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## **THE TECHNICAL MATERIEL CORPORATION**

CABLE: TEPEI

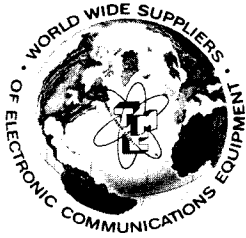
700 FENIMORE ROAD, MAMARONECK, NY 10543 U.S.A.

TLX: 137-358

TEL: 914-698-4800

TWX: 710-566-1100





# THE TECHNICAL MATERIEL CORPORATION

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## COMMUNICATIONS ENGINEERS

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700 FENIMORE ROAD  
PHONE 914-698-4800.

TWX 710-566 1100

MAMARONECK, N.Y. 10543  
CABLE "TEPEI"

January 1, 1976

### GENERAL CONDITIONS OF SALE

The sale of parts and equipment shall be governed by the terms and conditions contained in any written contract currently in effect between purchaser and TMC covering such sale. If there is no contract, then TMC offers to sell such parts and equipment to purchaser only upon the following General Conditions of Sale.

#### 1. PRICES, PAYMENT TERMS AND DELIVERY

Purchaser agrees to pay The Technical Materiel Corporation (herein called TMC) at its offices in Mamaroneck, New York, for parts, equipment, materials, or services (each or all of which are called Equipment) described herein at the prices specified.

TMC prices are net, F.O.B. ex-factory, Mamaroneck, New York. Shipping and inland freight charges, if prepaid, will be invoiced to the Purchaser at actual cost. In the absence of specific instructions, TMC will select the carrier to whom delivery will be made for shipment to the Purchaser. If all equipment is not delivered at one time, the Purchaser agrees to pay on the terms stated the unit prices applicable to the articles so delivered. TMC Prices are payable in United States dollars. TMC Prices include only standard commercial packaging, packing, and marking for domestic shipment. Prices for special and export packaging, packing and marking will be quoted separately on request. TMC Prices include testing in accordance with standard TMC published test procedures to TMC specifications. Any additional tests required will be quoted separately on request. All export documentation (ie.: consular invoices, certificates of origin, legalizations and visas, etc.), if required by the Purchaser, are to the account of the Purchaser, and will be invoiced at actual cost. All insurance costs, if prepaid by TMC, will be invoiced to the Purchaser at actual cost. Prices do not include installation or maintenance unless specifically stated. Title passes at the F.O.B. point for equipment fully paid for at the time of delivery. Title shall be retained by and remain in TMC until said purchase price is fully paid. Except for its obligations under the sections hereof entitled "Guarantee", all responsibility of TMC for said equipment ceases upon delivery to the Carrier.

TMC export terms of payment will be the issue of an irrevocable letter of credit for the total invoice value in U.S. dollars in favor of the Technical Materiel Corporation, Mamaroneck, New York for payment against presentation of shipping documents and invoices. TMC domestic terms of payment will be C.O.D. or cash in advance. If credit has been established with TMC, each invoice is due and payable thirty (30) days from date. (45 days in U.S. funds where customer's billing address is outside the United States). Purchaser agrees to pay on demand all reasonable costs of collection including collection agency fees, attorney's fees and legal expenses incurred or paid by TMC in collecting any delinquency.

Scheduled delivery as specified by TMC is approximate and subject to delays due to causes beyond TMC's control including but not limited to inability to obtain material, labor, or manufacturing facilities, acts of God, or of the public enemy, or any priority order by the U.S. Government, or by fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, or delays of TMC suppliers. In the event of such delay, delivery dates shall be extended accordingly for a period equal to the time lost by reason of such delay. In no event shall TMC be liable for consequential damages.

#### 2. GUARANTEE

TMC warrants the equipment — except electron tubes, semi-conductor devices, fuses, lamps, batteries and articles made of glass or other fragile or expendable materials — purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory, (ex-factory). TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, provided 1), that any claim of defect under this warranty is made within sixty days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction; 2), that the defect is not the result of damage incurred in shipment from or to the factory; 3), that the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise; and 4), that any equipment furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. Electron tube warranty claims should be made directly to the manufacturer of such tubes since electron tubes furnished by TMC bear only the manufacturer's warranty.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Purchaser's sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of such equipment, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

### **3. CANCELLATION AND DEFERMENT OF SHIPMENT**

If the Purchaser elects to cancel or reduce in amount any portion of a contract, TMC is entitled to recover all direct and pro-rata indirect costs incurred in the performance to date of cancellation or reduction according to TMC's standard accounting procedures. Deferral of equipment will be permitted without charge if the request is received by TMC at least four months prior to the month of scheduled delivery.

### **4. TAXES**

Prices do not include any sales, use, excise, or similar taxes which will be charged separately at actual cost should such taxes be imposed on or payable by TMC. If the Purchaser is exempt from such taxes, notice of tax status must be indicated on the purchase order.

### **5. RETURN OF EQUIPMENT OR PARTS**

No equipment shall be returned to TMC unless a written return authorization is issued by TMC.

### **6. INSPECTION, TECHNICAL LITERATURE, AND DATA**

Unless specifically stated in the purchase order, equipment furnished hereunder is not subject to test or inspection at a TMC plant by the Purchaser.

Two copies of applicable technical literature, including service or technical manuals as appropriate, will be furnished at no additional charge with each set of equipment.

TMC retains ownership of all proprietary data disclosed to the Purchaser by TMC in connection with this contract. Purchase agrees not to disclose such proprietary data to others except where data was already known to the general public prior to the disclosure. Manufacturing or installation drawings, information or samples of TMC equipment will not be furnished to the Purchaser.

### **7. SUBSTITUTIONS AND MODIFICATIONS**

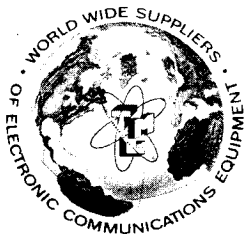
TMC reserves the right to modify the design and specifications of equipment designed by TMC, or to substitute equipment of later design to fulfill this contract, provided the modification or substitution does not materially and adversely affect the performance of such equipment or significantly lessen in any way the utility of such equipment.

### **8. APPLICABLE LAW**

The validity, performance and interpretation of this contract shall be governed by the laws of the State of New York.

### **9. ENTIRE CONTRACT**

The terms and provisions stated herein and in TMC's written technical proposal comprise all the terms, conditions and agreements of the parties respecting the sale of said equipment, and supersede any provisions on the face and reverse side of the Purchaser's order or any prior general agreement inconsistent with the provisions herewith. No modification hereof shall be valid unless in writing and duly signed by an officer of TMC.



Please indicate your interest by checking the appropriate box(es) below.

