

[illegible]

TECHNICAL SPECIFICATION

GE MDS Orbit MCR Radios

Annexure A

SPECIFICATIONS – ORBIT RADIOS

Features

- 400 ~470 MHz
- Half duplex
- Auto failover
- Modulation: CPFSK, QPSK, 16QAM, 32QAM, 64QAM
- Adaptive Modulation: Per-packet, per-remote, bi-directional
- Dynamic FEC; Convolutional, Reed Solomon
- Compression: IP Header & Payload, $\leq +30\%$ efficiency
- Media Access Control: High performance
- Topologies: Point to Multipoint (PTMP), PTP, Daisy Chain
- Collision avoidance over Serial traffic, proprietary MAC – no Retransmissions

Transmitter

- Frequency stability: +/- 0.5 ppm
- Peak carrier power: +40 dBm 330-470 MHz, +39.5 dBm 896-960 MHz
- Average Power: QPSK: +36 dBm
- (Programmable): 16QAM: +33 dBm, 64QAM: +33 dbm
- Power range: +20 dBm to +40 dBm
- Carrier power accuracy: (+/- 1.5 dB typical)
- Adjacent channel power: < -60 dB
- Output impedance: 50 Ohms

Receiver

- Type: Direct Conversion
- Adjacent channel rejection: > -48 dBm
- Sensitivity (Actual) @ 1×10^{-6} BER,
- low FEC (ETSI 80% PSR eqv.)

Networking

- Pv4 Routing OSPF, EBGp, RIPv2 with performance-based
- route failover
- IPv6 Routing*
- Full managed switch capability, IEEE 802.3, 802.1Q/VLANs,
- 64 LANs, STP
- Concurrent bridging & routing
- GRE tunnelling with Layer 2 (Ethernet) and Layer 3 support
- Route/path failover between any two wireless/Ethernet
- interfaces based on link loss, latency degradation or packet.
- loss thresholds
- Quality of Service 16 egress queues, Priority Queuing, Fair

TECHNICAL SPECIFICATION

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Annexure A

- Queuing, Traffic Shaping, Classification based on DSCP,
- 802.1p and Layer 2-4 classifiers
- IP Protocols TCP, UDP, ARP, DHCP, ICMP, NTP, FTP, SFTP,
- TFTP, DNS, configurable HTTP and HTTPS, SSH
- Serial TCP server, Modbus/TCP, Modbus RTU, TCP client, UDP
- Unicast and Multicast, BSAP, and DNP3

Security

- IPsec VPN Server (responder) & Client (initiator) with DMVPN
- Authentication public key, EAPTLS, Pre-Shared, Ike 1-2
- Encryption: 3DES, AES 128/192/256, CBC, CTR, CCM, GCM,
- SHA 256/384/512 HMAC. Wi-Fi: WPA WPA/WPA2 PSK,
- Enterprise
- Firewalling: stateful layer 3-4 with MAC filtering,
- NAT, Source NAT (Masquerading), static NAT, port forwarding.
- Device security: Secure boot, secure firmware, digitally signed.
- hardware & software, magnetometer tamper detection
- Certificate management: X.509, SCEP, PEM, DER, RSA
- User authentication: Local RBAC, AAA/RADIUS
- FIPS 140-2 (Level 2) certification in progress

Secondary Options

- Cellular (dual SIM, 3G Fallback)
 - 4G: 4G LTE-A NAM/EMEA/LATAM
- 2.4 GHz Wi-Fi
 - 1x1 SISO (single antenna/radio chain); 802.11 b/g/n
 - Scalability up to 2 SSIDs, up to 7 clients/stations
 - Max transmits power (adjustable): up to 20 dBm.
- Dual-Band 2.4/5 GHz Wi-Fi
 - 2x2 MIMO (dual antenna/radio chain); 802.11 a/b/g/n
 - Scalability up to 2 SSIDs, up to 32+ clients/stations
 - Max transmits power (adjustable): up to 26 dBm.

EVALUATION REQUIREMENTS

- The MCR digital radios must be factory configured for: 2x Ethernet, 1x Serial and 1x USB.
- If an equivalent digital radio is to be proposed, then the OEM must confirm in writing and that their radio is compatible to operate on the existing MDS SD4 radio platform used by the JW Telemetry System.

TECHNICAL SPECIFICATION

GE MDS Orbit MCR Radios

Annexure A

- The Brand Name and Model number of the radio to be provided for evaluation purposes.
- The digital radio proposed must carry a minimum of 36-months warranty.
- The delivery period of the digital radios from date the JW Official Purchase Order is issued.

