does TA2 have to develop a three-port circulator? Do the port impedances have to be the same?
    A: No.
13) Is there a limit on spectral regrowth?
    A: No.
14) Does SPAR require a specific modulation scheme?
    A: No.

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15) Must there be a monolithic implementation of the correlator and circulator?
    A: No.
16) Must the TX and RX correlators be implemented on the same substrate?
    A: No.
17) Must the. TX correlator be placed after the power amplifier?
    A: No
18) If a PLL is needed in a circulator implementation, is the PLL included in the 3mm size spec?
    A: No. The size of a component such as an integrated PLL is insignificant as compared to the size of the circulator system. However, the power needed for the frequency source must be included in the circulator power budget.
19) How is the bandwidth defined, is it to the 3dB point or the null?
    A: The bandwidth is defined to the 3dB points.
20) Must the correlator transmitter rejection specification be met for all 64 code combinations?
    A: No. The specs are defined for orthogonal pair of codes, not for every single code combination. It is desirable, however, to have multiple unique pairs of orthogonal codes available within the code set.
21) Should we be concerned with out-of-band interferers?
    A: No.
22) Does the page count of the Abstract submission include the references?
    A: No. Please place the references at the end of the document.
23) Can the controls for equalization and calibration be digital with the analog RF processing?
    A: Yes.
24) Do the power limits of TA1 include the power expended when reconfiguring codes?
    A: No.
25) Can digital pre- or post-processing of the transmitted/received signal be part of the TA3 development?
    A: Yes.
26) What is COTS in TA3? Can we use an internally developed technology not yet commercially available?
    A: Yes.
27) Are there restrictions on taking part in more than one proposal?
    A: No.
28) Are there preferred teaming arrangements?
    A: No.
29) What is chip scale?
    A: The largest dimension for the circulator is shown in Table 2. For Phase 3, that is 3 mm.
30) Can the proposer bid on TA1 and TA3, assuming TA2 will be finished by another performer?
    A: No.
31) If an abstract is rejected, can the proposer still submit a full proposal?
    A: Yes.
32) Is receiver/transmitter cancellation okay?
    A: Yes, if the technical approach can meet the metrics defined in Tables 1-3.
33) Can proprietary information be included in the abstract?

A: Yes. Proprietary information must be marked as described in the BAA.

34) The BAA shows both relative and absolute powers on page 11. What levels are expected?
A: The power transmitted is expected to be 30 dBm (1 Watt). All other levels are notional. Please refer to Tables 1-3 in the BAA for the program metrics.

35) Can the TA2 circulator approach make use of magnetic materials?
A: Yes.

36) The BAA seems to emphasize “correlators” in TA1. Are other approaches excluded?
A: No, as long as the proposed approach is responsive to the metrics.

37) Does the "Insertion loss" metric only apply to the forward direction (i.e. port 1 to 2 in a typical circulator) from Tx to Antenna? Since typically a preamplifier is placed on the receiver, are we allowed to have slightly higher losses in the reverse direction from Antenna to Rx?
A: The insertion loss and noise figure specifications apply to the Antenna to RX direction.

38) How is "Return Loss into Antenna" defined? The definition is not provided in the BAA and the term itself is ambiguous.
A: S11 at the antenna port.

39) Will DARPA assist in setting up a TA3 over-the-air-demo?
A: Yes.

40) Many COTS radios operate in frequencies near but not exactly at 1GHz. Is there any leeway in our ability to adapt a SPAR deliverable for an existing COTS radio?
A: Yes. Amendment 2 of the BAA now lists the center frequency spec as a proposer defined metric anywhere from 0.9 to 1.1 GHz.

41) Can you please clarify the linearity spec “IIP3 measured at Rx Port for Tx Input”?
A: This spec is for the input-referred third-order intercept point where the third order intercept is measured at the RX port and the power level of the intercept point is referred to the Tx port.

42) Does the “maximum power consumption” refer to a particular state of operation, such as a stand-by mode?
A: No, this is maximum power used by the device in any mode of operation.