

# State of Nebraska - INVITATION TO BID

## ONE TIME PURCHASE

Return to:  
 State Purchasing Bureau  
 1526 K Street, Suite 130  
 Lincoln, Nebraska 68508

Telephone: 402-471-6500  
 Fax: 402-471-2089

Date	12/14/18	Page	1 of 2
Solicitation Number	5970 OF REBID		
Opening Date and Time	12/28/18	2:00 PM	
Buyer	JULIE DABYDEEN (AS)		

**DESTINATION OF GOODS**  
 EDUCATIONAL TELECOMM COMM  
 KHNE - 1105 W 6 RD  
 TO SCHEDULE DELIVERY  
 CONTACT ROBERT VOS 308-991-7443  
 GILTNER NE 68841-0216

Per Nebraska's Transparency in Government Procurement Act, DAS is required to collect statistical information regarding the number of contracts awarded to Nebraska contractors. This information is for statistical purposes only and will not be considered for contract award purposes.

**NEBRASKA CONTRACTOR AFFIDAVIT:** Bidder hereby attests that bidder is a Nebraska Contractor. "Nebraska Contractor" shall mean any bidder who has maintained a bona fide place of business and at least one employee within this state for at least the six (6) months immediately preceding the posting date of this ITB.

\_\_\_\_\_ I hereby certify that I am a Resident disabled veteran or business located in a designated enterprise zone in accordance with Neb. Rev. Stat. §73-107 and wish to have preference, if applicable, considered in the award of this contract.

One Time Purchase to supply and deliver 13kW UHF TRANSMITTER, MASK FILTER, BACKUP TRANSMITTER, AND INSTALLATION to the State of Nebraska as per the attached specifications.

A response to this Solicitation is subject to, but not limited to, the Standard Terms and Conditions. PLEASE READ CAREFULLY!

This form is part of the specification package and must be signed and returned, along with all documents, by the opening date and time specified.

No facsimile or email solicitation responses will be accepted on bids \$25,000 and over.

(vc 11/16/18)

### INVITATION

Line	Description	Quantity	Unit of Measure	Unit Price	Extended Price
1	13KW UHF TRANSMITTER WITH DUAL EXCITERS AND RF MASK FILTER	1.0000	EA	\$305,520.40	\$305,520.40
2	4 PORT RF TRANSFER SWITCH	1.0000	EA	\$19,327.74	\$19,327.74

### BIDDER MUST COMPLETE THE FOLLOWING

DISCOUNT PAYMENT TERMS: NA % NA DAYS

By signing this Invitation to Bid form, the bidder guarantees compliance with the provisions stated in this Invitation to Bid, agrees to the terms and conditions unless otherwise agreed to (see Section III) and certifies that bidder maintains a drug free work place environment. Vendor will furnish the items requested within \_\_\_\_\_ days after receipt of order. Failure to enter Delivery Date may cause quotation to be REJECTED.

Sign Here \_\_\_\_\_  
 (Authorized Signature MANDATORY - MUST BE SIGNED IN INK)

Enter Contact Information Below

VENDOR# 2176621  
 VENDOR: Technical Services Group, Inc.  
 Address: 12015 Cloverland Court  
Baton Rouge, La 70809

Contact Arthur Hoover III.  
 Telephone 225-751-9800  
 Facsimile 225-753-1726  
 Email derek@tsgcom.com



**TO:** Julie Dabydeen  
**FROM:** Arthur "Bo" Hoover  
**RE:** 5970-OF REBID KHNE 13kW Transmitter, Mask Filter, Backup Transmitter & Installation  
**DATE:** Wednesday, December 26, 2018  
**FILE:** **2018145 KHNE 13kW Transmitter**

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Thank you for the opportunity for TSG, Rohde & Schwarz(R&S), and other selected partners to work with you on this project.

In the following and attached, you will find our proposal for the KHNE Digital Solid State ATSC1.0/3.0 Television Transmitter.

We believe we are 100% compliant to the specifications in our offering as submitted.

TSG would like to point out notable design considerations, assumptions, and cost saving options for KHNE's consideration.

1. Our bid is based on the new Rohde & Schwarz THU9/TX9 Liquid Cooled TV transmitter family. Its overall energy efficiency values of up to 40 % for COFDM and 43 % for ATSC represent all-time highs.
2. Itemized detail for each section for KHNE's review available upon request.
3. Scan of required specification documents, COI, Manuals, diagrams, and executed submittals for electronic filing with originals available upon request.
4. Each section of our bid proposal includes shipping allocated to the delivery sub-total. TSG will coordinate a delivery date for TSG personnel to receive, store, and offload this equipment upon delivery within KHNE transmitter suite. TSG recommends acceptance of these materials as soon as available to avoid possible delivery delays.
5. Our response is based on provided specifications, addendums 1 and 2, and manufacturers specifications.

We understand and appreciate the unique mission of public media vs commercial broadcasters. TSG is a proud supporter of both Public Radio and Public Television and member of LPB. We apologize for our web site being under construction at

this time as we are updating to include recent major market repack installations including Miami, Minneapolis, Philadelphia, Memphis, Jacksonville, Alabama Public Television, and others.

We look forward to your review. Please call me if you have any questions.

Best regards,



**TSG GENERAL CONDITIONS:**

This bid is based on the specifications and drawings (including addenda) referenced herein. Changes or alterations to the specifications will require a change order. Our price is additionally subject to supplied equipment manufacturer standard terms and conditions.

1. Bonding: TSG has **NOT INCLUDED ANY** bonding expenses within our proposal.
2. Taxes: TSG's proposal does **NOT** include sales taxes. TSG understands that this project is tax exempt.
3. Price lock and Storage: TSG's Proposal assumes ordering materials based on 60-day pricing lock for equipment and a one-week pricing lock for cable and commodity market-based materials, particularly copper, Aluminum, and Stainless steel.
4. All materials will be ordered after TSG receives notice to proceed. Once materials are received by TSG, a payment application for materials will be submitted to client under the terms of accepted Purchase Order. Client will accept immediate delivery and storage at jobsite or TSG can store materials at additional cost within TSG's fully insured Baton Rouge warehouse until installation begins.
5. Due to the volatile price on copper we shall order and submit for payment all procured wire and cable within the near term of receipt of NTP. Delays in acceptance of contract award may affect TSG's ability to maintain quoted pricing. This bid/quotation shall be valid for 60 days.
6. TSG excludes all smoke and fire proofing for all wall / ceiling/ floor penetrations. (TSG will provide fire caulk where required for standard penetrations)
7. TSG excludes all conduit and raceways for Class 2 wiring.
8. TSG excludes all lifts and floor protection required for the lifts. (N/A for this project)
9. Delays caused by others will result in a change order to extend the installation time. Dependencies including but not limited to:
  1. Electrical, site conditions, work by others.
  2. Travel
  3. Installation expense.
10. The 1-year warranty does not cover warranty service calls because of end user error or damage resulting from misuse, accident, modification or alteration to hardware or software, tampering, unsuitable physical or operating environment beyond product specifications or maintenance by any parties other than TSG or its authorized subcontractors.
11. TSG requires a network drop at locations requiring IP access to owner's network and the internet to allow for VPN tunnel, remote access, firmware downloads and warranty support.
12. Items requiring power will use existing 120VAC circuits within the facility unless additional circuits were specified within project specifications.
13. All supplied equipment manufacturer standard conditions apply.

**Standard Transmitter installation assumes:**

<b>General TSG INSTALLATION SERVICES</b>	
	<b>TSG Standard Terms and Conditions Apply</b>
	<b>Includes labor and expenses for (2-4) TSG Service Representatives to perform work on site, Principal and factory personnel for commissioning and proofing.</b>
	<b>Includes complete installation and interconnection of a complete transmitter and associated equipment such as external (indoor) pump module assemblies, Dual Fan Heat Exchangers, tunable Filter, Dual HT Exchanger plumbing kits, dummy load, and Hose Plumbing Kits.</b>
	<b>Includes installation of cooling system utilizing TSG supplied rubber hose plumbing kit.</b>
	<b>Includes installation of RF components utilizing clamp coupling components and soft soldering of RF components as necessary on site.</b>
	<b>Includes complete system commissioning into know good test load, commissioning test will be performed utilizing TSG calibrated test equipment and standard commissioning test/documentation to TSG standard specifications.</b>
	<b>Project will be considered and planned to be a start to finish project without delay from</b>



Technical Services Group, Inc.

<b>installation to commissioning of system into known good or TSG provided test load.</b>
<b>Misc.: TSG Project details and assumptions:</b>
<b>Assumes any NETV delays or issues that delay the project once TSG personnel are on site will be charged to NETV at TSG Standard rates plus expenses.</b>
<b>Assumes all TSG supplied equipment has been delivered to site prior to TSG arrival.</b>
<b>Assumes site access a minimum of 7 days a week and 12 hours per day.</b>
<b>Assumes there is adequate space within the facilities to support the installation of all supplied equipment without the removal of any existing equipment.</b>
<b>Assumes adequate and proper space existing external to the building to support cooling system.</b>
<b>Assumes appropriate electrical and HVAC work to support new equipment has been completed prior to transmission equipment installation.</b>
<b>Assumes NETV hired electrician if being provided shall be on site day of or day after TSG arrival to site to discuss equipment layout and final AC connection to each.</b>
<b>Assumes electrical work can be completed without delaying installation and commissioning of equipment.</b>
<b>Any delays that a considered NETV delays can be charged to NETV at TSG daily rates plus expenses.</b>
<b>Assumes NETV qualified staff shall be available to support TSG Service Representatives with appropriate site access and other needs as they arise.</b>
<b>Assumes work schedule shall be 7 days a week and a minimum of 10 hours per day unless other arrangements are negotiated prior to project start dates.</b>
<b>Assumes NETV's antenna connection is within 10ft of location of RF mask filter or system output.</b>
<b>Assumes NETV to supply appropriate acetylene and oxygen tanks for connections beyond soft solder welding requirements.</b>
<b>Misc: TSG Exclusions:</b>
<b>Does not include repair of any existing transmitter/s or any other NETV equipment that will be reused in final configuration. Repairs if required and agreed upon will be charged at the standard TSG daily rates plus expenses.</b>
<b>Does not include any disposal of any equipment that may have been removed during installation process. NETV shall be responsible for proper storage and disposal.</b>
<b>Does not include Installation or Commissioning Services for any Non-TSG supplied equipment related to towers, antennas or transmission line from tower to building.</b>
<b>Does not include any work beyond commissioning and operational testing of any TSG supplied remote control equipment at site, demolition, with NETV responsible for configuration and connection to any link to studio that may exist.</b>
<b>Does not include any taxes, duties or VAT as related to services performed on -site.</b>
<b>Please refer to TSG Standard Terms and Conditions of installation for other details</b>

*By acceptance of our price submitted herein by, Technical Services Group, Inc., respectfully requests keeping our bid information confidential from competitors bidding similar scopes of work. Should our offering be the lowest price and responsive, TSG maintains a good faith expectation for award.*

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 CONTACT ROBERT VOS 308-991-7443  
 GILTNER NE 68841-0216

### INVITATION

Line	Description	Quantity	Unit of Measure	Unit Price	Extended Price
3	LIQUID COOLED DUMMY LOAD	1.0000	EA	<u>\$14,129.29</u>	<u>\$14,129.29</u>
4	3-PHASE SURGE SUPPRESSOR FOR 13KW TRANSMITTER	1.0000	EA	<u>\$711.59</u>	<u>\$711.59</u>
5	600-800 WATT BACK-UP TRANSMITTER WITH RF MASK FILTER	1.0000	EA	<u>\$24,017.46</u>	<u>\$24,017.46</u>
6	1-PHASE SURGE SUPPRESSOR FOR 600-800 WATT TRANSMITTER	1.0000	EA	<u>\$878.02</u>	<u>\$878.02</u>
7	INSTALLATION AND PROOF OF PERFORMANCE TESTING	1.0000	EA	<u>\$34,165.11</u>	<u>\$34,165.11</u>
8	DELIVERY INCLUDING ALL COSTS ASSOCIATED	1.0000	EA	<u>\$12,750.39</u>	<u>\$12,750.39</u>
9	EXTRA COST PER DAY FOR STATE DELAY/ISSUES THE ONLY ADDITIONAL COST ALLOWED WOULD BE FOR DELAYS DUE TO THE STATE. BIDDER SHOULD PROVIDE A DAILY COST INCLUDING ALL PER DIEM FOR DELAYS DUE TO THE STATE OR REQUESTED BY THE STATE	1.0000	EA	<u>\$3,000.00</u>	<u>\$3,000.00</u>

## INVITATION TO BID Number 5970-OF REBID

The State of Nebraska (State), Department of Administrative Services (DAS), Materiel Division, State Purchasing Bureau (SPB), is issuing this Invitation to Bid (ITB) for a one time purchase, ITB Number 5970 OF REBID for the purpose of selecting a qualified Bidder to provide 13kW UHF Transmitter, Mask Filter, Backup Transmitter, and Installation. Specifications can be found in Section VI. The resulting contract may not be an exclusive contract as the State reserves the right to contract for the same or similar goods from other sources now or in the future.

**INFORMATION PERTINENT TO THIS INVITATION TO BID CAN BE FOUND ON THE INTERNET AT:**  
<http://das.nebraska.gov/materiel/purchasing.html>.

**IMPORTANT NOTICE:** Pursuant to Neb. Rev. Stat. § 84-602.04, State contracts in effect as of January 1, 2014, and contracts entered into thereafter, must be posted to a public website. The resulting contract, the ITB, and the successful Bidder's bid or response will be posted to a public website managed by DAS, which can be found at:  
<https://statecontracts.nebraska.gov/>

In addition and in furtherance of the State's public records statute (Neb. Rev. Stat. § 84-712 et seq.) all bids or responses received regarding this ITB will be posted to the SPB website.

These postings will include the entire bid or response. Bidders must request that proprietary information be excluded from the posting. The Bidder must identify the proprietary information, mark the proprietary information according to state law, and submit the proprietary information in a separate container or envelope marked conspicuously using an indelible method with the words "PROPRIETARY INFORMATION". The Bidder must submit a **detailed written document showing** that the release of the proprietary information would give a business advantage to named business competitor(s) and explain how the named business competitor(s) will gain an actual business advantage by disclosure of information. The mere assertion that information is proprietary or that a speculative business advantage might be gained is not sufficient. (See Attorney General Opinion No. 92068, April 27, 1992) **THE BIDDER MAY NOT ASSERT THAT THE ENTIRE BID OR RESPONSE IS PROPRIETARY. COST WILL NOT BE CONSIDERED PROPRIETARY AND IS A PUBLIC RECORD IN THE STATE OF NEBRASKA.** The State will then determine, in its discretion, if the interests served by nondisclosure outweighs any public purpose served by disclosure. (See Neb. Rev. Stat. § 84-712.05(3)) The Bidder will be notified of the agency's decision. Absent a State determination that information is proprietary, the State will consider all information a public record subject to release regardless of any assertion that the information is proprietary.

If the agency determines it is required to release proprietary information, the Bidder will be informed. It will be the Bidder's responsibility to defend the Bidder's asserted interest in non-disclosure.

To facilitate such public postings, with the exception of proprietary information, the State of Nebraska reserves a royalty-free, nonexclusive, and irrevocable right to copy, reproduce, publish, post to a website, or otherwise use any contract, bid, or response to this ITB for any purpose, and to authorize others to use the documents. Any individual or entity awarded a contract, or who submits a bid or response to this ITB, specifically waives any copyright or other protection the contract, bid, or response to the ITB may have; and, acknowledges that they have the ability and authority to enter into such waiver. This reservation and waiver is a prerequisite for submitting a bid or response to this ITB, and award of a contract. Failure to agree to the reservation and waiver will result in the bid or response to the ITB being found non-responsive and rejected.

**Any entity awarded a contract or submitting a bid or response to the ITB agrees not to sue, file a claim, or make a demand of any kind, and will indemnify and hold harmless the State and its employees, volunteers, agents, and its elected and appointed officials from and against any and all claims, liens, demands, damages, liability, actions, causes of action, losses, judgments, costs, and expenses of every nature, including investigation costs and expenses, settlement costs, and attorney fees and expenses, sustained or asserted against the State, arising out of, resulting from, or attributable to the posting of the contract or the bids and responses to the ITB, awards, and other documents.**

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**II. TERMS AND CONDITIONS**

**Bidders should complete Section II through IV as part of their bid.** Bidder is expected to read the Terms and Conditions and must initial either accept, reject, or reject and provide alternative language for each clause. The Bidder should also provide an explanation of why the Bidder rejected the clause or rejected the clause and provided alternate language using 'Track Changes'. Upon request an electronic copy of the bid with 'Track Changes' must be submitted in an editable Word format. By signing the ITB Bidder is agreeing to be legally bound by all the accepted terms and conditions, and any proposed alternative terms and conditions submitted with the bid. The State reserves the right to negotiate rejected or proposed alternative language. If the State and Bidder fail to agree on the final Terms and Conditions, the State reserves the right to reject the bid. The State is soliciting bids in response to the ITB. The State reserves the right to reject bids that attempt to substitute the Bidder's commercial contracts and/or documents for this ITB.

The Bidder should submit with their bid any license, user agreement, service level agreement, or similar documents that the Bidder wants incorporated in the Contract. Upon notice of Intent to Award, the Bidder must submit a copy of these documents in an editable Word format. The State will not consider incorporation of any document not submitted with the Bidder's bid. These documents shall be subject to negotiation and will be incorporated as addendums if agreed to by the Parties.

If a conflict or ambiguity arises after the addendums have been negotiated and agreed to, the addendums shall be interpreted as follows:

1. If only one (1) Party's document has a particular clause then that clause shall control;
2. If both Party's documents have a similar clause, but the clauses do not conflict, the clauses shall be read together;
3. If both Party's documents have a similar clause, but the clauses conflict, the State's clause shall control.

**A. GENERAL**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The contract resulting from this ITB shall incorporate the following documents:

1. Invitation to Bid and Addenda;
2. Amendments to the ITB;
3. Questions and Answers;
4. Contractor's bid (ITB);
5. Award;
6. The executed Contract and any Addenda; and,
7. Amendments to the Contract

These documents constitute the entirety of the contract.

Unless otherwise specifically stated in a future contract amendment, in case of any conflict between the incorporated documents, the documents shall govern in the following order of preference with number one (1) receiving preference over all other documents and with each lower numbered document having preference over any higher numbered document: 1) Amendment to the executed Contract with the most recent dated amendment having the highest priority, 2) executed Contract and any attached Addenda, 3) Amendments to ITB and any Questions and Answers, 4) the original ITB document and any Addenda, and 5) the Contractor's submitted Bid.

Any ambiguity or conflict in the contract discovered after its execution, not otherwise addressed herein, shall be resolved in accordance with the rules of contract interpretation as established in the State.

**B. NOTIFICATION**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Contractor and State shall identify the contract manager who shall serve as the point of contact for the executed contract.

Communications regarding the executed contract shall be in writing and shall be deemed to have been given if delivered personally or mailed, by U.S. Mail, postage prepaid, return receipt requested, to the parties at their respective addresses set forth below, or at such other addresses as may be specified in writing by either of the parties. All notices, requests, or communications shall be deemed effective upon personal delivery or five (5) calendar days following deposit in the mail.

Vendor Contract Manager	Agency Contract Manager Julie Dabydeen
Vendor	Agency Department of Administrative Services, State Purchasing Bureau
Vendor Street Address	Agency Street Address 1526 K Street, Suite 130
Vendor City, State, Zip	Agency City, State, Zip Lincoln, NE 68508

Either party may change its address for notification purposes by giving notice of the change, and setting forth the new address and an effective date.