TECHNICAL SPECIFICATION

GE MDS Orbit ECR Radios

Annexure B

SPECIFICATIONS – ORBIT RADIOS

Features

- 400 ~470 MHz
- Half duplex
- Auto failover
- Modulation: CPFSK, QPSK, 16QAM, 32QAM, 64QAM
- Adaptive Modulation: Per-packet, per-remote, bi-directional
- Dynamic FEC; Convolutional, Reed Solomon
- Compression: IP Header & Payload, $\leq +30\%$ efficiency
- Media Access Control: High performance
- Topologies: Point to Multipoint (PTMP), PTP, Daisy Chain
- Collision avoidance over Serial traffic, proprietary MAC – no Retransmissions

Transmitter

- Frequency stability: +/- 0.5 ppm
- Peak carrier power: +40 dBm 330-470 MHz, +39.5 dBm 896-960 MHz
- Average Power: QPSK: +36 dBm
- (Programmable): 16QAM: +33 dBm, 64QAM: +33 dbm
- Power range: +20 dBm to +40 dBm
- Carrier power accuracy: (+/- 1.5 dB typical)
- Adjacent channel power: < -60 dB
- Output impedance: 50 Ohms

Receiver

- Type: Direct Conversion
- Adjacent channel rejection: > -48 dBm
- Sensitivity (Actual) @ 1×10^{-6} BER,
- low FEC (ETSI 80% PSR eqv.)

Networking

- Pv4 Routing OSPF, EBGp, RIPv2 with performance-based
- route failover
- IPv6 Routing*
- Full managed switch capability, IEEE 802.3, 802.1Q/VLANs,
- 64 LANs, STP
- Concurrent bridging & routing
- GRE tunnelling with Layer 2 (Ethernet) and Layer 3 support
- Route/path failover between any two wireless/Ethernet
- interfaces based on link loss, latency degradation or packet.
- loss thresholds
- Quality of Service 16 egress queues, Priority Queuing, Fair

TECHNICAL SPECIFICATION

GE MDS Orbit ECR Radios

Annexure B

- Queuing, Traffic Shaping, Classification based on DSCP,
- 802.1p and Layer 2-4 classifiers
- IP Protocols TCP, UDP, ARP, DHCP, ICMP, NTP, FTP, SFTP,
- TFTP, DNS, configurable HTTP and HTTPS, SSH
- Serial TCP server, Modbus/TCP, Modbus RTU, TCP client, UDP
- Unicast and Multicast, BSAP, and DNP3

Security

- IPsec VPN Server (responder) & Client (initiator) with DMVPN
- Authentication public key, EAPTLS, Pre-Shared, Ike 1-2
- Encryption: 3DES, AES 128/192/256, CBC, CTR, CCM, GCM,
- SHA 256/384/512 HMAC. Wi-Fi: WPA WPA/WPA2 PSK,
- Enterprise
- Firewalling: stateful layer 3-4 with MAC filtering,
- NAT, Source NAT (Masquerading), static NAT, port forwarding.
- Device security: Secure boot, secure firmware, digitally signed.
- hardware & software, magnetometer tamper detection
- Certificate management: X.509, SCEP, PEM, DER, RSA
- User authentication: Local RBAC, AAA/RADIUS
- FIPS 140-2 (Level 2) certification in progress

EVALUATION REQUIREMENTS

- The MCR digital radios must be factory configured for: 1x Ethernet, 1x Serial and 1x USB.
- If an equivalent digital radio is to be proposed, then the OEM must confirm in writing and that their radio is compatible to operate on the existing MDS SD4 radio platform used by the JW Telemetry System.
- The Brand Name and Model number of the radio to be provided for evaluation purposes.
- The digital radio proposed must carry a minimum of 36-months warranty.
- The delivery period of the digital radios from date the JW Official Purchase Order is issued.
- Case- Rugged die cast aluminium
- Mounting options: Integrated DIN rail mount and standard mounting bracket

MBD 4

DECLARATION OF INTEREST

1. No bid will be accepted from persons in the service of the state¹.
2. Any person, having a kinship with persons in the service of the state, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to persons in service of the state, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority.

3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Full Name of bidder or his or her representative:.....

3.2 Identity Number:

3.3 Position occupied in the Company (director, trustee, shareholder²):.....

3.4 Company Registration Number:

3.5 Tax Reference Number:.....

3.6 VAT Registration Number:

3.7 The names of all directors / trustees / shareholders members, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below.

3.8 Are you presently in the service of the state? **YES / NO**

3.8.1 If yes, furnish particulars.

.....

¹MSCM Regulations: "in the service of the state" means to be –

(a) a member of –

- (i) any municipal council;
- (ii) any provincial legislature; or
- (iii) the national Assembly or the national Council of provinces;

(b) a member of the board of directors of any municipal entity;

(c) an official of any municipality or municipal entity;

(d) an employee of any national or provincial department, national or provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999);

(e) a member of the accounting authority of any national or provincial public entity; or

(f) an employee of Parliament or a provincial legislature.

² Shareholder" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

3.9 Have you been in the service of the state for the past twelve months?YES / NO

3.9.1 If yes, furnish particulars.....

.....

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?YES / NO

3.10.1 If yes, furnish particulars.

.....

.....

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid? YES / NO

3.11.1 If yes, furnish particulars

.....

.....

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state? YES / NO

3.12.1 If yes, furnish particulars.

.....

.....

3.13 Are any spouse, child or parent of the company's directors trustees, managers, principle shareholders or stakeholders in service of the state? YES / NO

3.13.1 If yes, furnish particulars.

.....