**TYPE OF PRODUCT LITERATURE REQUESTED:**

- All Literature Listed Below
- Communication Systems – LF/MF/HF/VHF
- SSB/ISB Transmitter-Receiver and Transceivers
- SSB/ISB Transmitters – LF/MF/HF/VHF
- SSB/ISB Receivers – VLF/LF/MF/HF/VHF
- SSB/ISB Exciters – LF/MF/HF/VHF
- Antenna Multicouplers – LF/MF/HF/VHF
- Antenna Switching Matrices
- Antenna Tuning Systems
- MF/HF Antenna Systems
- RF Rejection Filters
- RF Connector Products
- Digital Control Systems
- Digital Products
- Audio Products
- Audio Keyer/Converters
- Test Equipment and Tools
- Cabinets/Consoles/Portable Cases/Shelters
- Power Systems/Generators/Regulators
- Technical Services – Design/Maintenance/Operation
- Technical Training
- Technical Publications

— Fold

Is your name and address as printed on the front correct? If not, please complete the following:

— Fold

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

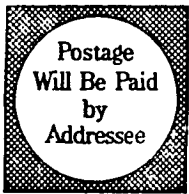
ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE/PROV \_\_\_\_\_

COUNTRY \_\_\_\_\_ TELEPHONE/TLX/TWX \_\_\_\_\_

THANK YOU

**THE TECHNICAL MATERIEL CORPORATION**



**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT No. 10, MAMARONECK, N. Y.

THE TECHNICAL MATERIEL CORPORATION

P. O. Box 142

Mamaroneck, New York, 10543 U. S. A.



We are updating our mailing list to provide you with the latest information on TMC products and services.

Please indicate your area of interest in the space provided on the back of this card. Re-fold the card, covering your printed address, and return to TMC.

Thank you,

*THE TECHNICAL MATERIEL CORPORATION*

THE TECHNICAL MATERIEL CORP.

700 Fenimore Road

Mamaroneck, N.Y. 10543

U. S. A.

## THE TECHNICAL MATERIEL CORPORATION

### Background Information

The Technical Materiel Corporation (TMC) is a worldwide supplier of electronic communications equipment with Headquarter facilities and principal manufacturing plants located in Mamaroneck, New York (USA). The corporation was founded and organized in 1947 as a prime manufacturer of practical, reliable radio communications products. Three decades of growth measure TMC's success in providing the finest products and services at minimum cost, on time. Today, manufacturing plants in the United States and Canada provide over 400 products and services for more than 140 countries throughout the world.

TMC was founded in the tradition of responsiveness to its customers and excellence in its products. Early to recognize the continuing responsibility of a manufacturer to the customer who uses his products, TMC has developed a competent staff of professional engineers and managers whose primary purpose is to provide uncompromising support to all TMC customers and equipment. For TMC, responsibility to the customer does not end with the completion of contract but continues far beyond the normal equipment warranty period. As a direct result of TMC's commitment to field support on a 24-hour basis, TMC equipment throughout the world today continues to provide the dependable service it is noted for.

The excellence of TMC products and the large share TMC has maintained of the world telecommunications market was achieved by a basic ability to produce and market high quality equipment over the years under very competitive conditions. This ability has been demonstrated by TMC's past performances, by TMC's stability and technical competence, and by the proven reliability of TMC products in service worldwide. The inherent flexibility of TMC enables management to assign the most competent, practical talent available to meet the most complex tasks. This talent - the professional engineers and managers at TMC - have broad experience in modern communications systems and have worked for many years in the research, design, development and production of electronic communications equipment. The success of TMC in developing today the products that meet the needs of the future is in no small way a result of the coordinated team effort of these people.

Major communications devices have been designed and placed into service by TMC to meet virtually all needs of the telecommunications market. The development of this extensive product line was brought about by the basic need of people and machines to communicate with one another. To meet the challenge of providing an efficient, dependable means of transferring intelligence, TMC actively engaged in the engineering and manufacture of communications equipment capable of carrying data, teletype, facsimile and voice. Eventually, this equipment was integrated into complete fixed and transportable systems capable of handling the total traffic demands of a modern communications net. Today, TMC is a valued supplier of radio equipment and systems, particularly in the long-haul field, and on a regular basis

provides the engineering, installation, field maintenance, management service, material support, and training that is vital to the successful operation of a modern communications system.

TMC equipment is designed to assure that constant communications is maintained at all times. Thus TMC equipment possesses a degree of quality and reliability far beyond the normal commercial needs. In fact, TMC equipment operates dependably in virtually all demanding environments including the Arctic and Antarctic, the desert, underground, in submarines, in aircraft, on surface ships, and on floating icebergs. TMC equipment has performed exceptionally well over long periods of time in the most difficult operating conditions - earning for itself a reputation unequalled in the field. Worldwide acceptance of TMC and its products attests to this demonstrated performance.

The general ruggedness and dependability of TMC equipment - as demanded by the United States Military, and important and satisfied TMC customer - reflects the attention TMC gives to both design and workmanship. The continuing programs of research and development carried on by TMC assure that modern equipment is made available to meet the changing demands of a modern, dynamic market. TMC equipment must successfully complete a program of rigid reliability and environmental testing before it is released for manufacturing. Each phase of the manufacturing process is then strictly monitored so that all TMC specifications are met. Final inspections and test procedures are followed immediately prior to shipment to measure the acceptability of the equipment as a product qualified to carry the TMC name. The emphasis TMC places on quality in the factory assures dependability in the field. This tradition of quality has developed in the short space of 35 years and is an integral part of all phases of the TMC operation.

TMC has specialized primarily in VLF/LF/MF/HF/VHF communications systems utilizing single sideband (SSB) techniques in its designs. TMC equipment is capable of providing voice, teletype, facsimile, data, or other forms of transmission at power output levels in excess of 200,000 watts (PEP). Operating frequencies are extremely stable and controlled by frequency synthesizers integral to the equipment. Diversity systems and tone multiplex systems are often used to increase the basic capability of TMC equipment. Such related systems enable TMC to provide either individual items or whole stations completely designed to suit a particular application. Many such stations are operating throughout the world today and range in size from small transportable systems to large communication complexes.

The projects TMC has undertaken and successfully completed are too numerous to list in this Background summary. A partial list of TMC customers, however, gives an indication of the extent to which TMC equipment and services have been accepted by professional communicators worldwide.

Government and commercial PTT departments in Greece, Italy, Switzerland, Spain, Portugal, Turkey, Ethiopia, Kenya, Morocco, Liberia, Saudi Arabia, Pakistan, Indonesia, Korea, Canada, United States, Australia, New Zealand.

Civil Aviation and related departments in Belgium, France, Spain, Greece, Chile, Brazil, Turkey, Italy, Ethiopia, Pakistan, Algeria, Saudi Arabia, Liberia, Kenya, Zambia, Canada, United States.



