FORM N: EQUIPMENT PROPOSAL - REQUIREMENTS

Instructions for filling out Form N: Equipment Proposal - Requirements

1. Complete Form N: Equipment Proposal - Requirements
2. Follow the proposal instructions in the Proposal Instructions section below

PROPOSAL INSTRUCTIONS

1. **For each Mandatory requirement, provide a Y (Yes) or N (No), indicating whether your solution can meet the requirement**. Y indicates that the solution you are proposing will meet the requirements listed in the requirement statement. N indicates that the solution you are proposing will not meet the requirements.

2. For each **Non-Mandatory** requirement indicate which proponent response code that best describes your solution:

    Y – Available: the solution for the requirement is currently available in the existing product.

    S – Available via Software Upgrade: the solution for the requirement is not available by default but may be enabled by software upgrade by simply plugging in a USB stick or via the RTE's Ethernet connection to the Internet or other similar method.

    F – Future Availability: the solution for the requirement is not currently available, but will be available in an upcoming planned product release.   If this option is indicated, include the date/timeframe when the requirement will be available for implementation, which should be either:
    a) A planned release up to 3 calendar months after the RFP.654-2017 competition close date, where an additional Proponent response code of **3** should be provided;
    b) A planned release up to 6 calendar months after the RFP 654-2017 competition close date, where an additional Proponent response code of **6** should be provided, or
    c) A planned release up to 12 calendar months or longer after the RFP 654-2017 competition close date, where an additional Proponent response code of **12** should be provided.

    3 – Third Party Supplied: the solution for the requirement is expected to be met by using a third party vendor's existing product, either integrated or non-integrated.

    N – Not Possible: the solution for the requirement will not be provided by the Proponent.

3. For each requirement in which the City has noted as "Please Describe", and/or asked specific questions, Bidder should include additional information, referencing the specific Ref #, at the end of the section and/or as appendices. **Ref # is highly important to ensure linkage between requirement and description.**

Notes:

1. An omitted response will be assumed to be the same as a response code of "N".
2. Any deviation from the response code will be re-coded at the discretion of the City of Winnipeg.

A. Requirements for Radio Test Equipment – Fixed Bench Application

A.1 Mandatory Requirements		Proponent Response (Y, N)
Requirement Description	**RFP Requirement Ref#**	
Shall support full duplex testing for Analog and Digital FM radios and system tests	E2.2.1a	
Shall support test and alignment of Project 25 Phase 1 & Phase 2 radios	E2.2.1b(i)	
Shall be able to generate test signals using P25 Phase 1 and Phase 2 protocols with frequency range of 10MHz to 1.05GHz, resolution 1Hz, and accuracy of ±1 count.	E2.2.1b(ii)	
Shall have RF Signal Generator Frequency Range of 10MHz to 1.05 GHz (standard); 10 MHz to 2.7 GHz (32XOPT058). Both Usable from 100 kHz.	E2.2.1c(i)	
Shall have RF Signal Generator Frequency Resolution of 1 Hz or less.	E2.2.1c(ii)	
Shall have RF Signal Generator Frequency accuracy of frequency standard ±1 count.	E2.2.1c(iii)	
Shall have RF Signal Generator Output Level Range: - T/R Port: -130.0 to -30 dBm max for CW or FM; -35 dBm max for AM modulations; -40 dBm max for complex modulations). - Duplex: -130.0 to +10.0 dBM (+10 dBm max for CW or FM; +5 dBm max for AM modulations; 0 dBm max for complex modulation)	E2.2.1c(iv)	
Shall have RF Signal Generator Output level Resolution: 0.1dB	E2.2.1c(v)	
Shall have RF Signal Generator Output Level Accuracy: 1.0 dB for levels > -110dBm (Typical better than 0.6 dB). 1.5 dB for levels ≤ (typical better than ±1.0 dB)	E2.2.1c(vi)	
Shall have RF Signal Generator spectral purity harmonic spurious specification that is not higher than -30 dBc and have non Harmonic spurious specifications not higher than -40 dBc.	E2.2.1c(vii)	
Shall have RF Receiver Demod Selections of AM, FM, FM50us, FM75us, FM750us, AM, USB, and AM LSB	E2.2.1d(i)	
Shall have RF Receiver Frequency Range of 10 MHz to 1.05 GHz (Standard); 10 MHz to 2.7 GHz (392XOPT058). Both Usable from 100 kHz.	E2.2.1d(ii)	

