Signal Processing at RF (SPAR)

Proposers Day

Dr. Troy Olsson, Program Manager, MTO

02/22/2016

Distribution Statement “A” (Approved for Public Release, Distribution Unlimited)

Agenda

- 08:00AM - 08:30AM Registration & Poster Set Up
- 08:30AM - 08:45AM Welcome, Security & Ground Rules
- 08:45AM - 09:30AM Program Overview & Structure
- 09:30AM - 10:00AM Q & A
- 10:00AM - 10:30AM Contracting with DARPA
- 10:30AM - 10:50AM Cost Proposal Format &Template
- 10:50AM - 11:00AM Closing Remarks
- 11:00AM - 12:15PM Posters and Networking Session
- 12:15PM - 12:30PM BREAK (Posters Removal)
- 12:30PM - 03:00PM One-on-One Meetings with PM

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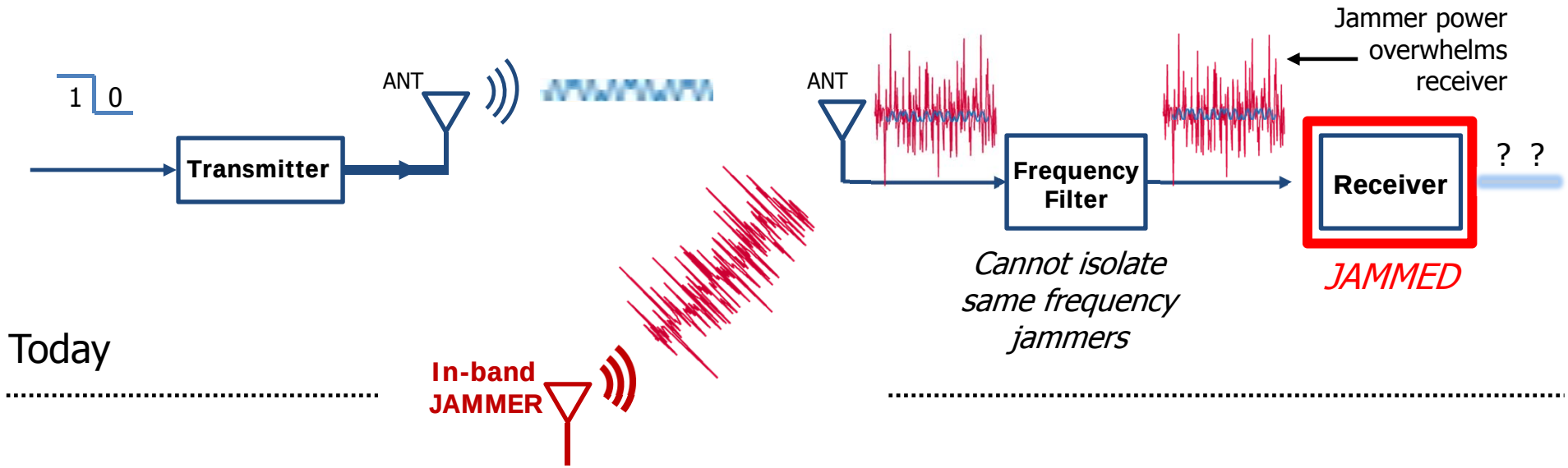
Program Overview

Today's RF Systems are Susceptible to In-Band Jamming



Objectives of SPAR:

- Develop and Demonstrate Signal Processing Components That Reduce In-Band Interference Prior to the Receiver to Prevent Jamming
- Enable RF Operations in Unpredictable and High Interference Environments

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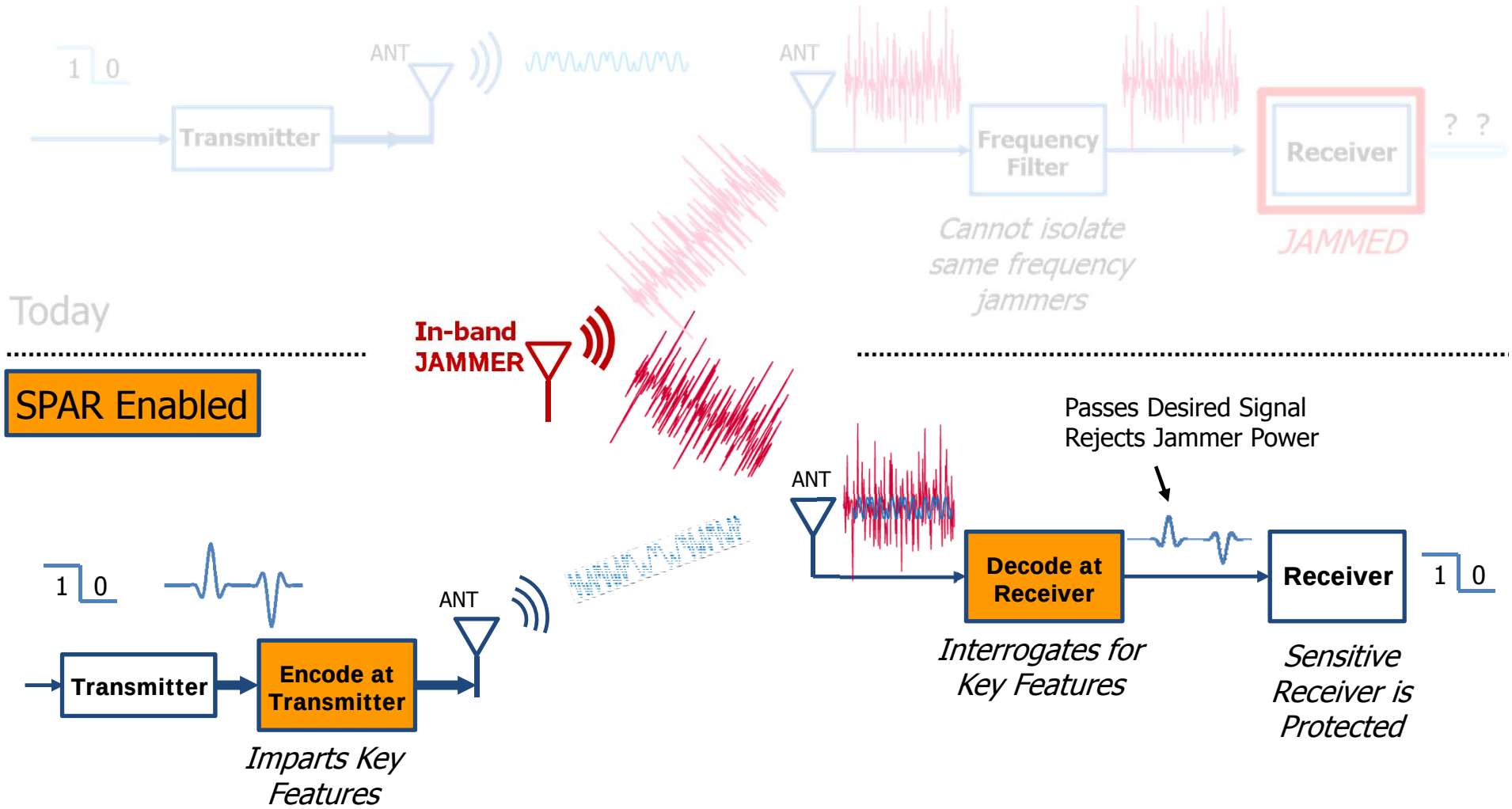
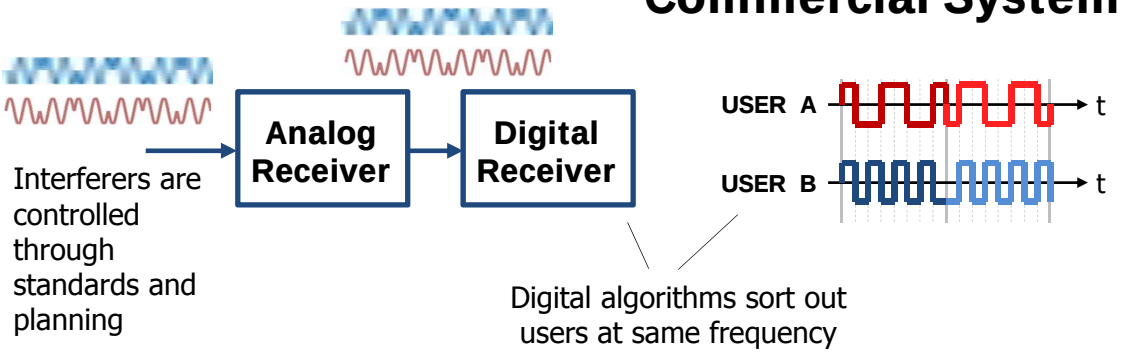
SPAR Approach Overview



SPAR Selects Signals at RF Based on Waveform Features to Reduce Jamming

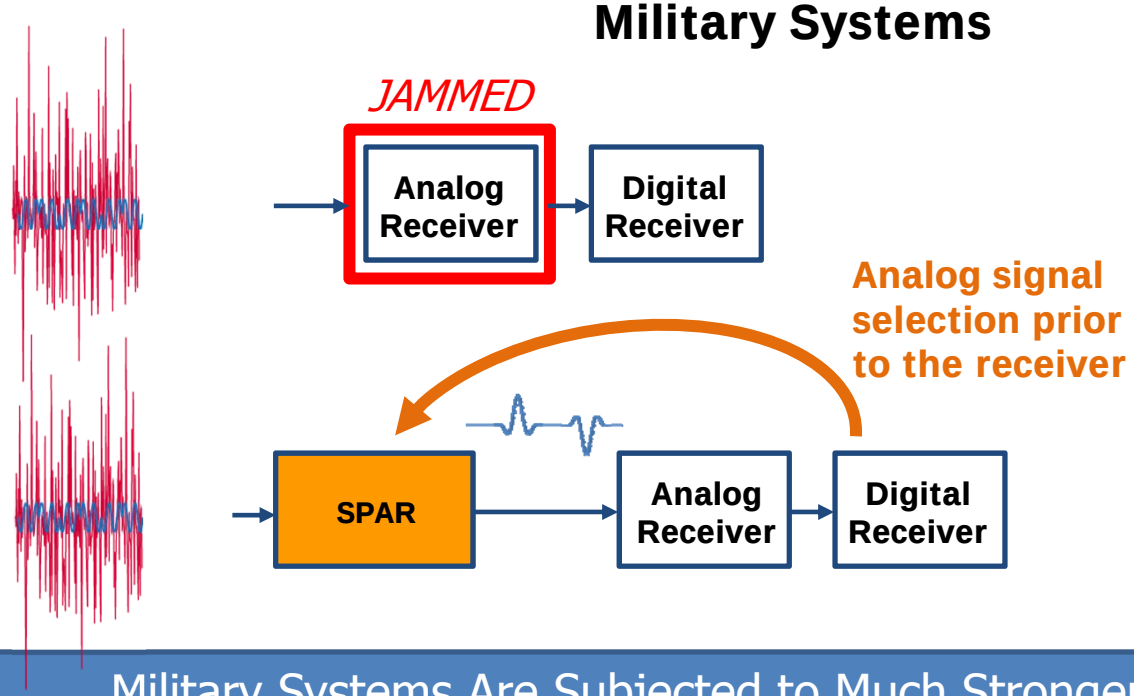
Commercial Radio vs. Military Radio

Commercial Systems



- Careful planning
- Interference is low
- **Thus, commercial wireless devices can interrogate signal in the digital domain**

Military Systems



- Unplanned, uncontrolled EM environment
- Strong adversarial and close proximity interference
- **To protect receiver, signals should be interrogated in the analog domain**

Military Systems Are Subjected to Much Stronger In-Band Jamming

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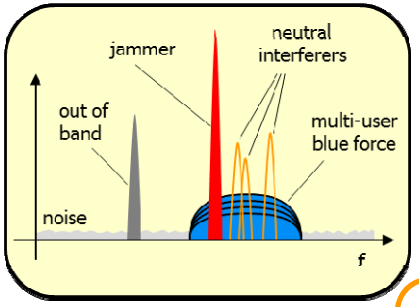
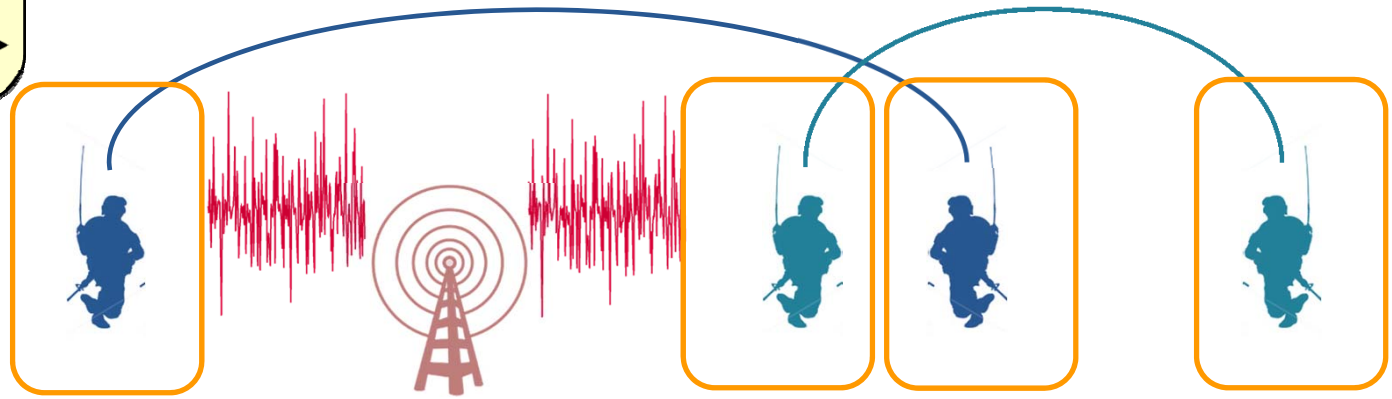
SPAR: DoD Can Operate in the Presence of Jamming Without Changing Frequency

