



Republic of the Philippines  
Department of Science and Technology

**ADVANCED SCIENCE AND TECHNOLOGY INSTITUTE**



ASTI-FM 03-11  
REV 0/2 APR 2018

**DOST-ASTI Bids and Awards Committee  
Invitation to Bid (Public Bidding)**

ITB No:	18-09-2102	Date:	September-04-2018
PR No:	GAA-18-08-6537	Date:	August-28-2018
Source of Funds:	GAA		
Total ABC:	Php 1,889,020.00		
Time, Date & Venue of Pre-bid Conference:	September 18, 2018, 1:30 PM at DOST-ASTI		
Time and Date of Submission of Bids:	October 01, 2018, 12:00 PM		
Time, Date & Venue of Opening Bids:	October 01, 2018, 3:00 PM at DOST-ASTI		
Date of availability of Complete Set of Documents:	September 10, 2018		
Deadline of Potential Bidder's Clarifications:	September 22, 2018		
Deadline of ASTI's Supplemental Bid Bulletin:	September 25, 2018		
Delivery Schedule:			


The Advanced Science and Technology Institute (ASTI), through its Bids and Awards Committee (BAC), hereby invites all interested bidders to submit their bids for the item(s) listed below. Guidelines regarding the format, eligibility, technical and financial documents needed are described in the Instruction to Bidders of the Philippine Bidding Documents

Bidding will be conducted through open competitive bidding procedures using a non discretionary "pass/fail" criterion as specified in the 2016 R-IRR of RA 9184.

A complete set of Bidding Documents may be purchased by interested bidders upon payment of a fee for the Bidding Documents. It is also downloadable for free of charge at DOST-ASTI's website - [www.asti.dost.gov.ph](http://www.asti.dost.gov.ph)

For further inquiries, contact ASTI's BAC Secretariat via email at [bac-sec@asti.dost.gov.ph](mailto:bac-sec@asti.dost.gov.ph). Interested bidders may also call the number - (632)-426-7423 and look for ASTI's BAC Secretariat.

Respectfully,

  
Pedrito B. Mangahas  
BAC Chairman

NO.	TECHNICAL SPECIFICATIONS	QTY	UNIT	UNIT PRICE(Php)	TOTAL PRICE(Php)
1	<b>Log Periodic Antenna (SDR)</b> "PCB Log periodic antenna 850 - 6500 MHz Typical Forward Gain: 6dBi Delivery: 30 days upon receipt of NTP"	2	pc	3400.00	6,800.00
2	<b>SMA Connector (SDR)</b> "SMA Female PCB mount Right angle Solder termination 50 ohms impedance Gold body plating Threaded Delivery: 30 days upon receipt of NTP"	3	pc	350.00	1,050.00
3	<b>Low Noise Amplifier Module (SDR)</b> with aluminum casing	2	unit	8800.00	17,600.00

ASTI Bldg., U.P. Technology Park Complex, C.P. Garcia Ave., Diliman, Quezon City, Philippines 1101

• Website: [www.asti.dost.gov.ph](http://www.asti.dost.gov.ph) • E-mail: [info@asti.dost.gov.ph](mailto:info@asti.dost.gov.ph) • Tel. No.s: +632 927-2541, +632 927-3502, +632 426-9759, +632 426-9760  
• Fax No.: +632 925-8598

	Power supply: 6-9V DC or 5V Consumption: 18mA Frequency range: 28MHz - 2500MHz Receive gain: 11 to 23dB NF: 0.75dB @ 1GHz Impedance: 50 ohms Antenna Connector: SMA Female Delivery: 30 days upon receipt of NTP				
4	<b>N type to SMA Connector (SDR)</b> "Connector 1: N Type Female Connector 2: SMA Type Female Impedance: 50 ohms Frequency range: DC to 11GHz Shell Plating: Nickel Body Material: Brass Contact Plating: Gold Adapter Style: Straight Panel mount Delivery: 30 days upon receipt of NTP"	5	pc	1000.00	5,000.00
5	<b>USB Software Defined Radio (SDR)</b> Bandwidth: Up to 2.4 MHz stable ADC: RTL2832U 8-bits Frequency Range: 500 kHz – 1766 MHz (500 kHz – 24 MHz in direct sampling mode) Typical Input Impedance: 50 Ohms Typical Current Draw: 270 – 280 mA Compatible with Windows XP and above, Linux, MacOS and Android Single board PCs like the Raspberry Pi, Odroid, C.H.I.P are also supported with 1 PPM temperature compensated oscillator (TCXO) Enclosed in Aluminum Enclosure SMA female antenna port Delivery: 30 days upon receipt of NTP 1 year warranty	2	unit	3500.00	7,000.00
6	<b>N male to N male Cable (SDR)</b> "Connector A: Male N type Connector B: Male N type Length: 1.5 meters Characteristic Impedance: 50 Ω Coaxial Type: RG213 Cable Shape: Coaxial Delivery: 30 days upon receipt of NTP"	3	pc	3600.00	10,800.00
7	<b>N Type Coaxial RF Surge Protector (Repeater Buoy / CocoMoNets)</b> DC to 6 GHz 1:1.2 Max VSWR (0 - 6GHz) 0.6dB Max Insertion Loss (0 - 6GHz) 90 V Gas Tube Breakdown Voltage N Male to N Female Connector Gold Plated Brass Pin Material Nickel Plated Brass Body Material Includes Mounting Bracket	7	pc	5480.00	38,360.00