**C. GOVERNING LAW**

Notwithstanding any other provision of this contract, or any amendment or addendum(s) entered into contemporaneously or at a later time, the parties understand and agree that, (1) the State of Nebraska is a sovereign state and its authority to contract is therefore subject to limitation by the State's Constitution, statutes, common law, and regulation; (2) this contract will be interpreted and enforced under the laws of the State of Nebraska; (3) any action to enforce the provisions of this agreement must be brought in the State of Nebraska per state law; (4) the person signing this contract on behalf of the State of Nebraska does not have the authority to waive the State's sovereign immunity, statutes, common law, or regulations; (5) the indemnity, limitation of liability, remedy, and other similar provisions of the final contract, if any, are entered into subject to the State's Constitution, statutes, common law, regulations, and sovereign immunity; and, (6) all terms and conditions of the final contract, including but not limited to the clauses concerning third-party use, licenses, warranties, limitations of liability, governing law and venue, usage verification, indemnity, liability, remedy or other similar provisions of the final contract are entered into specifically subject to the State's Constitution, statutes, common law, regulations, and sovereign immunity.

The Parties must comply with all applicable local, state and federal laws, ordinances, rules, orders, and regulations.

**D. BEGINNING OF WORK**

The Contractor shall not commence any billable work until a valid contract has been fully executed by the State and the successful Contractor. The Contractor will be notified in writing when work may begin.

**E. CHANGE ORDERS OR SUBSTITUTIONS**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The State and the Contractor, upon the written agreement, may make changes to the contract within the general scope of the ITB. Changes may involve specifications, the quantity of work, or such other items as the State may find necessary or desirable. Corrections of any deliverable, service, or work required pursuant to the contract shall not be deemed a change. The Contractor may not claim forfeiture of the contract by reasons of such changes.

The State or Contractor may prepare a written description of the work required due to the change and the Contractor shall prepare an itemized cost sheet for the change. Changes in work and the amount of compensation to be paid to the Contractor shall be determined in accordance with applicable unit prices if any, a pro-rated value, or through negotiations. The State shall not incur a price increase for changes that should have been included in the Contractor's bid, were foreseeable, or result from difficulties with or failure of the Contractor's bid or performance.

No change shall be implemented by the Contractor until approved by the State, and the Contract is amended to reflect the change and associated costs, if any. If there is a dispute regarding the cost, but both parties agree that immediate implementation is necessary, the change may be implemented, and cost negotiations may continue with both Parties retaining all remedies under the contract and law.

Vendor will not substitute any item that has been awarded without prior written approval of SPB.

**F. BREACH**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Either Party may terminate the contract, in whole or in part, if the other Party breaches its duty to perform its obligations under the contract in a timely and proper manner. Termination requires written notice of default and a thirty (30) calendar day (or longer at the non-breaching Party's discretion considering the gravity and nature of the default) cure period. Said notice shall be delivered by Certified Mail, Return Receipt Requested, or in person with proof of delivery. Allowing time to cure a failure or breach of contract does not waive the right to immediately terminate the contract for the same or different contract breach which may occur at a different time.

In case of breach by the Contractor, the State may, without unreasonable delay, make a good faith effort to make a reasonable purchase or contract to purchased goods in substitution of those due from the contractor. The State may recover from the Contractor as damages the difference between the costs of covering the breach. Notwithstanding any clause to the contrary, the State may also recover the contract price together with any incidental or consequential damages defined in UCC Section 2-715, but less expenses saved in consequence of Contractor's breach.

The State's failure to make payment shall not be a breach, and the Contractor shall retain all available statutory remedies. (See Indemnity - Self-Insurance and Payment)

**G. NON-WAIVER OF BREACH**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The acceptance of late performance with or without objection or reservation by a Party shall not waive any rights of the Party nor constitute a waiver of the requirement of timely performance of any obligations remaining to be performed.

**H. SEVERABILITY**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

If any term or condition of the contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and conditions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the provision held to be invalid or illegal.

**I. INDEMNIFICATION**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

**1. GENERAL**

The Contractor agrees to defend, indemnify, and hold harmless the State and its employees, volunteers, agents, and its elected and appointed officials (“the indemnified parties”) from and against any and all claims, liens, demands, damages, liability, actions, causes of action, losses, judgments, costs, and expenses of every nature, including investigation costs and expenses, settlement costs, and attorney fees and expenses (“the claims”), sustained or asserted against the State for personal injury, death, or property loss or damage, arising out of, resulting from, or attributable to the willful misconduct, negligence, error, or omission of the Contractor, its employees, Subcontractors, consultants, representatives, and agents, resulting from this contract, except to the extent such Contractor liability is attenuated by any action of the State which directly and proximately contributed to the claims.

**2. INTELLECTUAL PROPERTY**

The Contractor agrees it will, at its sole cost and expense, defend, indemnify, and hold harmless the indemnified parties from and against any and all claims, to the extent such claims arise out of, result from, or are attributable to, the actual or alleged infringement or misappropriation of any patent, copyright, trade secret, trademark, or confidential information of any third party by the Contractor or its employees, Subcontractors, consultants, representatives, and agents; provided, however, the State gives the Contractor prompt notice in writing of the claim. The Contractor may not settle any infringement claim that will affect the State’s use of the Licensed Software without the State’s prior written consent, which consent may be withheld for any reason.

If a judgment or settlement is obtained or reasonably anticipated against the State’s use of any intellectual property for which the Contractor has indemnified the State, the Contractor shall, at the Contractor’s sole cost and expense, promptly modify the item or items which were determined to be infringing, acquire a license or licenses on the State’s behalf to provide the necessary rights to the State to eliminate the infringement, or provide the State with a non-infringing substitute that provides the State the same functionality. At the State’s election, the actual or anticipated judgment may be treated as a breach of warranty by the Contractor, and the State may receive the remedies provided under this ITB.

**3. PERSONNEL**

The Contractor shall, at its expense, indemnify and hold harmless the indemnified parties from and against any claim with respect to withholding taxes, worker’s compensation, employee benefits, or any other claim, demand, liability, damage, or loss of any nature relating to any of the personnel, including subcontractor’s and their employees, provided by the Contractor.

**4. SELF-INSURANCE (Statutory)**

The State is self-insured for any loss and purchases excess insurance coverage pursuant to Neb. Rev. Stat. § 81-8,239.01 (Reissue 2008). If there is a presumed loss under the provisions of this agreement, Contractor may file a claim with the Office of Risk Management pursuant to Neb. Rev. Stat. §81-8,829 through 81-8,306 for review by the State Claims Board. The State retains all rights and immunities under the State

Miscellaneous (Section 81-8,294), Tort (Section 81-8,209), and Contract Claim Acts (Section 81-8,302), as outlined in Neb. Rev. Stat. § 81-8,209 et seq. and under any other provisions of law and accepts liability under this agreement to the extent provided by law.

**J. ATTORNEY'S FEES**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

In the event of any litigation, appeal, or other legal action to enforce any provision of the contract, the Parties agree to pay all expenses of such action, as permitted by law and if order by the court, including attorney's fees and costs, if the other party prevails.

**K. ASSIGNMENT, SALE, OR MERGER**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Either party may assign the contract upon mutual written agreement of the other party. Such agreement shall not be unreasonably withheld.

The Contractor retains the right to enter into a sale, merger, acquisition, internal reorganization, or similar transaction involving Contractor's business. Contractor agrees to cooperate with the State in executing amendments to the contract to allow for the transaction. If a third party or entity is involved in the transaction, the Contractor will remain responsible for performance of the contract until such time as the person or entity involved in the transaction agrees in writing to be contractually bound by this contract and perform all obligations of the contract.

**L. CONTRACTING WITH OTHER POLITICAL SUB-DIVISIONS OF THE STATE OR ANOTHER STATE**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The Contractor may, but shall not be required to, allow agencies, as defined in Neb. Rev. Stat. §81-145, to use this contract. The terms and conditions, including price, of the contract may not be amended. The State shall not be contractually obligated or liable for any contract entered into pursuant to this clause.

The Contractor may, but shall not be required to, allow other states, agencies or divisions of other states, or political subdivisions of other states to use this contract. The terms and conditions, including price, of this contract shall apply to any such contract, but may be amended upon mutual consent of the Parties. The State of Nebraska shall not be contractually or otherwise obligated or liable under any contract entered into pursuant to this clause. The State shall be notified if a contract is executed based upon this contract.

**M. FORCE MAJEURE**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Neither party shall be liable for any costs or damages, or for default resulting from its inability to perform any of its obligations under the contract due to a natural or manmade event outside the control and not the fault of the affected party ("Force Majeure Event"). The Party so affected shall immediately make a written request for relief to the other party, and shall have the burden of proof to justify the request. The other Party may granted the relief requested; relief may not be unreasonably withheld. Labor disputes with the impacted party's own employees will not be considered a Force Majeure Event.

**N. CONFIDENTIALITY**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

All materials and information provided by the Parties or acquired by a Party on behalf of the other Party shall be regarded as confidential information. All materials and information provided or acquired shall be handled in accordance with federal and state law, and ethical standards. Should said confidentiality be breached by a Party, the Party shall notify the other Party immediately of said breach and take immediate corrective action.

It is incumbent upon the Parties to inform their officers and employees of the penalties for improper disclosure imposed by the Privacy Act of 1974, 5 U.S.C. 552a. Specifically, 5 U.S.C. 552a (i)(1), which is made applicable by 5 U.S.C. 552a (m)(1), provides that any officer or employee, who by virtue of his/her employment or official position has possession of or access to agency records which contain individually identifiable information, the disclosure of which is prohibited by the Privacy Act or regulations established thereunder, and who knowing that disclosure of the specific material is prohibited, willfully discloses the material in any manner to any person or agency not entitled to receive it, shall be guilty of a misdemeanor and fined not more than \$5,000.

**O. EARLY TERMINATION**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The contract may be terminated as follows:

1. The State and the Contractor, by mutual written agreement, may terminate the contract at any time.
2. The State, at its sole discretion, may terminate the contract for any reason upon thirty (30) calendar day's written notice to the Contractor. Such termination shall not relieve the Contractor of warranty or other service obligations incurred under the terms of the contract. In the event of termination the Contractor shall be entitled to payment, determined on a pro rata basis, for products or services satisfactorily performed or provided.
3. The State may terminate the contract immediately for the following reasons:
  - a. if directed to do so by statute;

- b. Contractor has made an assignment for the benefit of creditors, has admitted in writing its inability to pay debts as they mature, or has ceased operating in the normal course of business;
- c. a trustee or receiver of the Contractor or of any substantial part of the Contractor's assets has been appointed by a court;
- d. fraud, misappropriation, embezzlement, malfeasance, misfeasance, or illegal conduct pertaining to performance under the contract by its Contractor, its employees, officers, directors, or shareholders;
- e. an involuntary proceeding has been commenced by any party against the Contractor under any one of the chapters of Title 11 of the United States Code and (i) the proceeding has been pending for at least sixty (60) calendar days; or (ii) the Contractor has consented, either expressly or by operation of law, to the entry of an order for relief; or (iii) the Contractor has been decreed or adjudged a debtor;
- f. a voluntary petition has been filed by the Contractor under any of the chapters of Title 11 of the United States Code;
- g. Contractor intentionally discloses confidential information;
- h. Contractor has or announces it will discontinue support of the deliverable; and,
- i. In the event funding is no longer available.

**P. CONTRACT CLOSEOUT**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Upon termination of the contract for any reason the Contractor shall within thirty (30) days, unless stated otherwise herein:

1. Transfer all completed or partially completed deliverables to the State;
2. Transfer ownership and title to all completed or partially completed deliverables to the State;
3. Return to the State all information and data, unless the Contractor is permitted to keep the information or data by contract or rule of law. Contractor may retain one copy of any information or data as required to comply with applicable work product documentation standards or as are automatically retained in the course of Contractor's routine back up procedures;
4. Cooperate with any successor contractor, person or entity in the assumption of any or all of the obligations of this contract;
5. Cooperate with any successor contractor, person or entity with the transfer of information or data related to this contract;
6. Return or vacate any state owned real or personal property;

Nothing in this Section should be construed to require the Contractor to surrender intellectual property, real or person property, or information or data owned by the Contractor for which the State has no legal claim.

**III. CONTRACTOR DUTIES**

**A. INDEPENDENT CONTRACTOR / OBLIGATIONS**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

It is agreed that the Contractor is an independent contractor and that nothing contained herein is intended or should be construed as creating or establishing a relationship of employment, agency, or a partnership.

The Contractor is solely responsible for fulfilling the contract. The Contractor or the Contractor's representative shall be the sole point of contact regarding all contractual matters.

The Contractor shall secure, at its own expense, all personnel required to perform the services under the contract. The personnel the Contractor uses to fulfill the contract shall have no contractual or other legal relationship with the State; they shall not be considered employees of the State and shall not be entitled to any compensation, rights or benefits from the State, including but not limited to, tenure rights, medical and hospital care, sick and vacation leave, severance pay, or retirement benefits.

By-name personnel commitments made in the Contractor's bid shall not be changed without the prior written approval of the State. Replacement of these personnel, if approved by the State, shall be with personnel of equal or greater ability and qualifications.

The Contractor warrants that all persons assigned to the project shall be employees of the Contractor or a Subcontractor, and shall be fully qualified to perform the work required herein. Personnel employed by the Contractor or a subcontractor to fulfill the terms of the contract shall remain under the sole direction and control of the Contractor or the subcontractor respectively.

With respect to its employees, the Contractor agrees to be solely responsible for the following:

1. Any and all pay, benefits, and employment taxes and/or other payroll withholding;
2. Any and all vehicles used by the Contractor's employees, including all insurance required by state law;
3. Damages incurred by Contractor's employees within the scope of their duties under the contract;
4. Maintaining Workers' Compensation and health insurance that complies with state and federal law and submitting any reports on such insurance to the extent required by governing law;
5. Determining the hours to be worked and the duties to be performed by the Contractor's employees; and,
6. All claims on behalf of any person arising out of employment or alleged employment (including without limit claims of discrimination alleged against the Contractor, its officers, agents, or subcontractors or subcontractor's employees).

If the Contractor intends to utilize any subcontractor, the Subcontractor's level of effort, tasks, and time allocation must be clearly defined in the Contractor's bid. The Contractor shall agree that it will not utilize any Subcontractors not specifically included in its bid in the performance of the contract without the prior written authorization of the State.

The State reserves the right to require the Contractor to reassign or remove from the project any Contractor or Subcontractor employee.

Contractor shall insure that the terms and conditions contained in any contract with a sub-contractor does not conflict with the terms and conditions of this contract.

The Contractor shall include a similar provision, for the protection of the State, in the contract with any Subcontractor engaged to perform work on this contract.

**B. EMPLOYEE WORK ELIGIBILITY STATUS**

The Contractor is required and hereby agrees to use a federal immigration verification system to determine the work eligibility status of employees physically performing work within the State. A federal immigration verification system means the electronic verification of the work authorization program authorized by the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, 8 U.S.C. 1324a, known as the E-Verify Program, or an equivalent federal



program designated by the United States Department of Homeland Security or other federal agency authorized to verify the work eligibility status of an employee.

If the Contractor is an individual or sole proprietorship, the following applies:

1. The Contractor must complete the United States Citizenship Attestation Form, available on the DAS website at <http://das.nebraska.gov/materiel/purchasing.html>

The completed United States Attestation Form should be submitted with the ITB response.

2. If the Contractor indicates on such attestation form that he or she is a qualified alien, the Contractor agrees to provide the U.S. Citizenship and Immigration Services documentation required to verify the Contractor's lawful presence in the United States using the Systematic Alien Verification for Entitlements (SAVE) Program.
3. The Contractor understands and agrees that lawful presence in the United States is required and the Contractor may be disqualified or the contract terminated if such lawful presence cannot be verified as required by Neb. Rev. Stat. § 4-108.

**C. COMPLIANCE WITH CIVIL RIGHTS LAWS AND EQUAL OPPORTUNITY EMPLOYMENT / NONDISCRIMINATION (Statutory)**

The Contractor shall comply with all applicable local, state, and federal statutes and regulations regarding civil rights laws and equal opportunity employment. The Nebraska Fair Employment Practice Act prohibits Contractors of the State, and their Subcontractors, from discriminating against any employee or applicant for employment, with respect to hire, tenure, terms, conditions, compensation, or privileges of employment because of race, color, religion, sex, disability, marital status, or national origin (Neb. Rev. Stat. §48-1101 through 48-1125). The Contractor guarantees compliance with the Nebraska Fair Employment Practice Act, and breach of this provision shall be regarded as a material breach of contract. The Contractor shall insert a similar provision in all Subcontracts for goods or services to be covered by any contract resulting from this ITB.

**D. COOPERATION WITH OTHER CONTRACTORS**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Contractor may be required to work with or in close proximity to other contractors or individuals that may be working on the same or different projects. The Contractor shall agree to cooperate with such other contractors or individuals, and shall not commit or permit any act which may interfere with the performance of work by any other contractor or individual. Contractor is not required to compromise Contractor's intellectual property or proprietary information unless expressly required to do so by this contract.

**E. PERMITS, REGULATIONS, LAWS**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The contract price shall include the cost of all royalties, licenses, permits, and approvals, whether arising from patents, trademarks, copyrights or otherwise, that are in any way involved in the contract. The Contractor shall obtain and pay for all royalties, licenses, and permits, and approvals necessary for the performance of the contract. The Contractor must guarantee that it has the full legal right to the materials, supplies, equipment, software, and other items used to execute this contract.

**F. INSURANCE REQUIREMENTS**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The Contractor shall throughout the term of the contract maintain insurance as specified herein and provide the State a current Certificate of Insurance/Accord Form (COI) verifying the coverage. The Contractor shall not commence work on the contract until the insurance is in place. If Contractor subcontracts any portion of the Contract the Contractor must, throughout the term of the contract, either:

1. Provide equivalent insurance for each subcontractor and provide a COI verifying the coverage for the subcontractor;
2. Require each subcontractor to have equivalent insurance and provide written notice to the State that the Contractor has verified that each subcontractor has the required coverage; or,
3. Provide the State with copies of each subcontractor's Certificate of Insurance evidencing the required coverage.

The Contractor shall not allow any Subcontractor to commence work until the Subcontractor has equivalent insurance. The failure of the State to require a COI, or the failure of the Contractor to provide a COI or require subcontractor insurance shall not limit, relieve, or decrease the liability of the Contractor hereunder.

In the event that any policy written on a claims-made basis terminates or is canceled during the term of the contract or with in one (1) year of termination or expiration of the contract, the contractor shall obtain an extended discovery or reporting period, or a new insurance policy, providing coverage required by this contract for the term of the contract and one (1) year following termination or expiration of the contract.

If by the terms of any insurance a mandatory deductible is required, or if the Contractor elects to increase the mandatory deductible amount, the Contractor shall be responsible for payment of the amount of the deductible in the event of a paid claim.

Notwithstanding any other clause in this Contract, the State may recover up to the liability limits of the insurance policies required herein.