Near-far problem in communication networks

- In commercial systems, the base station dynamically controls the users' power levels, mitigating self-interference
- In military systems, peer-to-peer communications are essential, making the near-far problem a significant challenge for receivers
- Jammers are often closer to the receiver than the transmitter node

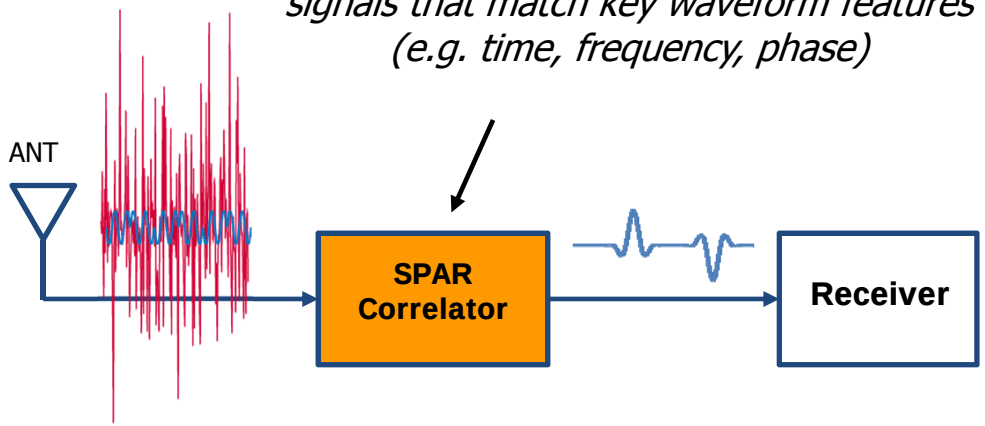


Coexisting DoD Networks



SPAR Correlator Requirements

*A **Correlator** is a signal processing component that is only responsive to signals that match key waveform features (e.g. time, frequency, phase)*

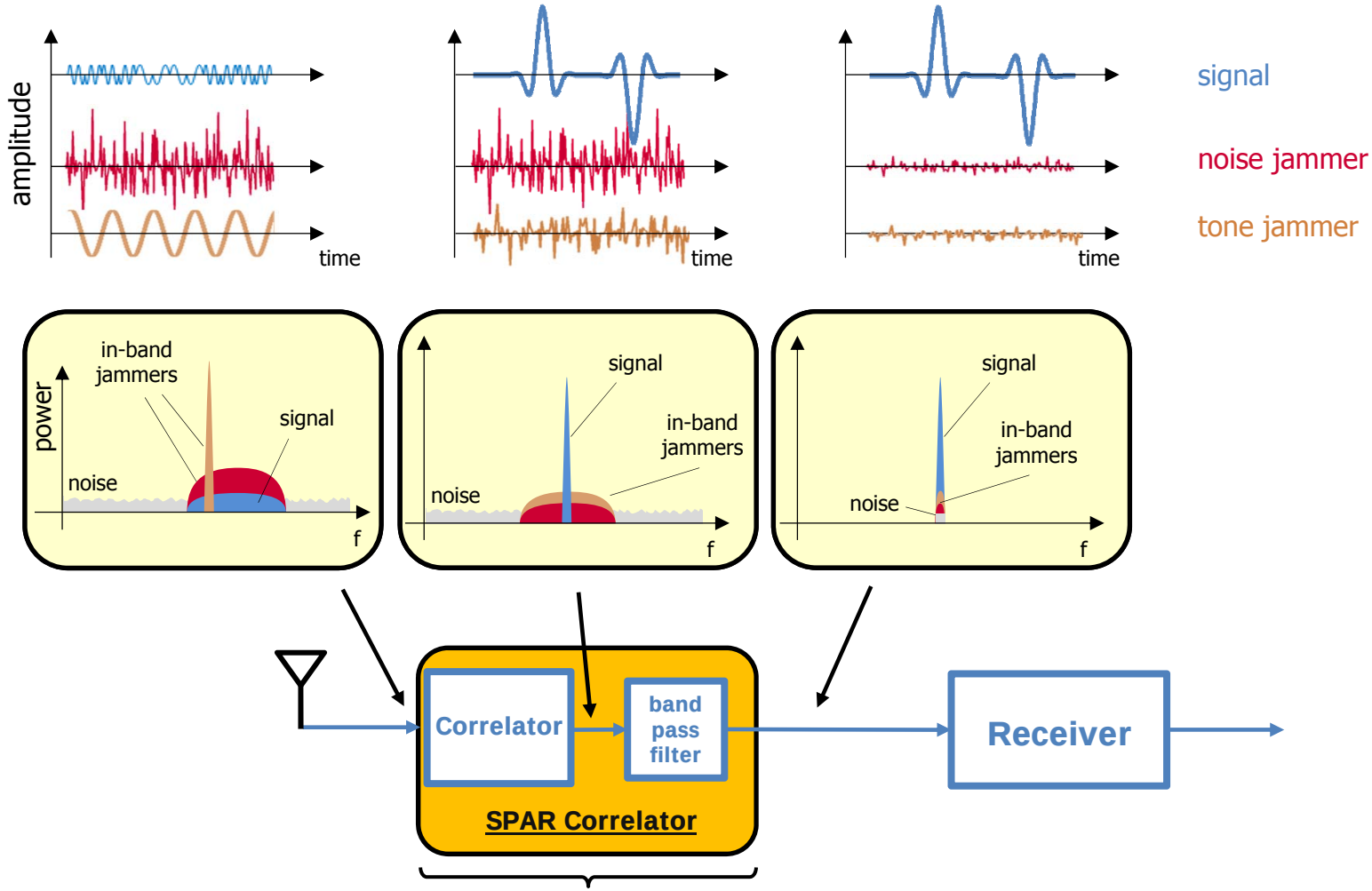


<u>Demos have shown analog correlators can select signals based on waveform features but:</u>

- ✘ Excessive attenuation of the desired signal precludes use at RF
- ✘ Can't reprogram the key waveform features because the code is locked in during the correlator's device design phase

Analog Correlator at RF not Realizable Today

Selecting Signals, Rejecting Interference



100x increase in signal to interference ratio (S/I)
100x reduced instantaneous bandwidth

SPAR Allows Operation in Highly Contested Environments

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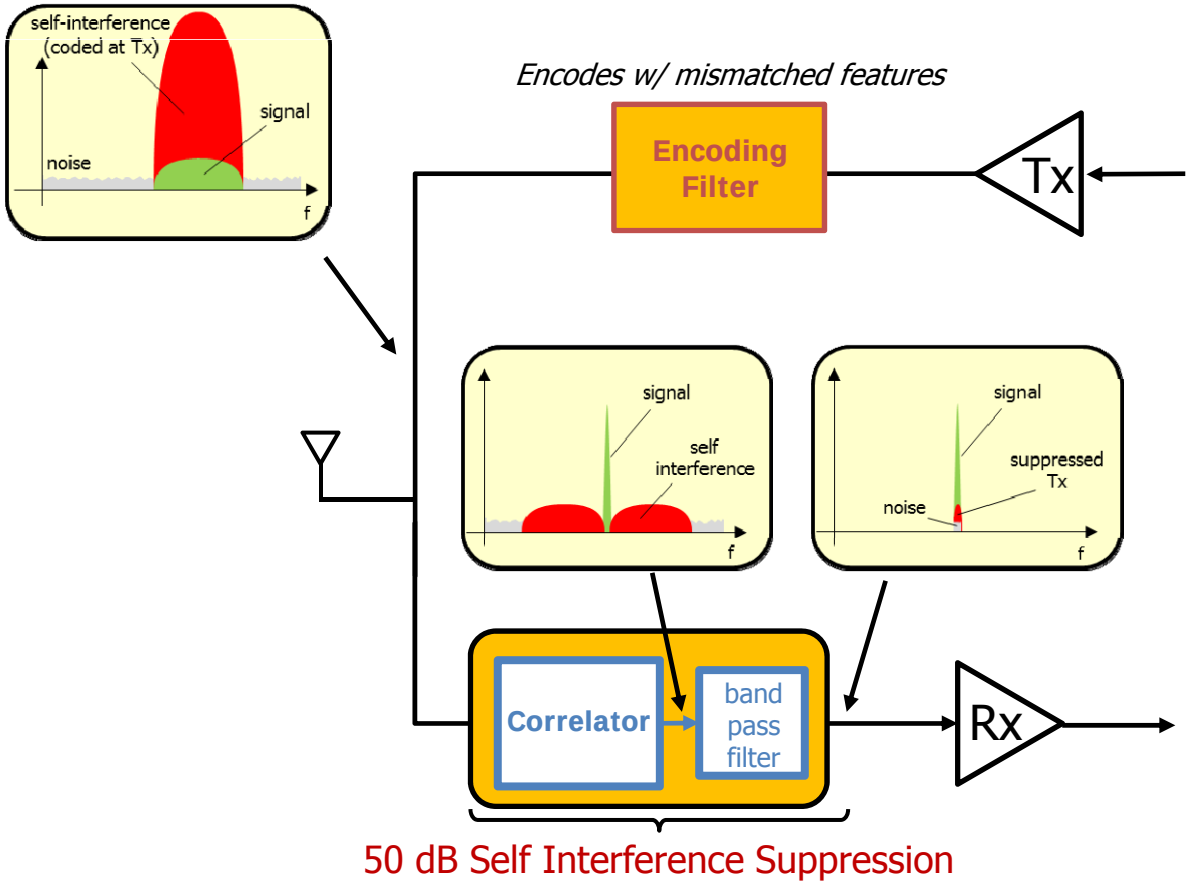
SPAR Transmit (Tx) Correlator Approach

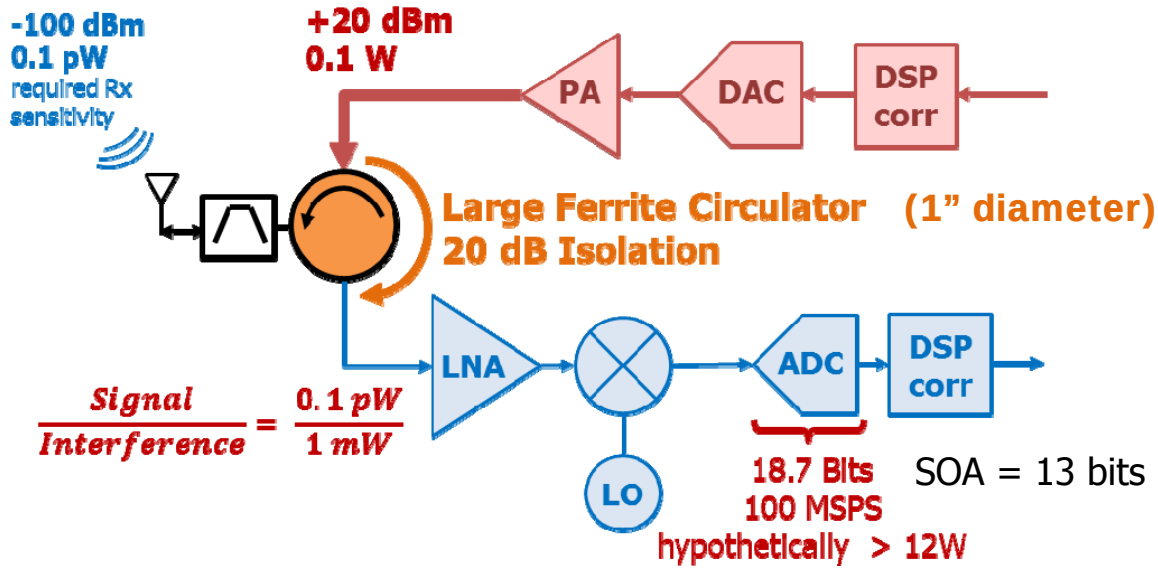


What Correlation Can Do That Cancellation Cannot

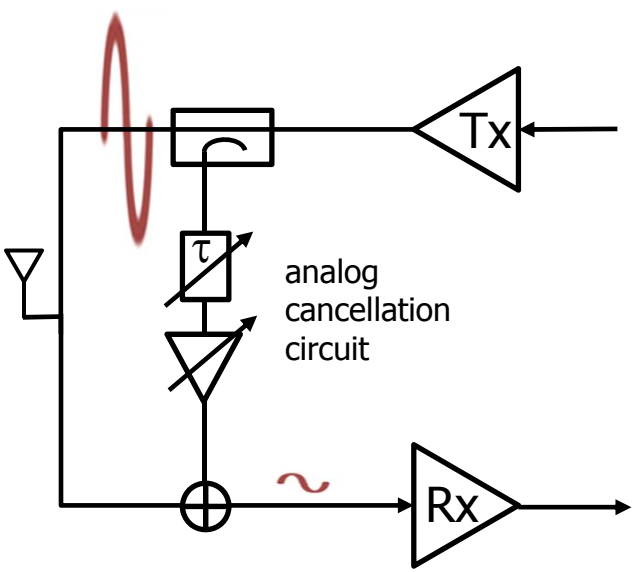
- Suppress external interference (including in an array)
- Does not degrade the receiver sensitivity
- Maintain communication while transmitting the same frequency