	Delivery: 45 days upon issuance of NTP				
8	<b>90V Replacement Gas Tube (Repeater Buoy / CocoMoNets)</b> 90V Breakdown Voltage For Coax Lightning Protector .24 inch diameter .32 inch height Delivery: 45 days upon issuance of NTP	20	pc	860.00	17,200.00
9	<b>Differential I2C (Repeater Buoy / CocoMoNets)</b> I2C Supply voltage range 2.3-5.5V Differential Supply voltage range 3-5.5V Draws 16µA of current Extends I2C bus up to 100 feet Data rate up to 400kHz Delivery: 45 days upon issuance of NTP	4	pc	1100.00	4,400.00
10	<b>DC to DC Converter with PoE Inserter (Repeater Buoy / CocoMoNets)</b> Input Voltage: 10-15VDC Output: 24VDC +/-2.5% Output Power (maximum): 35W Data in & Data/POE Output Connector: RJ45 (Shielded) Safety Standards: UL1950, CSA 22.2 &TUV EN60950 POE Specification: Passive Integrated POE Inserter High Power 35W Short Circuit, Over Current and Over Voltage Protection Delivery: 45 days upon issuance of NTP	3	unit	5200.00	15,600.00
11	<b>Solar Charge Controller with USB Meterbus Adapter (Repeater Buoy / CocoMoNets)</b> Peak Efficiency: 97.5% Nominal Battery Voltage: 12 or 24 volts Maximum Battery Charging Current: 15 amps Battery Voltage Range: 7-36 volts Nominal Maximum Operating Power: 12 volt battery 200 Watts 24 volt battery 400 Watts Maximum PV Open Circuit Voltage: 60 volts Rated Load Current: 15 amps Self Consumption: 35 milliamps Transient Surge Protection: 4 x 1500 Watts Operating Temperature: -40°C to +60°C Storage Temperature -55°C to +100°C Humidity: 100%, non-condensing Tropicalization: Epoxy encapsulation Conformal coating Marine rated terminals PV Protection: Overload, Short Circuit, High Voltage Load: Overload, Short Circuit Reverse Polarity: Battery, PV and Load Lightning and Transient Surges High Temperature Reverse Current at Night CE Compliant RoHS Compliant UL 1741 / CSA 107.1-01 recognized component Manufactured in a Certified ISO 9001 Facility	1	unit	27000.00	27,000.00

	Delivery: 45 days upon issuance of NTP				
12	<b>Ethernet Module (Repeater Buoy / CocoMoNets)</b> Provides a network (IP) stack capable of both TCP and UDP Uses W5100 10BaseT/100BaseTX Ethernet PHY embedded Compatible with the Arduino Duemilanove (168 or 328), UNO as well as Mega (1280 / 2560) Delivery: 45 days upon issuance of NTP	3	pc	1000.00	3,000.00
13	<b>GPS Breakout for Active Antennas (Repeater Buoy / CocoMoNets)</b> SMA Female Connector Uses ublox MAX-M8Q With PPS LED and Supercap Featuring a TCXO for better power saving and quicker startup I2C, UART Delivery: 45 days upon issuance of NTP	3	pc	3600.00	10,800.00
14	<b>3x3 WiFi Module (Repeater Buoy / CocoMoNets)</b> 2.4GHz / 5GHz Operating Frequency 26dB / 29 dBm Output Power 3x3 MIMO enabled MMCX Antenna connector type Rugged packaging Uses QCA9890-BR4B chipset miniPCIe board interface Delivery: 45 days upon issuance of NTP Warranty: 1 year	2	pc	19500.00	39,000.00
15	<b>680MHz WiFi Router Board (Repeater Buoy / CocoMoNets)</b> 880 MHz CPU nominal frequency MMIPS Architecture RouterOS operating system 2 CPU Core Count 1 MiniPCIe slot 1 Modem Sim 1 10/100/1000 Ethernet Port 11W Max Power Consumption Passive PoE 2 10-30V DC Input (PoE In and DC Jack) Includes: 24V 0.8A Power Adapter Aluminum Case 9-48V PoE Injector Delivery: 45 days upon issuance of NTP Warranty: 1 year	2	lot	6800.00	13,600.00
16	<b>480MHz WiFi Module (Repeater Buoy / CocoMoNets)</b> Industrial grade 480MHz - 550MHz 1000mW TX power Mini-PCI radio module Enhanced resilience to RF surges & ESD Delivery: 45 days upon issuance of NTP Warranty: 1 year	3	pc	19200.00	57,600.00