**NATO procurement agencies in Europe.**

**The United Nations.**

**Military forces in Norway, Denmark, Holland, Germany, Belgium, France, Switzerland, Italy, Spain, Portugal, Greece, Turkey, Great Britain, Morocco, Algeria, Nigeria, Kenya, Pakistan, Canada, United States, Australia.**

**International corporations such as American Telephone and Telegraph, International Telephone and Telegraph, Page Communications, Aeroneutronic-Ford, Marconi, Rockwell International (Collins Radio), Harris Corporation (RF Communications), Radio Corporation of America (RCA), Raytheon Service Corporation, World Wide Wilcox, Bell Canada, Arabian-American Oil Company, Marcona Corporation, Pan American Airlines, Air Canada, Western Union International.**

**The numerous projects completed with each customer demonstrates an added feature of TMC's wide ranging capabilities - that of assisting in all phases of the project from planning through to installation supervision and training of station personnel. This capability has developed with years of experience in designing, laying out, and installing complex systems involving message centers, antenna fields, transmitter and receiver terminals, traffic control and planning, and many related operations that comprise a modern radio facility. Such expertise in the field of communications is a vital element in the proven ability of TMC to properly plan out and successfully execute a complex program on time. This background, along with the constant attention to improving design and to maintaining high quality standards keeps TMC in the position of having its equipment selected more often than any other.**

#### **Qualifications**

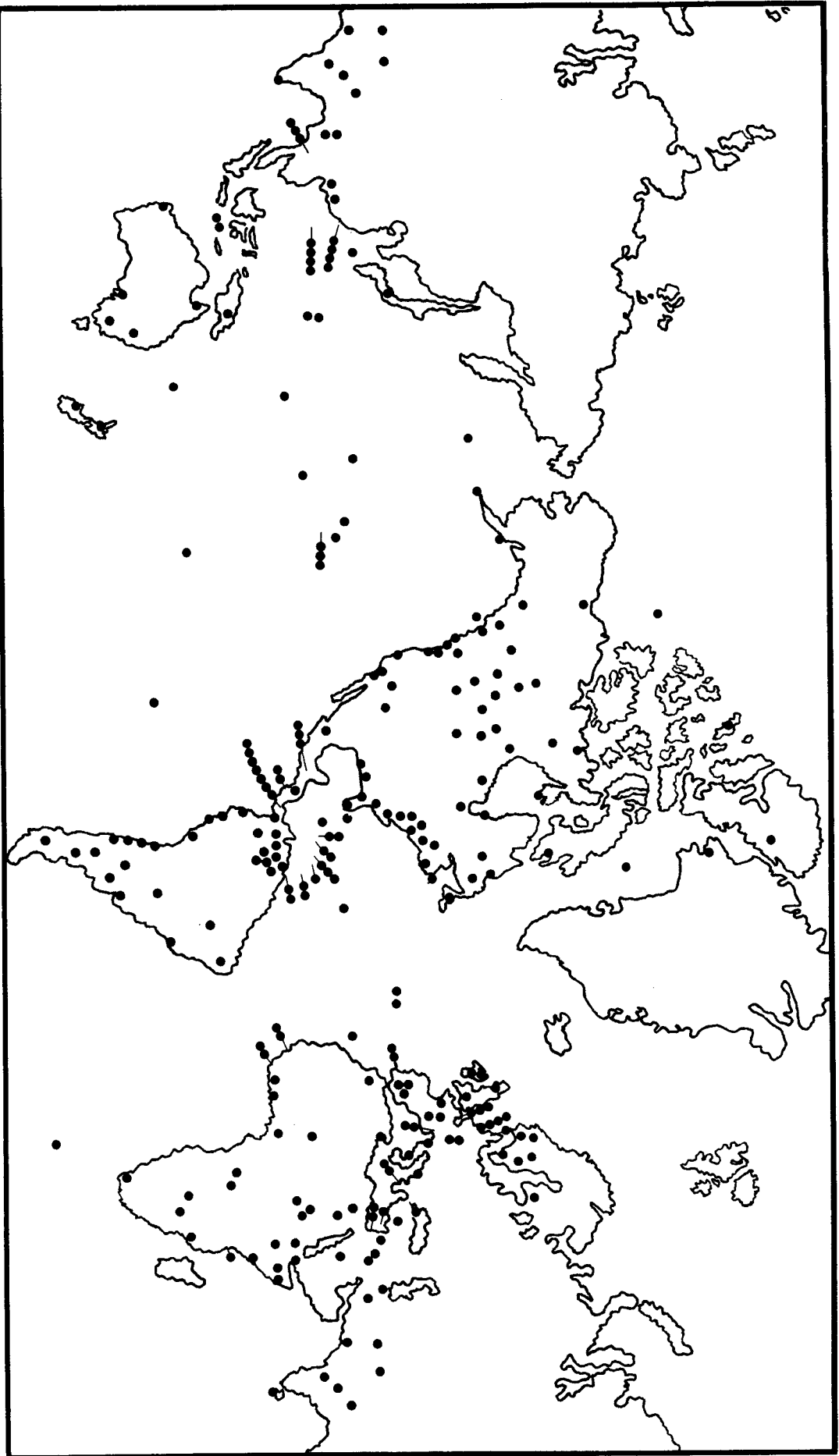
**TMC is a world-wide supplier of electronic communications equipment designed to meet the exacting requirements of professional communicators. With over 35 years of experience in the VLF/LF/MF/HF/VHF field, TMC has established a tradition of quality and a reputation for excellence in design, equipment dependability, and technical service. Today, thousands of TMC receivers and transmitters operate reliably. Many of them were built over 20 years ago and together with more modern equipment are actively supported by TMC with maintenance service and spare parts.**

**TMC equipment is designed to operate continuously and to withstand severe environmental operating conditions. The general ruggedness, dependability, and demonstrated efficiency of the equipment assures its long life and attests to the attention given to quality and reliability by TMC engineers. Many TMC equipments are nomenclatured by the U.S. Military and are supported by components in the Federal Support System.**

**All the necessary facilities are on-hand to provide TMC customers with efficient production of equipment, design of systems, and availability of supporting services. These facilities are modern and fully equipped with the most advanced equipment needed to successfully build and maintain any TMC equipment. Over 50,000 square feet of space is used for engineering, manufacturing and administrative activities. In addition, facilities are maintained for specialized work in system engineering and training.**

**The experience of TMC in the field of long-haul radio communications is well-known worldwide. The depth of this experience is best represented by a world map located at the end of this section.**

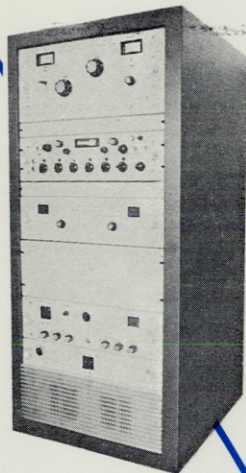
LOCATIONS OF TMC COMMUNICATION INSTALLATIONS THROUGHOUT THE WORLD



# TECHNICAL MATERIEL CORPORATION'S...

## COMPLETE SELECTION OF HF EQUIPMENT AND THEIR ACCESSORIES

...36 YEARS OF SERVICE AND RELIABILITY



HIGH FREQUENCY  
1,000 WATT  
TRANSMITTER

MODEL  
HFT-1K



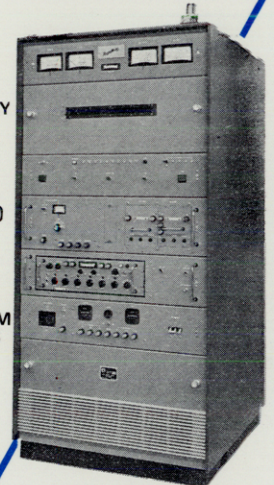
MODEL MMX-2 Series  
0-1706/TSC-25  
MD-846/UR