Simultaneous Transmit and Receive is Not Feasible Today at RF

Currently STAR operation is impossible due to Tx self-interference



SOA Tx Cancellers



- Do not suppress external in-band interference
- Do not work for reflected transmit signals or in an array
- Typically achieve less than 30 dB of Tx cancellation
- Often do not reject transmitter noise leaking into Rx

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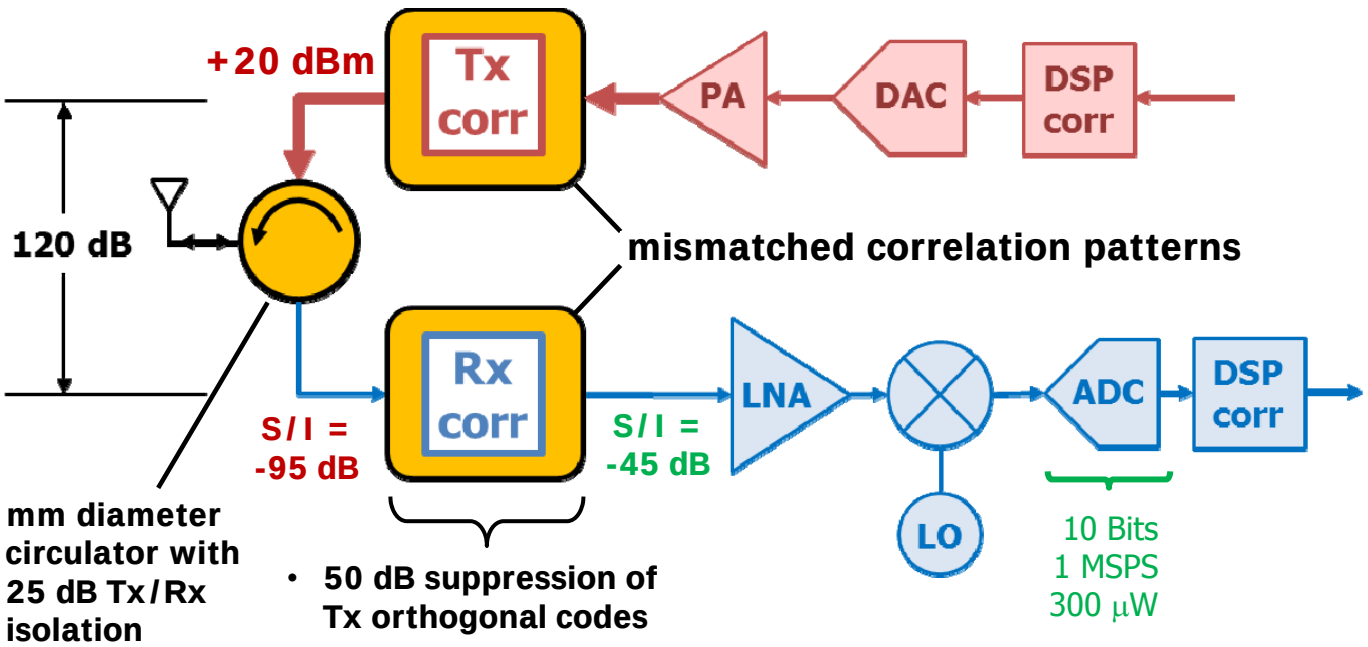
STAR Transceiver Enabled by SPAR



SPAR Allows Listening While Transmitting Enabling New Capabilities for Communications and DoD

Program Overview

Program Objectives

- Mitigate same frequency (in-band) RF interference of known and unknown characteristics prior to the RF receiver
- Provide at least 20 dB suppression of external (unknown) in-band interferers
- Provide at least 75 dB cancelation of internal self-interference
- Demonstrate the technology in a communications link capable of single antenna simultaneous transmit and receive (STAR)

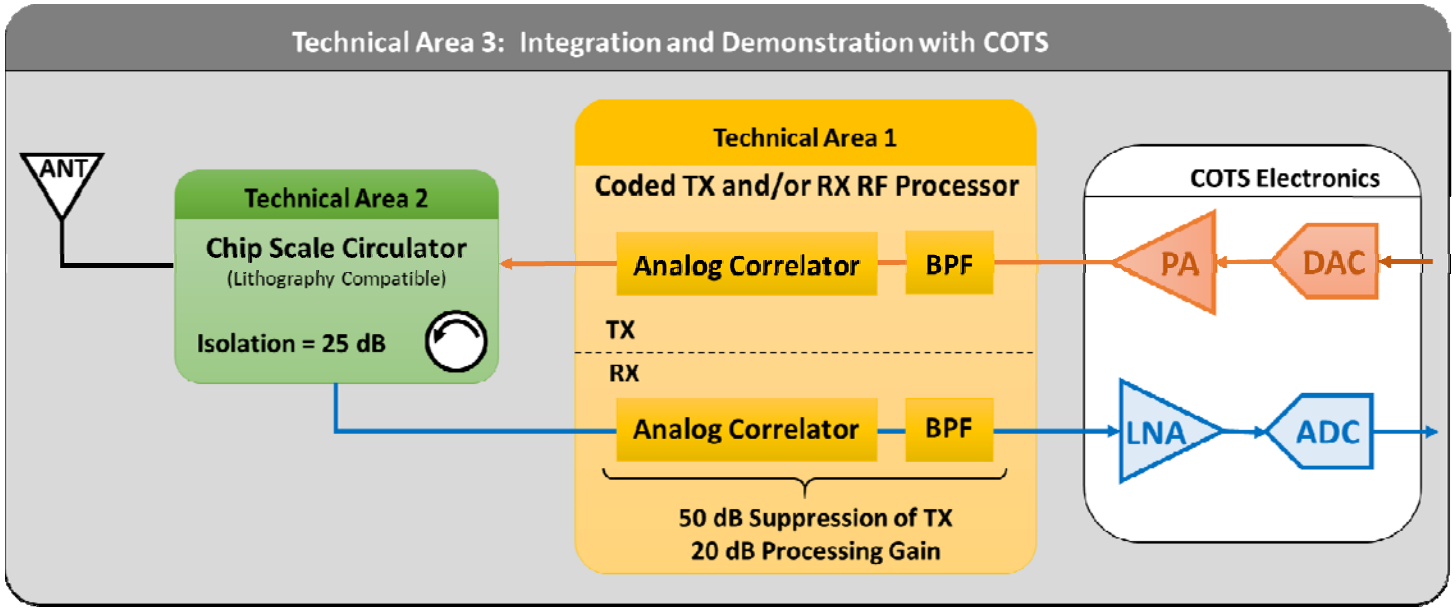
Of Particular Interest

- Approaches that exceed the BAA metrics, creating additional DoD capabilities
    - Power Handling ≥ 40 dBm
    - Noise Figure ≤ 2dB

Program Structure

Technical Areas of Interest

- Technical Area 1 – RF Correlation Processing
- Technical Area 2 – Chip-Scale Circulators and Nonreciprocal Components
- Technical Area 3 – STAR Technology Demonstration



BAA Overview

Total anticipated budget: $30M

- $17M for Technical Area 1 including Options
- $8M for Technical Area 2 including Options
- $5M for Technical Area 3

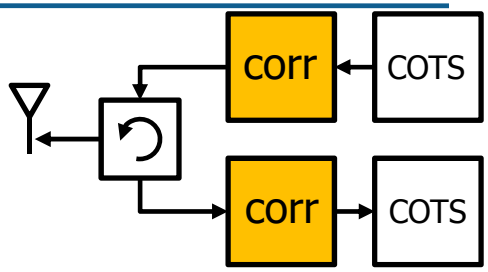
Expected duration

- 39 months (in 3 phases) for TA1 and TA2
- 12 months (single phase) for TA3

Anticipated individual awards: multiple

Anticipated funding type: 6.1 and/or 6.2

Technical Area 1 (TA1) - RF Correlation Processing



Common RF Correlator Metrics (Phase)	1	2	3
Center Frequency (GHz)	1		
Minimum Bandwidth at the Antenna (MHz)	10	20	**30**
Minimum RF Processing Gain (dB)^	10	15	**20**
Minimum Rejection of TX (dB)+	20	35	**50**
Reconfigurable Codes (#)	4	16	**64**
Code Reconfiguration Time (µs)	Performer Defined		
Range in Specific Channel Models (km)	Performer Defined		
Maximum Power Consumption (mW)	100		
Temperature Range (°C)	20 to 30	0 to 70	**0 to 70**
Receive Correlator Metrics (Phase)	**1**	**2**	**3**
Noise Figure (dB)*	6	4	**3**
Linearity: In-Band IIP3 (dBm)	15	22	**25**
Transmit Correlator Metrics (Phase)	**1**	**2**	**3**
Insertion Loss (dB)	5	3	**2**
Output P1dB (dBm)	28	35	**38**

^ Difference in dB between the signal-to-interferer ratio (S/I) coming out of the correlator and the S/I going into the correlator for noise or tone based interferers.

+ Rejection of signal and noise output from the Tx correlator at the output of the Rx correlator.

* When followed by a receiver with 1 dB noise figure, includes Tx noise.

Technical Area 1 – Options (TA1O)

- **What will be considered as an Option**
  - Should leverage work in the main TA1 track
  - Should not be a trivial or incremental extension of TA1 work
  - Proposal should answer the questions:
    Why is it DoD relevant? Why is it DARPA-level impact?
    How will we measure success (suggested metrics)?

- **Examples**
  - Analog filters based on the same material systems that are not correlators
  - Tx components withstanding ≥ 40 dBm (enables new applications: radar)
  - Components with lower noise figure, NF ≤ 2dB
  - Demonstrates the TA1 technology in a non-communication scenario (e.g. GPS, radar)

- **What will not be considered as an Option**
  - Slight improvements in TA1 metrics (e.g. Proc. Gain 20dB → 25dB)
  - Modeling studies that do not result in device demonstration

Up to $0.5M for 12 mo.
Executes concurrently with Phase III

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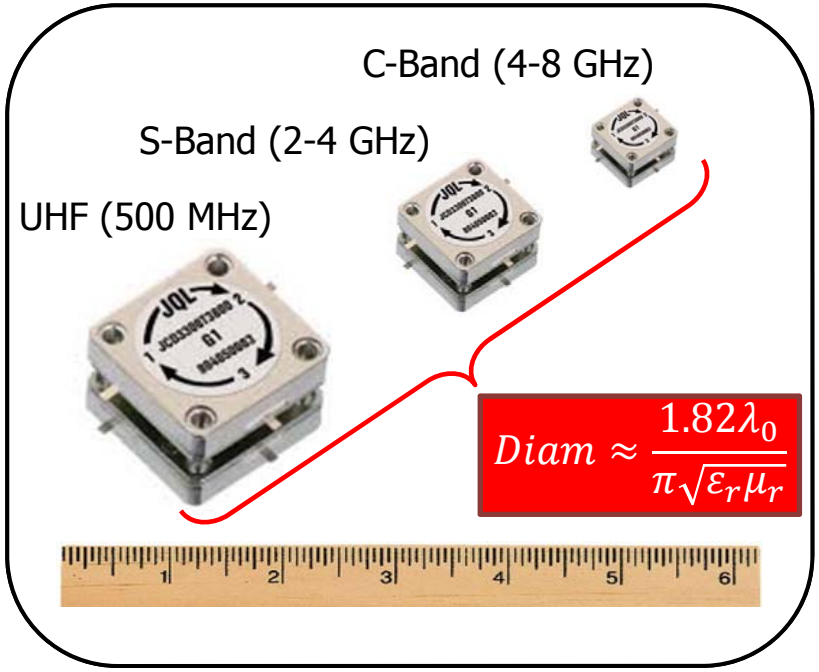
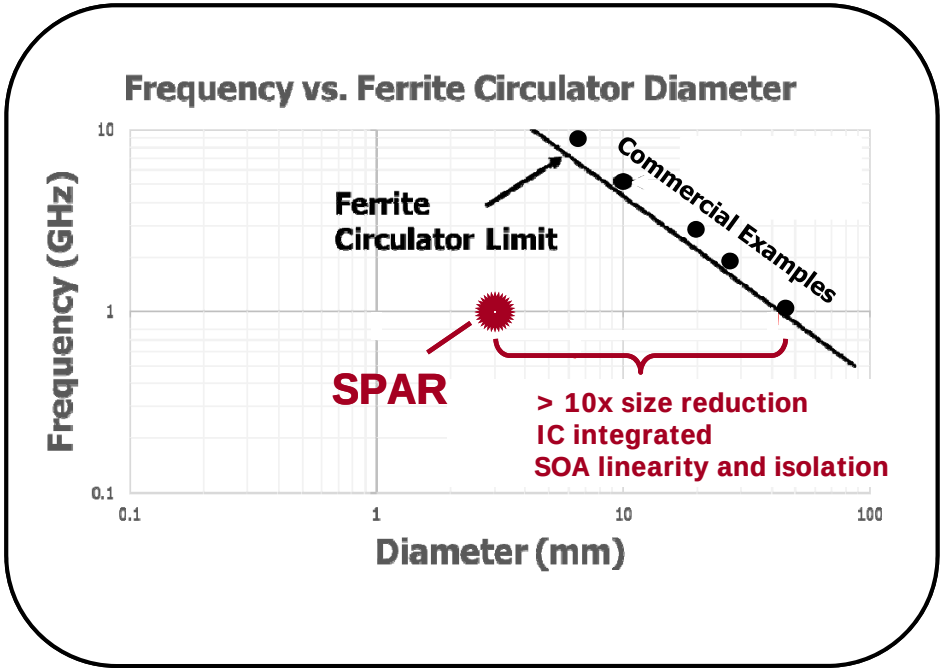
TA2: Limits of SOA Nonreciprocal Circuits

RF wavelength in magnetic material prevents miniaturization of ferrite circulators

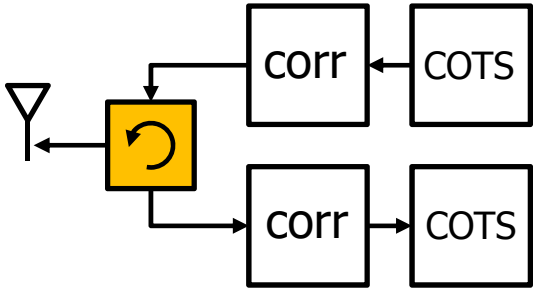




SPAR Breaks Inherent Frequency/Size Tradeoff in Traditional Ferrite Circulators

Technical Area 2 (TA2) – Chip-Scale Circulators and Nonreciprocal Components

Metric (Phase)	1	2	3
Frequency (GHz)	1		
Minimum Bandwidth (MHz)	10	20	30
Insertion Loss (dB)*	4	3	2
Minimum TX → RX Isolation (dB)*	15	20	25
Return Loss into Antenna (dB)*	15	20	25
Maximum Noise Figure (dB)*^	5	4	3
Output P1dB at Antenna Port (dBm)*	23	29	36
IIP3 Measured at Rx Port for Tx Input*	32	40	47
IIP3 Measured at Rx Port for Antenna Input*	17	24	27
Maximum Power Consumption (mW)	100		
Temperature Range (°C)	20 to 30	0 to 70	0 to 70
Maximum Dimension (mm)	10	6	3



* Specification must be met across the entire bandwidth.