17	<b>680MHz WiFi Router Board (Repeater Buoy / CocoMoNets)</b> 680 MHz CPU nominal frequency MIPSBE Architecture RouterOS operating system 1 CPU Core Count 1 MiniPCI slot RS232 Serial Port Voltage Monitor Feature 1 10/100 Ethernet Port 14W Max Power Consumption Passive PoE 2 10-28V DC Input (PoE In and DC Jack) Includes: 24V 0.8A Power Adapter Plastic Outdoor Case with mounting set 10-28V PoE Injector Delivery: 45 days upon issuance of NTP Warranty: 1 year	3	lot	15000.00	45,000.00
18	<b>300MHz WiFi Router Board (Repeater Buoy / CocoMoNets)</b> 300 MHz CPU nominal frequency MIPSBE Architecture RouterOS operating system 1 CPU Core Count 1 MiniPCI slot 1 MiniPCI-e slot 1 Modern (Mini Sim) slot RS232 Serial Port Voltage Monitor Feature 1 10/100 Ethernet Port 12W Max Power Consumption Passive PoE 2 10-28V DC Input (PoE In and DC Jack) Delivery: 45 days upon issuance of NTP Warranty: 1 year	1	lot	7700.00	7,700.00
19	<b>480M Yagi Antenna (Repeater Buoy / CocoMoNets)</b> 480-520MHz 13 dBi Input Impedance: 50Ω VSWR: <1.5:1 Vertical Beamwidth: 46 degrees Horizontal Beamwidth: 54 degrees Directional Maximum Power: 100Watts Wind rating: >240km/hr Delivery: 45 days upon issuance of NTP	2	pc	22000.00	44,000.00
20	<b>High Gain UHF Omnidirectional Antenna (Repeater Buoy / CocoMoNets)</b> 440-512MHz (tunable) VSWR: Less than 1.5:1 Gain: 5.5dBi Max Power: 150 watts Max Wind Survival: 135MPH Wind Load: 25.75sq in (.179 sq ft) Connector: Integral N- female Radome: One piece white UV stabilized fiberglass Delivery: 45 days upon issuance of NTP	1	pc	25000.00	25,000.00

21	<b>30W Solar Panel (Repeater Buoy / CocoMoNets)</b> Monocrystalline Maximum Power: 30W Optimum Operating Voltage (Vmp): 17.5V Optimum Operating Current (Imp): 1.71A Maximum System Voltage: 600V DC (UL) Open-Circuit Voltage (Voc): 21.6V Short-Circuit Current (Isc): 1.85A Wind Speed: ≤ 60m/s 25-year power output warranty: 5 year/95% efficiency rate, 10 year/90% efficiency rate, 25-year/80% efficiency rate 5-year material and workmanship warranty Delivery: 45 days upon issuance of NTP	3	unit	6000.00	18,000.00
22	<b>Valve Regulated Lead Acid (Repeater Buoy / CocoMoNets)</b> 12 Volts 38Ah Excellent cycling capability Very high energy density High rate discharge capability Lowest self discharge rate Approved for shipping as non-hazardous, non-spillable Operates in any position Low internal resistance Dimension: 196 x 164 x 169 mm. Delivery: 30 days upon issuance of NTP	2	pc	5500.00	11,000.00
23	<b>Female SMA to Male MMCX (Repeater Buoy / CocoMoNets)</b> SMA Female Jack to Male MMCX Length: at least 6 inches RG-316 50 Ohms up to 6GHz shielded Delivery: 45 days upon issuance of NTP	6	pc	1000.00	6,000.00
24	<b>GPS Active Antennas (Repeater Buoy / CocoMoNets)</b> Mounting Type: Magnetic base Connector: SMA Cable: 3 meters Housing: Black Band Width: ≥10 MHz V.S.W.R: ≤1.5 Axial Ratio: 3.0dB Polarization: Right-Handed Circular Impedance: 50Ω Frequency Temperature Coefficient: 0±10(ppm/°C) Center Frequency: 1575.42MHz±1.1MHz Working Temperature: -35°C~+85°C Humidity Humidity: 0%~95% Range of Frequency: 1575.42MHZ Amplifier Gain: 28±2dB SWR:≤2.0 Noise Figure:≤2.0dB Delivery: 45 days upon issuance of NTP	3	pc	800.00	2,400.00
25	<b>UHF Transceiver (Repeater Buoy / CocoMoNets)</b>	4	unit	33600.00	134,400.00

	<p>UHF Band Transceiver  Custom channel Plan, TVWS Band within 400MHz to 700MHz  1x1 SISO  x1 MMCX Antenna Connector  IEEE 802.11 b/g/n Standards Compliant with Base Band  5MHz/10MHz/20MHz/40 MHz Channel Band Width  High TX Power of 29 dBm for lower data rates  MiniPCI Type IIIA form factor  Custom Form factor, MAC ID, PCI device ID &amp; other mechanical  mounts for OEM needs  Delivery: 45 days upon receipt of NTP  Warranty: at least 1 year</p>				
26	<p><b>Mini Universal Software Radio Peripheral (Repeater Buoy / CocoMoNets)</b>  Wide frequency range: 70 MHz - 6 GHz  Single channel transceiver  Up to 56 MHz of instantaneous bandwidth  Full duplex operation  User-programmable FPGA  Fast and convenient bus-powered USB 3.0 connectivity  Synchronization with 10 MHz clock reference or PPS time  reference  GPIO and JTAG for control and debug capabilities  Full aluminum enclosure  USRP Hardware Driver (UHD) open-source software API version  3.9.0 or later  GNU Radio support maintained by Ettus Research through  GR-UHD, an interface to UHD distributed by GNU Radio  Delivery: 45 days upon receipt of NTP  Warranty: at least 1 year</p>	4	unit	80000.00	320,000.00
27	<p><b>900MHz Transceiver (Repeater Buoy / CocoMoNets)</b>  High Power 30dBm (1000mW)  Frequency range 902MHz to 928MHz  Support 5Mhz/10Mhz/20Mhz channel bandwidth maximizing  spectrum efficiency  Accurate power control from 0dBm to 30dBm range  Compatible with OpenWRT and many other 3rd party wireless  router operating systems  Operation Voltage 3.3V  Interface 32bits, 33MHz miniPCI Type III A  Radio Frequency Band 900 Mhz ISM (902MHz - 928MHz)  Data Rates 54, 48, 36, 24, 18, 12, 9, 6 Mbps (Auto fall back)  Channel Bandwidth 5, 10, 20 Mhz  Delivery: 45 days upon receipt of NTP  Warranty: at least 1 year</p>	3	unit	13500.00	40,500.00
28	<p><b>High gain omnidirectional antenna 900MHz</b></p>	2	unit	17000.00	34,000.00