SYNTHESIZED MULTI-MODE EXCITER  
250MW 1.6 - 30 MHZ

HIGH FREQUENCY  
10,000 WATT  
TRANSMITTER

MODEL  
HFT-10K  
AN/URT-39(V)

ALSO  
AVAILABLE  
IN LOW & MEDIUM  
FREQUENCIES



ANTENNA MULTICOUPLERS

AMC-21C



MODELS LMC, AMC, VMC Series  
10KHZ - 150MHZ

- # AMPLIFIERS, R-F
- # AMPLIFIERS, SSB
- # ANTENNAS, PHASED
- # ANTENNAS, RHOMBIC
- # COMM. SYSTEMS, SSB
- # CONNECTORS, R-F
- # CONVERTERS, SSB
- # COUPLERS, ANTENNA
- # COUPLERS, DIRECTIONAL
- # DIGITAL COUNTERS
- # FILTERS, LOW-PASS
- # PANELS, JACK
- # RECEIVERS
- FIXED FREQUENCY
- FREQUENCY SHIFT
- SSB
- # TRANSMITTERS
- FIXED FREQUENCY
- FIXED STATION
- SSB
- # REMOTE CONTROL SYSTEMS

RF PATCH PANELS

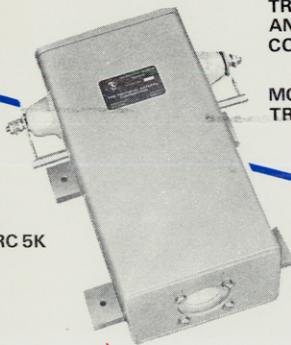


CONNECTOR PRODUCTS

TRANSMITTING  
ANTENNA  
COUPLER

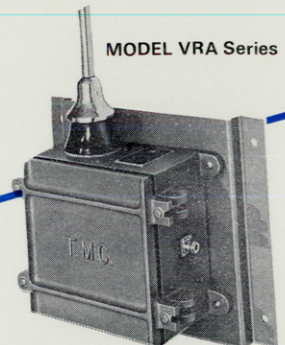
MODEL  
TRC Series

TRC 5K



VERTICAL  
RECEIVING  
ANTENNA

MODEL VRA Series



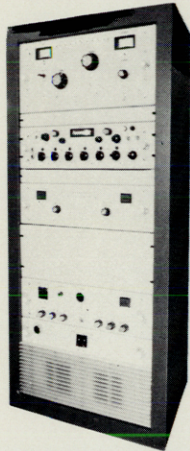
# TECHNICAL MATERIEL CORPORATION

700 FENIMORE ROAD • MAMARONECK, NEW YORK 10543

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VISIT AFCEA  
BOOTH B330

# FOR ALL YOUR COMMUNICATIONS NEEDS: 35 YEARS OF SERVICE

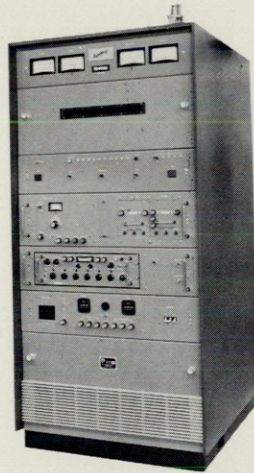


MODEL  
HFT-1K

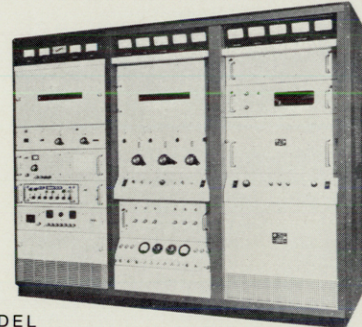
HIGH FREQUENCY  
1000 WATT  
TRANSMITTER

HIGH FREQUENCY  
10,000 WATT  
TRANSMITTER

MODEL  
HFT-10K  
AN/URT-37(V)

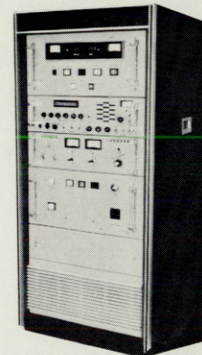


MODEL  
HFTM-40KJ  
AN/FRT-40



HIGH FREQUENCY  
40,000 WATT  
TRANSMITTER

- # FREQUENCY RANGE 1.6 TO 30 MHZ
- # CW, AM, AME, USB, LSB, ISB, FSK, FAX
- # SYNTHESIZED OR MULTI-CHANNEL
- # AUTO TUNING WITH MAN OVERRIDE
- # COMPLETE INTERLOCK PROTECTION
- # SOLID-STATE EXCITER AND P/S
- # RUGGED, MODULAR CONSTRUCTION
- # NO ROLLING CONTACTS
- # REMOTE CONTROL CAPABILITY

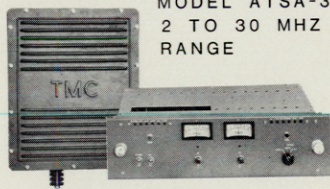


OUR NEW FAMILY

HIGH  
FREQUENCY  
SYNTHESIZED  
TRANSCEIVERS  
  
1,000 WATT

MODEL  
TTR-1000

ANTENNA TUNING SYSTEM  
MODEL ATSA-3  
2 TO 30 MHZ  
RANGE



MODEL LMC/AMC/VMC SERIES  
ANTENNA MULTICOUPLERS  
10KHZ-150MHZ



MODEL SBG-4  
FOUR CHANNEL  
SYNTHESIZED EXCITER  
100 MW, 2-30 MHZ



THE FINEST!!!

SYNTHESIZED  
MULTI-MODE  
EXCITER

250MW 1.6-30MHZ

MODEL MMX-2 SERIES  
0-1706/TSC-25  
MD-846/UR

MODEL BSP/LSP SERIES  
LS-521/FRR  
LS-509/G  
LOUDSPEAKER PANELS



- # AMPLIFIERS, R-F
- # AMPLIFIERS, SSB
- # ANTENNAS, PHASED
- # ANTENNAS, RHOMBIC
- # COMM. SYSTEMS, SSB
- # CONNECTORS, R-F
- # CONVERTERS, SSB
- # COUPLERS, ANTENNA
- # COUPLERS, DIRECTIONAL
- # DIGITAL COUNTERS
- # FILTERS, LOW-PASS
- # PANELS, JACK
- # RECEIVERS
- FIXED FREQUENCY
- FREQUENCY SHIFT
- SSB
- # TRANSMITTERS
- FIXED FREQUENCY
- FIXED STATION
- SSB
- # REMOTE CONTROL SYSTEMS