^ When followed by a receiver with 1 dB noise figure, includes Tx noise.

Technical Area 2 – Options (TA2O)

- **What will be considered as an Option**
  - Should leverage work in the main TA2 track
  - Should not be a trivial or incremental extension of TA2 work
  - Proposal should answer the questions:
    Why is it DoD relevant? Why is it DARPA-level impact?
    How will we measure success (suggested metrics)?

- **Examples**
  - Higher power handling ≥ 40 dBm and/or lower noise figure ≤ 2dB
  - Tx/Rx isolation ≥ 35 dB
  - Non-reciprocal components as constituent components in a higher-order circuit with new functionality
  - Demonstrate gyrator circuits capable of replacing inductors in higher-order circuits

- **What will not be considered as an Option**
  - Slight improvements in TA2 metrics
  - Modeling studies that do not result in device demonstration

Up to $0.5M for 12 mo.
Executes concurrently with Phase III

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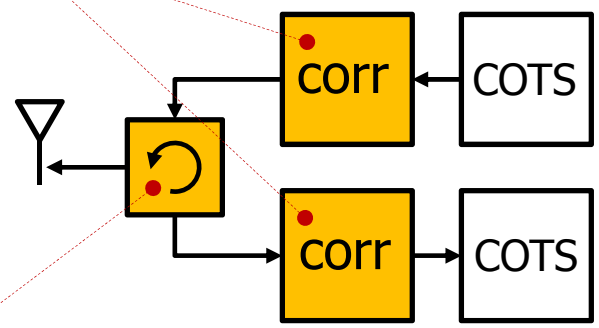
Technical Area 3 (TA3) – STAR Technology Demonstration

TA-1: RF correlators

TA-3: STAR link demonstrator (Phase 3 only)



TA-2: Chip-scale nonreciprocal circuits

Metrics	Phase III Minimum
Bidirectional Bit Rate (kbps in each direction)	> 200
Transmitter Power (dBm)	> 20
LOS Distance Between Transceiver Antennas (km)	> 1
Range Under Additional NLOS Channel Environments	Proposer Defined
Bit Error Rate*	Proposer Defined
Sensitivity at Antenna	Proposer Defined

* Specify if Error Correction is to be employed. Give rationale and description of the Error Correction model and specific implementation. If no Error Correction is intended, please state in the proposal.

Technical Area 3 (TA3) – STAR Technology Demonstration

Things to include in the TA3 proposal:

- Define DoD-relevant usage scenario (squad level comms, air-to-air, air-to-ground, other)
- For the selected scenario, analyze the wireless channel
  - Channel model, fast and slow fading, maximum delay spread/ coherence bandwidth / coherence time
  - Justify waveform selection
- Link range, Link budget, Link data rate, Bit Error Rate, Error Correction
- Final Demonstration Details, Test Plan

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Combining Technical Areas in One Proposal

A single proposal may address:

- **(a) Technical Area 1 only**
- **(b) Technical Area 2 only**
- **(c) Technical Areas 1 and 2**
- **(d) Technical Areas 1, 2, and 3**

Maximum one Option per proposal is allowed in all cases

Technical Area	A single proposal may address			
	(a)	(b)	(c)	(d)
TA1	X		X	X
TA2		X	X	X
TA3				X

Proposal Evaluation Criteria

<u>In order of importance:</u>

1. **Overall Scientific and Technical Merit**

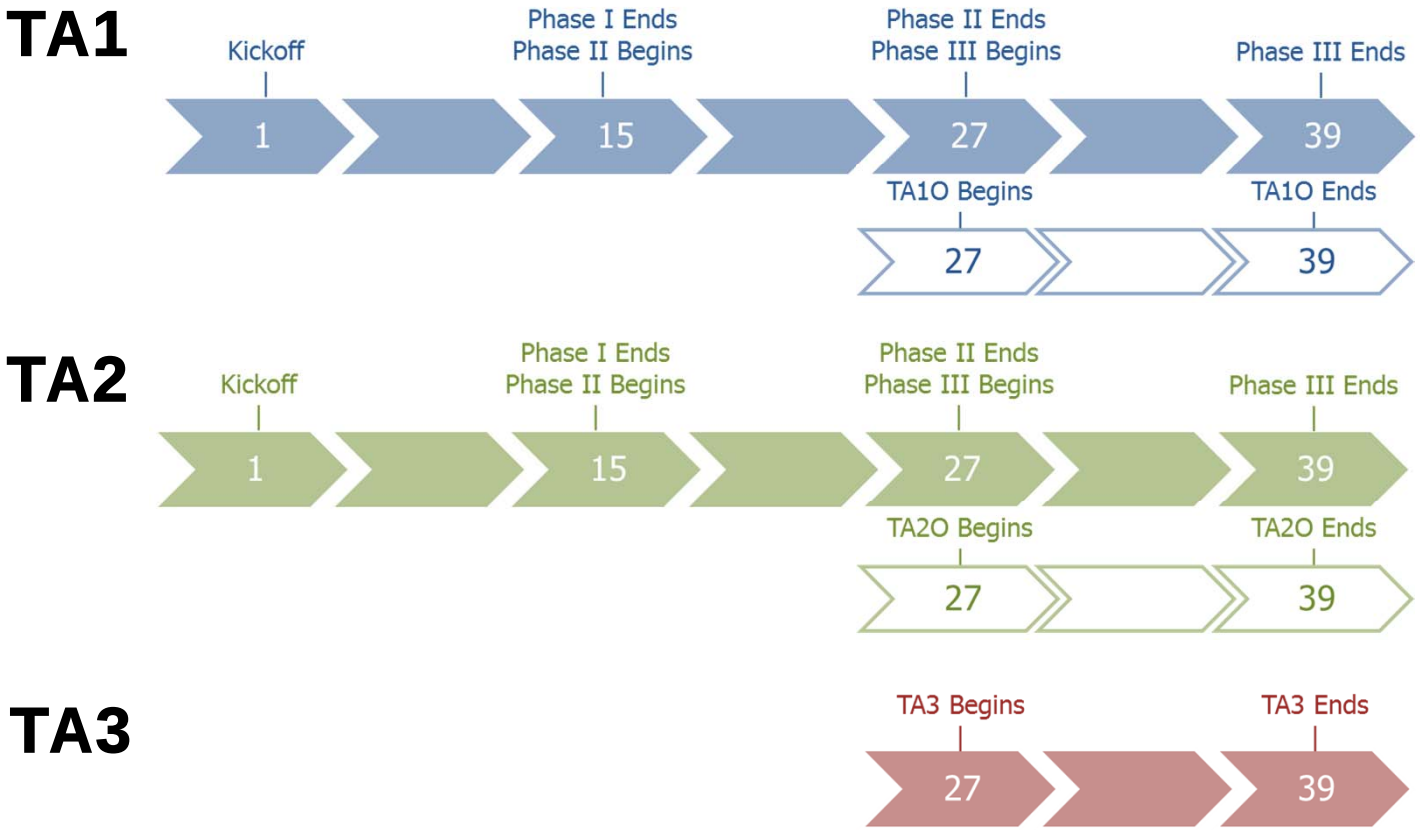
2. **Potential Contribution and Relevance to the DARPA Mission**

3. **Cost and Schedule Realism**
   - If proposing to more than one TA and/or proposing to either Option (only one Option allowed per proposal):
     Independently cost the TAs and Option, they must be clearly separable

   - If Proposing to TA3:
     The TA3 cost must be self-contained and clearly separable from TA1 and TA2
     TA3 System Integration costs must NOT appear under TA1 and TA2

4. **Plans and Capability to Accomplish Technology Transition**

Project Timelines



Abstracts due	March 11
Proposals due	May 12
Estimated period of performance start	October 1

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SPAR Questions and Answers Session

SPAR
DARPA-BAA-16-20

Jessica Downing
Contracting Officer
DARPA Contracts Management Office

22 February 2016

Proposers Day Disclaimer

- Plenty of good information is made available to potential proposers to help clarify program goals/objectives and proposal preparation instructions - those things that are stipulated in the BAA.

- However:
  - Only the information/instructions in the BAA counts.
  - Proposals will only be evaluated in accordance with the instructions provided in the BAA.
  - Any response provided by the Government in the FAQ that's different than what is provided in the BAA will be effected by an amendment to the BAA.
    - Such responses will make note of an impending BAA amendment.

- Only a duly authorized Contracting Officer may obligate the Government.

BAA Process - Overview

Broad Agency Announcement (BAA) has been released utilizing the procedures stipulated at FAR 35.016.

- BAA's may be used by agencies to fulfill their requirements for scientific study and experimentation directed toward advancing the state-of-the-art or increasing knowledge or understanding (Science and Technology) rather than focusing on a specific system or hardware solution.
  - Science and Technology (S&T) is what DARPA does.

Per FAR 35.016 -

The BAA, together with any supporting documents, shall—

- Describe the agency's research interest (program or broad research interests);
- Describe the criteria for selecting the proposals, their relative importance, and the method of evaluation;
- Specify the period of time during which proposals submitted in response to the BAA will be accepted; and
- Contain instructions for the preparation and submission of proposals.

Per FAR 35.016 -

- Proposals received as a result of the BAA shall be evaluated in accordance with evaluation criteria specified therein through a peer or scientific review process.
- Proposals need not be evaluated against each other since they are not submitted in accordance with a common work statement.
- The primary basis for selecting proposals for acceptance shall be technical, importance to agency programs, and fund availability. Cost realism and reasonableness shall also be considered to the extent appropriate.

- - That's it, as far as the regulations go - -

BAA Process - Overview

BAA allows for a variety of technical solutions and award instrument types.

- The BAA defines the problem set, the proposer defines the solution (and SOW).
- Allows for multiple award instrument types (depending on the nature of research).

DARPA Scientific Review Process.

- Proposals are evaluated on individual merit and relevance as it relates to the stated research goals/objectives rather than against one another (there is no common statement of work).
- Selections will be made to proposers whose proposals are determined to be most advantageous to the Government, all factors considered, including potential contributions to research program and availability of funding.

➢ **Government may select for negotiation all, some, or none of the proposals received.**

➢ **Government may accept proposals in their entirety or select only portions thereof.**

➢ **Government may elect to establish portions of proposal as options.**

BAA Details

BAA does include an Abstract phase.

- Strongly encouraged.
- 8 pages for combined TA1, TA2, and TA3
- 7 pages for TA1 and TA2
- 5 pages for either TA1 or TA2
- you will receive feedback from the PM.

- **6.1 (basic) or 6.2 (applied) funding is anticipated.**
  - 6.2: Universities - Fundamental Research, no publication restrictions apply.
    - One exception is non-university subcontractors.
  - 6.2: Other than Universities - Non-Fundamental/Restricted Research, publication restrictions apply.
    - One exception is University subcontractors.

Available award instrument types:

- All types are available (contract, cooperative agreement, grant or Other Transaction)

Total Funding Available For Awards: ~$30M (all performers, all TAs).

BAA Details

Program Structure, Milestones and Deliverables:

- TA1: RF Correlation Processing
  - Phase I: 15 months
  - Phase II: 12 months – Option
  - Phase III: 12 months – Option
- TA1 Option (TA1O): Other RF Signal Processors

- TA2: Chip-Scale Circulators and Nonreciprocal Components
  - Phase I: 15 months
  - Phase II: 12 months – Option
  - Phase III: 12 months – Option
- TA2 Option (TA2O): Other Nonreciprocal Devices and Circuits

- TA3: STAR Technology Demonstration
  - Phase III: 12 months – Option

May only propose to either TA1O or TA2O and the option must be completed within the existing period of performance of Phase III.