**1. WORKERS' COMPENSATION INSURANCE**

The Contractor shall take out and maintain during the life of this contract the statutory Workers' Compensation and Employer's Liability Insurance for all of the contractors' employees to be engaged in work on the project under this contract and, in case any such work is sublet, the Contractor shall require the Subcontractor similarly to provide Worker's Compensation and Employer's Liability Insurance for all of the Subcontractor's employees to be engaged in such work. This policy shall be written to meet the statutory requirements for the state in which the work is to be performed, including Occupational Disease. **The policy shall include a waiver of subrogation in favor of the State. The COI shall contain the mandatory COI subrogation waiver language found hereinafter.** The amounts of such insurance shall not be less than the limits stated hereinafter. For employees working in the State, the policy must be written by an entity authorized by the State of Nebraska Department of Insurance to write Workers' Compensation and Employer's Liability Insurance for Nebraska employees.

**2. COMMERCIAL GENERAL LIABILITY INSURANCE AND COMMERCIAL AUTOMOBILE LIABILITY INSURANCE**

The Contractor shall take out and maintain during the life of this contract such Commercial General Liability Insurance and Commercial Automobile Liability Insurance as shall protect Contractor and any Subcontractor performing work covered by this contract from claims for damages for bodily injury, including death, as well as from claims for property damage, which may arise from operations under this contract, whether such operation be by the Contractor or by any Subcontractor or by anyone directly or indirectly employed by either of them, and the amounts of such insurance shall not be less than limits stated hereinafter.

The Commercial General Liability Insurance shall be written on an **occurrence basis**, and provide Premises/Operations, Products/Completed Operations, Independent Contractors, Personal Injury, and Contractual Liability coverage. **The policy shall include the State, and others as required by the contract documents, as Additional Insured(s). This policy shall be primary, and any insurance or self-insurance**

carried by the State shall be considered secondary and non-contributory. The COI shall contain the mandatory COI liability waiver language found hereinafter. The Commercial Automobile Liability Insurance shall be written to cover all Owned, Non-owned, and Hired vehicles.

REQUIRED INSURANCE COVERAGE	
<b>COMMERCIAL GENERAL LIABILITY</b>	
General Aggregate	\$2,000,000
Products/Completed Operations Aggregate	\$2,000,000
Personal/Advertising Injury	\$1,000,000 per occurrence
Bodily Injury/Property Damage	\$1,000,000 per occurrence
Fire Damage	\$50,000 any one fire
Medical Payments	\$10,000 any one person
Damage to Rented Premises	\$300,000 each occurrence
Contractual	Included
XCU Liability (Explosion, Collapse, and Underground Damage)	Included
Independent Contractors	Included
If higher limits are required, the Umbrella/Excess Liability limits are allowed to satisfy the higher limit.	
<b>WORKER'S COMPENSATION</b>	
Employers Liability Limits	\$500K/\$500K/\$500K
Statutory Limits- All States	Statutory - State of Nebraska
Voluntary Compensation	Statutory
<b>COMMERCIAL AUTOMOBILE LIABILITY</b>	
Bodily Injury/Property Damage	\$1,000,000 combined single limit
Include All Owned, Hired & Non-Owned Automobile liability	Included
Motor Carrier Act Endorsement	Where Applicable
<b>UMBRELLA/EXCESS LIABILITY</b>	
Over Primary Insurance	\$5,000,000 per occurrence
<b>MANDATORY COI SUBROGATION WAIVER LANGUAGE</b>	
"Workers' Compensation policy shall include a waiver of subrogation in favor of the State of Nebraska."	
<b>MANDATORY COI LIABILITY WAIVER LANGUAGE</b>	
"Commercial General Liability & Commercial Automobile Liability policies shall be primary and any insurance or self-insurance carried by the State shall be considered secondary and non-contributory. State of Nebraska shall be included as additionally insured."	

If the mandatory COI subrogation waiver language or mandatory COI liability waiver language on the COI states that the waiver is subject to, condition upon, or otherwise limit by the insurance policy a copy of the relevant sections of the policy must be submitted with the COI so the State can review the limitations imposed by the insurance policy.

### 3. EVIDENCE OF COVERAGE

The Contractor should furnish the State, prior to beginning work and upon, a certificate of insurance coverage complying with the above requirements to the attention of:

Julie Dabydeen  
 State Purchasing Bureau  
 1526 K Street, Suite 130  
 Lincoln, NE 68508

These certificates or the cover sheet shall reference the ITB number, and the certificates shall include the name of the company, policy numbers, effective dates, dates of expiration, and amounts and types of coverage afforded. If the State is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall be responsible for all reasonable costs properly attributable thereto.

Reasonable notice of cancellation of any required insurance policy must be submitted to Administrative Services State Purchasing Bureau when issued and a new coverage binder shall be submitted immediately to ensure no break in coverage.

**4. DEVIATIONS**

The insurance requirements are subject to limited negotiation. Negotiation typically includes, but is not necessarily limited to, the correct type of coverage, necessity for Workers' Compensation, and the type of automobile coverage carried by the Contractor.

**G. NOTICE OF POTENTIAL CONTRACTOR BREACH**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

If Contractor breaches the contract or anticipates breaching the contract the Contractor shall immediately give written notice to the State. The notice shall explain the breach or potential breach, and may include a request for a waiver of the breach if so desired. The State may, at its discretion, temporarily or permanently waive the breach. By granting a temporary waiver, the State does not forfeit any rights or remedies to which the State is entitled by law or equity, or pursuant to the provisions of the contract. Failure to give immediate notice, however, may be grounds for denial of any request for a waiver of a breach.

**H. ANTITRUST**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The Contractor hereby assigns to the State any and all claims for overcharges as to goods and/or services provided in connection with this contract resulting from antitrust violations which arise under antitrust laws of the United States and the antitrust laws of the State.

**I. CONFLICT OF INTEREST**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

By submitting a bid, Contractor certifies that there does not now exist a relationship between the Contractor and any person or entity which is or gives the appearance of a conflict of interest related to this ITB or project.

The Contractor certifies that it shall not take any action or acquire any interest, either directly or indirectly, which will conflict in any manner or degree with the delivery of its goods hereunder or which creates an actual or an appearance of conflict of interest.

The Contractor certifies that it will not employ any individual known by Contractor to have a conflict of interest.

The Parties shall not knowingly, for a period of two years after execution of the contract, recruit or employ any employee or agent of the other Party who has worked on the ITB or project, or who had any influence on decisions affecting the ITB or project.

**J. STATE PROPERTY**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The Contractor shall be responsible for the proper care and custody of any State-owned property which is furnished for the Contractor's use during the performance of the contract. The Contractor shall reimburse the State for any loss or damage of such property; normal wear and tear is expected.

**K. SITE RULES AND REGULATIONS**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The Contractor shall use its best efforts to ensure that its employees, agents, and Subcontractors comply with site rules and regulations while on State premises. If the Contractor must perform on-site work outside of the daily operational hours set forth by the State, it must make arrangements with the State to ensure access to the facility and the equipment has been arranged. No additional payment will be made by the State on the basis of lack of access, unless the State fails to provide access as agreed to in writing between the State and the Contractor.

**L. ADVERTISING**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The Contractor agrees not to refer to the contract award in advertising in such a manner as to state or imply that the company or its goods are endorsed or preferred by the State. Any publicity releases pertaining to the project shall not be issued without prior written approval from the State.

**M. DRUG POLICY**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Contractor certifies it maintains a drug free work place environment to ensure worker safety and workplace integrity. Contractor agrees to provide a copy of its drug free workplace policy at any time upon request by the State.

**IV. PAYMENT**

**A. PROHIBITION AGAINST ADVANCE PAYMENT**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Payments shall not be made until contractual deliverable(s) are received and accepted by the State.

**B. TAXES**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

The State is not required to pay taxes and assumes no such liability as a result of this solicitation. The Contractor may request a copy of the Nebraska Department of Revenue, Nebraska Resale or Exempt Sale Certificate for Sales Tax Exemption, Form 13 for their records. Any property tax payable on the Contractor's equipment which may be installed in a state-owned facility is the responsibility of the Contractor.

**C. INVOICES**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Invoices for payments must be submitted by the Contractor to the agency requesting the services with sufficient detail to support payment. Mail invoices to NET, 1800 N 33<sup>rd</sup> St., Lincoln, NE 68503. The terms and conditions included in the Contractor's invoice shall be deemed to be solely for the convenience of the parties. No terms or conditions of any such invoice shall be binding upon the State, and no action by the State, including without limitation the payment of any such invoice in whole or in part, shall be construed as binding or estopping the State with respect to any such term or condition, unless the invoice term or condition has been previously agreed to by the State as an amendment to the contract.

**D. INSPECTION AND APPROVAL**

Accept (Initial)	Reject (Initial)	Reject & Provide Alternative within ITB Response (Initial)	NOTES/COMMENTS:
AMH			

Final inspection and approval of all work required under the contract shall be performed by the designated State officials.

The State and/or its authorized representatives shall have the right to enter any premises where the Contractor or Subcontractor duties under the contract are being performed, and to inspect, monitor or otherwise evaluate the work

being performed. All inspections and evaluations shall be at reasonable times and in a manner that will not unreasonably delay work.

If a simple inspection of the goods would reveal nonconformity, notice of nonconformity should be provided to the vendor as soon as reasonably practical, but not to exceed thirty (30) days from receipt of goods. This includes visual inspection of product to ensure packaging is not damaged, dented or compromised.

**E. PAYMENT (Statutory)**

State will render payment to Contractor when the terms and conditions of the contract and specifications have been satisfactorily completed on the part of the Contractor as solely determined by the State. (Neb. Rev. Stat. Section 73-506(1)). The State may require the Contractor to accept payment by electronic means such as ACH deposit. In no event shall the State be responsible or liable to pay for any services provided by the Contractor prior to the Effective Date of the contract, and the Contractor hereby waives any claim or cause of action for any such services.

**F. LATE PAYMENT (Statutory)**

The Contractor may charge the responsible agency interest for late payment in compliance with the State of Nebraska Prompt Payment Act (See Neb. Rev. Stat. §§ 81-2401 through 81-2408).

**G. SUBJECT TO FUNDING / FUNDING OUT CLAUSE FOR LOSS OF APPROPRIATIONS (Statutory)**

The State's obligation to pay amounts due on the Contract for a fiscal years following the current fiscal year is contingent upon legislative appropriation of funds. Should said funds not be appropriated, the State may terminate the contract with respect to those payments for the fiscal year(s) for which such funds are not appropriated. The State will give the Contractor written notice thirty (30) calendar days prior to the effective date of termination. All obligations of the State to make payments after the termination date will cease. The Contractor shall be entitled to receive just and equitable compensation for any authorized work which has been satisfactorily completed as of the termination date. In no event shall the Contractor be paid for a loss of anticipated profit.

**H. RIGHT TO AUDIT (Statutory)**

The State shall have the right to audit the Contractor's performance of this contract upon a thirty (30) day written notice. Contractor shall utilize generally accepted accounting principles, and shall maintain the accounting records, and other records and information relevant to the contract (Information) to enable the State to audit the contract. (Neb. Rev. Stat. §84-304 et seq.) The State may audit and the Contractor shall maintain the information during the term of the contract and for a period of five (5) years after the completion of this contract or until all issues or litigation are resolved, whichever is later. The Contractor shall make the Information available to the State at Contractor's place of business or a location acceptable to both Parties during normal business hours. If this is not practical or the Contractor so elects, the Contractor may provide electronic or paper copies of the Information. The State reserves the right to examine, make copies of, and take notes on any Information relevant to this contract, regardless of the form or the Information, how it is stored, or who possesses the Information. In no circumstances will contractor be required to create or maintain documents not kept in the ordinary course of contractor's business operations, nor will contractor be required to disclose any information, including but not limited to product cost data, which is confidential or proprietary to contractor.

The Parties shall pay their own costs of the audit unless the audit finds a previously undisclosed overpayment by the State. If a previously undisclosed overpayment exceeds three percent (3%) of the total contract billings, or if fraud, material misrepresentations, or non-performance is discovered on the part of the Contractor, the Contractor shall reimburse the State for the total costs of the audit. Overpayments and audit costs owed to the State shall be paid within ninety (90) days of written notice of the claim. The Contractor agrees to correct any material weaknesses or condition found as a result of the audit.

## V. SCOPE OF WORK

The Bidder must provide the following information in response to this ITB.

### A. SCOPE

It is the intent of this bid invitation to issue a purchase order for the item(s) requested.

All items bid shall be of the latest manufacture in production as of the date of the ITB and be of proven performance and under standard design complete as regularly advertised and marketed. All necessary materials for satisfactory performance of the supplies shall be incorporated into the 13kW UHF Transmitter, Mask Filter, Backup Transmitter, and Installation whether or not they may be specifically mentioned below.

Complete specifications, manufacturer's current descriptive literature and/or advertising data sheets with cuts or photographs must be included with the bid for the IDENTICAL items proposed. Any information necessary to show compliance with these specifications not given on the manufacturer's descriptive literature and/or advertising data sheets must be supplied in writing on or attached to the bid document. If manufacturer's information necessary to show compliance with these specifications is not attached to the bid document, the Bidder may be required to submit requested information within three (3) business days of a written request. Failure to submit requested descriptive literature or advertising data sheets may be grounds to reject the bid.

### B. CHANGE ORDER

This Purchase Order may be amended in writing, within scope, upon the agreement of both parties.

### C. REVISIONS

In the event any product is discontinued or replaced upon mutual consent prior to delivery of the goods, the State reserves the right to amend this purchase order to include the alternate product.

### D. STATE REQUIREMENTS AND GENERAL INFORMATION

NET will be employing an electrical contractor to perform electrical work. NET and NET's electrical contractor will be responsible for providing all raceway, electrical, including any service entry modifications, building penetrations.

NET will be responsible for disposal of refuse after installation. NET will be responsible for demolition and removal of old equipment and systems, including approved EPA disposal of glycol and oil filled high voltage transformers.

NET will be responsible for providing a roll off dumpster for disposal.

NET will be ready for installation when equipment is delivered. NET has a temporary 400W backup transmitter that will keep the site on the air during demolition phase and installation of new transmitters. This existing backup transmitter will be decommissioned by NET staff following installation of new transmitters. This temporary backup transmitter is placed in an area that will not interfere with installation of new equipment.

NET will be providing IP access and services for remote monitoring and IP control. NET will interface new transmitters to the existing remote control systems.

This is not an FCC repack station. Absolute deadline to be on the air is June 2019. It is not necessary to stagger delivery of backup and high power transmitters. No tower or antenna work are required for this installation.

Contractor will be allowed to work extended hours and weekends.

A bid bond is not required with this ITB. ITB does not have Liquidated Damages

Billing and payment will be lump sum at final acceptance.



**VI. INVITATION TO BID - TECHNICAL SPECIFICATIONS**

**A. BIDDER INSTRUCTIONS**

Bidder must respond to each of the following statements. Specifications listed are minimum conditions that must be met in order for a Bidder to qualify for the award.

"YES" response means the Bidder guarantees they can meet this condition.

"NO" response means the Bidder cannot meet this condition and will not be considered.

"NO & PROVIDE ALTERNATIVE" responses should be used only with a narrative response in the NOTES/COMMENTS section explaining in detail any deviation from the Bidder's ability to meet the condition, and an explanation of how this would be determined to be an acceptable alternative to meeting the condition. Alternatives must be detailed in such a way that allows such deviations to be fully evaluated. The State shall determine at its sole discretion whether or not the Bidder's alternative is an acceptable alternative.

**B. NON-COMPLIANCE STATEMENT**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. Read these specifications carefully. Any and all exceptions to these specifications must be written on or attached to quotation request. Any noncompliance may void your quotation. Non-compliance to any single specification can void your quotation.
✓			2. It is the responsibility of Bidders to obtain information and clarifications as provided below. The State is not responsible for any erroneous or incomplete understandings or wrongful interpretations of this ITB by any Bidder.
✓			3. No interpretation related to the meaning of bid specifications or other pre-bid documents will be made orally to any Bidder by the State. Any ITB interpretation must be put in writing and faxed by the Bidder to: the State Purchasing Bureau, Fax (402) 471-2089 or e-mailed to AS Materiel Purchasing <a href="mailto:as.materielpurchasing@nebraska.gov">as.materielpurchasing@nebraska.gov</a> by the last day to submit written questions that is specified in the Schedule of Events. (Inquiries received after the last day to submit written questions may not be addressed).
<b>NOTES/COMMENTS:</b>			

**C. TECHNICAL SPECIFICATIONS: 13kW (at output of mask filter) Main Transmitter, High-Efficiency, Solid State, Liquid Cooled Digital UHF Channel 28 Television Transmitter, 480V 3 phase electrical hookup**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. 13kW (at output of mask filter) High-Efficiency, Solid State Liquid Cooled Digital UHF Television Transmitter, Channel 28, 480V 3 phase WYE electrical hookup.
✓			2. Liquid cooled dummy load must be included in RF system. Please note that existing liquid cooled dummy load on site will be decommissioned by NET.
✓			3. Transmitter is to be capable of producing 13kW at output of mask filter.
✓			4. The FCC Facility ID for this site is 47987

✓			5. Dual Multi-Standard Exciter/Driver ATSC 3.0 capable, with web browser interface, front panel display of transmitter parameters, and built-in compliance monitoring.
✓			6. The exciter shall include at least one (1) ASI/SMPTE-310M input for ATSC 1.0. For ATSC 3, 0 the exciter shall include at least one (1) native 1GBE TSolP input. TSolP input connectors shall be RJ-45, female.
✓			7. Exciter upgradeable to ATSC 3.0 mode with minimum effort. Exciter to be shipped with ATSC 1.0 configuration. Provide description of process for upgrading to ATSC 3.0 _Add additional 1RU ATSC 3.0 Encoder and enable a key code
✓			8. A UPS or battery back-up system capable of maintaining exciter operation (except for final amplifier) for up to 15 minutes after an AC power loss shall be included.
✓			9. PA modules and associated power supplies must be hot swappable to maintain transmitter functionality.
✓			10. Transmitter shall be designed for unattended remote control operation, compatible with standard commercial parallel remote control systems and must be capable of remote control from either a web interface or SNMP protocol. External remote control system will be provided on site and all wiring/interfaces to remote control will be completed by NET.
✓			11. Complete liquid cooling system must be included with transmitter. This must include all components and installation needed for a complete cooling system. Cooling system must be of the type that employs dual pumps. Cooling system heat exchanger will be installed on existing outdoor concrete pad with overhead ice bridge. See Diagram 2 for placement details. Existing wall penetrations can be used for new installation. If existing penetrations are not adequate, NET will provide new penetrations. Contractor must supply any indoor or outdoor cable tray and supports used for routing, support, management, and protection of cooling hoses.
✓			12. Appropriate 3 Phase surge suppressor for transmitter only must be included.
✓			13. Manufacturer shall include one shelf spare PA module and associated power supplies to operate one module.
✓			14. PA modules must be broadband in operation with peak performance at UHF channel 28.
✓			15. Manufacturer shall be responsible for providing all recommended coolant needed for installation and final fill for operation.
✓			16. Channel 28 8-pole mask filter capable of handling transmitter TPO shall be included as part of the RF system. Output of mask filter needs to feed input of RF switch. RF system must include sampling ports on both sides of mask filter.
✓			17. 4 port RF motorized switch that is capable of remote control operation must be part of RF system. Output of switch must tie into existing 6 1/8" line to antenna. All components needed for RF system are to be supplied with switch. Switch controller and interconnect cables are to be included. Placement of this motorized switch will be in approximate location of existing RF patch panel as shown in Diagram 2. NET staff will remove existing RF patch panel.
✓			18. Information regarding placement of this transmitter and RF system can be found in Diagram 2 included with this ITB.