## TECHNICAL MATERIEL CORPORATION

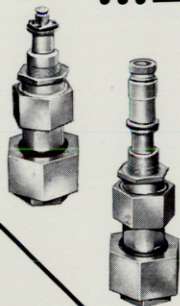
VISIT AFCEA  
BOOTH B330

700 FENIMORE ROAD • MAMARONECK, N.Y. 10543

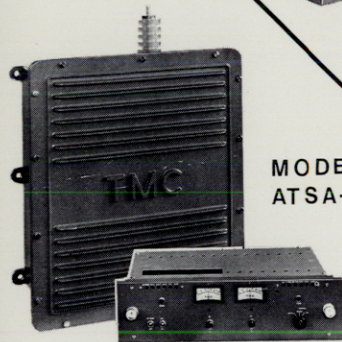
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# WHEN IT COMES TO ANTENNA PRODUCTS .... .... WE'VE BEEN AROUND 34 YEARS

CONNECTOR  
ADAPTER  
SERIES  
TCA



AUTOMATIC  
SEMI-AUTOMATIC  
MANUAL

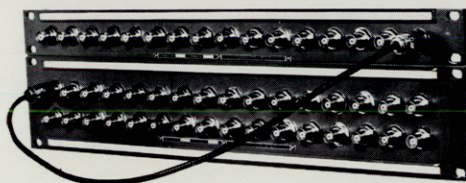


MODEL  
ATSA-3

FREQUENCY  
RANGE  
2 TO 30 MHZ

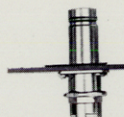
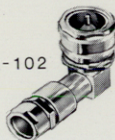
ANTENNA TUNING SYSTEM

RF PATCH PANELS  
AND  
CONNECTOR PRODUCTS

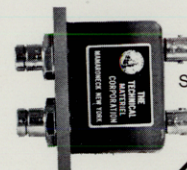


SB-932/U  
SB-931/U

SA-102



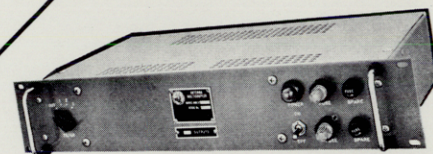
SPP/QDP PATCH PANELS



SW305

FREQUENCY  
RANGE  
10KHZ  
TO  
150MHZ

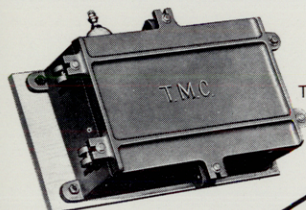
MODEL  
AMC/LMC/VMC SERIES



AMC-21C

ANTENNA MULTICOUPLERS

POWER DISSIPATION  
250 WATTS TO 100 KILOWATTS

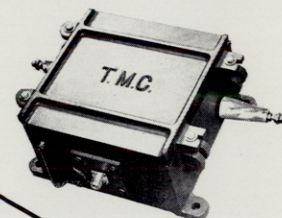


TER-250

MODEL  
TER SERIES

RHOMBIC ANTENNA COUPLERS

MODEL  
RAC SERIES



CU-836/U

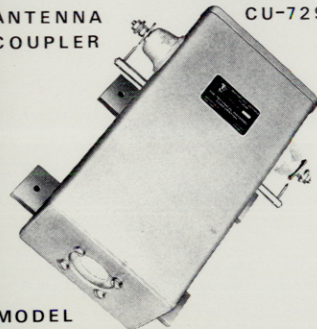
DA-209/U  
DA-201/U  
DA-210/U  
DA-199/U

TER-3500  
DA-200/U



TRANSMITTING  
ANTENNA  
COUPLER

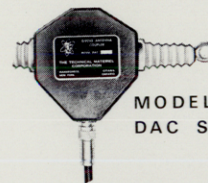
CU-1076/URT  
CU-729/URT



MODEL  
TRC  
SERIES

TRC-5K

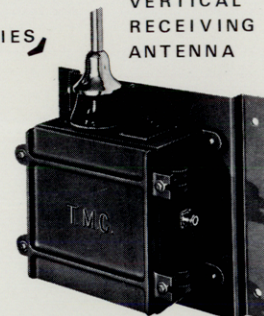
DIPOLE  
ANTENNA  
COUPLER



MODEL  
DAC SERIES

MODEL  
VRA SERIES

VERTICAL  
RECEIVING  
ANTENNA



- LOW FREQUENCY ANTENNA COUPLERS
- HIGH FREQUENCY ANTENNA COUPLERS
- VERY HIGH FREQUENCY ANTENNA COUPLERS
- MULTIPLE ANTENNA COUPLERS
- R.F. SWITCHING JACKS & PATCH PANELS
- QUICK DISCONNECT JACKS & PATCH PANELS
- R.F. PATCHING JACKS & PANELS
- R.F. COAXIAL CABLE END SEALS
- R.F. COAXIAL CONNECTOR ADAPTERS
- TRANSMITTING ANTENNA TUNING SYSTEMS
- TRANSMITTING LOW PASS FILTERS
- TRANSMITTING BAND PASS FILTERS
- ANTENNA TERMINATORS & DUMMY LOADS
- DIPOLE ANTENNA COUPLERS
- RHOMBIC ANTENNA COUPLERS, TERMINATORS
- VERTICAL ANTENNA COUPLERS

SERIES  
120-002

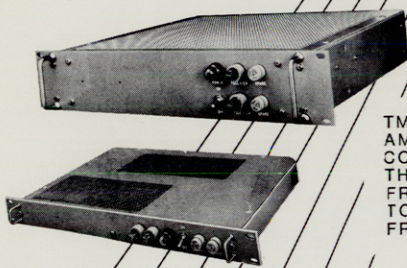
## TECHNICAL MATERIEL CORPORATION

700 FENIMORE ROAD MAMARONECK, N.Y. 10543  
PHONE (914)-698-4800 • TELEX 137-358 • TWX 710-566 1100 • CABLE TEPEI •

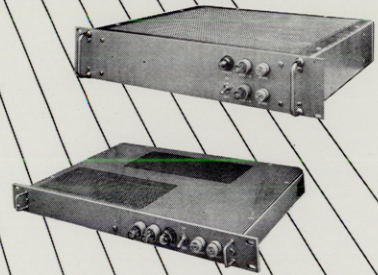


# TECHNICAL MATERIEL CORPORATION'S

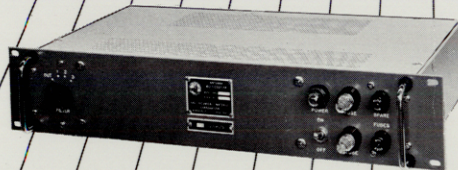
## FAMILY OF FULLY SOLID STATE .... ..ANTENNA MULTICOUPLERS



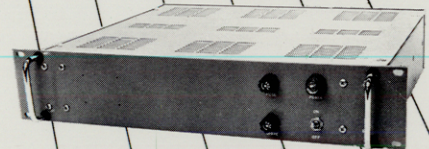
TMC MODELS AMC-8A, AMC-16A OR AMC-32A RECEIVING ANTENNA MULTICOUPLERS ARE BROADBAND DEVICES THAT COUPLE 8, 16 OR 32 HIGH FREQUENCY COMMUNICATION RECEIVERS TO A SINGLE ANTENNA INPUT IN THE FREQUENCY RANGE 2-32 MHZ