	<b>(Repeater Buoy / CocoMoNets)</b> Frequency: 900 - 928MHz Gain: 8 dBi Impedance: 50 Ohm Vertical Beamwidth: 12 degrees Polarization: Vertical VSWR: < 1.5 Max. input power: 100 Watt Connector: N female Maximum Wind Velocity: 210 km/h Delivery: 45 days upon receipt of NTP Warranty: at least 1 year				
29	<b>Parabolic grid antenna (Repeater Buoy / CocoMoNets)</b> Frequency: 824 - 960 MHz Gain: 15 dBi Impedance: 50 Ohm Vertical Beamwidth: 30 degrees Horizontal Beamwidth: 18 degrees Polarization: Vertical or horizontal VSWR: < 1.5 Max. input power: 100 Watt Connector: Integral N female Maximum Wind Velocity: 210 km/h Delivery: 45 days upon receipt of NTP Warranty: at least 1 year	3	unit	11000.00	33,000.00
30	<b>Touch Screen Display for Single board computer (Repeater Buoy / CocoMoNets)</b> 800x480 high resolution, touch control Compatible with Raspberry Pi 5 inches Drivers provided (works with Raspbian/Ubuntu directly) Backlight can be turned off to lower power consumption High quality immersion gold surface plating Includes HDMI Cable Delivery: 30 days upon receipt of NTP Warranty: at least 1 year	3	unit	3000.00	9,000.00
31	<b>Male MMCX to Female SMA right angle (Repeater Buoy / CocoMoNets)</b> Connector A: Male MMCX, Right Angle Connector B: Female SMA Length: 300mm Characteristic Impedance: 50 Ω Coaxial Type: RG178 Voltage Rating: 170 Vac Delivery: 30 days upon receipt of NTP	5	pc	1600.00	8,000.00
32	<b>Weatherproof Vented NEMA Enclosure with Cooling Fan (Repeater Buoy / CocoMoNets)</b> Fiberglass Reinforced Polyester (FRP) Stainless Steel Latches with Padlock Hasps Dual 4" Vents With Thermostat Controlled 12VDC Cooling Fan Includes Aluminum Mounting Plate with 12VDC Terminal Strip (4) Stainless Steel Mounting Feet Included NEMA Type 3R, 3RX / IP24 Rated Outer Dimensions: 15.75 x 13.83 x 8.73 Inches (401 x	3	unit	22000.00	66,000.00



	<p>352 x 222 mm) Inner Dimensions: 13.87 x 11.97 x 8.4 Inches (352 x 304 x 213 mm) Mounting Plate Material: 0.10 in (2.5 mm) Aluminum Mounting Plate Dimensions: 10.9 x 12.8 in. (276 x 324 mm) Ratings NEMA Type: 3R, 3RX / IP24 Flame Rating: UL94-5V Delivery: 45 days upon receipt of NTP</p>				
33	<p><b>Microcontroller board (Repeater Buoy / CocoMoNets)</b> 168MHz ARM Cortex-M4F core microcontroller with 1MB Flash memory, 192KB RAM On-board MEMS 3-axis accelerometer On-board MEMS audio omnidirectional digital microphone On-board stereo audio DAC 3.5mm jack socket for stereo headphones USB OTG FS Micro-AB connector ST-LINK/V2-A USB Mini-B connector SWD header On-board ST-LINK/V2 with mode selection switch 2 x status LEDs: PC to ST-LINK active, +3.3V Power-on 2 x USB OTG LEDs: VBus present, VBus over-current 4 x User LEDs Reset and User pushbuttons Extension header for all GPIO Power supply: USB VBus or external +5Vdc External application power supply output: +3V and +5V Delivery: 30 days upon receipt of NTP Warranty: at least 1 year</p>	3	unit	2680.00	8,040.00
34	<p><b>USB Oscilloscope (Repeater Buoy / CocoMoNets)</b> Two-channel USB digital oscilloscope Two-channel arbitrary function generator 16-channel digital logic analyser 16-channel pattern generator 16-channel virtual digital I/O Spectrum Analyser with power spectrum and spectral measurements Network analyser providing Bode, Nyquist and Nichols transfer diagrams Digital Bus Analysers (SPI, I<sup>2</sup>C, UART, Parallel) Two input/output digital trigger signals for linking multiple instruments (3.3V CMOS) Single channel voltmeter (AC, DC, ±20V) Two programmable power supplies (0 to +5V and 0 to -5V) With 12-bit ADCs and DACs running at 100 MSPS Warranty: at least 1 year Delivery: 45 days upon receipt of NTP</p>	2	unit	11000.00	22,000.00
35	<p><b>Tunable UHF Antenna (Repeater Buoy / CocoMoNets)</b></p>	3	unit	9500.00	28,500.00