BAA Details

Program Structure, Milestones and Deliverables:

- BAA Table 1 Stipulates The Gov't-defined Program Metrics for TA1 (by phase).
- BAA Table 2 Stipulates The Gov't-defined Program Metrics for TA2 (by phase).
- BAA Table 3 Stipulates The Gov't-defined Program Metrics for TA3 (by phase).

- **Deliverables are defined within the BAA for each TA.**

Proposal Preparation Guidelines:

- **Proposals may address only Technical Area 1.**
- **Proposals may address only Technical Area 2.**
- **Proposals may address Technical Areas 1 and 2.**
- **Proposals may address Technical Areas 1, 2, and 3.**
- **See Chart on Page 11 of BAA.**

BAA includes 3 attachments:

- Proposer Checklist.
- Summary Slide.
- Budget Spreadsheet Template.

Eligibility Issues

All interested/qualified sources may respond subject to the parameters outlined in BAA.

Foreign participants/resources may participate to the extent allowed by applicable Security Regulations, Export Control Laws, Non-Disclosure Agreements, etc. (No classified proposals anticipated).

FFRDCs and Government entities:

- Are not prohibited by the BAA from proposing.
- Are, however, subject to applicable direct competition limitations.
- Are, however, required to demonstrate eligibility (sponsor letter).
- ➢ The burden to prove eligibility for all such team members rests with the proposer.
- ➢ All elements of a proposal (tech and cost, prime and subs) must be included in the prime's submission in order to be reviewed.

Real and/or Perceived Conflicts of Interest:

- Identify any conflict/s.
- If any are identified, a mitigation plan must be included.

Proposal Preparation
(Volume I - Technical & Management)

Page Limitations (Sections A – H):

- 25 pages for combined TA1, TA2, and TA3
- 22 pages for combined TA1 and TA2
- 18 pages for either TA1 or TA2

Detailed Proposal Information:

- **Executive Summary**
- **Teaming Plan**
- **Technical Approach**
- **State-of-the-Art Comparison**
- **Statement of Work**
- **Deliverables**
- **Risk Mitigation Plan**
- **Schedule & Measurable Milestones**
- **Previous Accomplishments**
- **Facilities**
- **Technical Transfer**
- **Summary Slide**

***Nonstandard language is included throughout Volume 1 – read carefully!**

- **Make sure to include every proposal topic - the point is to ensure the Gov't fully understands what you are proposing.**
- **Make sure to review "Funding Opportunity Description" for additional proposal preparation information/instructions of a technical nature.**

Proposal Preparation
(Volume II - Cost Proposal)

No Page Limit.

Those Seeking a Contract (FAR/DFARS)

- Certified Cost and Pricing Information (required if over $750,000 – prime and subs)
  - Exception (DoD Waiver) for nonprofit organizations, including educational institutions.
  - Exception (DoD Pilot Program through 2020) for small businesses and non-traditional defense contractors if less than $7.5M.
  - No exception for FFRDC's (if selected, rates/factors reviewed by sponsor CO).
  - Primes <u>must</u> provide sub analysis (per FAR Part 15).
  - Provide <u>all</u> that is stipulated in the BAA and FAR Part 15 (Table 15-2).
  - Proposal Adequacy Checklist (DFARS 252.215-7009) <u>is required</u>.

All Others (Non-profits/Schools, Assistance Instruments, OT's, Pilot Program)

- Other than certified cost/pricing information <u>is required</u> (FAR Part 15).
- Provide the pricing info requested in the BAA.

Proposal Preparation
(Volume II - Cost Proposal)

All Proposers

- Detailed cost build-ups by phase, task and month.
- Cost build-ups using MS Excel with editable cells that include all formulas.

Cost Accounting System Approval

- Required if seeking a cost reimbursement type contract.
- Provide completed SF 1408 if system is not yet approved.
- DCMA approval can take 90+ days (after selected).

Small Business Subcontracting Plan - required if proposal from large business exceeds $700,000.

Subcontractor Proposal(s):

- The prime contractors submission <u>must</u> include, at a minimum, a non-proprietary, subcontractor proposal for <u>each</u> subcontractor.*
- All subcontractors <u>must</u> be able to submit a fully disclosed version of their proposal directly to the Government <u>immediately upon request.</u>

➢ *NO ROMS! (otherwise the proposal will be deemed noncompliant)

Proposal Preparation (Misc.)

Expected award date (for pricing purposes): ~ October 2016.

- Following the proposal preparation instructions assists the evaluation team to clearly understand what is being proposed and supports a timely negotiation.

- Proposers are cautioned that evaluation ratings may be lowered and/or proposals rejected if proposal submittal or preparation instructions are not followed.

Proposal Submission

Abstracts are due 11 March 2016 (1:00 PM Eastern)

- All abstracts must be submitted via DARPA BAA Website (https://baa.darpa.mil).
- You must click the "Finalize Proposal Abstract" button.
- If you don't then your abstract has not been submitted for review.

Proposals are due 12 May 2016 (1:00 PM Eastern)

- Late is Late!
- Proposals received after the due date/time will not be reviewed.

All proposals seeing a grant or cooperative agreement must be submitted via either Grants.gov or hard copy mailed to DARPA.

- ✓ Please read the instructions (warnings) in the BAA regarding use of Grants.gov NOW.

All proposals seeking a contract or OT must be submitted via DARPA BAA Website (https://baa.darpa.mil).

- You must click the "Finalize Full Proposal" button.
- If you don't then your proposal has not been submitted for review.

Data Rights

Government desires Unlimited Rights to data and/or software deliverables.

If asserting less than Unlimited Rights (e.g., Restrictions):

- Provide and justify basis of assertions using the prescribed format.
- Explain how each item will be used to support the proposed research project.
- Explain how the Government will be able to reach its program goals (including transition).

- The above Data Rights Cert includes prime and sub info, as applicable.
- Provide even if you are proposing other than a contract.
- This information is assessed during evaluations (barriers to transition).
- Final/Negotiated Data Rights Cert is made a part of the award instrument (for contracts and OT's).

Communications

Prior to Receipt of Proposals (Solicitation Phase): No restrictions, however Gov't (PM/PCO) shall not dictate solutions or transfer technology.

- Typically handled through the FAQ.

After Receipt of Proposals/Prior to Selections (Scientific Review Phase): Limited to Contracting Officer or BAA Coordinator (with approval) to address clarifications requested by the review team.

- Proposal cannot be changed in response to clarification requests.

After Selection/Prior to Award (Negotiation Phase): Negotiations are conducted by the Contracting Officer.

- PM and/or COR typically tasked with finalizing the SOW (with PI).
- PM and/or COR typically involved in any technical discussions (i.e., partial selection discussions).

Informal Feedback Sessions (Post Award): May be requested/provided once the selection(s) are made.

- If made on a timely basis (~2 wks after letter), all requests will be accepted.

FAQ

Questions must be submitted in writing to DARPA-BAA-16-20@darpa.mil.

- Send by no later than 29 April 2016, 1:00pm Eastern.
- Avoid including proprietary/sensitive information (mark such info if included).

FAQ will be posted to:

- http://www.darpa.mil/work-with-us/opportunities
- Filter by Office (select MTO)
- Select "DARPA-BAA-16-20."

The BAA, and any amendments thereto, is posted on https://www.fbo.gov/.

- ➢ Sometimes possible that the BAA is amended due to question/s received (FAQ will note this if applicable).

Highly Recommended Budget Template
Attachment 3 – DARPA-BAA-16-20

Elizabeth Kilpatrick and Logan Nichols

22 February 2016

Sales Pitch – why you should still use this template even through it is not mandatory

- Whether you choose to use this template or not, the SPAR BAA asks you to provide all the information the template asks for:
  - "The proposer shall provide a summary cost breakdown by **technical area** and a detailed cost breakdown by **phase**…, technical **task/sub-task**, and **total cost by month**." (*DARPA-BAA-16-20, page 31*)
  - The Government requires that tables included in the cost proposal also be provided in an **editable, MS Excel format with calculation formulas intact** to allow traceability of the cost proposal numbers across the prime and subcontractors (*DARPA-BAA-16-20, page 33*)
  - The Government also requires that the proposer provide a detailed cost breakdown to include: (1) **total program cost broken down by major cost items (direct labor, including labor categories; subcontracts; materials; other direct costs, overhead charges, etc.)** and further broken down by **task and phase**; (2) an itemization of major **subcontracts and equipment purchases**; (3) an itemization of any **information technology (IT) purchase**, …; (4) a summary of **projected funding requirements by month**; and (5) the source, nature, and amount of any industry **cost-sharing**; and (6) identification of pricing assumptions of which may require incorporation into the resulting award instrument (e.g., use of Government Furnished Property/Facilities/Information, access to Government Subject Matter Expert/s, etc.) (*DARPA-BAA-16-20, page 31*)

Attachment 1 – Cost Proposal Checklist

- Attachment 1, the cost proposal checklist, also asks you to provide all the information the template asks for:
  - Does your Cost Proposal include (1) a summary cost buildup by Phase, (2) a summary cost buildup by Year, and (3) a detailed cost buildup of for each Phase that breaks out each task and shows the cost per month?
  - Does your cost proposal (detailed cost buildup #3 above … show a breakdown of the major cost items listed below:
    - Direct Labor (Labor Categories, Hours, Rates)
    - Indirect Costs/Rates (i.e., overhead charges, fringe benefits, G&A)
    - Materials and/or Equipment
    - Subcontracts/Consultants
    - Other Direct Costs
    - Travel
  - Have you provided documentation for proposed costs related to travel, to include purpose of trips, departure and arrival destinations and sample airfare?
  - Does your cost proposal include a complete itemized list of all material and equipment items to be purchased (a priced bill-of-materials (BOM))?
  - Does your cost proposal include vendor quotes or written engineering estimates (basis of estimate) for all material and equipment with a unit price exceeding $2500?

Key Excel Concepts & Tutorial Videos

- We've made it easy for you to customize the template to reflect the structure of your particular project
- Key MS Excel Concepts
  - Linking data within tabs
  - Linking data across tabs
  - Absolute reference
    - http://youtu.be/NmVMjQzseLA
- Tutorial
  - Part I: Example Budget:
    - http://youtu.be/Np-OHcLnfdA
  - Part II: Editing and Customizing the Blank Budget Template:
    - http://youtu.be/Obr7H8bYIG4
- Contact the SPAR BAA Inbox with any questions
  - DARPA-BAA-16-20@darpa.mil

General Structure of Template

- Cost Proposal Summary
- Summary by Phase
- Summary by Task

High-level Summary Tabs

- Phase I, II
- Travel
- Program-Admin Costs (ODCs)
- Subcontractor Budget
  - Subcontractor Travel and ODCs

Detailed data-entry tabs
linked together

- Expenditures by Month
- Animal and Human Use
- Milestones and Deliverables

Other Essential Information

- Cell Color Legend
  - Grey Cells: Data Entry
  - White Cells: Formula
  - You can edit any cell (data or formula) as necessary to fit this template to the structure of your specific project
- Not your entire cost proposal
  - DARPA-BAA-16-20 – pages 30-32
  - Certified cost and pricing data
  - May still need to provide information to agent if selected for award