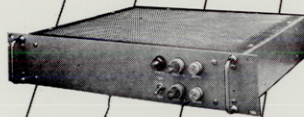
TMC MODELS LMC-8, LMC-16 OR LMC-32 RECEIVING ANTENNA MULTICOUPLERS ARE BROADBAND DEVICES THAT COUPLE 8, 16 OR 32 LOW FREQUENCY COMMUNICATIONS RECEIVERS TO A SINGLE ANTENNA INPUT IN THE FREQUENCY RANGE 10KHZ-2MHZ



TMC MODEL AMC-21C RECEIVING ANTENNA MULTICOUPLER IS A VERSATILE BROADBAND DEVICE THAT CAN COUPLE FROM 4 TO 16 RECEIVERS BY PLUG-IN MODULES TO A SINGLE ANTENNA IN THE FREQUENCY RANGE 2 TO 32 MHZ



TMC MODEL VMC-8 RECEIVING ANTENNA MULTICOUPLER IS A BROADBAND DEVICE THAT COUPLES 8 VERY HIGH FREQUENCY COMMUNICATIONS RECEIVERS TO A SINGLE ANTENNA INPUT IN THE FREQUENCY RANGE 20 MHZ TO 150MHZ



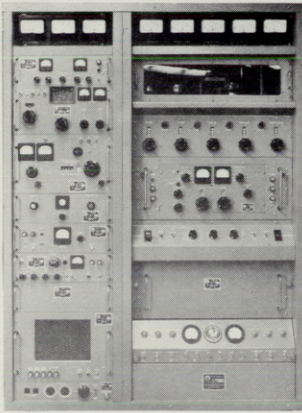
TMC MODEL MAC-1 MULTIAN TENNA COUPLER IS A BROADBAND ANTENNA COMBINING SYSTEM DESIGNED TO COUPLE FROM ONE TO EIGHT ANTENNAS TO A SINGLE HIGH-FREQUENCY COMMUNICATIONS RECEIVER OVER THE FREQUENCY RANGE OF 2 MHZ TO 32 MHZ

FOR FURTHER INFORMATION, CONTACT OUR SALES DEPARTMENT:  
TECHNICAL MATERIEL CORPORATION  
700 FENIMORE ROAD - MAMARONECK, N.Y. 10543  
PHONE (914)-698-4800 • TELEX 137-358 • TWX 710-566 1100 • CABLE TEPEI

SERIES  
120-003

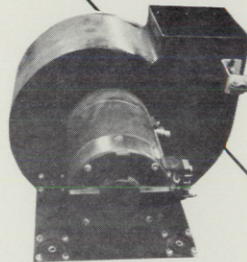
# TECHNICAL MATERIEL CORPORATION'S

## ... TRANSMITTER ... REFURBISHING PROGRAM

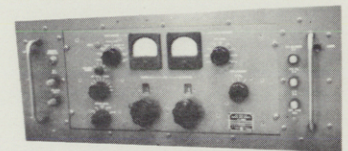


AN/FRT-39  
AN/FRT-52  
GPT-10K

THE UNITED STATES NAVY CALLS IT AN AN/FRT-39  
THE UNITED STATES ARMY CALLS IT AN AN/FRT-52  
OTHER CUSTOMERS CALL IT A GPT-10K  
BUT THEY ALL HAVE ONE THING IN COMMON  
A TIME PROVEN WORKHORSE THAT CAN BE  
CHANGED INTO A YOUNG THOROUGHbred  
WITH MANY YEARS OF EFFICIENT, QUIET  
AND RELIABLE SERVICE AT A FRACTION  
OF THE COST OF A NEW TRANSMITTER



BL111 MAIN BLOWER/FAN



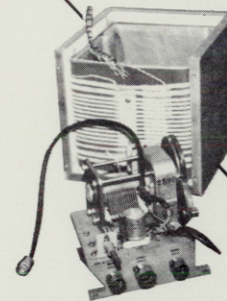
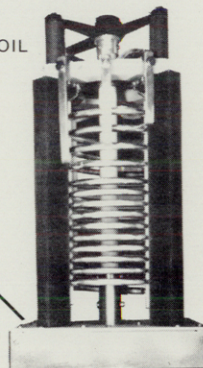
RFC  
AM-2103A/URT  
RF AMPLIFIER

THE  
TECHNICAL  
MATERIEL  
CORPORATION  
WILL ALSO REFURBISH  
ANY OF THE MAJOR  
COMPONENTS OR THE  
ENTIRE TRANSMITTER ON SITE  
OR IN OUR FACTORY AND  
PROVIDE SPARE ASSEMBLIES TO  
KEEP YOU ON THE AIR WHILE YOUR  
EQUIPMENT IS BEING PROCESSED

FOR FURTHER INFORMATION, CONTACT  
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AO105  
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PART/OF CMO  
AM-2505A/URA-31

CHG-2  
(O-716/URA-31)  
FREQUENCY  
AMPLIFIER



GPT-10KRL



# TECHNICAL MATERIEL CORPORATION

700 FENIMORE ROAD • MAMARONECK, N.Y. 10543



# The TMCommunicator

News from The Technical Materiel Corporation

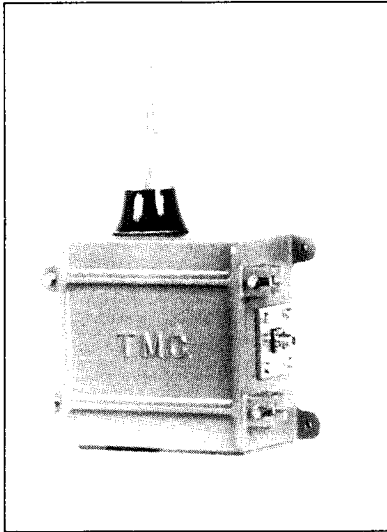
700 Fenimore Road

Mamaroneck, New York 10543

(914) 698-4800

## Active Antennas

In March, TMC introduced the AVA series of active receiving antennas for use in both large surveillance arrays and small monopole applications. Developed from the popular VRA series of vertical receiving antennas, the AVA provides a nominal +10dB gain across the LF, MF, and HF frequency regions with minimum VSWR. Its wide dynamic range and low internal noise figure make even marginal receivers perform to top-of-the-line standards.



AVA-2 Active Antenna

## Modular Design

The AVA active antenna consists of three elements: 1) a short rod antenna acting as an E-field pick-up sensor; 2) an input circuit used to couple the received energy to internal components; and 3) an amplifier with low internal noise and moderate gain. The input circuit performs double duty as a surge protector, alleviating much of the difficulty in operating around high-energy fields generated by static discharges and local broadcast stations in the near vicinity. The amplifier's wide dynamic range can tolerate high-level signals with little or no

evidence of overloading or inter-modulation generation. The AVA generates minimal noise that is lower than the CCIR recommended atmospheric noise level. In conjunction with a suitable receiver, the AVA will bring in signals even on those rare occasions when noise is well below the medium level.