Shall have RF Receiver Sensitivity of < - 100 dBm (for 10 dB SINAD, FM, 25 kHz, 1kHz rate, 6kHz FM Deviation, 300 Hz t0 3.4 kHz AF Filter, Pre-amp OFF).	E2.2.1d(iiii)	
Shall have RF Receiver Sensitivity of < - 133 dBm (for 10 dB SINAD, FM, 25 kHz, 1kHz rate, 6kHz FM Deviation, 300 Hz t0 3.4 kHz AF Filter, Pre-amp ON).	E2.2.1d(iv)	
Shall have RF Receiver FM Demod Output Level of nominally 1 Vrms (for deviation ±1/4 of selected BW; 25 kHz BW same output level as 30 kHz BW)	E2.2.1d(v)	
Shall have RF Receiver AM Demod Output Level of nominally 2 Vrms (100% AM)	E2.2.1d(vi)	
Shall have RF Power Meter (Broadband) : - Frequency Range 10 MHz to 1.05 GHz (Standard); 10 MHz to 2.7 GHz (329XOPT058). Both Usable from 2MHz - Level Range of 100 mW to 125 W (Usable from 10 mW) - Resolution of 4 digits for W or 0.1 dB - Accuracy of 10%, 1 digit - Signal including CW, FM, C4GM and 4FSK	E2.2.1e(i)	
Shall have RF Power Meter (Inband) : - Frequency Range of 10 MHz to 1.05 GHz (Standard); 10 MHz to 2.7 GHz (Freq Ext Opt). Both Usable from 100 kHz - Level RangeT/R Port: -60 to +51 dBm and ANT Port of -100 to +10 dBm - Resolution of 0.1 dB or less - Accuracy of ±1 dB - AM Filter BW of 6.25, 8.33, 10, 12.5, 25, and 30 kHz - FM Filter of 6.25, 10, 12.5, 25, 30, 100, and 300 kHz - Signal CW, FM, AM, C4FM, 4FSK, QPSK, and QAM	E2.2.1e(ii)	
Shall have RF Counter: - Range 10MHz to 1.05 GHz (Standard); 10 MHz to 2.7 GHz (392XOPT058). Both usable from 100 kHz, Auto-tune) - Resolution 1 Hz or less - Accuracy of Frequency Standard ± count - Level Range for Auto-tune: T/R Port of -10 to +50 dBm and ANT Port of -60 to +10 dBm - Signal including CW, FM, AM < 70 % modulation	E2.2.1e(iii)	
Shall have RF Error Meter: - Range: 0 to ±2.5 MHz from receiver frequency (6 MHz IF BW) - Resolution 1 Hz or less	E2.2.1e(iv)	

- Accuracy: Frequency standard ± count - Level Range T/R Port: -10 to +50 dBm; ANT Port: -60 to +10 dBm - Signal including CW, FM, AM < 70% modulation		
Shall have RF Input port that can accept a minimum of 50 Watt input continuously	E2.2.1e(v)	
Shall have transmit and receive port that can accept signals up to +52 dBm CW (Continuous Wave) without damage	E2.2.1e(vi)	
Shall allow for a minimum continuous 100 mW or +10 dBm at the Antenna/sensitive RF input port	E2.2.1e(vii)	
Shall have Demodulation RF Characteristics: - Frequency range of 10 MHz to 1.05 GHz (Standard); 10 MHz to 2.7 GHz (392XOPT058). Both usable from 100 kHz - Input RF Level: T/R Port of -10 to +50 dBm; ANT Port: -80 to +10 dBm	E2.2.1f(i)	
Shall have Demodulation Counter: - Range 20 Hz to 20 kHz (1 to 100 kHz FM Deviation, IF BW set approximately for the received modulation BW). Range 20 Hz to 10 kHz (30 to 90% AM, IF BW set appropriately for the received modulation BW) - Resolution: 0.1 Hz or less - Accuracy: ±50 ppm (+10 ppm typical) - Waveform: Sine or Square	E2.2.1f(ii)	
Shall have Demodulation FM Deviation Meter: - Range: 0 to 150 kHz - Resolution : 10 Hz - Accuracy: ±3 % plus source residual, ±1 count (30 to 90% AM, IF BW set appropriately for the received modulation BW) - FM Rate: 20 Hz to 20 kHz (IF BW set appropriately for the received modulation BW)	E2.2.1f(iii)	
Shall have Demodulation AM Deviation Meter: - Range: 0 to 100% - Resolution: 0.1% or less - Accuracy: ±3 % + source residual, ±1 count (30 to 90% AM, IF BW set appropriately for the received modulation BW) - AM Rate: 20 Hz to 15 kHz (IF BW set appropriately for the received modulation BW)	E2.2.1f(iv)	
Shall have Audio Input Characteristics for the following meters: AF Counter, AF Level Meter, SINAD Meter, Distortion Meter, Hum and Noise Meter, Signal-to-Noise Meter	E2.2.1g(i)	