✓			19. Please note that more than 100' of 4" grounding strap will be required for this installation.
✓			20. State length of time manufacturer has been established in the design and manufacture of broadcast television transmitters: 50 years Manufacturers with less than five (5) years transmitter manufacturing experience may be a factor in award consideration.
✓			21. Does the transmitter manufacturer maintain a service department that is staffed twenty four (24) hours a day, three hundred sixty five (365) days a year?
✓			22. Does the manufacturer maintain a staff of fully trained customer service engineers available for telephone assistance or on-site service? State technical hotline support availability: 24 X 7 X 365
✓			23. The manufacturer shall provide replacement parts and service for the equipment offered for a minimum of ten (10) years after the sale of the equipment. Parts warehouse, inventory, and shipping point shall be located in the United States. Replacement parts, or repairs requiring shipment from locations outside the United States will not be allowed.
<b>NOTES/COMMENTS:</b>			

**D. TECHNICAL SPECIFICATION: 600-800W BACKUP TRANSMITTER TECHNICAL SPECIFICATIONS**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. 600W-800W TPO is acceptable for this transmitter
✓			2. 208-240VAC, Single Phase electrical hookup
✓			3. Appropriate single phase surge suppressor for backup transmitter only must be included.
✓			4. Physical size requirement 4-8RU
✓			5. External channel 28 mask filter, 6 pole air cooled with insertion loss <1.0dB
✓			6. Single exciter configuration. Dual exciter not necessary for this transmitter.
✓			7. Configured for ATSC 1.0 modulation upgradable to ATSC 3.0
✓			8. Output of RF system must connect to RF Switch mentioned in above specification for larger transmitter
✓			9. Must include remote control monitoring and control capability with either web interface or SNMP and must include legacy parallel remote control connection interface. External remote control system will be provided on site and all wiring/interfaces to remote control will be completed by NET.
✓			10. This transmitter should be air cooled design.

✓			11. Transmitter must be installed in vendor supplied rack.
✓			12. Transmitter is to be placed between new high power transmitter and existing FM transmitter. Additional information regarding placement of this transmitter and RF system can be found in Diagram 2 included with this ITB.
<b>NOTES/COMMENTS:</b>			

**E. INSTALLATION & PROOF OF PERFORMANCE**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. Proof-of-performance testing for both transmitters to insure compliance with Federal Communications Commission (FCC) requirements and manufacturer specifications. Proof-of-performance testing to be coordinated with site contact Robert Vos (308) 991-7443
✓			2. Documentation for both transmitters will be provided to NET upon completion of performance testing and FCC compliance.
✓			3. Provide factory training on specified main high power transmitter for two site engineers following installation.
<b>NOTES/COMMENTS:</b>			

**F. ADDITIONAL INSTALLATION SITE CONDITIONS**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. State Delays/Issues – The only additional cost allowed would be for delays due to the State. Bidder should provide a daily cost including all per diem for delays due to the State or requested by the State. Please see line 5 on Invitation to Bid Form.
✓			2. NET will coordinate with contractor all equipment that has been delivered to site prior to INSTALLER installation arrival.
✓			3. Site access allowed a minimum of 7 days a week and 10 hours per day.
✓			4. NET will remove equipment prior to new installation and There will adequate space within the facilities to support the installation of all supplied equipment.
✓			5. NET will have adequate and proper space existing external to the building to support cooling system.
✓			6. NET will complete Appropriate electrical and HVAC work to support new equipment prior to installation work start.
✓			7. NET hired electrician shall be on site day of or day after INSTALLER arrival to site to discuss equipment layout and final AC connection to each.

✓			<b>8.</b> Electrical work can be completed without delaying installation and commissioning of equipment by NET.
✓			<b>9.</b> Delays that are considered NET delays can be charged to NET at INSTALLER daily rates plus expenses. See Invitation to Bid Form.
✓			<b>10.</b> NET staff shall be available to support INSTALLER Service Representatives with appropriate site access and other needs as they arise.
✓			<b>11.</b> Existing combiner and mask filter will be removed. New mask filter if ceiling mounted can be positioned within 10'. If not ceiling mounted the dimensions and physical layout will determine the length of this run, please see Diagram 2.
✓			<b>12.</b> NET to supply appropriate acetylene and oxygen tanks for all soft solder and welding requirements.
✓			<b>13.</b> The Station will not have a pallet Jack suitable for moving around and setting cabinets and Heat exchangers.
✓			<b>14.</b> Station will have Ladders on site suitable for operating at facility interior ceiling elevations. Yes
✓			<b>15.</b> Standard HOTEL Rates. Seasonal or Rates beyond Hotel allocation will be included in unit price.
✓			<b>16.</b> The State will not agree to any major design changes, example additional materials, Primary, or 3rd Party material repairs.
✓			<b>17.</b> All work must be completed within one mobilization and within initial proposed time allocation.
✓			<b>18.</b> Any revision or changes associated with cost will have to be agreeable to all parties and formalized through the State Purchasing Bureau as a change order after award has been completed.
✓			<b>19.</b> No additional cost to the State will be allowed for travel from INSTALLER to NET location.
✓			<b>20.</b> Contractor to provide offloading equipment for debris disposal. See section V. D. of ITB for information on debris disposal.
✓			<b>21.</b> NET shall be responsible for proper storage or disposal of any equipment that may have been removed during installation process.
✓			<b>22.</b> Installation or of Commissioning Services any INSTALLER supplied equipment as related to towers, antennas or transmission line from tower to building is not included in this ITB.
✓			<b>23.</b> NET is responsible for work beyond commissioning and operational testing, example, interfacing Remote control, interlocks, and all other external equipment.
✓			<b>24.</b> Installation does not require exterior wall penetrations, Ice Bridge, Electrical, or mechanical additions or modifications unless otherwise specified by customer.
✓			<b>25.</b> INSTALLER will assist NET with Video Input, Remote Control, Network, and Interlock locations; however, NET not INSTALLER will be responsible for all associated wiring, commissioning, programming, and labor related to devices outside the transmitter cabinet.

**G. DELIVERY ARO**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. Bidder must provide both transmitters at the same time. There is no need to stagger delivery for this installation.
✓			2. It is understood by NET that currently all transmitter manufacturers have long lead times due to the TV repack. However due to state of current transmitter and urgency of replacement, shorter lead times are an award consideration. Absolute deadline for transmitter to be operational on the air is June 2019.
			3. State delivery time ARO: _____
<b>NOTES/COMMENTS:</b>			

**H. DELIVER LOCATIONS/INSTRUCTIONS (BIDDER IS CERTIFYING THAT THEY CAN MEET THE DELIVER LOCATIONS/INSTRUCTIONS)**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			1. KHNE-TV Transmitter site, 1105 W 6 Rd., Giltner, NE 68441
✓			2. Contact Site Manager Robert Vos at 308-991-7443 at least three (3) business days prior to delivery.
✓			3. Must be delivered with vehicle with lift gate. Contractor must provide all equipment required to unload and facilitate installation (including fork lift.) No loading dock on site. Storage facility is available on site if needed.
✓			4. NET staff will be present at site and could help with offloading but anything beyond that is responsibility of contractor.
✓			5. Secure storage garage available for contractor use if needed. Contractor will be responsible for moving equipment from storage garage to final destination.
<b>NOTES/COMMENTS:</b>			

I. PACKAGING

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			<p>1. Cartons are to be clearly marked with size, weight, color, quantity, and the purchase order number. Cartons must be of suitable size and of sufficient strength to protect the contents during shipping, handling and storage.</p>
<p>NOTES/COMMENTS:</p>			

J. QUALITY

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			<p>1. Product quality must meet specifications and be consistent for the term of the contract. A guarantee of satisfactory performance by the supplier and meeting delivery dates are considered to be an integral part of the purchase contract resulting from this bid invitation. All materials must be of first quality, under standard production by the manufacturer and be of standard design, complete as regularly advertised and marketed and be of proven performance. Products are to be fully guaranteed and may be returned for full credit or replacement (at the State's option) for any reason during the initial warranty period with no additional charges for shipping or restocking.</p>
<p>NOTES/COMMENTS:</p>			

**K. PRICES**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			<p>1. Price quoted shall be unit price and shall be firm for sixty (60) days from date of an award and are to be net; including transportation and delivery charges fully prepaid by the Bidder F.O.B. Destination as specified. No additional charges will be allowed for packing, handling, fuel surcharge, or partial delivery costs. Any request for an increase must be submitted in writing to the SPB a minimum of thirty (30) days prior to proposed effective date of increase, and must show cause and be accompanied by supporting documentation (such as notification letter from manufacturer). Further documentation may be required by the State, to authenticate the increase (such as manufacturer invoices). Failure to supply any requested supporting documentation may be grounds to cancel the contract. In no instance may a price increase be billed to the State until the contract is amended. The State further reserves the right to reject any proposed price increase(s), cancel the contract and re-bid if determined to be in the best interest of the State. The State will be given full proportionate benefit of any decrease for the term of the contract. Contract supplier or suppliers may honor pricing and extend the contract to political sub-divisions, cities, and counties. Terms and conditions of the contract must be met by political sub-divisions, cities, and counties.</p>
<p><b>NOTES/COMMENTS:</b></p>			

**L. GRAY MARKET PRODUCTS PROHIBITION**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			<p>1. The State will not accept Gray Market Products for this solicitation. Gray Market is defined as the trade of a commodity through distribution channels which, while legal, are unofficial, unauthorized, or unintended by the original manufacturer. Gray Market items are not designed to be sold in a particular market and cannot be supported by the authorized importer because of various reasons.</p>
<p><b>NOTES/COMMENTS:</b></p>			



**M. WARRANTY**

YES	NO	NO & PROVIDE ALTERNATIVE	
✓			<p>1. Contractor must warrant the average life expectancy supplies hereunder to be not less than that stated in the manufacturer's price list and agree to replace, without cost, all supplies failing to meet this requirement, except where the reduced life is due to conditions beyond the control of the Contractor. Defective parts or those damaged in shipment must be replaced by the Contractor at no charge to the State. The manufacturer's standard warranty shall apply and be in effect for at least three (3) years from the date the equipment was placed in service.</p>
✓			<p>2. The manufacturer shall warrant the transmitter to be free from defects in the material and workmanship under normal use and service for a period of three (3) years from the date of final acceptance.</p>
✓			<p>3. Please provide a copy of the warranty terms and conditions with ITB.</p>
<p><b>NOTES/COMMENTS:</b></p>			

**N. SECRETARY OF STATE REGISTRATION REQUIREMENTS**

\*\*\*CHOOSE "YES" TO BEST ANSWER ONLY, CHOOSE "NO" FOR REMAINING LINES\*\*\*

YES	NO	<b>*Prior to contract award and/or upon request of SPB, potential award recipient(s) will be asked to certify compliance with Nebraska Secretary of State Registration by providing a true and exact copy of current (dated within 90 days) valid Certificate of Good Standing or Letter of Good Standing.</b>
	✓	<p><b>1.</b> Bidder is a SOLE PROPRIETORSHIP (in which case, no Letter of Good Standing/Certificate of Good Standing is required)</p> <p>If the Bidder is an Individual or Sole Proprietorship, the following applies:</p> <p>a. The Bidder must complete the United States Citizenship Attestation Form, available on the Department of Administrative Services website at <a href="http://das.nebraska.gov/materiel/purchasing.html">http://das.nebraska.gov/materiel/purchasing.html</a></p> <p>The completed United States Attestation Form should be submitted with the Invitation to Bid response.</p> <p>b. If the Bidder indicates on such attestation form that he or she is a qualified alien, the Contractor agrees to provide the U.S. Citizenship and Immigration Services documentation required to verify the Contractor's lawful presence in the United States using the Systematic Alien Verification for Entitlements (SAVE) Program.</p> <p>c. The Bidder understands and agrees that lawful presence in the United States is required and the Contractor may be disqualified or the contract terminated if such lawful presence cannot be verified as required by Neb. Rev. Stat. § 4-108.</p>
	✓	<p><b>2.</b> Bidder is a GENERAL PARTNERSHIP (in which case, no Letter of Good Standing/Certificate of Good Standing is required).</p>
✓		<p><b>3.</b> Bidder is a FOREIGN or DOMESTIC CORPORATION or BUSINESS and a copy of current Letter of Good Standing/Certificate of Good Standing from the Nebraska Secretary of State is provided within bid submission documents.</p>
	✓	<p><b>4.</b> Bidder is a FOREIGN or DOMESTIC CORPORATION or BUSINESS and a copy of current Letter of Good Standing/Certificate of Good Standing from the Nebraska Secretary of State will be provided in a timely manner upon request prior to award.</p>

**Form A**  
**Bidder Contact Sheet**  
**Invitation To Bid Number 5970 OF**

Form A should be completed and submitted with each response to this ITB. This is intended to provide the State with information on the Bidder's name and address, and the specific person(s) who are responsible for preparation of the Bidder's response.

<b>Preparation of ITB Contact Information</b>	
Bidder Name:	<b>Technical Services Group, Inc.</b>
Bidder Address:	<b>12015 Cloverland Court Baton Rouge, La 70809</b>
Contact Person & Title:	<b>Derek Luce, Business Manager</b>
E-mail Address:	<b>derek@tsgcom.com</b>
Telephone Number (Office):	<b>225-751-9800</b>
Telephone Number (Cellular):	
Fax Number:	<b>225-753-1726</b>

Each Bidder shall also designate a specific contact person who will be responsible for responding to the State if any clarifications of the Bidder's response should become necessary.

<b>Communication with the State Contact Information</b>	
Bidder Name:	<b>Technical Services Group, Inc.</b>
Bidder Address:	<b>12015 Cloverland Court Baton Rouge, La 70809</b>
Contact Person & Title:	<b>Derek Luce, Business Manager</b>
E-mail Address:	<b>derek@tsgcom.com</b>
Telephone Number (Office):	<b>225-751-9800</b>
Telephone Number (Cellular):	
Fax Number:	<b>225-753-1726</b>

**ADDENDUM ONE,  
REVISED INVITATION TO BID**

Date: December 14, 2018

To: All Bidders

From: Julie Dabydeen, Buyer  
AS Materiel State Purchasing

RE: Addendum for Invitation to Bid Number 5970 OF REBID to be opened December 28,  
2018 at 2:00 p.m. Central

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**REVISED INVITATION TO BID**

Invitation to Bid dated December 12, 2018 is hereby deleted and replaced with Revised Invitation to Bid dated December 14, 2018

This addendum will become part of the ITB and should be acknowledged with the Invitation to Bid response.

**Technical Services Group, Inc. acknowledges this addendum.**

## ADDENDUM TWO, QUESTIONS and ANSWERS

Date: December 21, 2018

To: All Bidders

From: Julie Dabydeen, Buyer  
Materiel State Purchasing

RE: Addendum for Invitation to Bid Number 5970 OF Rebid to be opened December 28, 2018 at 2:00 p.m. Central Time

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### Questions and Answers

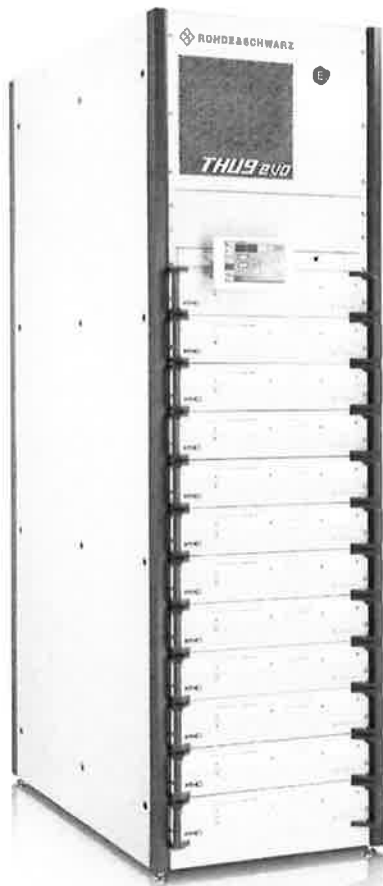
Following are the questions submitted and answers provided for the above mentioned Invitation to Bid. The questions and answers are to be considered as part of the Invitation to Bid. It is the Bidder's responsibility to check the State Purchasing Bureau website for all addenda or amendments.

<u>Question Number</u>	<u>ITB Section Reference</u>	<u>ITB Page Number</u>	<u>Question</u>	<u>State Response</u>
1.			It would be extremely helpful if the state could provide some feedback on bid rejection. It would greatly assist in putting together a competitive bid since every bid has been rejected multiple times.	The solicitation was rejected due to an error on Addendum Two indicating that the opening bid date was December 13, 2018, not December 7, 2018.  5970 OF REBID is a revised document that includes the most current specification changes, which is the reason for the multiple solicitations for this commodity.

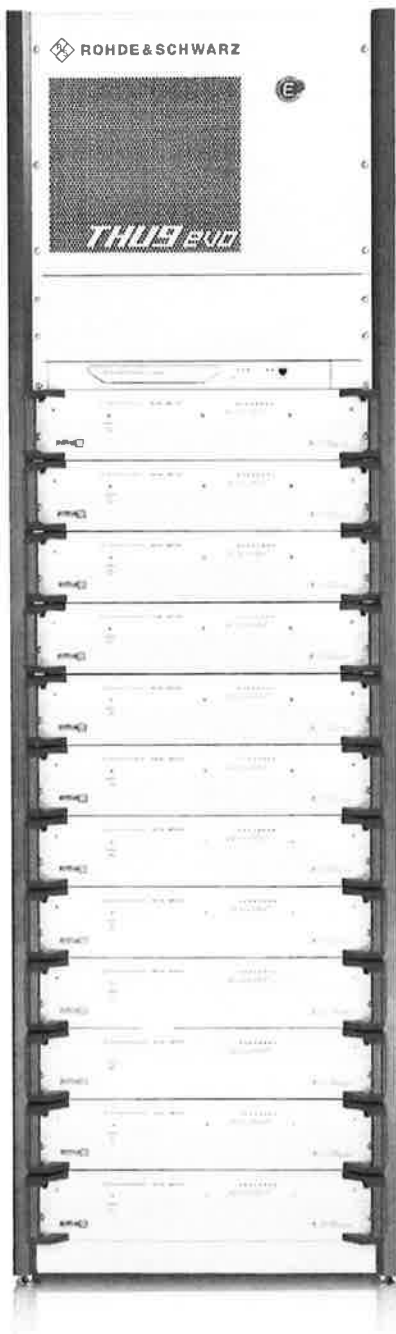
This addendum will become part of the ITB and should be acknowledged with the Invitation to Bid response.

**Technical Services Group, Inc. acknowledges this addendum.**

# R&S® THU9evo Liquid-Cooled Transmitter Family The best even better



# R&S®THU9evo Liquid-Cooled Transmitter Family At a glance



The R&S®THU9evo UHF high-power transmitter family heralds the next step toward minimizing operating costs for terrestrial broadcasting. Its overall energy efficiency values of up to 40% for COFDM and 43% for ATSC represent all-time highs. The transmitter family is based on the well-established R&S®THU9 platform and carries forward all of its proven strengths. Network operators benefit from low operating costs throughout the product's lifecycle.

The liquid-cooled UHF high-power transmitters deliver output power levels from 1.5 kW to 96.5 kW for COFDM TV standards (including ATSC 3.0) and from 1.65 kW to 106 kW for ATSC. With the R&S®THU9evo, Rohde & Schwarz offers the highest power density on the market at up to 17.4 kW per rack for COFDM standards and up to 19 kW for ATSC.