## In-Line Coaxial Supply

The AVA requires less than 50 watts power to operate. An in-line coaxial supply provides operating voltages to the amplifier at the base of the antenna via the coaxial antenna cable. This supply voltage is applied at the antenna input terminal of the communications receiver or receiving antenna multicoupler. The modest heat generated by the AVA is transferred through its cast aluminum enclosure to the outside environment.

## Protection

Several reliability features set the AVA apart from comparable antennas. It is equipped with gas diodes that conduct high-energy fields directly to ground - effectively bypassing more sensitive circuits in the antenna/receiver chain and preventing permanent damage to front-end components. In addition, if power is lost, the AVA automatically reverts to its passive state without interrupting service. Both the input and amplifier circuits are individually sealed and securely mounted internally. If damaged, either module can easily be replaced in the field.

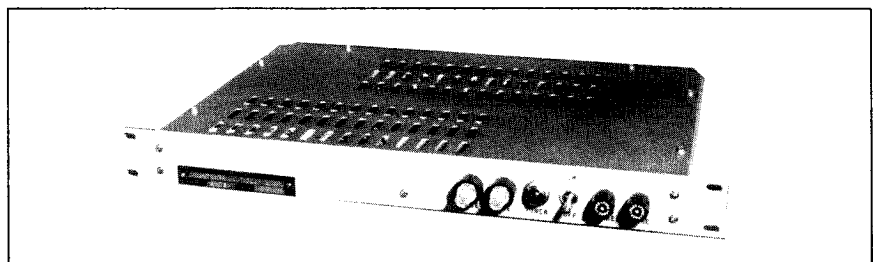
All AVA antenna components are enclosed in a rugged, weatherproof

case constructed of cast aluminum alloy and available in standard or EMI/RFI shielded versions. Except for the tongue and groove gasket channel, the external surfaces of the enclosure are painted and internal surfaces are coated with a clear iridite for maximum conductivity and protection.

## Receiving Multicouplers

Shipments of active receiving multicouplers continue at a brisk pace from the TMC manufacturing plant in Mamaroneck, New York. Both commercial and government customers, who operate over 10,000 of these units, have found them to perform consistently beyond published specifications. As evidenced by the infrequent calls for spare parts support, TMC multicouplers are inherently reliable, whether installed on shipboard or in fixed shore stations. The multicouplers allow simultaneous reception of LF, MF, HF or VHF signals by up to 32 communications receivers using one antenna. Broadband coverage is provided throughout each region and out-of-band radiation is dramatically suppressed at the input. Gas discharge assemblies provide critical front-end protection to keep stations up and running under the poorest operating conditions. A full range of multicouplers is available - from the combined-MF/HF four-output model to the high-end 32-output LF and HF models.

AMC-2X4 Multicoupler



### **The TMCommunicator . . .**

A monthly newsletter, this bulletin is distributed to active professionals in the communications field. Its topics range from the latest advances in RF and digital equipment to new releases of TMC's ever-expanding computer software packages. The newsletter is designed simply to inform; other TMC publications detail technical features and applications of the products. A full list of publications is available on request. In addition, application notes on all topics in the newsletter are provided free. Simply telephone Customer Service at (914) 698-4800 with your request.

### **The Business of TMC . . .**

TMC has been in the business of communications engineering since 1947, when it was first organized as a supplier to the U.S. Navy. Over 400 modern products make up TMC's current product line, which are sold worldwide to both commercial and military customers. A wide array of engineering services is also available to make certain customers get the maximum use out of their investment in TMC equipment. Free brochures and catalogs are available directly from TMC in New York or through one of TMC's many field offices in the United States and overseas.

### **April's Topics . . .**

Active receiving equipment is one of TMC's specialties. For many years one of the leading suppliers of antennas and active receiving multicouplers, TMC has completed development of the low-noise active receiving antenna - a direct outgrowth of TMC's popular vertical receiving antenna series. The antenna is a low-profile whip which provides much-needed gain in the LF/MF and HF frequency regions directly at the antenna base. The antenna and one of eight different TMC multicouplers give users better than 10dB of additional gain. More inside.

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## *World Wide Suppliers of Electronic Communications Equipment*

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**Communication Systems**

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**RF Transmitters, Transceivers and Receivers**

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**Antennas and Antenna Couplers**

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**Remote Control and Security Systems**

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**Computer Hardware and Software**

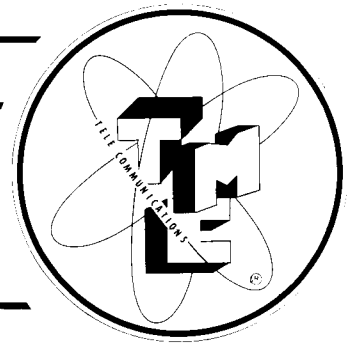
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**RF Connector Products, Patch Panels and Cables**

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**Engineering Services, Test Equipment and Tools**

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**CLC Associates**  
**Attn: Mr. Mahlon Norton/301-340-1175**  
**P.O. Box 4093**  
**Rockville, Maryland 20850**

**Instrucom, Inc.**  
**Mr. A.R. Faiola**  
**Suite 310**  
**655 15th Street, N.W.**  
**Washington DC 20005**

*THIS ISSUE: Active Receiving Antennas and Multicouplers*

# The TMCommunicator

*News and Views from The Technical Materiel Corporation*

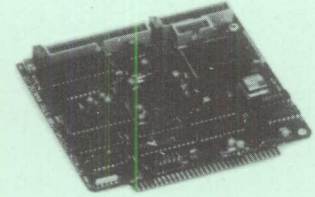
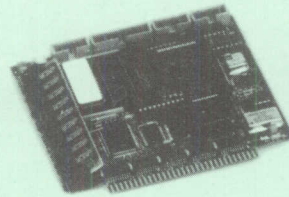
700 Fenimore Road

Mamaroneck, New York 10543-2301

(914) 698-4800

## TMC Aids "Desert Voices"

We received a call last month from Northwest Antenna in Minnesota. Ed Addy, president of Northwest, outlined a truly unique project to set up shortwave communications links between States-side families and U.S. troops in Saudi Arabia. TMC donated several TRC couplers and TER terminating units for rhombic antennas set up locally. Many other companies gave time, facilities and material to assure the project's success. Included were telephone lines for local links, power for the station, computers, transceivers, cable and a variety of ancilliary items designed to handle daily traffic of over 500 messages. "Desert Voices" began to take shape. In little more than a month, all facilities were installed and the station was put into operation. Although TMC has equipment installed in the "Desert Shield" and "Desert Storm" theater of operations, we are proud of our small role in providing that extra measure of local support so important to all of our people serving overseas.