.....

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract. YES / NO

3.14.1 If yes, furnish particulars:

.....

.....

4. Full details of directors / trustees / members / shareholders.

Full Name	Identity Number	State Employee Number

.....
Signature

.....
Date

.....
Capacity

.....
Name of Bidder

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and

1.2 **To be completed by the organ of state**

a) The applicable preference point system for this tender is the 80/20 preference point system.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
- (b) Specific Goals.

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80
SPECIFIC GOALS	20
Total points for Price and SPECIFIC GOALS	100

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

- (a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;

- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 PREFERENCE POINT SYSTEMS

A maximum of 80 points is allocated for price on the following basis:

80/20

$$Ps = 80 \left(1 - \frac{Pt - P_{min}}{P_{min}} \right)$$

Where

- Ps = Points scored for price of tender under consideration
- Pt = Price of tender under consideration
- Pmin = Price of lowest acceptable tender

3.1.1. POINTS AWARDED FOR PRICE

A maximum of 80 points is allocated for price on the following basis:

80/20

$$Ps = 80 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right) \text{ o}$$

Where

- Ps = Points scored for price of tender under consideration
- Pt = Price of tender under consideration
- Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

The specific goals allocated points in terms of this tender	Number of points allocated (80/20 system)	Number of points claimed (80/20 system)	Proof of documents per specific goals
Business owned by 51% or more – Black Youth	20		Valid BBEE Certificate issued by SANAS accredited verification agency or Affidavit sworn under oath.

DECLARATION WITH REGARD TO COMPANY/FIRM

4.2. Name of company/firm.....

4.3. Company registration number:

4.4. TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
 - ☐ One-person business/sole propriety
 - ☐ Close corporation
 - ☐ Public Company
 - ☐ Personal Liability Company
 - ☐ (Pty) Limited
 - ☐ Non-Profit Company
 - ☐ State Owned Company
- [TICK APPLICABLE BOX]

4.5. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;
 - (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
 - (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
 - (e) forward the matter for criminal prosecution, if deemed necessary.

.....
SIGNATURE(S) OF TENDERER(S)

SURNAME AND NAME:

DATE:

ADDRESS:

.....

.....

.....

DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

- 1 This Municipal Bidding Document must form part of all bids invited.
- 2 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.
- 3 The bid of any bidder may be rejected if that bidder, or any of its directors have:
 - a. abused the municipality's / municipal entity's supply chain management system or committed any improper conduct in relation to such system;
 - b. been convicted for fraud or corruption during the past five years;
 - c. willfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years; or
 - d. been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).
- 4 **In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.**

Item	Question	Yes	No
4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer/Authority of the institution that imposed the restriction after the <i>audi alteram partem</i> rule was applied). The Database of Restricted Suppliers now resides on the National Treasury's website(www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	Yes ☐	No ☐
4.1.1	If so, furnish particulars:		
4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	Yes ☐	No ☐
4.2.1	If so, furnish particulars:		
4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	Yes ☐	No ☐

4.3.1	If so, furnish particulars:		
Item	Question	Yes	No
4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	Yes ☐	No ☐
4.4.1	If so, furnish particulars:		
4.5	Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	Yes ☐	No ☐
4.7.1	If so, furnish particulars:		

CERTIFICATION

**I, THE UNDERSIGNED (FULL NAME)
CERTIFY THAT THE INFORMATION FURNISHED ON THIS
DECLARATION FORM TRUE AND CORRECT.**

**I ACCEPT THAT, IN ADDITION TO CANCELLATION OF A CONTRACT,
ACTION MAY BE TAKEN AGAINST ME SHOULD THIS DECLARATION PROVE
TO BE FALSE.**

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

CERTIFICATE OF INDEPENDENT BID DETERMINATION

- 1 This Municipal Bidding Document (MBD) must form part of all bids¹ invited.

- 2 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or bid rigging).² Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

- 3 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:
 - a. take all reasonable steps to prevent such abuse;
 - b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
 - c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

- 4 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of bid-rigging.

- 5 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid:

¹ Includes price quotations, advertised competitive bids, limited bids and proposals.

² Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity)

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of: _____ that:

(Name of Bidder)

1. I have read and I understand the contents of this Certificate;
2. I understand that the accompanying bid will be disqualified if this Certificate is found not to be true and complete in every respect;
3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;
4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;
5. For the purposes of this Certificate and the accompanying bid, I understand that the word "competitor" shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
 - (a) has been requested to submit a bid in response to this bid invitation;
 - (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience; and
 - (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder

6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.
7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
 - (a) prices;
 - (b) geographical area where product or service will be rendered (market allocation)
 - (c) methods, factors or formulas used to calculate prices;
 - (d) the intention or decision to submit or not to submit, a bid;
 - (e) the submission of a bid which does not meet the specifications and conditions of the bid; or
 - (f) bidding with the intention not to win the bid.
8. In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.
9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

³ Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

.....
Signature

.....
Date

.....
Position

.....
Name of Bidder

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