Rohde & Schwarz has poured its many years of pioneering experience in Doherty technology into the design of the R&S®THU9evo, achieving efficiency values of up to 40% for COFDM standards and up to 43% for ATSC, including the cooling system. The new adaptive efficiency optimization feature ensures maximum energy cost savings even after channel changes or output power adjustments.

The transmitters are based on the established R&S®THU9 platform with all of its proven strengths, including the MultiTX concept, outstanding system flexibility and ease of use. Thousands of installed R&S®THU9 transmitters around the globe are proof of how well the platform meets network operators' needs.

## Key facts

- Even greater efficiency gains through many years of experience with Doherty technology
- Highest power density on the market
- Built on the strengths of the established R&S®THU9 platform
- Intelligent efficiency optimization for minimized energy costs for all types of applications
- Future-ready ATSC 3.0 support

# R&S®THU9evo Liquid-Cooled Transmitter Family Benefits and key features

## Minimized operating costs for every application

- Minimized energy costs thanks to new R&S®PHU903 amplifier with enhanced Doherty technology
  - Rapid channel change and maximum efficiency combined in a single amplifier
  - Minimum energy costs for every operating scenario thanks to intelligent efficiency optimization
- ▷ page 5

## Compact design and easy operation

- Highest power density on the market – 30% higher compared with R&S®THU9
  - Compact, expandable exciter – the new R&S®TCE901
  - Space-saving, scalable cooling system
  - Intuitive operation
- ▷ page 7

## Future-ready ATSC 3.0 support

- Server-based exciter solution
  - Easy upgrade
- ▷ page 10

## R&S®THU9 platform – field-proven thousands of times over

- Built on the known strengths of the R&S®THU9 platform
  - MultiTX systems with up to four transmitters per rack
  - All-in-one transmitter with built-in pump unit and bandpass filter
- ▷ page 12

## Rohde & Schwarz – the partner you can count on

- Quality transmitters since 1949 – decades of experience in transmitter design and production
  - Spare parts available even ten years after product discontinuation
- ▷ page 14

### E<sup>5</sup> – efficiency to the power of five

The R&S®Tx9 transmitter generation scores with efficiency on five different levels:

#### ■ Efficiency in energy

Economical: minimum power consumption for cost savings over system lifetime

#### ■ Efficiency in space

Space-saving: several transmitters and additional components in one rack

#### ■ Efficiency in operation

Smooth: installation, operation and maintenance

#### ■ Efficiency in configuration

Customer-focused: modular solutions for flexible system configuration

#### ■ Efficiency for a lifetime

Future-ready: can be expanded to accommodate new standards and technologies





# Model overview

## R&S®THU9evo high-power transmitter family

Number of amplifiers per transmitter	Output power (AVG) <sup>1)</sup> for COFDM			Output power (AVG) <sup>1)</sup> for ATSC		Dimensions (H x W x D)	Number of transmitters per rack with MultiTX configurations
	474 MHz to 680 MHz	680 MHz to 720 MHz	720 MHz to 790 MHz	474 MHz to 720 MHz	720 MHz to 790 MHz		
1	1.5 kW	1.4 kW	1.2 kW	1.65 kW	1.5 kW	2000 mm x 600 mm x 1100 mm (78.74 in x 23.62 in x 43.31 in)	up to 4
2	3.0 kW	2.8 kW	2.4 kW	3.3 kW	3.0 kW		
3	4.5 kW	4.2 kW	3.6 kW	4.9 kW	4.5 kW		
4	6 kW	5.6 kW	4.8 kW	6.5 kW	6.0 kW		
5	7.5 kW	7.0 kW	6.0 kW	8.2 kW	7.5 kW	up to 3	up to 2
6	9.0 kW	8.4 kW	7.2 kW	9.8 kW	9.0 kW		
8	11.9 kW	11.0 kW	9.5 kW	13.0 kW	11.9 kW		
10	14.5 kW	13.5 kW	11.5 kW	15.5 kW	14.5 kW	no MultiTX configuration	
12	17.4 kW	16.2 kW	14.0 kW	19.0 kW	17.4 kW		
16	23.0 kW	21.5 kW	18.5 kW	25.5 kW	23.0 kW		
20	28.0 kW	26.5 kW	22.5 kW	31.0 kW	28.0 kW		
24	34.0 kW	31.5 kW	27.0 kW	37.0 kW	34.0 kW	2000 mm x 1200 mm x 1100 mm (78.74 in x 47.24 in x 43.31 in)	
30	42.0 kW	39.0 kW	33.5 kW	46.0 kW	42.0 kW		
36	50.0 kW	47.0 kW	40.5 kW	55.0 kW	50.0 kW	2000 mm x 1800 mm x 1100 mm (78.74 in x 70.87 in x 43.31 in)	
40	56.0 kW	52.0 kW	45.0 kW	61.0 kW	56.0 kW	2000 mm x 2400 mm x 1100 mm (78.74 in x 94.49 in x 43.31 in)	
48	67.0 kW	62.5 kW	54.0 kW	73.5 kW	67.0 kW	2000 mm x 3600 mm x 1100 mm (78.74 in x 141.73 in x 43.31 in)	
60	80.5 kW	75.0 kW	65.0 kW	88.5 kW	80.5 kW		
72	96.5 kW	90.0 kW	78.0 kW	106.0 kW	96.5 kW		

<sup>1)</sup> Before bandpass filter.

# Minimized operating costs for every application

## Minimized energy costs thanks to new R&S®PHU903 amplifier with enhanced Doherty technology

Focusing on the challenges faced by network operators has always been one of the driving principles behind transmitter development at Rohde & Schwarz. Customer satisfaction and the market success experienced with the R&S®THU9 are proof of how well the R&S®THU9 platform satisfies this principle. One of the primary challenges for network operators is and will remain the reduction of operating costs. The R&S®THU9evo incorporates all of the proven and valued strengths of the R&S®THU9 platform, while taking key features such as energy efficiency and power density to the next level. Built on years of pioneering achievements with Doherty technology, the R&S®THU9evo offers even greater efficiency.

In combination with the new R&S®PHU903 amplifier, the R&S®THU9evo transmitters achieve energy efficiency of up to 40% for COFDM standards and up to 43% for ATSC, including the cooling system, once again setting the benchmark in their class. One R&S®PHU903 amplifier module delivers up to 1.55 kW output power for COFDM standards and up to 1.7 kW for ATSC. Years of experience and continuous development have given Rohde & Schwarz complete mastery over the Doherty technology, which the company has been able to deploy to the greatest advantage.

The multiband Doherty technology was first introduced in the R&S®Tx9 generation of transmitters in 2012. Since that time, this amplifier technology has become synonymous with energy cost savings for many network operators. Today, thousands of Rohde & Schwarz amplifier modules employing multiband Doherty technology are in use in transmitter networks worldwide. Each and every day, Rohde & Schwarz technology saves more than 400 000 kWh of energy compared with conventional amplifier technology.

Liquid-cooled R&S® PHU903 Doherty amplifier.



The R&S®PHU903 employs the proven design of the liquid-cooled aluminum heat sink known from the R&S®THU9. This design maintains the same operating temperature for all transistors, ensuring maximum service life. Even the power supplies in the R&S®PHU903 are liquid-cooled, making separate fans in the amplifier unnecessary. Three efficient, integrated power supplies deliver power for the transistors. This integrated power supply redundancy allows the Doherty amplifier to operate at close to maximum power even if one of the power supplies fails.

**Rapid channel change and maximum efficiency combined in a single amplifier**

Thanks to the multiband Doherty technology, the R&S®PHU903 can be operated over the entire frequency range without modifications. Optimizations for the various frequency bands are even easier with the R&S®PHU903 than with predecessor models. With the R&S®THU9evo, network operators are optimally equipped for channel changes.

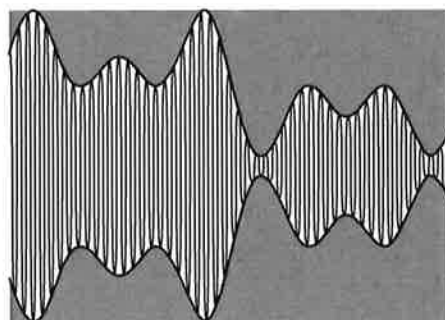
**Minimum energy costs for every operating scenario thanks to intelligent efficiency optimization**

Normally, transmitters are not operated at their full nominal power. Conventional transmitters experience a significant reduction in efficiency at reduced power. This is where other intelligent R&S®THU9evo technologies come into play. The R&S®THU9evo transmitter family features power agile efficiency, i.e. transmitter efficiency remains optimal even at reduced power. This is made possible through complete control of the Doherty amplifier circuits along with intelligent control of amplifier parameters, plus advanced precorrection.

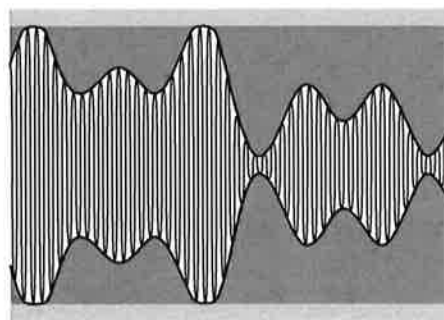
To allow network operators to use this potential to maximize energy economy, the R&S®THU9evo transmitter family offers the newly developed efficiency optimization feature. This intelligent algorithm, deployed at the press of a button or adaptively, optimizes amplifier parameters to meet specific signal quality requirements. Whether changing channels or adjusting the transmitter output power, efficiency optimization ensures that the system delivers maximum efficiency at all times.

The R&S®THU9evo also offers improved adaptive precorrection (ADE). This technology has consistently been optimized for the Rohde&Schwarz Doherty amplifier characteristics, making it the most effective and fastest precorrection technology on the market. With the advanced R&S®Tx9evo technologies, network operators are optimally prepared for channel changes and output power adjustments.

**Adaptive efficiency optimization minimizes energy costs for all operating scenarios**



**Without efficiency optimization**  
 ■ Unadjusted power amplifier parameters  
 ■ Low efficiency



**With efficiency optimization**  
 ■ Adaptively adjusted power amplifier parameters  
 ■ High efficiency

Reduced headroom

# Compact design and easy operation

## Highest power density on the market – 30% higher than the R&S®THU9

Apart from energy costs, infrastructure costs account for the majority of expenses incurred during the lifecycle of a transmitter system. The R&S®THU9evo offers the highest power density on the market for solid-state transmitters. Up to 12 amplifiers can be accommodated in a single transmitter rack. This configuration allows an output power of up to 17.4 kW per rack for COFDM standards and up to 19 kW for ATSC.

This is an additional 30% increase in power density as compared with the R&S®THU9. With this increase, the R&S®THU9evo transmitter family delivers an astonishing maximum output power of 106 kW for ATSC. This means that the state-of-the-art, solid-state transmitters from Rohde & Schwarz can now achieve power classes previously attainable only with inductive output tube (IOT) transmitters.

## Compact, expandable exciter – the new R&S®TCE901

The R&S®THU9evo transmitter family comes with the new R&S®TCE901 exciter. The exciter offers an even higher level of integration than the previous model, R&S®TCE900. This saves space and increases the system's availability. The exciter supports the latest functionality implemented in the R&S®THU9evo, such as adaptive efficiency optimization. The exciter also offers free slots for expanding its functionality (e.g. with optional satellite receivers).

The R&S®TCE901 exciter is multifunctional and extremely versatile. It supports the DVB-T, DVB-T2, ISDB-T/ISDB-T<sub>B</sub> and ATSC digital TV standards. Together with the R&S®SDE900, it provides a future-ready solution for ATSC 3.0. Multiple standards (e.g. DVB-T and DVB-T2) can be installed in a single exciter. GPS and Glonass functionality can be activated via option keys.

The R&S®TCE901 comes with an optional, integrated exciter backup battery – a unique feature providing maximum transmitter availability. The battery minimizes the negative effects of mains voltage interruptions. It powers the CPU and the signal processing components during voltage interruptions, ensuring that interruptions of up to 10 seconds do not result in a time-consuming reboot of the transmitter. The battery reduces off-the-air time, without requiring a full-featured UPS.

### Highest power density per transmitter rack



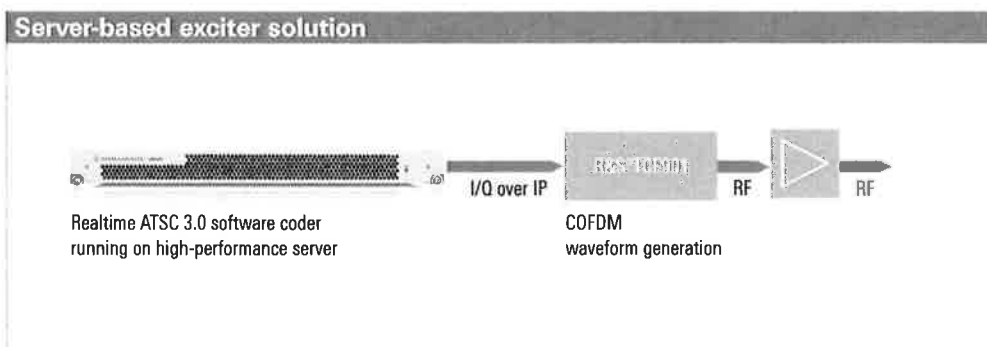
# Future-ready ATSC 3.0 support

R&S®SDE900 server-based exciter solution

The ATSC 3.0 broadcast standard was defined to give broadcast network operators a great degree of flexibility in their service offerings. ATSC 3.0 was designed to evolve together with broadcasters' future requirements. To optimally address network operators' future needs for flexibility, Rohde & Schwarz revolutionized how a broadcast standard is implemented. The R&S®SDE900 has a pure software-based approach that ideally prepares network operators for ATSC 3.0. Based on a high-performance IT server, it enables network operators to optimally leverage the full capabilities of the standard and flexibly respond to signal processing requirements of the future. The Rohde & Schwarz exciter solution fully supports ATSC 3.0 features such as multiple physical layer pipes (PLP), multiple subframes and SFN capabilities for optimal utilization of valuable spectrum. The R&S®SDE900 also supports ATSC 3.0 layered division multiplexing (LDM), helping network operators maximize coverage for different reception scenarios (e.g. fixed and mobile reception).

By design, broadcast standard evolutions can easily be accommodated. Operators benefit from a secure investment and can optimally capitalize on their valuable spectrum assets even in the broadcasting days after tomorrow.

The R&S®SDE900 is designed as a plug-in, rackmount module for the R&S®Tx9 generation of transmitters, making it an easy upgrade path to the ATSC 3.0 standard. The R&S®SDE900 software-based encoder generates the I/Q modulation data. The field-proven R&S®TCE901 exciter generates the COFDM waveform based on the I/Q data and applies the most powerful precorrection on the market with the high level of signal quality expected from Rohde & Schwarz.



### ATSC 3.0

ATSC 3.0 is a digital terrestrial broadcasting standard from the Advanced Television Systems Committee (ATSC) that has been substantially enhanced compared with the ATSC A/53 predecessor standard. ATSC 3.0 is designed to give network operators more flexibility, greater robustness and more efficient operation. It employs state-of-the-art encoding and modulation technologies, enabling a significantly more effective use of the limited spectrum resources. Using minimal resources, it creates capacity to transfer UHD video contents and immersive audio contents to the end user via terrestrial channels. The consistent focus on IP technology in the baseband makes it possible to merge cost-effective terrestrial broadcasting with other IP-based services.

ATSC 3.0 is the first ATSC standard to employ coded orthogonal frequency division multiplexing (COFDM). This modulation method uses a large number of orthogonal carriers, resulting in a signal that is robust against disturbance. COFDM technology also makes it possible to set up spectrum-efficient ATSC 3.0 single-frequency networks (SFN).



Use of the latest low density parity check (LDPC) codes in combination with Bose-Chaudhuri-Hocquenghem (BCH) codes allows the usable channel capacity to approach the theoretical Shannon limit, as does the use of non-uniform constellations (NUC) for modulation. ATSC 3.0 employs multiple PLP technology, enabling flexible use of the channel. With the latest technologies such as LDM, an effective simultaneous crossover can be realized both for mobile reception and for stationary reception.

R&S SDE900 rackmount module



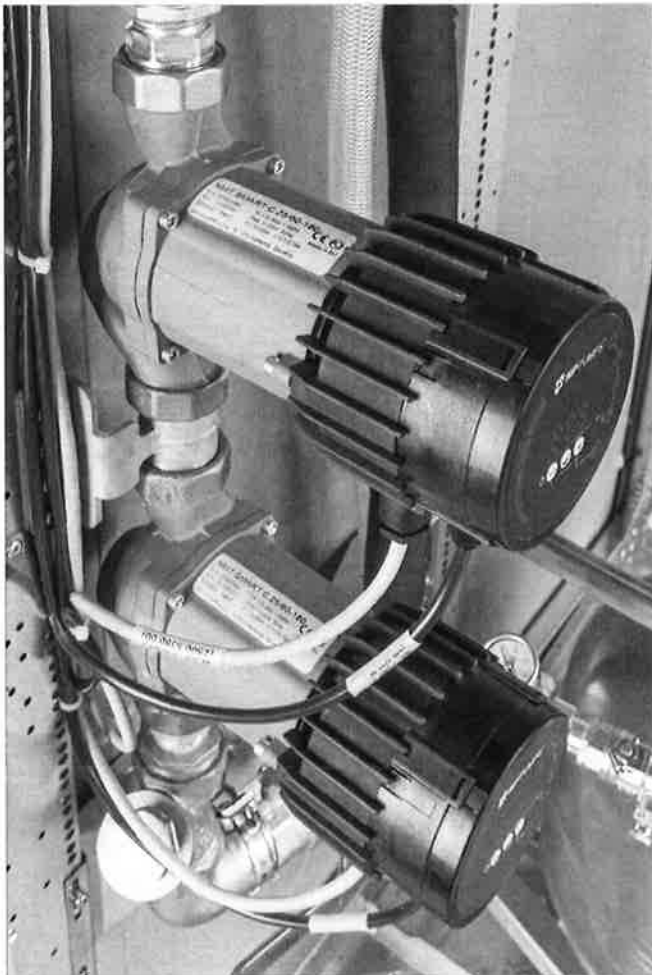
### Space-saving, scalable cooling system

The cooling system of the R&S®THU9evo transmitters uses efficient, field-proven components for different output powers. It can be scaled according to network operator requirements, the system configuration and the number of amplifiers used in a system. For single transmitters with up to four amplifiers, the new compact cooling system with two redundant pump modules integrated into the rack is the ideal choice. The high-power cooling system known from the R&S®THU9 is ideal for single transmitters with more than four amplifiers and for MultiTX systems. Depending on the configuration, this high-power system can also be integrated into the rack.