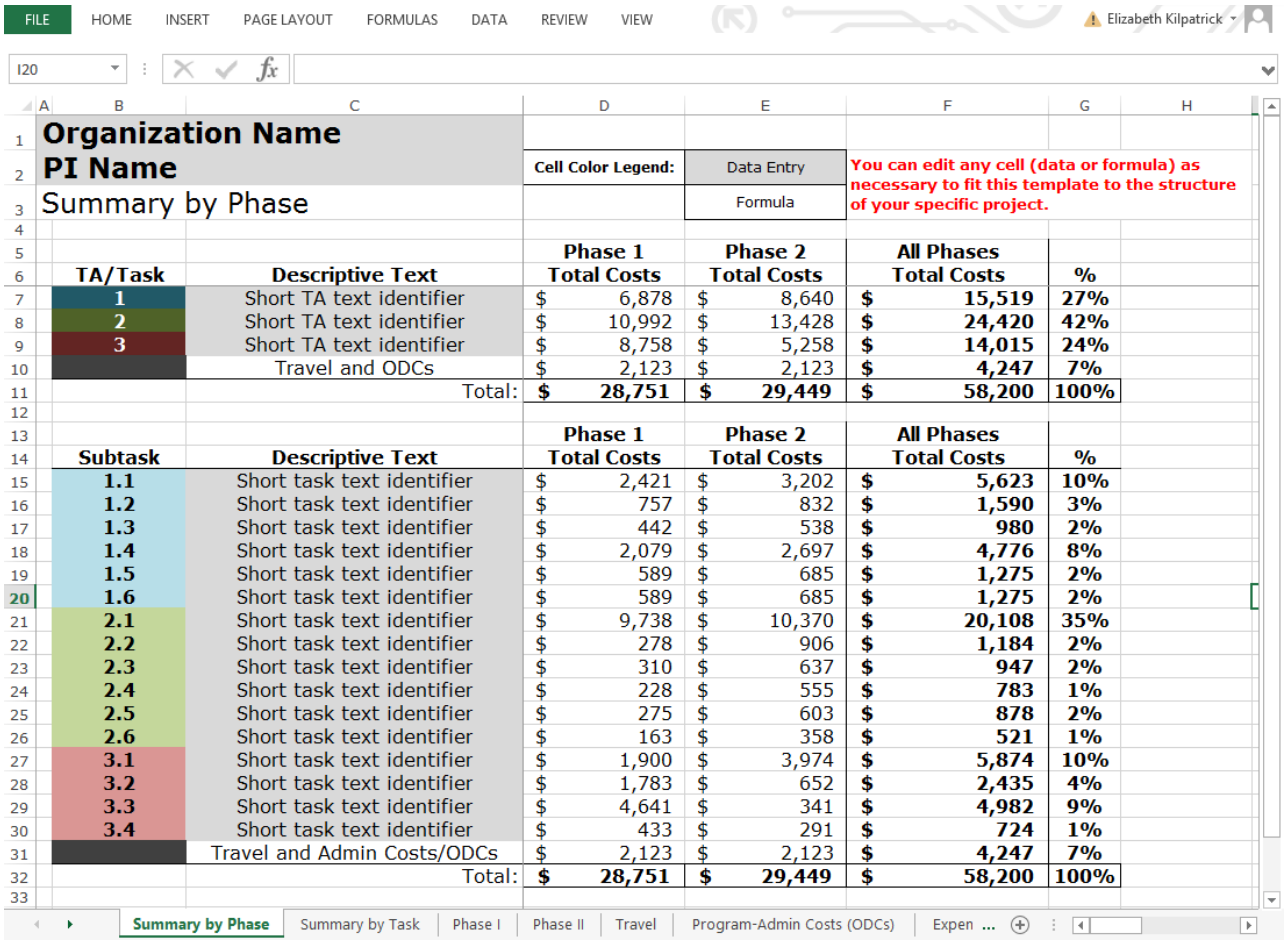
Cost Proposal Summary Tab

	A	B	C	D
1	**Cost Proposal Summary**			
2				
3	**Title**	list title of proposal		
4	**TA**	indicate if this is a proposal for TA 1 or TA 2		
5	**Prime**	list prime institution		
6	**Prime PI**	list prime PI name and email address		
7	**Prime Co-PIs/Co-Is**	list prime Co-PIs and Co-Is		
8	**Subs**	list ALL subcontractor institutions		
9	**Sub PIs**	list subcontractor PIs		
10				
11	**Period of Performance - Phase I/Base**	insert period of performance (e.g., 24 months) for Phase I		
12	**Period of Performance - Phase II/Option 1**	insert period of performance (e.g., 24 months) for Phase II		
13	**Period of Performance - Total Project**	insert period of performance (e.g., 48 months) for total project		
14				
15	**Phase I/Base Total Cost**	$ -		
16	**Phase II/Option 1 Total Cost**	$ -		
17	**Total Project Cost**	**$ -**		
18				
19	**Total Prime**	$ -		
20	**Total Subcontractor**	$ -		
21				
22	**Personnel + Benefits**	$ -		
23	**Supplies**	$ -		
24	**Equipment**	$ -		
25	**Subcontractors**	$ -		
26	**Patient/Animal Related**	$ -		
27	***Sub-Total: Direct Costs***	$ -		
28	**Modified Total Direct Costs**	$ -		
29	***Sub-Total: Indirect Costs***	$ -		
30				
31				

Cost Proposal Summary | Summary by Phase | Summary by Task | Phase I | Phase II | Travel | Program-Adr ...

- Add requested information to rows 3-13
- Rows 15-29 contain formulas that link to data from the "Summary by Phase" and "Summary by Task" tabs
- Unless you make substantial edits to the template, you will probably not need to edit the formulas
  - If you add another cost item (e.g., animal studies) to the phase tabs, please link to it here

Summary by Phase Tab



Organization Name
PI Name
Summary by Phase

Cell Color Legend:	Data Entry
	Formula

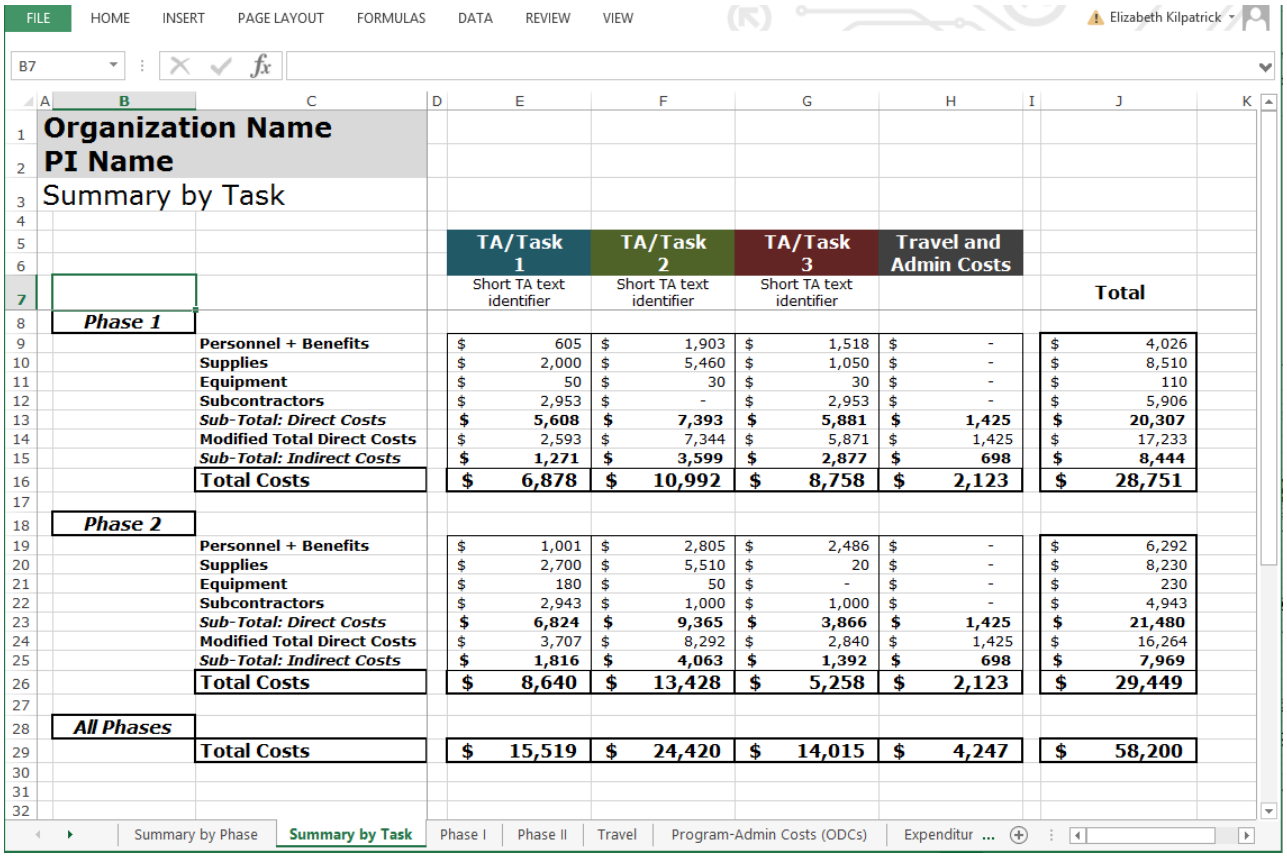
You can edit any cell (data or formula) as necessary to fit this template to the structure of your specific project.

TA/Task	Descriptive Text	Phase 1 Total Costs	Phase 2 Total Costs	All Phases Total Costs	%
1	Short TA text identifier	$ 6,878	$ 8,640	$ 15,519	27%
2	Short TA text identifier	$ 10,992	$ 13,428	$ 24,420	42%
3	Short TA text identifier	$ 8,758	$ 5,258	$ 14,015	24%
	Travel and ODCs	$ 2,123	$ 2,123	$ 4,247	7%
	Total:	$ 28,751	$ 29,449	$ 58,200	100%

Subtask	Descriptive Text	Phase 1 Total Costs	Phase 2 Total Costs	All Phases Total Costs	%
1.1	Short task text identifier	$ 2,421	$ 3,202	$ 5,623	10%
1.2	Short task text identifier	$ 757	$ 832	$ 1,590	3%
1.3	Short task text identifier	$ 442	$ 538	$ 980	2%
1.4	Short task text identifier	$ 2,079	$ 2,697	$ 4,776	8%
1.5	Short task text identifier	$ 589	$ 685	$ 1,275	2%
1.6	Short task text identifier	$ 589	$ 685	$ 1,275	2%
2.1	Short task text identifier	$ 9,738	$ 10,370	$ 20,108	35%
2.2	Short task text identifier	$ 278	$ 906	$ 1,184	2%
2.3	Short task text identifier	$ 310	$ 637	$ 947	2%
2.4	Short task text identifier	$ 228	$ 555	$ 783	1%
2.5	Short task text identifier	$ 275	$ 603	$ 878	2%
2.6	Short task text identifier	$ 163	$ 358	$ 521	1%
3.1	Short task text identifier	$ 1,900	$ 3,974	$ 5,874	10%
3.2	Short task text identifier	$ 1,783	$ 652	$ 2,435	4%
3.3	Short task text identifier	$ 4,641	$ 341	$ 4,982	9%
3.4	Short task text identifier	$ 433	$ 291	$ 724	1%
	Travel and Admin Costs/ODCs	$ 2,123	$ 2,123	$ 4,247	7%
	Total:	$ 28,751	$ 29,449	$ 58,200	100%

- Provides totals for task and subtask per phase and for the total project
- Links to data from the "Phase" tabs
- If you have a different number of TAs, tasks, or subtasks, it will be necessary for you to modify the structure and formulas in this tab
  - Part II of the tutorial videos will show you how to do this

Summary by Task Tab



Organization Name
PI Name

Summary by Task

		TA/Task 1	TA/Task 2	TA/Task 3	Travel and Admin Costs	Total
		Short TA text identifier	Short TA text identifier	Short TA text identifier		
Phase 1						
	Personnel + Benefits	$ 605	$ 1,903	$ 1,518	$ -	$ 4,026
	Supplies	$ 2,000	$ 5,460	$ 1,050	$ -	$ 8,510
	Equipment	$ 50	$ 30	$ 30	$ -	$ 110
	Subcontractors	$ 2,953	$ -	$ 2,953	$ -	$ 5,906
	Sub-Total: Direct Costs	**$ 5,608**	**$ 7,393**	**$ 5,881**	**$ 1,425**	**$ 20,307**
	Modified Total Direct Costs	$ 2,593	$ 7,344	$ 5,871	$ 1,425	$ 17,233
	Sub-Total: Indirect Costs	**$ 1,271**	**$ 3,599**	**$ 2,877**	**$ 698**	**$ 8,444**
	Total Costs	**$ 6,878**	**$ 10,992**	**$ 8,758**	**$ 2,123**	**$ 28,751**
Phase 2						
	Personnel + Benefits	$ 1,001	$ 2,805	$ 2,486	$ -	$ 6,292
	Supplies	$ 2,700	$ 5,510	$ 20	$ -	$ 8,230
	Equipment	$ 180	$ 50	$ -	$ -	$ 230
	Subcontractors	$ 2,943	$ 1,000	$ 1,000	$ -	$ 4,943
	Sub-Total: Direct Costs	**$ 6,824**	**$ 9,365**	**$ 3,866**	**$ 1,425**	**$ 21,480**
	Modified Total Direct Costs	$ 3,707	$ 8,292	$ 2,840	$ 1,425	$ 16,264
	Sub-Total: Indirect Costs	**$ 1,816**	**$ 4,063**	**$ 1,392**	**$ 698**	**$ 7,969**
	Total Costs	**$ 8,640**	**$ 13,428**	**$ 5,258**	**$ 2,123**	**$ 29,449**
All Phases						
	Total Costs	**$ 15,519**	**$ 24,420**	**$ 14,015**	**$ 4,247**	**$ 58,200**

- Provides totals for each major cost item (e.g., labor, equipment, subcontractors, etc.) for each task, each phase, and the total project
- Links to data from the "Phase" tabs
- If you have a different number of TAs, tasks, or subtasks, it will be necessary for you to modify this tab
  - Part II of the tutorial videos will show you how to do this

Phase Tabs

- Data entered and calculated in to this tab will feed in to most other sections of the budget
- Majority of cells in the "Phase" tabs are white, which means that a majority of the cells are calculated
- Asks for a breakdown of the following major cost items:
  - Labor and Benefits
  - Supplies
  - Equipment
  - Patient related/animal related
  - Subcontractors
- By:
  - Item name
  - Description
  - Page reference to supporting documentation (if applicable)
  - Cost
  - Unit description
  - How much is being applied to each task

Phase Tab Walkthrough

(bring up spreadsheet)