	<p>Specific Freq. (MHz): 440-512 MHz  Gain (dB): 5.5  Maximum Input Power (Watts): 150 watts  Bandwidth &gt;1.5 VSWR: 10 MHz  Direct Termination: N Female  Overall Length: 3' 6"  Rated Wind Velocity (MPH): 135 MPH  Mount Hardware Included: Yes  Warranty: 1 Year  Delivery: 45 days upon receipt of NTP</p>				
36	<p><b>LoRa Module (Repeater Buoy / CocoMoNets)</b>  868/915 MHz Frequency Range  Uses LoRa Modulation Technique  Embedded MESH distributed MANET protocols  -148dBm Receiver Sensitivity  20dBm Maximum Transmit Power  Can be flexibly set the module parameters via software or  microcontroller commands  TTL serial communication Interface  Includes 2 Modules  Includes 2 Antennas  Delivery: 45 days upon receipt of NTP</p>	3	set	3800.00	11,400.00
37	<p><b>Microcontroller module (Repeater Buoy / CocoMoNets)</b>  ATmega328 MCU  Compatible with Arduino IDE  22 x digital I/O pins (6 can be used as PWM outputs)  8 x Analogue inputs  16MHz crystal oscillator  1 x Mini-B USB  Operating voltage: 5V  FLASH memory: 32KB  SRAM: 2KB  EEPROM: 1KB  Dimensions: 45 x 18 mm  Delivery: 30 days upon receipt of NTP  Warranty: at least 1 year</p>	6	unit	1500.00	9,000.00
38	<p><b>Weatherproof Enclosure (Repeater Buoy / CocoMoNets)</b>  335 x 236 x 150 mm  Rating: IP65, NEMA 4  Material: ABS  With rubber gasket around the lid  Hinged type design  Delivery: 30 days upon receipt of NTP</p>	3	pc	2400.00	7,200.00
39	<p><b>Microcontroller Development Board (PEDRO)</b>  Supports microcontroller with the following specifications:  Ultra-low power FRAM platform  16-bit RISC Architecture  Up to 8-MHz FRAM access/ 16MHz system clock speed  16 Channel 12-bit differential ADC  16 Channel Comparator  5 16-bit Timers  At least 40 GPIO pins, 2 UART, 2 SPI</p>	5	unit	1760.00	8,800.00

	-40C to +85C operating temperature Must have onboard programmer At least 20 exposed pins for user application Buttons and LED for user interaction Supports back-channel UART via USB to PC Includes Micro USB Cable				
40	<b>Microcontroller Programmer and Debugger (PEDRO)</b> Supports USB debugging interface for MSP430 MCU to computer Software configurable supply voltage between 1.8 V and 3.6 V at 100 mA Supports JTAG Security Fuse blown to protect code Supports all MSP430 boards with JTAG header Supports JTAG and Spy-Bi-Wire (2-wire JTAG) debug protocols Supports ARM JTAG and ARM SWD debug protocols Must include conductor cable and micro-usb cable	3	unit	12650.00	37,950.00
41	<b>Flex Antenna (PEDRO)</b> Frequency: 868-960/1710-1990 MHz VSWR: <4:1 Gain: at least 3 dBi Mounting: adhesive tape Interface: SMA Male Operating temperature: -40 to +85C	5	pc	770.00	3,850.00
42	<b>Memory IC Breakout Board (PEDRO)</b> Memory type: FRAM Memory size: 4Mbit Organization: 512K x 8 Interface: GPIO, SPI Operating Supply: 3.3V	5	pc	2176.00	10,880.00
43	<b>Inertial Measurement Unit Board (PEDRO)</b> Interface: I <sup>2</sup> C, SPI VDD supply voltage range: 2.4 – 3.6V Accelerometer range: ±2g, ±4g, ±8g and ±16g Gyroscope range: ±250, ±500, ±1000, and ±2000°/sec Magnetometer range: ±4800µT Digitally programmable low-pass Gyroscope filter Gyroscope operating current: 3.2mA Accelerometer normal operating current: 450µA Magnetometer normal operating current: 280µA at 8Hz repetition rate	5	pc	1650.00	8,250.00
44	<b>Barometric and Temperature Sensor (PEDRO)</b> Interface: I <sup>2</sup> C, SPI Voltage supply: 3V - 5V Pressure range: 300 - 1100 hPa Temperature range (C): -40 to +85 Temperature coefficient offset: 1.5 Pa/K Absolute accuracy: typ. ±1 hPa Current consumption: 2.7µA @ 1 Hz sampling rate Must be RoHS compliant, halogen-free	5	pc	1100.00	5,500.00
45	<b>Solar charge controller module (PEDRO)</b> Ultra Low-Power With High-Efficiency DC-DC Boost	5	pc	2666.00	13,330.00