Shall have Front Panel Audio Inputs: Audio 1 or Audio 2 (unbalanced, chassis reference); Audio 1 and Audio 2 (balanced, 600 W differential input)	E2.2.1g(ii)	
Shall have Audio Input Impedance (Audio 1 and 2): Hi-Z (>10 kW) - Unbalanced input 600 W - Unbalanced input (8 Vrms MAX input*) 600 W - Balanced input (Audio 1 and 2) * Note - 600W unbalanced will auto-switch to Hi-Z @ 8 Vrms	E2.2.1g(iii)	
Shall have Audio and Modulation AF Counter : - Range: 20 Hz to 20 kHz (usable from 10 Hz) - Resolution: 0.1 Hz or less - Accuracy: ±50 ppm max, ±10 ppm typical - Wave shape: Sine or Square - Level Range (Audio): 20 mV to 30 Vrms	E2.2.1g(iv)	
Shall have Audio and Modulation AF Level Meter: - Range: 0 to 30 Vrms - Resolution: Volts: 1 mV (input < 1V), 10 mV (input ≥1 V) - Accuracy: 5% (Unbalanced, Hi-Z, 300 to 3 kHz, 0.1 to 30 Vrms) - Frequency: 20 Hz to 20 kHz	E2.2.1g(v)	
Shall have Audio and Modulation SINAD Meter: - Range: 0 to 60 dB - Resolution: 0.01 dB or less - Accuracy: ±1 dB, ±1 count (SINAD >3 dB, ≤40 dB, 5 kHz LP AF filter - Frequency Range: 300 Hz to 5 kHz - Level Range (Audio): 0.1 to 30 Vrms	E2.2.1g(vi)	
Shall have Audio and Modulation Distortion Meter: - Range: 0.0 to 100.0 % - Resolution: 0.1% - Accuracy: <±0.5% (Distortion 1 to 10%, 5 kHz LP AF Filter). <±1.0% (Distortion 10 to 20%, 5 kHz LP AF Filter) - Frequency Range: 300 Hz to 5kHz - Level Range (Audio): 0.1 to 30 Vrms	E2.2.1g(vii)	
Shall have Audio and Modulation Hum and Noise : - Range 100 dB to 0 dB - Resolution: 0.01 dB - Accuracy: ±1 dB, ±1 count (>-60 dB, ≤-20 dB) - Signal Frequency: 300 Hz to 5 kHz - Audio Input Level: 0.1 to 30 Vrms - RF Input Level: T/R Port: - 10 to +50 dBm; ANT Port: - 80 to +10 dBm	E2.2.1g(viii)	

Shall have Audio and Modulation Signal-to-Noise-Ratio : - Range: -100 to 0 dB - Resolution: 0.01 dB - Accuracy: ±1 dB, ±1 count (>-60 dB, ≤-20 dB) - Signal Frequency: 300 Hz to 5 kHz - Audio Input Level: 0.1 to 30 Vrms - RF Input Level: T/R Port: - 10 to +50 dBm; ANT Port: - 80 to +10 dBm	E2.2.1g(ix)	
On Frequency Standard I/O – Shall have: - Internal Frequency Standard output: Frequency 10MHz (nominal) - Output level: 1 Vpp (nominal) into 50 Ohms - Temperature stability (at 0 to 50): ±0.01 ppm - Aging rate: ±0.1 ppm/year after 1 month continuous use - Warm up time: less than 5 minutes to ±0.02 ppm	E2.2.1(h)	
Environmental/Safety: Shall have - Have operating temperature: -40C to 71°C, shock and vibrations of 30G Shock at 5-500 Hz random vibrations. - Comply with the safety standards UL 61010B-1, EN 61010-1, and CSA C22.2 No. 61010-1. - Maximum warm-up time of 15 minutes for every measurement to be within specifications.	E2.2.1(i)	