Summarizes major cost items

	B	C	D	E	F	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
1	Oraganization Name					TA (for TAs 1-3) / Task (for Advanced Studies) 3									
2	PI Name			Cell Color Legend:	Data Entry										
3	Phase I				Formula	Task 3.1 number	Total cost	Task 3.2 number	Total cost	Task 3.3 number	Total cost	Task 3.4 number	Total cost	Task 3 number	Total cost
5	Item Name	Item Description	Proposal Reference (pg #)	Effort/ Unit Cost	Unit	Effort/Qty	Cost	Effort/Qty	Cost	Effort/Qty	Cost	Effort/Qty	Cost	Effort/Qty	Cost
6	Summary														
7		Personnel + Benefits				0.96	$ 1,056	0.17	$ 187	0.13	$ 143	0.12	$ 132	1.38	$ 1,518
8		Supplies					$ 40		$ 1,010		$ -		$ -		$ 1,050
9		Equipment					$ -		$ -		$ 20		$ 10		$ 30
10		Patient Related					$ 180		$ -		$ -		$ 150		$ 330
11		Subcontractors					$ -		$ -		$ 2,953		$ -		$ 2,953
12		Sub-Total: Direct Costs					$ 1,276		$ 1,197		$ 3,116		$ 292		$ 5,881
13		Less Exclusions:													
14		GSR fringe benefits					$ 2		$ 1		$ 3		$ 4		$ 10
15		Capital Equipment (unit Cost > $5K)					$ -		$ -		$ -		$ -		$ -
16		Subcontracts > $25K							$ -		$ -		$ -		$ -
17		Sub-Total: Exclusions					$ 2		$ 1		$ 3		$ 4		$ 10
18		Modified Total Direct Costs					$ 1,274		$ 1,196		$ 3,113		$ 288		$ 5,871
19		Sub-Total: Indirect Costs		49%	negotiated rate		$ 624		$ 586		$ 1,525		$ 141		$ 2,877
20		Total Costs					$ 1,900		$ 1,782		$ 4,641		$ 433		$ 8,758
21	Personnel														
22	Person's Name	PI (Bioengineering)	Tech Prop - pg. 4, 65	$ 1,000	Calendar Year	0.100	$ 100	0.100	$ 100	0.040	$ 40	0.020	$ 20	0.260	$ 260
23	Person's Name	Surgeon	Tech Prop - pg. 4, 69	$ 1,000	Calendar Year	0.020	$ 20	0.020	$ 20	0.020	$ 20	0.020	$ 20	0.080	$ 80
24	Person's Name	Postdoc (BioEng)	Tech Prop - pg. 4, 71	$ 1,000	Calendar Year	0.020	$ 20	0.020	$ 20	0.020	$ 20	0.020	$ 20	0.080	$ 80
25	Person's Name	Graduate Student (EE)	Tech Prop - pg. 4, 75	$ 1,000	Calendar Year	0.020	$ 20	0.010	$ 10	0.030	$ 30	0.040	$ 40	0.100	$ 100
26	Person's Name	Animal Technician	Tech Prop - pg. 4, 81	$ 1,000	Calendar Year	0.800	$ 800	0.020	$ 20	0.020	$ 20	0.020	$ 20	0.860	$ 860
27		Personnel Total				0.960	$ 960	0.170	$ 170	0.130	$ 130	0.120	$ 120	1.380	$ 1,380
28	Benefits														
29	Person's Name	PI (Bioengineering)	N/A	10.00%			$ 10		$ 10		$ 4		$ 2		$ 26
30	Person's Name	Surgeon	N/A	10.00%			$ 2		$ 2		$ 2		$ 2		$ 8
31	Person's Name	Postdoc (BioEng)	N/A	10.00%			$ 2		$ 2		$ 2		$ 2		$ 8
32	Person's Name	Graduate Student (EE)	N/A	10.00%			$ 2		$ 1		$ 3		$ 4		$ 10
33	Person's Name	Animal Technician	N/A	10.00%			$ 80		$ 2		$ 2		$ 2		$ 86
34		Benefits Total					$ 96		$ 17		$ 13		$ 12		$ 138
35	Supplies	***must be broken out individually - see below													
36	Silicon Wafer	4" <100> n-Type	N/A	$ 10	per wafer	4.00	$ 40	0.00	$ -	0.00	$ -	0.00	$ -	4.00	$ 40
37	Rats	Size, Type, etc.	N/A	$ 10	per rat	0.00	$ -	50.00	$ 500	0.00	$ -	0.00	$ -	50.00	$ 500
38	Rat per diem	Housing and care	N/A	$ 10	per rat, per day	0.00	$ -	50.00	$ 500	0.00	$ -	0.00	$ -	50.00	$ 500
39	Cleanroom Fees	Lab Name	N/A	$ 10	per year	0.00	$ -	1.00	$ 10	0.00	$ -	0.00	$ -	1.00	$ 10
40		Supplies Total					$ 40		$ 1,010		$ -		$ -		$ 1,050
41	Equipment	***must provide supporting documentation (e.g., quote)													
42	MicroCT	Company, Model Number	Cost Prop - pg. 45	$ 10	per machine	0.00	$ -	0.00	$ -	1.00	$ 10	0.00	$ -	1.00	$ 10
43	Impedance Analyzer	Company, Model Number	Cost Prop - pg. 46	$ 10	per machine	0.00	$ -	0.00	$ -	1.00	$ 10	0.00	$ -	1.00	$ 10
44	Microscope	Company, Model Number	Cost Prop - pg. 51	$ 10	per machine	0.00	$ -	0.00	$ -	0.00	$ -	1.00	$ 10	1.00	$ 10
45		Equipment Total					$ -		$ -		$ 20		$ 10		$ 30
46	Patient Related														
47	Patient care, outpatient	Physical therapy	N/A	$ 10	per patient	3.00	$ 30	0.00	$ -	0.00	$ -	5.00	$ 50	8.00	$ 80
48	Medication	post-surgery pain medication	N/A	$ 10	per patient	3.00	$ 30	0.00	$ -	0.00	$ -	5.00	$ 50	8.00	$ 80
49	X-ray		N/A	$ 10	per x-ray	12.00	$ 120	0.00	$ -	0.00	$ -	5.00	$ 50	17.00	$ 170
50		Patient Related Total					$ 180		$ -		$ -		$ 150		$ 330
51	Subcontractors														
52	Subcontract	University XYZ	Cost Prop - pg. 60-65	$ 2,953	per phase	0.00	$ -	0.00	$ -	1.00	$ 2,953	0.00	$ -	1.00	$ 2,953
53		Subcontractors Total					$ -		$ -		$ 2,953		$ -		$ 2,953

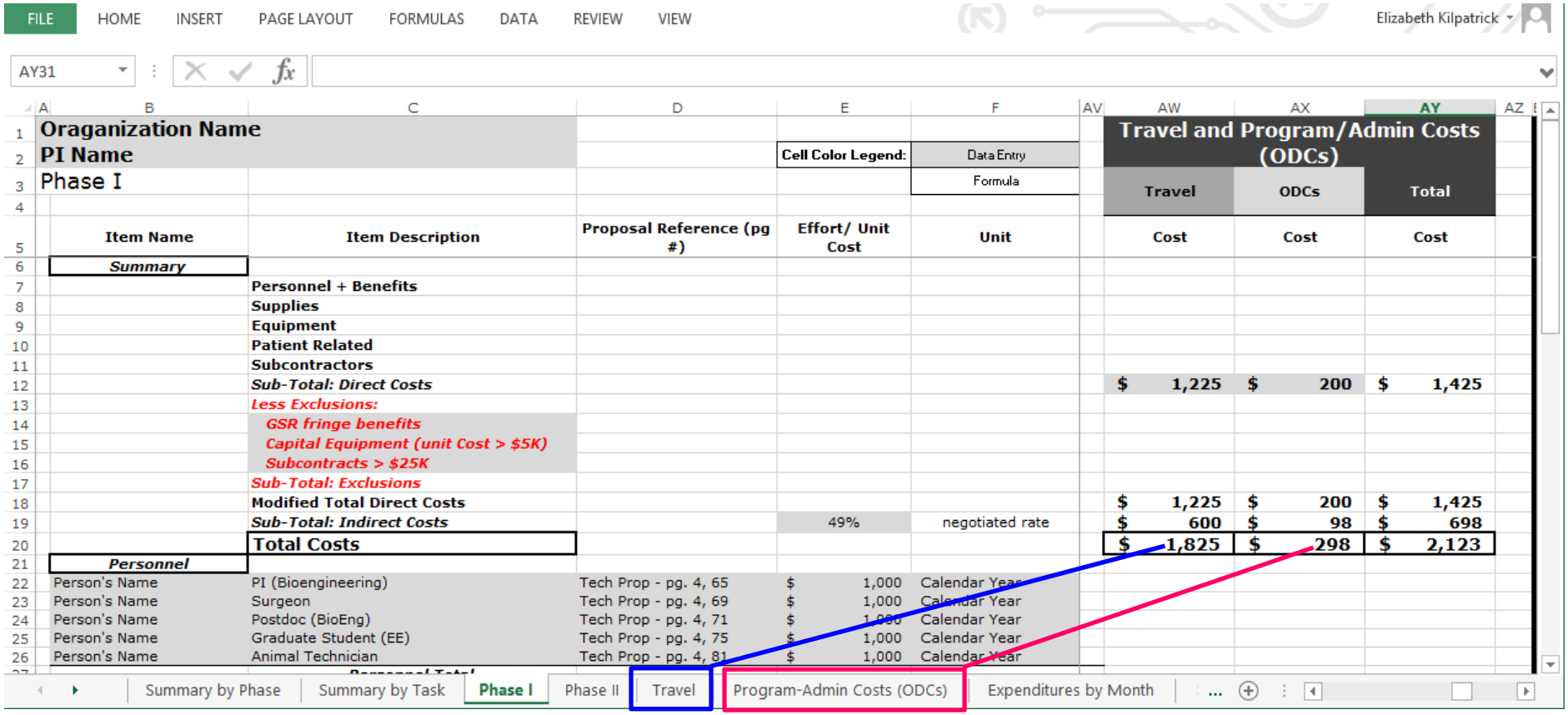
Summary by Phase | Summary by Task | Phase I | Phase II | Travel | Program-Admin Costs (ODCs) | Expenditures by Month | Sub - University XYZ Budget | Sub - University XYZ Travel | Anim ...

Insert descriptive information and effort/unit cost – this will be used to calculate totals throughout the "Phase" tab

Once the effort/quantity is entered (column AL) the total cost per subtask will be calculated from the effort/unit cost (column AM)

calculates the total per task once effort/quantity is entered for each subtask

Phase Tab – Travel and ODCs



	B	C	D	E	F	AW	AX	AY
1	Oraganization Name					Travel and Program/Admin Costs (ODCs)		
2	PI Name			Cell Color Legend:	Data Entry			
3	Phase I				Formula	Travel	ODCs	Total
4								
5	Item Name	Item Description	Proposal Reference (pg #)	Effort/ Unit Cost	Unit	Cost	Cost	Cost
6	*Summary*							
7		Personnel + Benefits						
8		Supplies						
9		Equipment						
10		Patient Related						
11		Subcontractors						
12		*Sub-Total: Direct Costs*				$ 1,225	$ 200	$ 1,425
13		*Less Exclusions:*						
14		*GSR fringe benefits*						
15		*Capital Equipment (unit Cost > $5K)*						
16		*Subcontracts > $25K*						
17		*Sub-Total: Exclusions*						
18		Modified Total Direct Costs				$ 1,225	$ 200	$ 1,425
19		*Sub-Total: Indirect Costs*		49%	negotiated rate	$ 600	$ 98	$ 698
20		Total Costs				$ 1,825	$ 298	$ 2,123
21	*Personnel*							
22	Person's Name	PI (Bioengineering)	Tech Prop - pg. 4, 65	$ 1,000	Calendar Year			
23	Person's Name	Surgeon	Tech Prop - pg. 4, 69	$ 1,000	Calendar Year			
24	Person's Name	Postdoc (BioEng)	Tech Prop - pg. 4, 71	$ 1,000	Calendar Year			
25	Person's Name	Graduate Student (EE)	Tech Prop - pg. 4, 75	$ 1,000	Calendar Year			
26	Person's Name	Animal Technician	Tech Prop - pg. 4, 81	$ 1,000	Calendar Year			

- Travel and ODCs pull data from the "Travel" and Program-Admin Costs (ODCs) tabs
- These data series do not cleanly fit beneath a task and subtask
  - You don't need to artificially assign travel and ODC costs to tasks and subtasks