	<p>Converter/Charger  Programmable Dynamic Maximum Power Point Tracking (MPPT)  Continuous Energy Harvesting From Low-Input Sources: VIN ≥ 80 mV (Typical)  Ultra-Low Quiescent Current: Iq &lt; 330 nA (Typical)  Cold-Start Voltage: VIN ≥ 330 mV (Typical)  User Programmable Undervoltage and Overvoltage Levels  On-Chip Temperature Sensor with Programmable Overtemperature Shutoff</p>				
46	<p><b>Solar cell (PEDRO)</b>  Open circuit voltage: 4.00 V  Short circuit current: 47.5 mA  Voltage at max. power point: 3.18 V  Current at max. power point: 42.9 mA  Maximum peak power: 136 mW  Solar cell efficiency: 22 %  Dimension: 41.0 x 21.0x 2.0mm</p>	15	pc	750.00	11,250.00
47	<p><b>Battery (PEDRO)</b>  Output: 500mAh at 3.7V nominal  With JST plug  With protection circuit module</p>	5	pc	800.00	4,000.00
48	<p><b>High-gain yagi antenna (Spectrum Monitoring)</b>  Gain: 9.2 dBic  Frequency range: 143 to 148 MHz  Beamwidth: 60 degrees circular  VSWR: 1.3: 1  Feed type: "T" Match  Input connector: "N" Female  Power handling: 1.5kW  Wind survival: 100 MPH</p>	1	unit	29260.00	29,260.00
49	<p><b>Omni-directional egg-beater antenna (Spectrum Monitoring)</b>  Gain: 5.5 dBic  Frequency range: 135 to 150 MHz  Impedance: 50 ohms  VSWR at 144-148 MHz: 1.2:1  Polarity: Right Hand Circular Overhead  Power handling: 500W Max  Wind survival: 100 MPH</p>	1	unit	30000.00	30,000.00
50	<p><b>Long range radio with adapter board (PEDRO)</b>  Has onboard long-range radio  LoRaWAN protocol certified  Operates in 868MHz band  -138 dBm sensitivity  12 km free space line-of-sight range  1.8V to 3.6V operating voltage  40mA consumption at +14dBm transmit output power  1.4uA consumption in sleep mode  11.2 mA consumption in receive mode  -40C to +85C operating temperature</p>	6	pc	5600.00	33,600.00
51	<p><b>LORAWAN Gateway (Spectrum Monitoring)</b>  Operating Voltage: 5 V</p>	2	unit	25000.00	50,000.00

	<p>Modulation: LoRa® Spread-Spectrum  RF Output Power (max.) +20 dBm  Operating Temperature: 15°C to 35°C  Interfaces: DC-Jack  RJ45 Ethernet  USB (2x)  SMA Connector  Dimension (LxWxH): 151 x 80 x 71 mm (excl. Antenna)  Concentrator: Contains iC880A-SPI  With on - board single board computer</p>				
52	<p><b>High performance 3D printing filament (PEDRO)</b>  High performance 3D printing filament  Material: Carbon Fiber HTPLA  Diameter: 1.75mm  Maintains properties at up to 120C</p>	6	unit	4400.00	26,400.00
53	<p><b>Prototyping 3D printer filament (PEDRO)</b>  Prototyping 3D printer filament  Material: Tough PLA  Diameter: 1.75mm  Printing Temperature: 195C to 230C</p>	8	unit	1000.00	8,000.00
54	<p><b>GPS Active Antenna (PEDRO)</b>  Frequency: 1575 +/- 3MHz  VSWR: 2:1  Bandwidth: 20Hz Minimum  Impedance: 50 ohms  Polarization: RHCP  Connector: SMA-male  LNA gain: 29 dB  Noise figure: 0.9 dB  Operating temperature: -40C to +85C</p>	2	pc	1100.00	2,200.00
55	<p><b>GPS Module (PEDRO)</b>  Receiver type 72-channel u-blox M8 engine -  GPS/QZSS L1 C/A,  GLONASS L10F, BeiDou B1, Galileo E1B/C, SBAS L1  C/A:  WAAS, EGNOS, MSAS, GAGAN  Nav. update rate Single GNSS: up to 10 Hz, 2  Concurrent GNSS:  up to 5 Hz  Position accuracy 2.0 m CEP  Acquisition Cold starts: 26 s  Aided starts: 2 s  Re-acquisition: 1 s  Sensitivity Tracking &amp; Nav: -167 dBm  Cold starts: -148 dBm  Hot starts: -157 dBm  Oscillator TCXO  RTC crystal Built-In  with patch antenna</p>	5	pc	2000.00	10,000.00
56	<p><b>GSM Module (PEDRO)</b>  u-blox SARA-G3 series 2.5G GSM/GPRS cellular  quad-band  module  GSM Quad-band 850/1900, 900/1800 MHz, Maximum  output  power -8dBm, IPv4/IPv6 dual-stack</p>	5	pc	7400.00	37,000.00