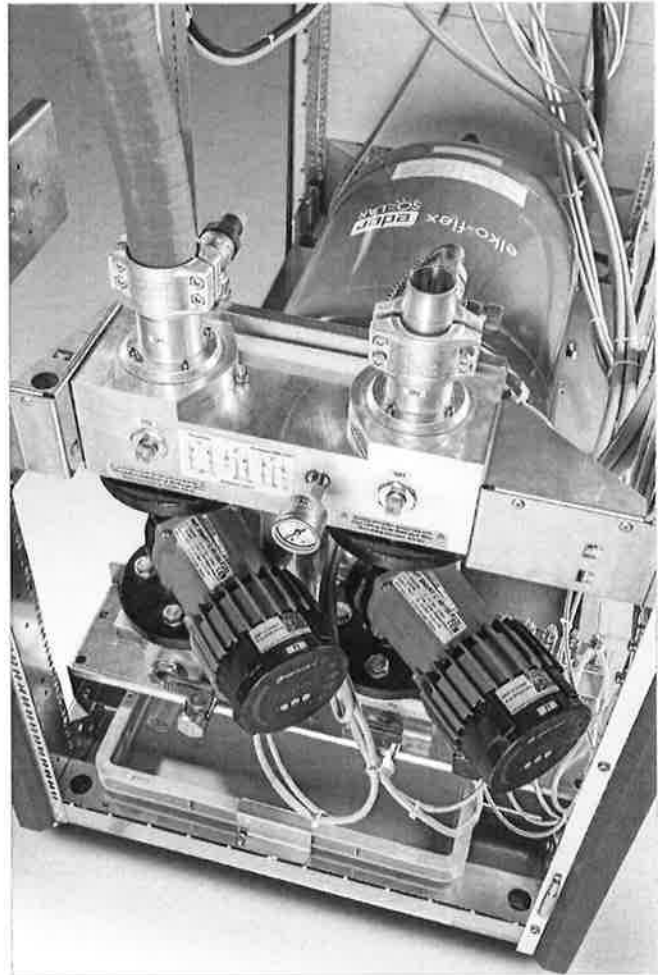
The footprint can also be minimized when the pump unit is installed outside the rack since its compact hydraulic block takes up little space. The cleverly designed supporting frame makes installation flexible. The pump can be installed on the floor (standard solution) or on the wall. Two pumps can also be stacked vertically.

The heat exchangers have a practice-proven design with two redundant, high-efficiency fans. The heat exchangers can be installed in different arrangements to accommodate site constraints.

Compact cooling system with redundant pump modules.



High-power cooling system for enhanced requirements.



### Intuitive operation

The R&S®THU9evo transmitter family offers the same ease and convenience as the R&S®Tx9 family. Each R&S®THU9evo comes with transmitter status LEDs on the front panel. The buttons on the front panel make it quick and easy to switch from remote to local mode and to switch the transmitter on and off.

The optional R&S®TDU900 transmitter display unit allows fast, intuitive operation of the transmitter system via touchscreen. In addition, a web interface is available that makes it possible to operate the transmitter either locally or remotely, or to integrate it into a network management system via SNMP.

Whether via touchscreen or web interface – the user benefits from the same convenient GUI used throughout the R&S®Tx9 transmitter generation. This means that if multiple R&S®Tx9 transmitter families are used in a network, the uniform GUI significantly reduces training effort for operating personnel.

The R&S®THU9evo GUI offers network operators the convenience they want and need when installing, commissioning and operating transmitters. The GUI is straightforward and makes it possible to check the system status at a glance. The device-based menu provides a graphical view of the transmitter structure. The user simply touches a component to directly access its parameters.

The task-oriented menu shows the different tasks that can be performed with the transmitter. The tasks and their individual steps are presented in a well-structured layout so that they can be accomplished in a minimum of time. For example, when putting the transmitter into operation, the operator is guided through the configuration of the different devices and given help when entering parameters and changing settings.

R&S®TDU900 transmitter display unit





# R&S®THU9 platform – field-proven thousands of times over

## **Built on the known strengths of the R&S®THU9 platform**

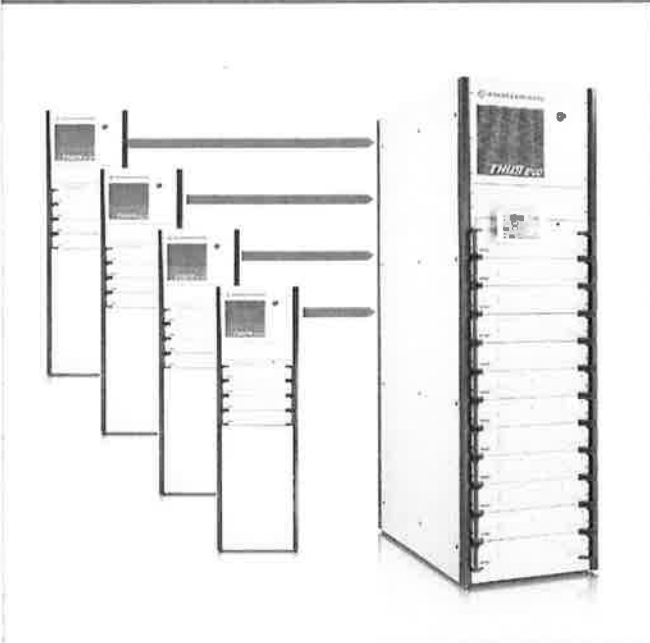
The R&S®THU9 has been a mainstay of broadcast networks for several years. The R&S®THU9 has had a lasting influence on the transmitter market over the past few years, thanks to its unparalleled efficiency made possible by the pioneering efforts of Rohde & Schwarz in multi-band Doherty technology combined with unprecedented space savings achieved through MultiTX configurations for liquid-cooled transmitters. Thousands of R&S®THU9 transmitters are in operation around the world. This exceptional success is a clear statement of how the R&S®THU9 transmitter platform meets the needs of network operators, both in terms of minimal operating costs and maximum availability. Transmitter development at Rohde & Schwarz always focuses on the challenges faced by network operators. Key features such as energy efficiency and power density were targeted for improvement in the R&S®THU9evo, while all of the field-proven strengths of the R&S®THU9 platform were maintained, including MultiTX and highly optimized, low-attenuation RF power components. The broad base of installed R&S®THU9 systems exhibits extremely low failure rates. Based on this established platform, the R&S®THU9evo demonstrates the same level of proven reliability.

## **MultiTX systems with up to four transmitters per rack**

The revolutionary MultiTX concept was first introduced for liquid-cooled transmitters in the R&S®THU9 and met with a tremendous response from network operators around the world. The R&S®THU9evo builds on this concept, offering improved power density and allowing operators to make even better use of the MultiTX concept. Depending on the number of amplifiers per transmitter, a rack can hold up to four transmitters. All other transmitters on the market require much more floor space for such a configuration. The significantly smaller footprint of the Rohde & Schwarz solution compared with conventional transmitters allows operators to substantially reduce site rental costs.

In contrast to conventional couplers, the power combiner is located behind, and directly plugged into, the amplifiers, and it comes with integrated coolant distribution. This saves so much space that four RF rigid lines can be installed. This allows a rack to accommodate, for example, four transmitters with 4.5 kW output power or three transmitters with 6 kW output power.

**MultiTX system with four 4.5 kW transmitters in a single rack**

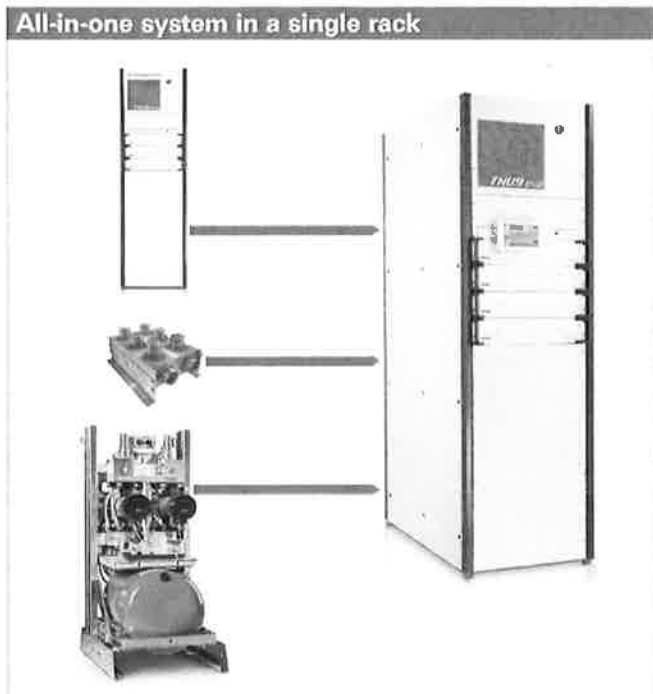


The transmitter control unit and exciters also require very little space. Up to seven R&S®TCE900/TCE901 units can be installed in the mounting frame at the transmitter top. The vertical arrangement of the equipment, with all interfaces at the top of the transmitter, makes installation and access easy.

The innovative MultiTX design even makes entire N+1 transmitter systems more compact. One rack can maximally accommodate a 3+1 configuration. To save space, the RF coaxial switches are installed directly on the top of the rack.

### **All-in-one transmitter with built-in pump unit and bandpass filter**

The high power density also offers advantages for all-in-one configurations. For UHF transmitters with up to four amplifiers, both the pump unit and a six-cavity bandpass filter can be integrated into the rack. This approach considerably reduces the space required for a single transmitter. The hydraulic components of the pump are installed in the rear part of the transmitter rack and can easily be accessed via the rear door.



# Rohde & Schwarz – the partner you can count on

**Quality transmitters since 1949 – decades of experience in transmitter design and production**  
Rohde & Schwarz has developed and produced quality transmitters for more than 65 years. During this time, the transmitters have been continuously enhanced with new and improved functionality.

The company stands for quality, precision and innovation in all fields of wireless communications. As an independent, family-owned company, Rohde & Schwarz finances its growth from its own funds. The company is not bound by short-term, quarterly results. It plans for the long term, which greatly benefits customers. Purchasing Rohde & Schwarz products is a safe investment for the future.

## **Spare parts available even ten years after product discontinuation**

Rohde & Schwarz ensures its customers spare parts availability for a period of 10 years from the time a product is discontinued. For new products such as the R&S®THU9evo, this means ensured spare parts availability far beyond 10 years. Broadcast network operators can count on professional, expert support from Rohde & Schwarz during the entire service life of their transmitters. Rohde & Schwarz transmitters offer investment security that is unparalleled on the broadcast market.



# Specifications in brief

<b>Specifications</b>		
<b>Digital TV</b>		
Standards		DVB-T, DVB-T2, ISDB-T, ISDB-T <sub>g</sub> , ATSC, ATSC 3.0
Channel bandwidth	DVB-T	5/6/7/8 MHz
	DVB-T2	1.7/5/6/7/8 MHz
	ISDB-T, ISDB-T <sub>g</sub>	6/8 MHz
	ATSC	6 MHz
	ATSC 3.0	6 MHz
Inputs	DVB-T, DVB-T2	2 × ASI (BNC, 75 Ω), 2 × TSolP (Gigabit Ethernet)
	ISDB-T, ISDB-T <sub>g</sub>	2 × ASI (BNC, 75 Ω), 2 × TSolP (Gigabit Ethernet)
	ATSC	2 × SMPTE 310M or ASI (BNC, 75 Ω), 2 × TSolP (Gigabit Ethernet)
	ATSC 3.0	2 × STL or TSolP (Gigabit Ethernet)
<b>General data</b>		
Frequency range	UHF band IV/V	470 MHz to 790 MHz
Supply voltage		400 V/230 V; 4 wires + PE (L1/L2/L3/N/PE) ±15% 208 V; 3 wires + PE (L1/L2/L3/PE) ±15% 220 V; 3 wires + PE (L1/L2/L3/PE) ±15% 240 V; 3 wires + PE (L1/L2/L3/PE) -15%/+10%
Max. installation height		2000 m above sea level (> 2000 m on request)
Operating temperature range		+1 °C to +45 °C
Relative humidity (max.)		+1 °C to +40 °C (with R&S®SDE900)
<b>Immunity</b> <sup>1)</sup>	to fast transients and bursts in line with IEC 61000-4-4	± 2 kV (AC supply) ± 1 kV (signal inputs)
	to surges in line with IEC 61000-4-5	symmetrical: ± 1 kV (e.g. L-N), asymmetrical: ± 2 kV (e.g. L-PE, N-PE)
<b>Synchronization</b>		
Reference frequency		10 MHz, 0.1 V to 5 V (V <sub>pp</sub> ) or TTL, BNC
Reference pulse		1 Hz, TTL, BNC
<b>Operation</b>		
Status panel with buttons and LEDs		local operation
Transmitter display unit with touchscreen and LEDs	optional	local display and operation
Ethernet interface, RJ-45		web interface: local, remote network management interface via SNMP
Parallel remote interface	optional	floating contacts for messages and commands

<sup>1)</sup> More stringent requirements must be satisfied by implementing appropriate measures at the transmitter site.

To comply with the applicable standards and limit values for the suppression of out-of-band emissions and for maintaining the required shoulder distance, the transmitter may only be operated with suitable filters at the RF output.

Your local Rohde & Schwarz expert will help you determine the optimum solution for your requirements.

To find your nearest Rohde & Schwarz representative, visit

[www.sales.rohde-schwarz.com](http://www.sales.rohde-schwarz.com)

## Service that adds value

- ▮ Worldwide
- ▮ Local and personalized
- ▮ Customized and flexible
- ▮ Uncompromising quality
- ▮ Long-term dependability

## Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

## Sustainable product design

- ▮ Environmental compatibility and eco-footprint
- ▮ Energy efficiency and low emissions
- ▮ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

## Rohde & Schwarz GmbH & Co. KG

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

## Regional contact

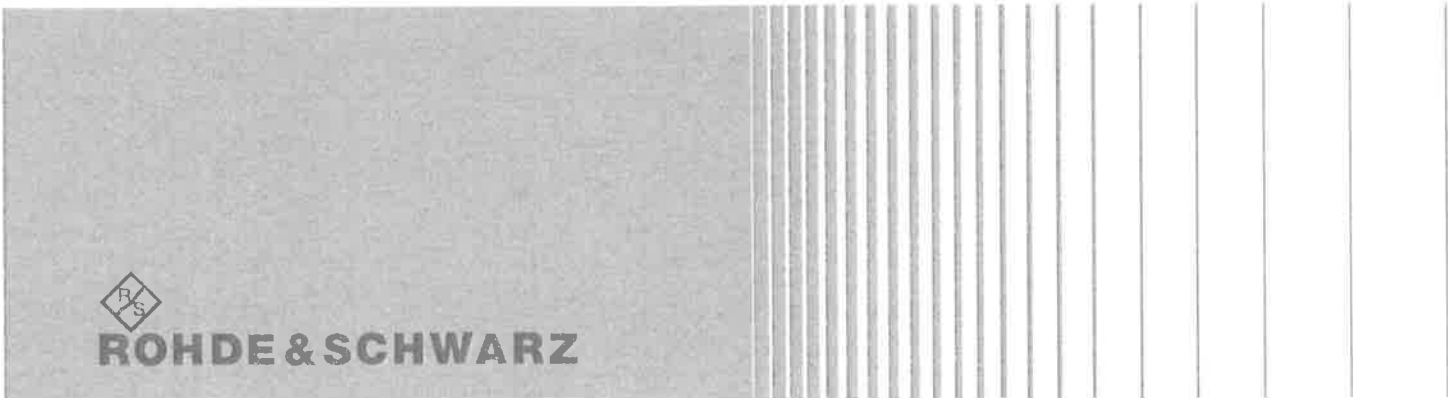
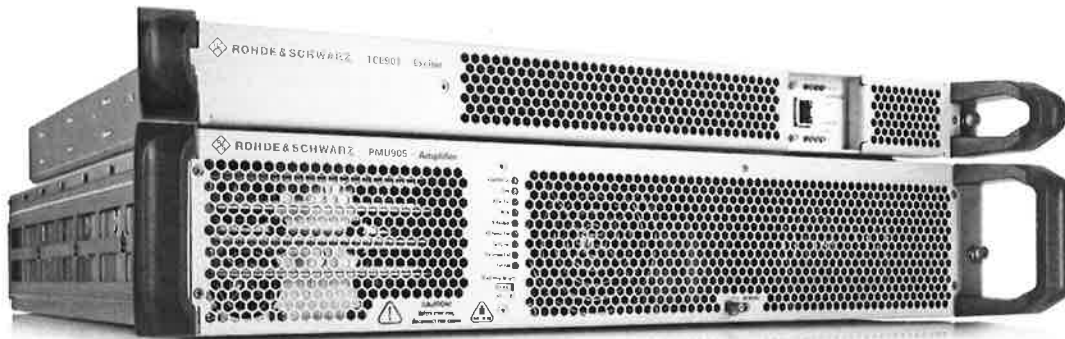
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R&S\*THU9evo Liquid-Cooled Transmitter Family  
Data without tolerance limits is not binding | Subject to change  
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# R&S® TMU9compact Air-Cooled UHF Transmitter Efficient, reliable, lean



# R&S®TMU9compact Air-Cooled UHF Transmitter At a glance

The R&S®TMU9compact UHF transmitter offers a level of compactness unique in its class, combined with excellent energy efficiency for minimal operating costs. Broadcast network operators will appreciate the transmitter's exceptionally high availability achieved through outstanding product quality and innovative redundancy solutions. The easy-to-operate transmitter fits seamlessly into existing infrastructures.

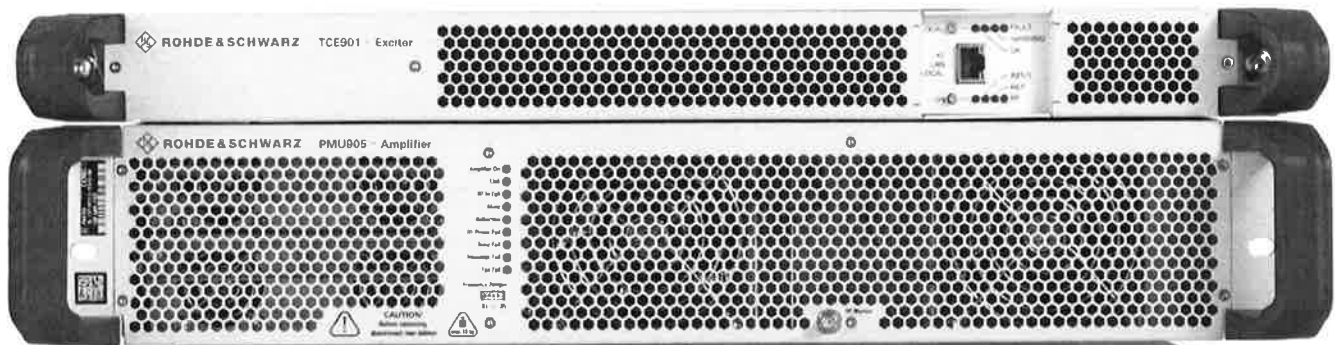
The R&S®TMU9compact UHF transmitter features an exceedingly compact design, delivering an astonishing COFDM output power of 400 W in 3 units and 600 W in 4.5 units. It enhances the established R&S®TMU9 transmitter toward the lower end of the medium-power range. While the R&S®TMU9 shows to its best advantage as a rack-mounted transmitter, the R&S®TMU9compact is an ideal choice both as a desktop transmitter and for rack integration.

As a member of the successful R&S®Tx9 transmitter generation, the R&S®TMU9compact minimizes total cost of ownership (TCO) with an efficiency of up to 43%, minimal space requirements and a design optimized for efficient service. For broadcast network operators, this means a significant reduction in operating expense (OPEX) of up to 50% over the life of the product.

The R&S®TMU9compact offers maximum availability through the recognized quality of Rohde & Schwarz products. The transmitter's intelligent redundancy concepts ensure exceptionally high reliability. Intuitive operation based on the tried and tested GUI of the R&S®Tx9 transmitter generation makes the transmitter very easy to use.