A.2 Non-Mandatory		Proponent Response (Y, S, F, 3, N)
Requirement Description	**RFP Requirement Ref#**	
RF Signal Generator: Should support modulations including C4FM, CQPSK, and LSM. Proponents should provide the complete list of modulations that are supported	E2.2.2(a)	
RF Measurements – Should: - have RF Sensitivity of <-100dBm (for 10 db SINAD, FM, 25kHz, 1kHz rate, 6 kHz FM Deviation, 300 Hz to 3.4 kHz Filter, Pre-amp OFF) & <-113 dBm (10 dB SINAD, FM, 25 kHz, 1 kHz rate, 6 kHz FM Deviation, 300 Hz to 3.4 kHz AF Filter, Pre-amp ON) - have user adjustable Resolution Bandwidths of 300 Hz, 3 kHz, 30 kHz, 60 kHz, 300 kHz and 6 MHz	E2.2.2(b)	
Built in Test Function: Should support fully automated alignment and testing that is validated and approved by vendors/manufacturers for the P25 Mobile and Portable radios, including the Harris XL-200P, XG-75M, XG-75P, XG-25M, & XG-25P. If the auto test and alignment support for XL-200P or any of the others is currently not available, the bidder should indicate when this support will become available and the value of associated cost – if any	E2.2.2(c)	
Vocoder: Should include a Phase 1 & Phase 2 P25-compatible vocoder which enables the user to perform, transmit and receive audio testing live. If support for Phase II is currently not available, it should be available by the end of third quarter of the year 2018. The bidder should indicate, in their proposal, the estimated cost of providing this feature at the said future time	E2.2.2(d)	
Dimensions and Weight: Should - weigh approximately 13kg to 20kg with an LCD Display Screen Size of approximately 16.26 cm diagonal - have approximate dimensions of Height 20cm, Width 36 cm, and Depth 52.0 cm	E2.2.2(e)	
Should have an oscilloscope with two channel input and at least 4MHz bandwidth	E2.2.2(f)	
Should have Ethernet, USB and RS-232 connection interfaces for remote control operation. Proponents should provide a list of all interfaces available for remote control operation	E2.2.28(g)	

Should provide a standard video output port to allow interfacing to an external display with size of at least 21 inches	E2.2.2(h)	
Should have, for the I/O Connectors, an Antenna RF Input port protection of 10W with warning from +16dBm to +18dBm and Generator RF Input protection of 10W with warning above +23dBm (Remove power immediately when alarm sounds)	E2.2.2(i)	
Should have General Purpose Interface Bus (GPIB) connection interface	E2.2.2(j)	
The Equipment Provider Should have a factory-approved calibration and service facility located in Canada	E2.2.2(k)	

B. Requirements for Radio Test Solution - Portable Application		
B.1 Mandatory Requirements		**Proponent Response (Y, N)**
Requirement Description	**RFP Requirement Ref#**	
Shall support full duplex testing for Analog and Digital FM radios and system tests	E2.4a(i)	
Technology: Shall support test and alignment of Project 25 Phase 1 & Phase 2 radios	E2.4a(ii)	
RF Generator: Shall have a generator spectral purity harmonic spurious specification that is not higher than -30 dBc, and have non Harmonic spurious specifications no higher than -40 dBc	E2.4a(iii)	
RF Measurements: Shall - provide an FM deviation accuracy specification of 3% or better - have a FM sensitivity of 1 uV or better for 10 dB EIA Signal-to-noise and distortion ratio SINAD - have RF Input port that can accept a minimum of 50 Watt input continuously - have transmit and receive port that provides protection up to +52 dBm CW - allow for a minimum continuous 100 mW or +10 dBm at the Antenna/sensitive RF input port	E2.4a(iv)	
Demodulations Measurements: Shall be able to - demodulate AM/FM audio at any Channel/ Spectrum Analyzer span setting - demodulate RF in the range 10 MHz to 1 GHz	E2.4a(v)	
Audio and Modulation Measurement: Shall include a P25-compatible vocoder which enables the user to perform, transmit and receive audio testing live	E2.4a(vi)	
Power Requirement: Shall have a rechargeable internal battery with a life of at least 2.5 to 3 hour	E2.4a(vii)	
Environmental/Safety: Shall - Shall be able to operate in an environmental temperature of -20C to 80°C - It Shall comply with the safety standards CE/ UL2054 / UL1642 / FCC IEC 62133 / EN6095 / ROHS UN 38.3 / PSE / RCM - Shall have a maximum warm-up time of 15 minutes for every measurement to be within specifications	E2.4a(viii)	