	Power consumption in idle-mode 0.3mA GPIO,UART,USB 3.3V or 5V				
57	<b>High Gain Omnidirectional Antenna (PEDRO)</b> 860-870 MHz 8dBi Peak gain IP65 waterproof N type Female connector VSWR 1.5:1 Wind Resistance: >150mph (>241km/h)	2	pc	14000.00	28,000.00
58	<b>High Gain Directive Yagi Antenna (PEDRO)</b> 860 - 960MHz +23dBi Gain VSWR <2:1 Vertical Polarisation 50Ω Impedance	2	pc	7000.00	14,000.00
59	<b>DC - DC Converter Step-down (Spectrum Monitoring)</b> Input Range: 10 - 30VDC Output: 5 VDC Output Current: 5A IP67 Waterproof Full-load Efficiency > 90% Ripple p-p: 1% of output voltage (MAX) Load Regulation: 1.5% Max Non-load Consumption: 0.5% of full-load power Over-load Protection: +10% of rated output current Short-circuit Protection: yes Delivery: 30 days upon receipt of NTP	5	pc	1500.00	7,500.00
60	<b>Real Time Clock Module for Heterogenous Multicore Single Board Computer (Spectrum Monitoring)</b> PCF8563 based RTC module Provides year, month, day, weekday, hours, minutes, and seconds based on a 32.768 kHz quartz crystal Century flag Clock operating voltage: 1.0 V to 5.5 V at room temperature Low backup current; typical 0.25 uA at VDD = 3.0 V and Tamb = 25 degrees Celsius 400 kHz two-wire I2C-bus interface (at VDD = 1.8 V to 5.5 V) Programmable clock output for peripheral devices (32.768 kHz, 1.024 kHz, 32 Hz, and 1 Hz) Alarm and timer functions Integrated oscillator capacitor Internal Power-On Reset (POR) Compatible with Odroid XU4 single board computer Delivery: 30 days upon receipt of NTP	5	pc	500.00	2,500.00
61	<b>DC Plug Assembly for Heterogenous Multicore Single Board Computer (Spectrum Monitoring)</b>	5	pc	70.00	350.00

	<p>Inner diameter 2.1mm  Outer diameter 5.5mm  Center is positive (RED wire)  Outer is negative(BLACK wire)  Cable Length : 270mm approx. (10 inch)  Delivery: 30 days upon receipt of NTP</p>				
62	<p><b>Mini Single Board Computer (Spectrum Monitoring)</b>  1GHz, Single-core CPU  512MB RAM  Mini HDMI and USB On-The-Go ports  Micro USB power  HAT-compatible 40-pin header  Composite video and reset headers  CSI camera connector  Warranty: 1 year  Delivery: 30 days upon receipt of NTP</p>	2	unit	1200.00	2,400.00
63	<p><b>Mini HDMI Plug to Standard HDMI Jack Adapter (Spectrum Monitoring)</b>  Mini HDMI Plug to Standard HDMI Jack Adapter  Delivery: 30 days upon receipt of NTP</p>	2	pc	200.00	400.00
64	<p><b>Multipolarized antenna (Spectrum Monitoring)</b>  FREQUENCY RANGE: 25MHz-1300MHz  GAIN: Unity (3 dBi)  VSWR: 1:2-1.9:1  HORIZONTAL PATTERN TYPE: Omnidirectional  Vertical PATTERN TYPE: Hemispheric  POLARIZATION: Multi-Polarized  POWER: 200 Watts Input  IMPEDANCE: 50 ohms nominal  CONSTRUCTION: Stainless Steel, Aluminum  ENVIRONMENTAL CONDITIONS: Outdoor  OPERATION TEMPERATURE: -40 to 85 deg C  STORAGE TEMPERATURE: -40 to 85 deg C  TRANSPORT TEMPERATURE: -40 to 85 deg C  IP RATING: IP66  Delivery: 45 days upon receipt of NTP  Warranty: 1 year</p>	2	pc	7000.00	14,000.00
65	<p><b>Spectrum Sensor IoT Shield for Single Board Computer (Spectrum Monitoring)</b>  Frequency Band Coverage: 15 - 2700MHz  Antenna connector: Standard SMA 50 Ohms  Advanced selectable internal input stage: Normal, LNA, 30dB attenuator  Amplitude resolution: 0.5dBm  Dynamic range: -130dBm to +10dBm  Absolute Max Input Power: +30dBm  Average noise floor level: -120dBm  Frequency stability and accuracy: +-10ppm  Amplitude stability and accuracy: +-3dBm  Frequency resolution: 1kHz  Resolution Bandwidth (RBW): automatic 3kHz to 600kHz  Delivery: 45 days upon receipt of NTP</p>	1	pc	13000.00	13,000.00
66	<p><b>NMO to SMA Round Magnetic Mount Assembly</b></p>	2	pc	6000.00	12,000.00