## Key facts

- Exceptionally compact in all configurations
- Superior energy efficiency at up to 43%
- Maximum reliability
- Easiest operation and maintenance
- Intelligent redundancy concepts



# R&S®TMU9compact Air-Cooled UHF Transmitter Benefits and key features

## Minimal operating costs

- Superior energy efficiency thanks to R&S®Multiband Doherty technology
  - Highly compact system design
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## Maximum availability

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## Minimized service effort

- Servicing at the component level thanks to modular design
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  - No special knowledge or tools required
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## Rohde & Schwarz – the partner you can count on

- Quality transmitters since 1949
  - Spare parts availability far beyond 10 years
  - From pre-sale to service. At your doorstep.
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### E<sup>5</sup> – efficiency to the power of five

The R&S®Tx9 transmitter generation scores with efficiency on five different levels:

#### ■ Efficiency in energy

Economical: minimum power consumption for cost savings over system lifetime

#### ■ Efficiency in space

Space-saving: several transmitters and additional components in one rack

#### ■ Efficiency in operation

Smooth: installation, operation and maintenance

#### ■ Efficiency in configuration

Customer-focused: modular solutions for flexible system configuration

#### ■ Efficiency for a lifetime

Future-ready: can be expanded to accommodate new standards and technologies





# Model overview

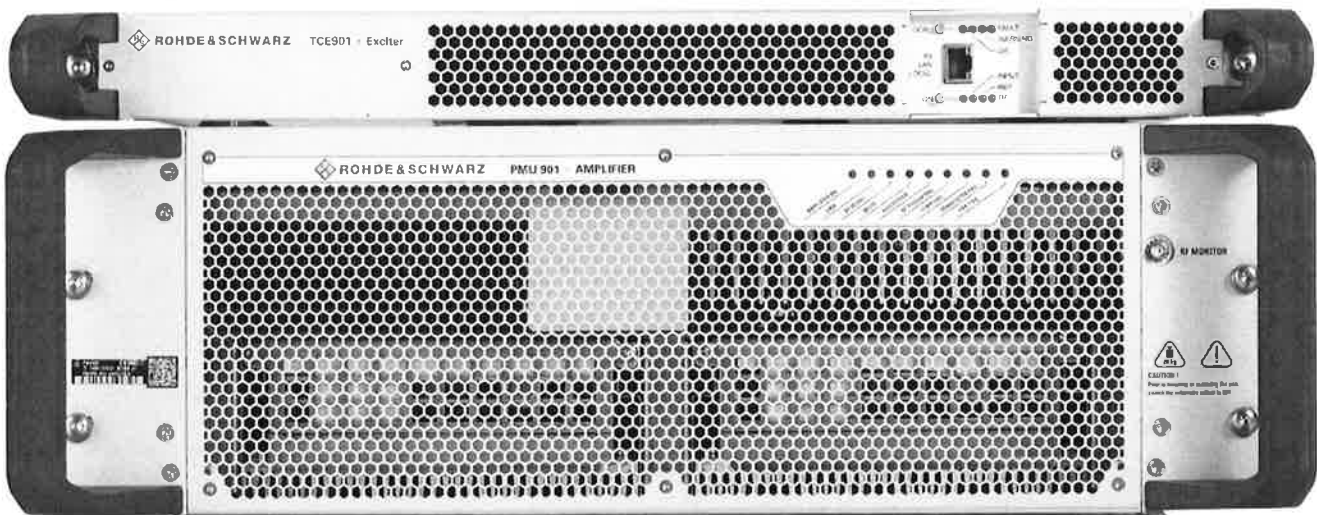
## R&S®TMU9compact UHF transmitter system

### Output power (AVG) for digital TV standards in Doherty and normal operation <sup>1)</sup>

DVB-T2, DVB-T, ISDB-T <sub>B</sub>	400 W	600 W
ATSC/ATSC Mobile DTV	450 W	600 W
<b>Dimensions (W x H x D)</b>	483 mm x 132 mm (3 HU) x 550 mm 19 in x 5.2 in x 21.6 in	483 mm x 198 mm (4.5 HU) x 550 mm 19 in x 7,8 in x 21,6 in

<sup>1)</sup> Before bandpass filter,

The R&S®TMU9compact in a  
600 W configuration with the  
R&S® PMU901 amplifier.



# Minimal operating costs

## Superior energy efficiency thanks to R&S®Multiband Doherty technology

The introduction of the R&S®Multiband Doherty technology in the R&S®Tx9 transmitter generation has revolutionized the broadcast transmitter market. With the R&S®TMU9compact, this amplifier technology is now available for the first time in the compact class, allowing the R&S®TMU9compact to reach the next level of energy efficiency. The transmitter sets the benchmark with an efficiency of up to 43%. It reduces energy costs by up to 50% compared with the average efficiency delivered by other transmitters in this power class.

The R&S®Multiband Doherty technology was first introduced in the R&S®Tx9 generation of transmitters in 2012. Since that time, this amplifier technology has become synonymous with energy cost savings for many network operators. In the meantime, thousands of amplifier modules employing R&S®Multiband Doherty technology are in use around the world. Each and every day, Rohde & Schwarz technology saves in excess of 400 000 kWh compared with conventional amplifier technology. This corresponds to the power consumption per day of a medium-sized European town.

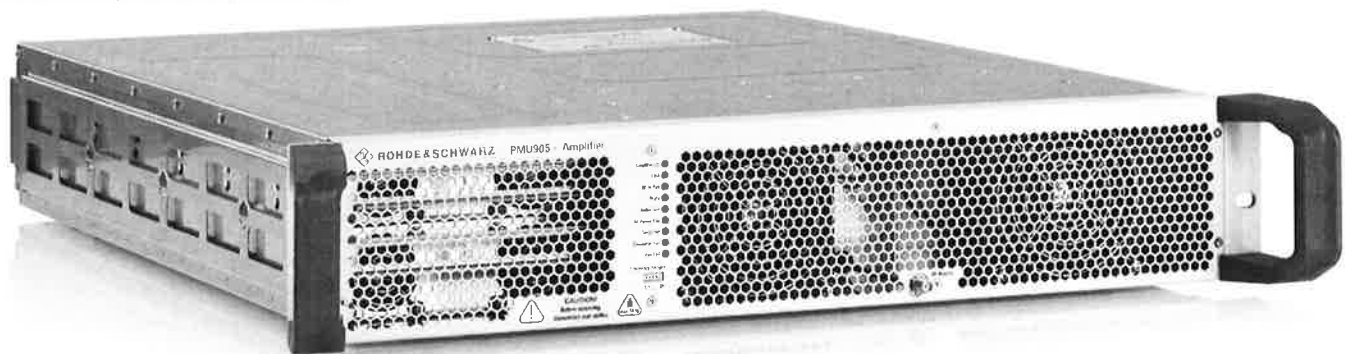
The R&S®TMU9compact can be equipped with R&S®PMU901 as well as with R&S®PMU905 amplifiers. Both amplifier models offer R&S®Multiband Doherty technology for maximum efficiency as well as frequency agility across the entire band IV and V. The R&S®PMU901 delivers up to 600 W and the R&S®PMU905 up to 400 W output power (COFDM). The two amplifier models with different output powers can address an extended power range without requiring a coupler. Losses associated with a coupler are avoided, optimizing overall system efficiency. In addition, this design saves space and simplifies commissioning.

## Highly compact system design

Apart from energy and service costs, infrastructure costs account for a large proportion of the expenses incurred during a transmitter's lifecycle. Through numerous innovations and by focusing on what is essential for transmission, the R&S®TMU9compact is able to minimize infrastructure costs and condense transmitter functionality in the smallest of spaces.

At only 3 units for 400 W and 4.5 units for 600 W, the R&S®TMU9compact requires minimal space, whether used as a single transmitter or configured as a multitransmitter (e.g. passive standby) system.

The R&S®PMU905 amplifier (400 W) offers the highest efficiency in its class.



This exceptionally compact size has been achieved by implementing signal generation and system control with a high level of integration, and by superior power density in the amplifier. The new R&S®TCE901 exciter platform integrates signal processing as well as transmitter and system control functionality. In addition, the R&S®TCE901 offers numerous functions and options that make extra equipment superfluous, such as an integrated satellite receiver and integrated system components for N+1 configurations. As a result, the space required for an R&S®TMU9compact system can in some cases be reduced by significantly more than 50% as compared with conventional transmitter systems in this power class.

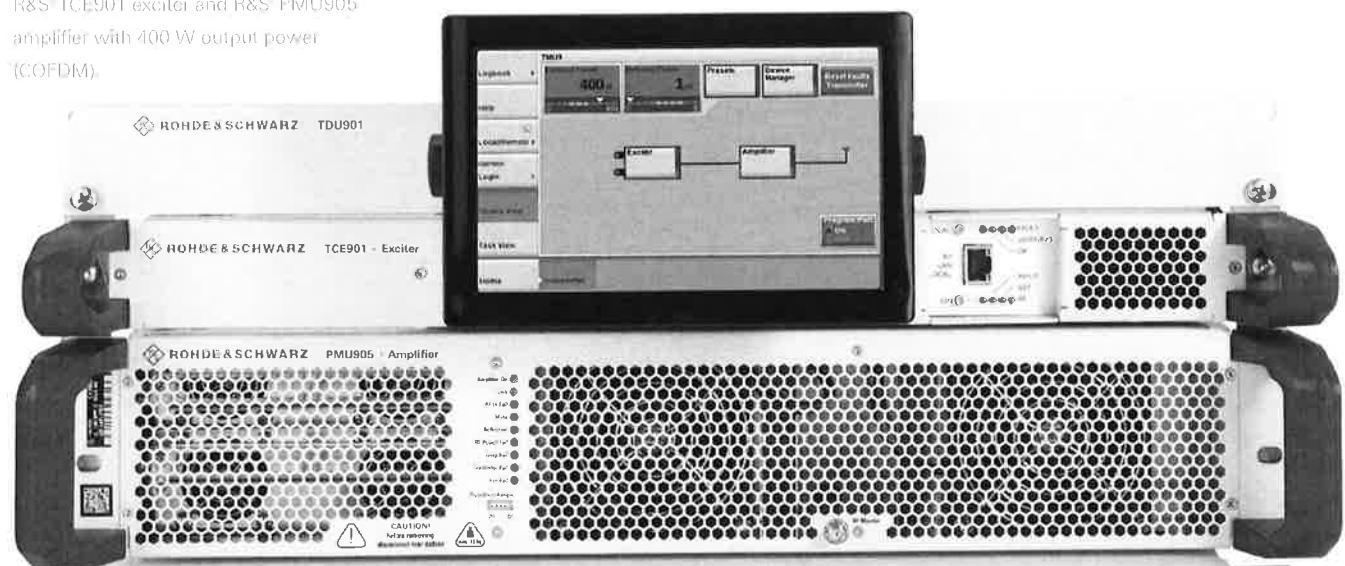
### Cost-optimized service concept

The R&S®TMU9compact has been designed for minimum maintenance and testing effort in line with customer requirements. Servicing is simple and straightforward, whether on site or at a Rohde & Schwarz service center, significantly reducing operating expense for transmitter networks.

### IP transport stream feed to reduce infrastructure costs

Due to its cost-effectiveness, IP technology is also gaining ground in broadcast feed networks. The R&S®TCE901 exciter offers two Gigabit Ethernet interfaces for redundant feed of two transport streams for all digital standards. External IP-to-ASI gateways are no longer needed. The TSolP functionality is monitored by the exciter, so this solution saves money and space and simplifies program feed monitoring.

The R&S®TMU9compact with optional R&S®TDU901 transmitter display unit, R&S®TCE901 exciter and R&S®PMU905 amplifier with 400 W output power (COFDM).



# Maximum availability

## Field-proven components and robust transmitter design

The R&S®TMU9compact offers the same excellent level of quality as the rack transmitters from the R&S®Tx9 generation. Built with high-quality components and based on a superior architecture, it offers unmatched reliability and excellent signal quality. For example, the R&S®TCE901 exciter delivers TV signals by means of direct digital RF generation.

The R&S®TMU9compact is based on the R&S®TMU9 medium-power transmitter, which has been a market success since 2012. A large number of R&S®TMU9 transmitters are in operation around the world. This broad base of installed R&S®TMU9 systems exhibits extremely low failure rates. The R&S®TMU9compact, which enhances the R&S®TMU9 toward the lower end of the medium-power range, is based on R&S®TMU9 components and demonstrates the same level of proven reliability, keeping off-the-air time to a minimum.

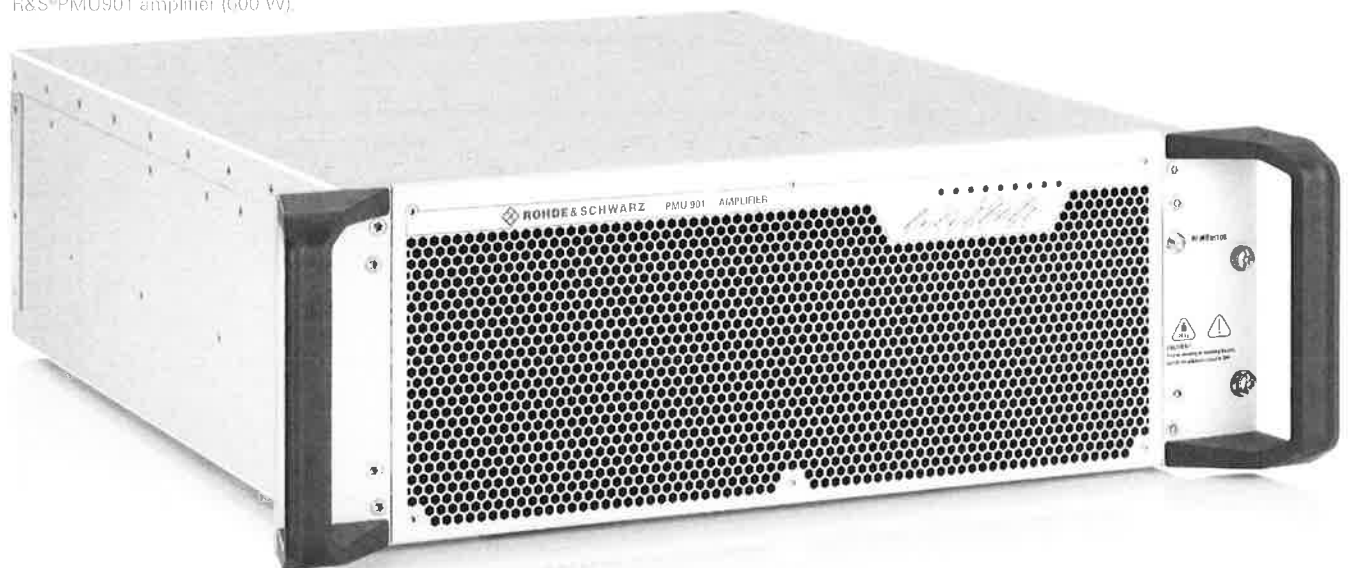
## Built-in redundancies for increased availability

The R&S®TMU9compact comes with an optional, integrated exciter backup battery, a feature that is unique in this power class. The battery minimizes the negative effects of mains voltage interruptions. It powers the CPU and the signal processing components during voltage interruptions, ensuring that interruptions of up to 10 seconds do not result in a time-consuming reboot of the transmitter. The battery thus reduces off-the-air time, without requiring a full-featured uninterruptible power supply (UPS).

Optional power supply redundancy for the amplifiers also helps to increase availability. Normally, each of the two power supplies delivers half of the necessary current. If one of the power supplies fails, the other delivers the full current. This ensures interruption-free transmission even if a power supply or a phase in the feed network fails. The power supplies can be easily replaced during operation.

In addition to the optional power supply redundancy, the intelligent amplifier design based on multiple output-stage transistors maximizes availability. If one transistor fails, the amplifier can still supply a major portion of the output power.

Built-in reliability based on high-quality components and superior architecture: the field-proven R&S®PMU901 amplifier (600 W).



### **Innovative redundancy concepts at the device and system level**

At the device level, the R&S®TMU9compact uses the backup drive redundancy concept known from the R&S®TMU9 transmitter family and comprising only two R&S®TCE901 exciters. It operates without a centralized monitoring unit, since the passive exciter monitors the active one. The backup drive configuration offers the functionality and convenience of a classic exciter redundancy configuration and also increases transmitter availability.

At the system level, the R&S®TMU9compact offers two innovative redundancy configurations: BackupTx and Compact N+1.

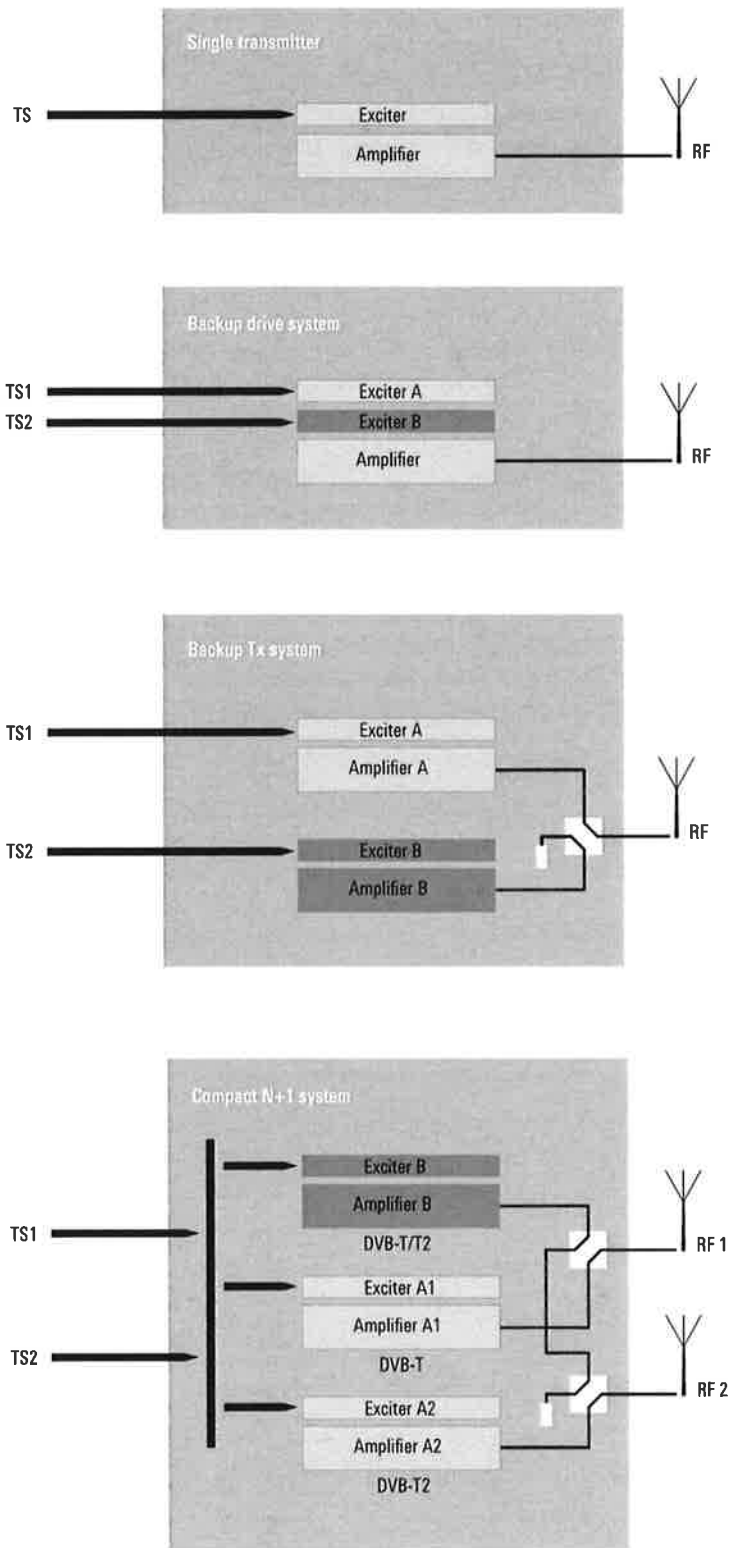
In a BackupTx system, two R&S®TMU9compact transmitters operate in a fully symmetrical 1+1 configuration. The two transmitters monitor each other, making extra hardware for system monitoring and control unnecessary. Doing away with a separate, governing control unit eliminates the risk of a single point of failure. The BackupTx configuration offers the functionality and convenience of a classic passive standby configuration and also increases the availability of transmitter functionality. BackupTx systems require considerably less space than conventional 1+1 systems.