B.2 Non-Mandatory		**Proponent Response (Y, S, F, 3, N)**
Requirement Description	**RFP Requirement Ref#**	
RF Measurements: Should have - a power measurement that provides accuracy of better than 7% - an option for an internal thru-line power meter capable of 500 W signals and a measurement accuracy of better than 5%	E2.4b(i)	
Built in Test Function: Should support fully automated alignment and testing that is validated and approved by Harris, for Project 25 Phase 1 & Phase 2 radios, including the Harris XL-200P, XG-75M, XG-75P, XG-25M, & XG-25P. If the auto test and alignment support for XL-200P or any of the others is currently not available, the bidder should indicate when this support will become available and the value of associated cost – if any	E2.4b(ii)	
Vocoder: Should include a Phase 1 & Phase 2 P25-compatible vocoder which enables the user to perform, transmit and receive audio testing live. If support for Phase II is currently not available, it Should be available by the end of third quarter of the year 2018. The bidder should indicate, in their proposal, the estimated cost of providing this feature at the said future time	E2.4b(iii)	
Dimensions and Weight – Should : - weigh between 5 – 10 kg - have approximate dimensions of Height 24 cm, Width 33 cm, and Depth 20 cm	E2.4b(iv)	
Should have Video Graphics Array (VGA), and USB connection interfaces	E2.4b(v)	
Should provide remote control operation through Ethernet including control of Duplex and Generation functions. Proponents should provide a list of all interfaces available for remote control operation	E2.4b(vi)	
Should be ruggedized and able to withstand a Shock of 30g (multiples of the acceleration of gravity)	E2.4b(vii)	
Should have an output that can be extended to an external display of at least 21 inches	E2.4b(viii)	
The Equipment Provider should have a factory approved calibration and service facility located in Canada	E2.4b(ix)	

C. Requirements for Professional Services (Maintenance, Support & Calibration) for the Fixed Bench RTE		Proponent Response (Y, N)
C.1 Mandatory Requirements		
Requirement Description	**RFP Requirement Ref#**	
Shall provide caliberation service for each of the first 5 service years of the RTE	E2.7(a)	

C.2 Non-Mandatory Requirements		Proponent Response (Y, S, F, 3, N)
Requirement Description	**RFP Requirement Ref#**	
RTE Should have Remote Access Capabilities for softwares updates, support and maintenance	E2.2b(vi)	
RTE Should have online support for maintenance and support	E2.6(c)	
RTE Support and Maintenance contract should be renewable	E2.6(d)	
Provision of loan RTE in the event of original RTE being serviced	E2.6(f)	
Should provide Extended Warranty	E2.8	
Should provide Software Patch Updates, if covered under a support and maintenance contract and if renewable	E2.9	

D. Requirements for Professional Services (Maintenance, Support, & Calibration) for the Portable RTE		Proponent Response (Y, N)
D.1 Mandatory Requirements		
Requirement Description	**RFP Requirement Ref#**	
Shall provide calibration service for each of the first 5 service years of the RTE	E2.7(b)	

D.2 Non-Mandatory Requirements		Proponent Response (Y, S, F, 3, N)
Requirement Description	**RFP Requirement Ref#**	
RTE Should have Remote Access Capabilities for softwares upgrades, support and maintenance	E2.4b(v)	
RTE Should have online support for maintenance and support	E2.6(c)	
RTE Support and Maintenance contract should be renewable	E2.6(d)	
Should provide loan RTE in the event of original RTE being serviced	E2.6(f)	
Should provide Provision of Optional Extended Warranty	E2.8	
Should provide Software Patch Updates, if covered under a support and maintenance contract and if renewable	E2.9	