Travel Tab

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW

Elizabeth Kilpatrick

F30

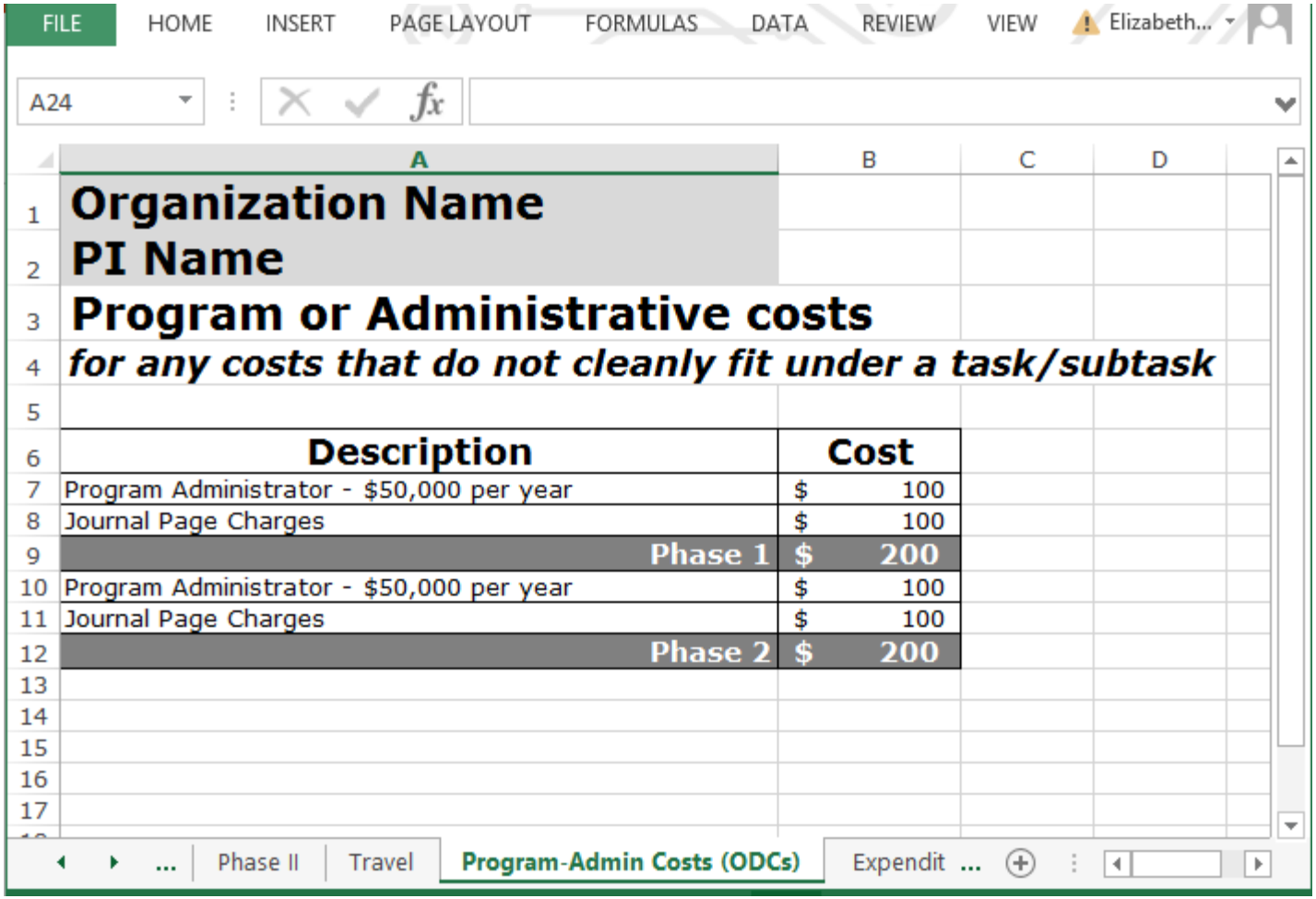
Organization Name
PI Name
Travel Summary
Lodging and Meals & Incidentals Expenses (M&IE) must comply with GSA rates. You can access GSA rates at: www.gsa.gov/perdiem

Phase	Title of Event	From	To	Justification *Conference attendance must be justified, explain how it is in the best interest of the project*	Number of Travelers	Number of Days	Airfare	Lodging (GSA Rates) =Rate*Nights	M&IE (GSA Rates) =Rate*Days	Rental Car	Registration Fees	Other (mileage, baggage fees, etc.)	Define "other"	Cost for one person	Total Cost
1	Kick-off Meeting	Los Angeles, CA	Arlington, VA	Attend DARPA-mandated performance kick-off meeting	2	1	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 350
1	Collaborator Meeting	Los Angeles, CA	Cleveland, OH	Meet with University XYZ to review their facilities and progress towards manufacturing	2	2	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 350
1	Conference XYZ	Los Angeles, CA	New Orleans, LA	Attend conference XYZ, which will allow our team to present our <<DARPA program>> results to the broader scientific community, build relationships with performers and potential collaborators on our <<DARPA program>> effort, and stay current on advancements in scientific fields related to <<DARPA program>>	1	3	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 175
1	PI Meeting	Los Angeles, CA	Phoenix, AZ	Attend DARPA-mandated performance review meeting	2	2	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 350
														Phase 1 Total	**$ 1,225**
2	Workshop	Los Angeles, CA	Arlington, VA	Attend DARPA-mandated metrics development workshop	2	1	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 350
2	Collaborator Meeting	Los Angeles, CA	Cleveland, OH	Meet with University XYZ to review their facilities and progress towards manufacturing	2	2	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 350
2	Conference	Los Angeles, CA	New Orleans, LA	Attend conference XYZ, which will allow our team to present our <<DARPA program>> results to the broader scientific community, build relationships with performers and potential collaborators on our <<DARPA program>> effort, and stay current on advancements in scientific fields related to <<DARPA program>>	1	3	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 175
2	PI Meeting	Los Angeles, CA	Phoenix, AZ	Attend DARPA-mandated performance review meeting	2	2	$ 10	$ 10	$ 10	$ 10	$ 10	$ 125	$25 baggage fees, $50 mileage, $50 taxi	$ 175	$ 350
														Phase 2 Total	**$ 1,225**

... Phase II | Travel | Program-Admin Costs (ODCs) | Expenditures by Month | Sub - University XYZ Budget | Sub - University XYZ Travel | Animal and Human Use | Milestones and Deliverables

- The level of detail illustrated above is required for negotiations
- We understand that it is difficult to plan for DARPA-specific travel because the meeting dates, duration, and location are TBD
  - Estimate to the best of your ability
  - Meetings will be domestic, there will not be a reg fee
- Pull lodging and M&IE rates from the GSA website
- Conference attendance needs to be supported with a very strong justification of how it is in the best interest of the project

Program-Admin Costs (ODCs) Tab



Organization Name
PI Name
Program or Administrative costs
for any costs that do not cleanly fit under a task/subtask

Description	Cost
Program Administrator - $50,000 per year	$ 100
Journal Page Charges	$ 100
Phase 1	**$ 200**
Program Administrator - $50,000 per year	$ 100
Journal Page Charges	$ 100
Phase 2	**$ 200**

- Costs that do not cleanly fit under a task or subtask
- Provide a description and cost for each phase
- Should be used sparingly

Subcontractor Budget

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L44

	A	B	C	D	E	F	G	H	I	J	K	L	M
1		**University XYZ - Subcontractor Budget**			Cell Color Legend:	Enter Text (Editable)		**Phase 1**		**Phase 2**		**Total**	
2		**University XYZ POC Name**				Calculated (Do not edit)							
3		**Item Name**	**Item Description**	**Proposal Reference (pg #)**	**Cost Per or Rate**	**Unit**		**Effort/ Qty**	**Cost**	**Effort/ Qty**	**Cost**	**Effort/ Qty**	**Cost**
4		***Summary***											
5			**Personnel + Benefits**					**0.08**	**$ 88**	**0.08**	**$ 88**	**0.16**	**$ 176**
6			**Supplies**						**$ 1,050**		**$ 1,050**		**$ 2,100**
7			**Equipment**						**$ 110**		**$ 100**		**$ 210**
8			**Travel and ODCs**						**$ 770**		**$ 770**		**$ 1,540**
9			***Sub-Total: Direct Costs***						**$ 2,018**		**$ 2,008**		**$ 4,026**
10			**Modified Total Direct Costs**						**$ 1,908**		**$ 1,908**		**$ 3,816**
11			***Sub-Total: Indirect Costs***		49%	negotiated rate			**$ 935**		**$ 935**		**$ 1,870**
12			**Total Costs**						**$ 2,953**		**$ 2,943**		**$ 5,896**
13													
14		***Personnel***											
15		Person's Name	Project Manager	Tech Prop - pg. 4, 69	$ 1,000	Calendar Year		0.020	$ 20	0.020	$ 20	0.040	$ 40
16		Person's Name	Postdoc (BioEng)	Tech Prop - pg. 4, 71	$ 1,000	Calendar Year		0.020	$ 20	0.020	$ 20	0.040	$ 40
17		Person's Name	Postdoc (Neurosci)	Tech Prop - pg. 4, 73	$ 1,000	Calendar Year		0.020	$ 20	0.020	$ 20	0.040	$ 40
18		Person's Name	Graduate Student (EE)	Tech Prop - pg. 4, 75	$ 1,000	Calendar Year		0.020	$ 20	0.020	$ 20	0.040	$ 40
19			***Personnel Total***					0.080	$ 80	0.080	$ 80	0.160	$ 160
20													
21		***Benefits***											
22		Person's Name	Project Manager	N/A	10.00%				$ 2		$ 2		$ 4
23		Person's Name	Postdoc (BioEng)	N/A	10.00%				$ 2		$ 2		$ 4
24		Person's Name	Postdoc (Neurosci)	N/A	10.00%				$ 2		$ 2		$ 4
25		Person's Name	Graduate Student (EE)	N/A	10.00%				$ 2		$ 2		$ 4
26			***Benefits Total***						$ 8		$ 8		$ 16
27													
28		***Supplies***	*****must be broken out individually - see below**										
29		Silicon Wafer	4" <100> n-Type	N/A	$ 10	per wafer		100.00	$ 1,000	100.00	$ 1,000	200.00	$ 2,000
30		Glass Slides	Size, Type, etc.	N/A	$ 10	per box of 50		5.00	$ 50	5.00	$ 50	10.00	$ 100
31			***Supplies Total***						$ 1,050		$ 1,050		$ 2,100
32													
33		***Equipment***	*****must provide supporting documentation (e.g., quote)**										
34		Impedance Analyzer	Company, Model Number	Cost Prop - pg. 46	$ 10	per machine		1.00	$ 10	0.00	$ -	1.00	$ 10
35		Power Supplies	Company, Model Number	Cost Prop - pg. 48	$ 10	per machine		10.00	$ 100	10.00	$ 100	20.00	$ 200
36			***Equipment Total***						$ 110		$ 100		$ 210
37													
38		***Travel***							$ 770		$ 770		$ 1,540
39													
40		*****If a subcontractor costs more than $500,000 per phase, use the more detailed format for the subcontractor budget breakdown (as seen in the tabs titled Phase I, II & III)**											
41													
42													
43		***Add other fields (e.g., Program-Admin Costs, patient related, etc.) as applicable											
44													
45													
46													

... | Phase II | Travel | Program-Admin Costs (ODCs) | Expenditures by Month | Sub - University XYZ Budget | Sub - University XYZ Travel | Animal and Human Us ...

- In the "phase" tabs, we ask for subcontractor costs to be applied to tasks and subtasks to understand how the costs are applied to the overall tasks and subtasks for the project

- Recommended Use
  - <$500,000 per phase: use format Illustrated above
  - >$500,000 per phase: use more detailed "phase" tab format

Animal and Human Use Tab

Organization Name
PI Name

Animal/Human Use Summary

Task	Descriptive Text	Animal Use (Y/N)	Human Use (Y/N)
1	Short TA text identifier	N	N
1.1	Short task text identifier	N	N
1.2	Short task text identifier	N	N
1.3	Short task text identifier	N	N
1.4	Short task text identifier	N	N
1.5	Short task text identifier	N	N
1.6	Short task text identifier	N	N
2	Short task text identifier	Y	N
2.1	Short task text identifier	Y	N
2.2	Short task text identifier	Y	N
2.3	Short task text identifier	Y	N
2.4	Short task text identifier	Y	N
2.5	Short task text identifier	Y	N
2.6	Short task text identifier	Y	N
3	Short task text identifier	N	Y
3.1	Short task text identifier	N	Y
3.2	Short task text identifier	N	Y
3.3	Short task text identifier	N	Y
3.4	Short task text identifier	N	Y

- A few tabs are not linked to any other tab in particular, but still contain essential information
- Designed to easily display what tasking has animal and human use associated with it

Expenditures by Month Tab

Organization Name
PI Name
Expenditures by Month

Phase I													
Length:	18 months												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2015													$ -
2016													$ -
2017													$ -
												Total	$ -

Phase II													
Length:	30 months												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2017													$ -
2018													$ -
2019													$ -
													$ -

- Important is very helpful for internal planning purposes within DARPA
- Try to make the data as accurate as possible
  - Consider increases/decreases in spend rate rather than simply dividing the cost for a given phase by the months in a given phase

Milestones and Deliverables Tab

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F55

Milestones and Deliverables

Organization Name	
PI Name	

Phase	TA/Task/ Subtask #	TA/Task/Subtask Title	Cost ($)	Organization	Description/Approach	Exit Criteria/Metrics	Milestones/Deliverables (if applicable)	Task/Subtask Start Date	Task/Subtask End Date	Milestone Date (if applicable)
PHASE 1	1	Short task text identifier	$ -	Prime/Sub	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	1.1	Short subtask text identifier	$ -	Prime	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	1.2	Short subtask text identifier	$ -	Prime	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	1.3	Short subtask text identifier	$ -	Sub	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	1.4	Short subtask text identifier	$ -	Prime	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	1.5	Short subtask text identifier	$ -	Prime	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	1.6	Short subtask text identifier	$ -	Sub	1-2 sentence description of objective and approach	short text identifier	short text identifier	MM/DD/YY	MM/DD/YY	MM/DD/YY
	2		$ -							
	2.1		$ -							
	2.2		$ -							
	2.3		$ -							
	2.4		$ -							
	2.5		$ -							
	2.6		$ -							
	3		$ -							
	3.1		$ -							
	3.2		$ -							
	3.3		$ -							
	3.4		$ -							
		Phase 1 Total	$ -							
PHASE 2	1		$ -							
	1.1		$ -							
	1.2		$ -							
	1.3		$ -							
	1.4		$ -							
	1.5		$ -							
	1.6		$ -							
	2		$ -							
	2.1		$ -							
	2.2		$ -							
	2.3		$ -							
	2.4		$ -							
	2.5		$ -							
	2.6		$ -							
	3		$ -							
	3.1		$ -							
	3.2		$ -							
	3.3		$ -							
	3.4		$ -							
		Phase 2 Total	$ -							
		TCV	$ -							

... Milestones and Deliverables

- Coupled very closely with the technical proposal and statement of work (SOW)
- Links tasks/subtask costs with the following:
  - Description
  - Exit criteria/metrics
  - Milestones
  - Deliverables
  - Start/end dates
  - Milestone and deliverable due dates

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