	<p><b>(Spectrum Monitoring)</b>  0-6GHz High Frequency Magnetic NMO Mount  10 Feet, 200 Series Coax cable  SMA Male  Delivery: 45 days upon receipt of NTP</p>				
67	<p><b>USB to Serial UART Module (Spectrum Monitoring)</b>  FTDI FT232RL chip  3.3V or 5V  UART interface support  Delivery: 30 days upon receipt of NTP</p>	2	pc	1600.00	3,200.00
68	<p><b>WiFi module for Heterogenous Multicore Single Board Computer (Spectrum Monitoring)</b>  IEEE 802.11ac/a/b/g/n WLAN module with on-board 2.4Ghz and 5Ghz Dual band antenna  Works with ODROID-XU4 / C2 / C1+ / C0  Android and Linux compatible  Realtek RTL8812AU chipset (ID = 0bda:8812)  Dual-Band MIMO 2x2 Solution (11ac 2x2 MAC/BB/RF+PA)  USB 3.0 Super-Speed interface (Compatible with USB2.0 too)  LED for WiFi Link Activity and button of WPS  Delivery: 30 days upon receipt of NTP</p>	3	pc	2000.00	6,000.00
69	<p><b>Battery Charge Monitoring (Spectrum Monitoring)</b>  LTC2943, battery gas gauge designed for use with multicell batteries  Can measure battery terminal voltages from 3.6V to 20V  Board should be compatible with Arduino, with Arduino UNO bootloader  Programmable in Arduino IDE, over USB port  Delivery: 30 days upon receipt of NTP</p>	3	pc	1800.00	5,400.00
70	<p><b>MC4 Connector Male (Spectrum Monitoring)</b>  Gender: Male  Cable CSA : 4 - 6mm<sup>2</sup>  Mounting Type : Cable Mount  IP Rating: IP2x (Un Mated), IP67 (Mated)  Current Rating: 30A  Voltage Rating: 1 kV  Maximum Operating Temperature: +90°C  Minimum Operating Temperature: -40°C  Delivery: 30 days upon receipt of NTP</p>	10	pc	437.00	4,370.00
71	<p><b>MC4 Connector Female (Spectrum Monitoring)</b>  Gender: Female  Cable CSA: 4 - 6mm<sup>2</sup>  Mounting Type: Cable Mount  Termination Method: Quick Connect  IP Rating: IP2x (Un Mated), IP67 (Mated)  Current Rating: 30A  Voltage Rating: 1 kV  Maximum Operating Temperature: +90°C  Minimum Operating Temperature: -40°C  Delivery: 30 days upon receipt of NTP</p>	10	pc	433.00	4,330.00



72	<b>Power Switch module with reverse voltage protection (Spectrum Monitoring)</b> Absolute max voltage: 20 V Recommended operating voltage: 2.2 V to 16 V MOSFET combined on resistance (max) 26 mΩ @ 1.8 V , 16 mΩ @ 4.5 V Continuous current at 55°C: 3.0 A Continuous current at 150°C: 6.0 A Delivery: 30 days upon receipt of NTP	5	pc	400.00	2,000.00
73	<b>Enclosure (PEDRO)</b> Ventilation - two 4 inch air vents with cleanable aluminum mesh screens which are covered by rain shields Material: Fiberglass Reinforced Polyester Outer dimensions: 15.7 x 13.8 x 6.54 Inches Inner Dimensions: 13.87 x 11.97 x 6.2 Inches Mounting Plate Material: 0.10 inch Aluminum Mounting Plate Dimensions: 10.9 x 12.8 in. Ratings: NEMA Type 3R, 3RX / IP24 Flame rating: UL94-5V	5	unit	11770.00	58,850.00
74	<b>Battery Enclosure (PEDRO)</b> Material: Fiberglass Reinforced Polyester Outer Dimensions: 15.75 x 13.83 x 8.73 Inches Inner Dimensions: 13.87 x 11.97 x 8.4 Inches Ratings: NEMA Type 4, 4X / IP66 Flame Rating: UL94-5V	5	unit	9600.00	48,000.00
75	<b>Valve Regulated Lead Acid Battery (PEDRO)</b> 12V, 38Ah Valve Regulated Lead Acid Battery 196x164x169 mm.	5	unit	5500.00	27,500.00
76	<b>Solar charge controller (PEDRO)</b> True 0 to 100% PWM duty cycle Setpoint accuracy 12V: +/-25mV; 24V: +/-48mV Fully encapsulated in epoxy potting Marine rated terminals / anodized case With Temperature compensation Sealed / Flooded battery select Nominal system voltage: 12Vdc Max. solar input voltage: 30 V Max. solar current: 10 Battery voltage range: 6 -15V Self-consumption: < 8 mA Voltage Accuracy: 1.0 % Transient Surge Protection: 1500W per connection	5	unit	10000.00	50,000.00
77	<b>Solar panel (PEDRO)</b> 50 Watt Monocrystalline Solar Panel IP65 Rated waterproof junction box Maximum System Voltage: 600V DC (UL) Open-Circuit Voltage (Voc): 22.70V Short-Circuit Current (Isc): 2.84A Optimum Operating Voltage (Vmp): 18.50V Optimum Operating Current (Imp): 2.70A 25-year power output warranty: 5 year/95% efficiency rate, 10 year/90% efficiency rate, 25-year/80% efficiency rate	10	unit	9000.00	90,000.00

5-year material and workmanship warranty				
<b>TOTAL APPROVED BUDGET FOR THE CONTRACT (ABC):</b>				<b>Php 1,889,020.00</b>
<b>RESERVATION CLAUSE</b>				
<p>The Advanced Science and Technology Institute reserves the right to accept or reject any proposal, to annul the bidding process, and to reject all proposals at any time prior to contract award, without thereby incurring any liability to the affected proponent or proponents.</p>				