For example, a 400 W R&S®TMU9compact BackupTx system including integrated DVB-S/S2 receivers requires just 7 rack units, saving an enormous amount of space compared with conventional transmitters in this power class. This is a major advantage at locations where space is at a premium.

Compact N+1 is an enhanced version of the well-known N+1 configuration. Same as BackupTx, Compact N+1 requires no extra hardware for system monitoring and control. These functions are performed by the standby transmitter. The standby transmitter in a Compact N+1 configuration, same as the passive transmitter in a BackupTx configuration, is automatically adjusted to the settings of the active transmitters. If an active transmitter fails, the standby transmitter takes over without interruption of transmission. The same applies in the event a standby transmitter needs to be replaced. The new standby transmitter reads the settings from the active transmitters, which continue operating.

The R&S®TMU9compact offers a high degree of flexibility for network operators broadcasting DVB-T and DVB-T2 services in parallel or planning to migrate from DVB-T to DVB-T2. With the R&S®TMU9compact, operators can simultaneously broadcast DVB-T and DVB-T2 services in a Compact N+1 configuration, since the standby transmitter is immediately ready for operation as a DVB-T or DVB-T2 transmitter.

**R&S®TMU9compact redundancy configurations for maximum availability**



The standby components (blue) additionally perform the functions of system monitoring and control.

# Compact design and easy operation

## Minimal infrastructure requirements

The new R&S®TMU9compact is an excellent solution to close gaps in primary transmitter networks. The transmitter makes little demands on space, cooling and energy supply and is therefore ideal for use in environments that do not provide a typical transmitter site infrastructure. The transmitter's compact design with integrated cooling permits easy installation of the R&S®TMU9compact into existing racks, and costly cooling systems are made superfluous by the transmitter's excellent energy efficiency.

The R&S®TMU9compact can monitor ambient temperature and humidity, making it possible to verify that ambient conditions are within permissible limits to ensure a long service life. No extra equipment is required.

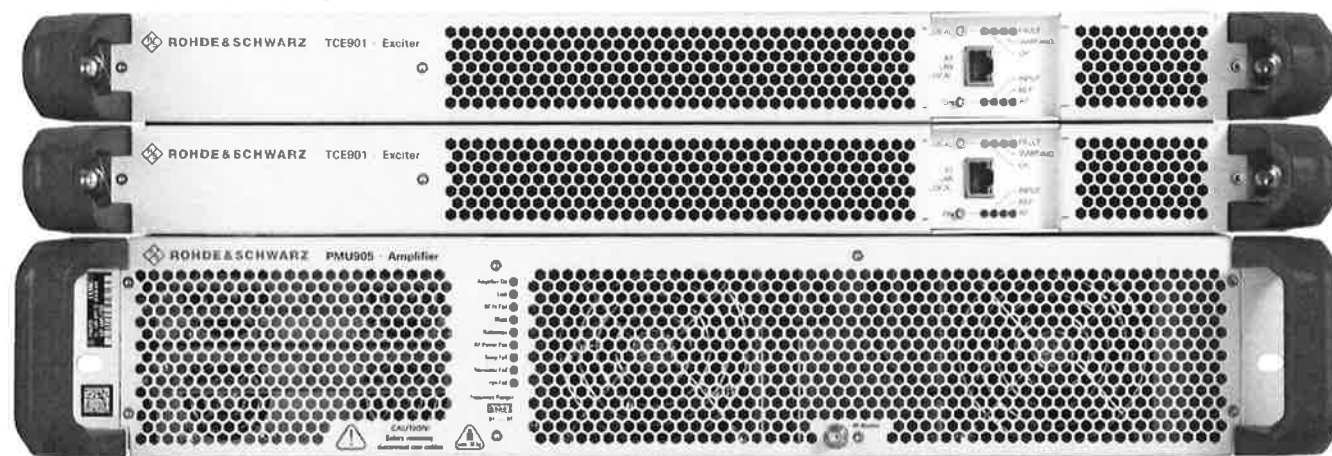
## Compact, expandable exciter

The R&S®TMU9compact transmitter family is the first product in the R&S®Tx9 transmitter generation to use the new R&S®TCE901 exciter platform. Same as the R&S®TCE900, the new platform brings together transmitter control and exciter functionality in a single rack unit. This saves space and increases the system's MTBF. The R&S®TCE901 additionally comes with a smart optioning system, offering free slots to accommodate hardware options to expand transmitter functionality, e.g. transport stream feed via satellite or via DVB-T/T2.

The R&S®TCE901 is multifunctional and extremely versatile. It supports the DVB-T, DVB-T2, ISDB-T/ISDB-T<sub>B</sub> and ATSC digital TV standards. All these standards are available as software options and can be easily retrofitted. Multiple standards can be installed in a single exciter, allowing switchover between transmission standards (e.g. from DVB-T to DVB-T2) at the push of a button, without any hardware modifications. The R&S®TCE901 is also well prepared to handle future transmission standards.

The R&S®TMU9compact has an integrated signal analysis function that continuously measures and outputs shoulder distance and MER values. Operators benefit from this feature as they can monitor signal quality without having to invest in additional measuring equipment.

The R&S®TMU9compact in backup drive configuration with 400 W output power (COFDM).



### Easy and efficient operation

The R&S®TMU9compact graphical user interface (GUI) offers broadcast network operators the convenience they want and need when installing, commissioning and operating transmitters. The home screen provides a complete status overview for the transmitter and its individual components. The optional R&S®TDU901 transmitter display unit allows fast, intuitive operation of the transmitter system via a 7" touchscreen. In addition, a web interface is available that makes it possible to operate the transmitter either locally or remotely, or to integrate it into a network management system via SNMP.

Whether via touchscreen or web interface, the user benefits from the same convenient GUI used throughout the R&S®Tx9 transmitter generation. This means that if multiple transmitter families from the R&S®Tx9 generation are installed in a broadcast network, the well-designed and uniform GUI significantly reduces training effort for service personnel.

The task-based menu shows the different tasks that can be performed with the transmitter. The tasks and their individual steps are presented in a well-structured layout so that they can be accomplished in a minimum of time. For example, when putting the transmitter into operation, the operator is guided through the configuration of the different devices and given help when entering parameters and changing settings.

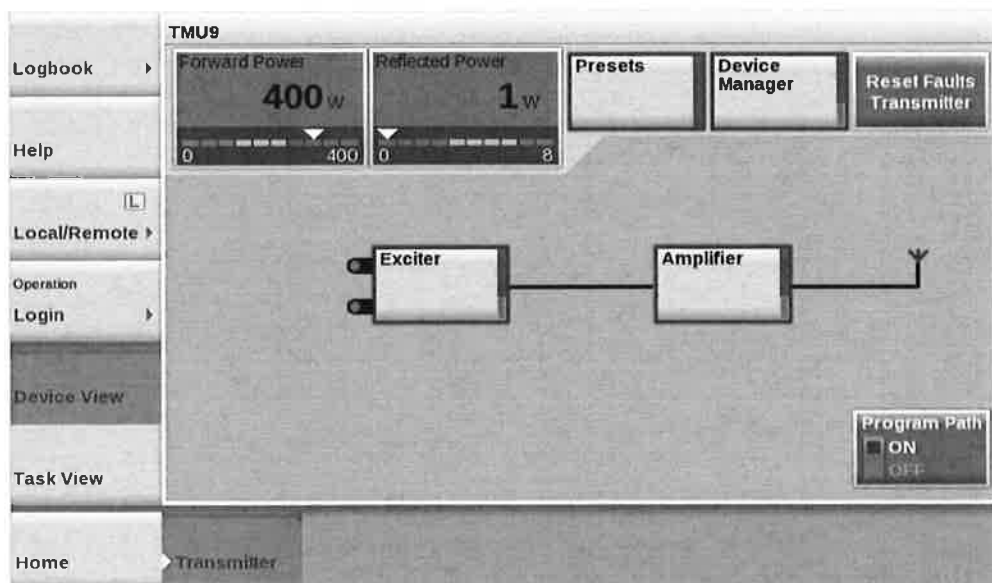
The device-based menu provides a graphical view of the transmitter structure. The user simply touches a component to directly access its parameters.

### Maximum efficiency at the push of a button

The R&S®TMU9compact offers a new feature referred to as R&S®Efficiency Optimization. It allows network operators to maximize energy savings even at reduced output power or when signal quality requirements change. An intelligent algorithm, deployed at the push of a button or adaptively, optimizes amplifier parameters to meet specific signal quality requirements. Whether changing channels or adjusting the transmitter output power, R&S®Efficiency Optimization ensures that the system delivers maximum efficiency at all times.

The R&S®TMU9compact also offers improved adaptive precorrection (ADE). This technology has consistently been optimized for Rohde & Schwarz Doherty amplifier characteristics, making it the most effective and fastest precorrection technology on the market.

With these advanced technologies, network operators are optimally prepared for channel changes and output power adjustments.



The user simply touches a transmitter component to directly access its parameters.



# Minimized service effort

## Servicing at the component level thanks to modular design

Broadcast networks often comprise a large number of transmitter stations delivering output powers below 1 kW. These stations usually have only minimal resources in terms of staff and equipment, i.e. no staff and few or no spare parts or replacement transmitters are available on site. In the event of a transmitter failure, this means considerable service effort for each transmitter, an effort that increases enormously with the large number of transmitters in the network. Long service intervals and minimum maintenance effort are thus vital requirements for the efficient and economical operation of a transmitter network.

The R&S®TMU9compact was engineered to provide the best serviceability on the market. With its modular design, the transmitter can be serviced at the component rather than the device level. Most of the transmitter components can be replaced by the customer, so that the transmitter does not have to be returned to Rohde&Schwarz or a representative for servicing. In addition, the R&S®TMU9compact shares components with other transmitters from the R&S®Tx9 generation, simplifying spare parts handling and cutting spare parts stocking expenses.

Another important feature that simplifies spare parts management is the fact that the currently set Doherty band is continuously shown on each amplifier, even if the amplifier is without power. The R&S®PMU905 is the world's first amplifier to implement this via an ePaper display. The new feature allows the current Doherty setting of each R&S®PMU905 to be immediately identified in the spare parts warehouse without having to switch on the amplifier or open its housing.

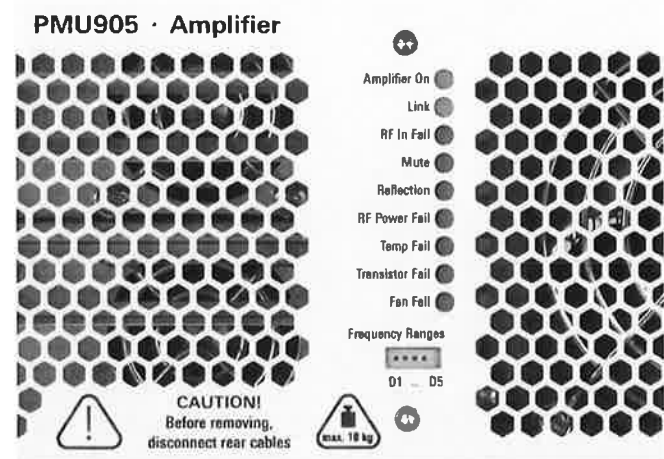
## Minimal adjustment and test effort

To minimize service work at the transmitter site, adjustment and test effort after replacing a defective component must be kept to a minimum. The R&S®TMU9compact fully addresses this need. For example, amplifiers can be replaced without any adjustments, making it quick and easy for service personnel to repair a transmitter on site.

## No special knowledge or tools required

Service expenses can be kept moderate – in terms of both equipment and personnel skills. No special tools are required. Customers can carry out even more challenging repairs using an easy-to-handle test system. The transmitter architecture is straightforward, significantly reducing training requirements for service personnel. This lowers operating expense even before an R&S®TMU9compact medium-power transmitter network is put into operation.

The currently set Doherty band is continuously displayed on the amplifier front panel, simplifying spare parts management.



# Rohde & Schwarz — the partner you can count on

**Quality transmitters since 1949 – decades of experience in transmitter design and production**  
Rohde&Schwarz has developed and produced quality transmitters for more than 65 years. During this time, the transmitters were continuously enhanced with new and improved functionality.

The company stands for quality, precision and innovation in all fields of wireless communications. As an independent, family-owned company, Rohde&Schwarz finances its growth from its own funds. The company is not bound by short-term, quarterly results. It plans for the long term, which greatly benefits customers. Purchasing Rohde&Schwarz products is a safe investment for the future.

**Spare parts availability even 10 years after product discontinuation**

Rohde&Schwarz ensures its customers spare parts availability for a period of 10 years from the time a product is discontinued. For new products such as the R&S®TMU9compact, this means ensured spare parts availability far beyond 10 years. Broadcast network operators can count on professional, expert support from Rohde&Schwarz during the entire service life of their transmitters.

Rohde&Schwarz transmitters offer safety of investment that is unparalleled on the broadcast market.



# From pre-sale to service. At your doorstep.

The Rohde&Schwarz network in over 70 countries ensures optimum on-site support by highly qualified experts. User risks are reduced to a minimum at all stages of the project:

- Solution finding/purchase
- Technical startup/application development/integration
- Training
- Operation/calibration/repair

The R&S®TMU9compact UHF transmitter family is the most efficient medium-power TV transmitter series on the market. To ensure operational readiness of your systems and plannable budgeting for operational expenditures, Rohde&Schwarz offers service level agreements (R&S®SLA) for your systems. The R&S®SLA allows you to concentrate on your core business. We take care of the service you require to succeed with your business model.

For details, please contact your local Rohde&Schwarz representative.



# Specifications

Specifications		
<b>Digital TV</b>		
Standards		DVB-T, DVB-T2, ISDB-TB, ATSC, DTMB
Channel bandwidth	DVB-T	5/6/7/8 MHz
	DVB-T2	1.7/5/6/7/8 MHz
	ISDB-T/ISDB-TB, DTMB	6/8 MHz
	ATSC	6 MHz
Inputs	DVB-T, DVB-T2, DTMB	2 × ASI (BNC, 75 Ω), 2 × TSoIP (Gigabit Ethernet)
	ISDB-T/ISDB-TB	2 × BTS (BNC, 75 Ω), 2 × TSoIP (Gigabit Ethernet)
	ATSC	2 × SMPTE 310M (BNC, 75 Ω) 2 × TSoIP (Gigabit Ethernet)
	DVB-S/S2 signal feed (optional)	2 × F (75 Ω)
<b>General data</b>		
Frequency range	UHF band IV/V	470 MHz to 790 MHz (790 MHz to 862 MHz on request)
Supply voltage		230 V ± 15%, 2 wires + PE (L1/N/PE), 400 V/230 V ± 15%, 4 wires + PE (L1/L2/L3/N/PE), 50 Hz to 60 Hz ± 5%
Max. installation altitude		3000 m above sea level (> 3000 m on request)
Operating temperature range		+1 °C to +45 °C
Relative humidity (max.)		95 %, non-condensing
Immunity <sup>1)</sup>	to fast transients and bursts in line with IEC 61000-4-4 to surges in line with IEC 61000-4-5	±2 kV (AC supply) ±1 kV (signal inputs) symmetrical: ±1 kV (e.g. L-N), asymmetrical: ±2 kV (e.g. L-PE, N-PE)
<b>Synchronization</b>		
Reference frequency		10 MHz, 0.1 V to 5 V (V <sub>pp</sub> ) or TTL, BNC
Reference pulse		1 Hz, TTL, BNC
GPS/Glonass receiver sensitivity	optional	-150 dBm (typ. -164 dBm), SMA
Integrated OCXO		bridges reference signal interruptions for up to 24 h
<b>Operation</b>		
Status panel with buttons and LEDs		local operation
Transmitter display unit with touchscreen	optional	local display and operation
Ethernet interface, RJ-45		web interface: local, remote; network management interface via SNMP
Parallel remote interface	optional	floating contacts for messages and commands

<sup>1)</sup> More stringent requirements must be satisfied by implementing appropriate measures at the transmitter site.

To comply with the applicable standards and limit values for the suppression of out-of-band emissions and for maintaining the required shoulder distance, the transmitter may only be operated with suitable filters at the RF output.

## Ordering information

Your local Rohde & Schwarz expert will help you determine the optimum solution for your requirements.

To find your nearest Rohde & Schwarz representative, visit:

[www.sales.rohde-schwarz.com](http://www.sales.rohde-schwarz.com)

## Service that adds value

- ▮ Worldwide
- ▮ Local and personalized
- ▮ Customized and flexible
- ▮ Uncompromising quality
- ▮ Long-term dependability

## Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

## Sustainable product design

- ▮ Environmental compatibility and eco-footprint
- ▮ Energy efficiency and low emissions
- ▮ Longevity and optimized total cost of ownership

Certified Quality Management

**ISO 9001**

Certified Environmental Management

**ISO 14001**

## Rohde & Schwarz GmbH & Co. KG

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

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Baton Rouge, LA 70809

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Lincoln, NE 68508  
402-471-2239

  
Commissioner of Labor



AGENCY CUSTOMER ID: \_\_\_\_\_

LOC #: \_\_\_\_\_



**ADDITIONAL REMARKS SCHEDULE**

AGENCY Arthur J. Gallagher Risk Management Services, Inc.		NAMED INSURED Technical Services Group, Inc. 12015 Cloverland Court Baton Rouge, LA 70809	
POLICY NUMBER		EFFECTIVE DATE:	
CARRIER	NAIC CODE		

**ADDITIONAL REMARKS**

**THIS ADDITIONAL REMARKS FORM IS A SCHEDULE TO ACORD FORM,  
FORM NUMBER: 25 FORM TITLE: CERTIFICATE OF LIABILITY INSURANCE**

Blanket Additional Insured provided if required by written contract for Ongoing Operations with respects to General Liability form #CGD417 07 01 12; Blanket Additional Insured provided if required by written contract for Completed Operations form #CGD417 07 01 & Auto Liability Form #CA F1 06 02 15.

Blanket Waiver of Subrogation provided if required by written contract with respects to General Liability form CGD417 01 12, Auto Liability form #CA F1 06 02 15 & Workers Compensation form #WC000313 (00)-01.

Coverage is Primary and Non-contributing for Third Party if required by written contract with respects to General Liability form CGD4250708. Coverage is Primary and Non-contributing for Third Party if required by written contract with respects to Auto Liability form CA F1 06 02 15

Umbrella is Follow Form for General Liability, Auto Liability and Workers Com

Leased/Rented Equipment on Package policy - with \$1000.00 Deductible.

Invitation Number: 5825 OF

Waiver of Transfer of Rights of Recover Against Others to Us CG2404 10 93 applies to the State of Nebraska.