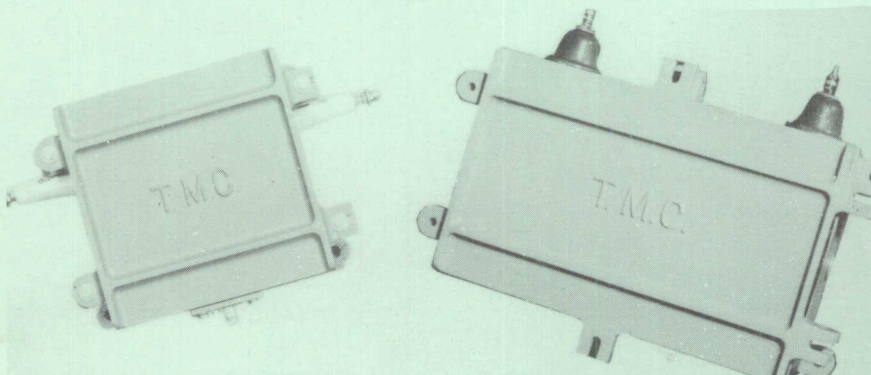


*Microprocessor Control and I/O Module Cards*

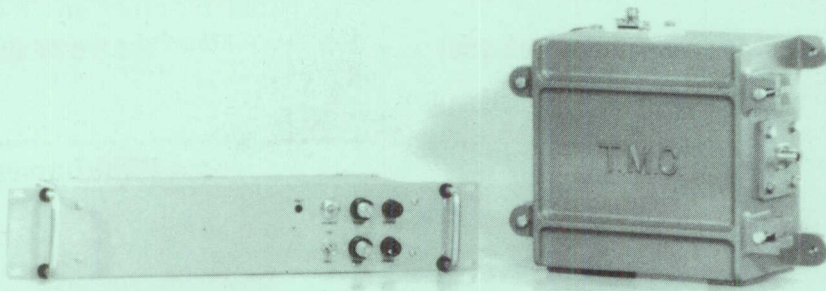
## Microprocessors and RF

Research and Development is a continuous process at TMC. In the rapidly changing field of communications, this activity provides the foundation for TMC's future products. One R&D effort in particular merits attention - that of reducing the workload on operators who monitor and control TMC's high-power transmitters. With microprocessors incorporated in recent designs, many of the feedback-control functions are now handled automatically without operator intervention. Three systems are standard to TMC transmitters: 1) BITE to the module level for evaluating the performance of internal circuits;

2) INTERLOCK for protecting both the system and personnel working on it; and 3) LEVEL which features adaptive control of internal levels to reduce stress on critical components, effectively increasing a system's service life. The settings for automatic transmitters are "learned" for each installation so that re-tuning takes less time to complete. Time-of-day changes are programmed locally to reduce the workload on central computers. Each change is recorded to an internal hard disk and optionally printed out at the front of the transmitter in transaction logs. Transmitters operating under remote control feature an internal modem that connects directly to telephone or microwave circuits and can be fitted with additional modules for extended control of ancilliary equipment. All of these advances in TMC transmitters are designed to blend analog high-power RF with modern digital control. Given the power of microprocessors and the savings they generate, new TMC transmitters not only continue to advance the state-of-the-art in performance but dramatically lower the capital cost of the entire system.



*Transmitting Antenna Coupler and Antenna Terminator*



*Model PAL-15 with Bypass Control and PSP-11 Power Supply*

### Boosting Receiver "Pull"

High-performance receivers operate around the most brutal environments imaginable. To increase the "pull" of these receivers and allow them to detect the faintest of signals, TMC developed receiving preamplifiers designated as the high-performance PAL-15 and PAL-16. These units operate in both MF/HF and VHF/UHF regions of the spectrum - from 100KHz to 500MHz - each providing a nominal +17dBm gain. True to its calling, TMC did not stop at just building preamplifiers to do the job. A separate transfer control module was added to monitor the electrical energy on the input and output terminals of the preamplifier module. This control is designed to instantly bypass the preamplifier when any potentially destructive levels are reached. Power to both modules is provided by an in-line coaxial supply located adjacent to either the receiver or a transceiver, since the PAL will perform equally well with both systems. When operated under voice conditions - as opposed to teletype, CW telegraphy or data

transmission - a separate PTT terminal is available to provide direct bypass control. Both the preamplifier and bypass control modules are housed in a cast aluminum case at the antenna base. An AVA active antenna system is created for operation in the VLF, LF, MF, HF and VHF regions by re-configuring the PAL-15 or PAL-16 with a TMC VRA or VTA vertical antenna.

### Expanding Station Capacity

TMC receiving multicouplers have a dual role in a typical receiving station. They provide a means for connecting up to 32 communications receivers to a common antenna and protect

receiver front end circuits from potentially destructive levels of RF energy. As an added bonus, the incoming signal is given a nominal boost (gain) of +1dB over the operating range. The multicouplers are broadbanded and require no tuning. Power needs are very low since all units are solidstate. The series provides for full-frequency coverage over the LF to VHF ranges (10KHz - 200MHz). A "mix-and-match" feature allows multi-range operation using the same multicoupler. The LMC, AMC and VMC models as an example cover the LF/MF, MF/HF and VHF ranges, respectively. The DMC models incorporate both LMC and AMC elements so that coverage of 10KHz to 60MHz is possible using one unit. Any of the units can be supplied with twin inputs in the case of two types of antenna feeding up 32 fixed-tuned receivers. We have even added expansion modules so that the first unit installed to meet current needs can later be expanded to increase capacity for future requirements. Another multicoupler function enables distribution of signals from a frequency standard to provide a common RF source for internal synthesizers. Call us for Application Notes on how best to utilize receiving multicouplers in a variety of communication systems.



*High-Capacity AMC-32 Receiving Antenna Multicoupler*

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## Using WestWind Software

WestWind<sup>R</sup> is the name given to TMC's most recent computer software. Developed initially for command and control of single transmitters, portable high-performance application modules now handle network management, security, site management and critical BITE/maintenance with ease. Additional modules are under development that allow users to construct their own protocol in communicating with remote equipment over asynchronous serial circuits. The WestWind application software is the heart of TMC's Remote Monitor and Control Center. As the name implies, this center combines all functions of the WestWind software to provide complete control of remote equipment connected to it. To date, this equipment includes multiple transmitters, receivers, audio and RF matrices, auxiliary computers, steerable antennas and on-site test equipment. A feature of each center is its modular construction - a trademark of all TMC designs. The RMCC can be expanded or trimmed to suit the needs of the complete system at considerable savings. Since the software modules are portable, RMCC computers - both master and standby - can be exchanged with equipment that users may already have installed and in service. Other options include interconnect to remote sensors, allowing security surveillance over distant sites. This includes freeze-frame video imaging and graphics displays on the CRT display monitors at the RMCC.

A by-product of the WestWind project is the business module which has been implemented in many single-user and multi-

user/LAN-based computers. This module provides the tools needed to track and manage the daily business affairs in both private and public sectors. Included in the module are such basic functions as accounting, inventory control, order entry, budgeting, documentation, costing, production planning, marketing (prospecting) and personnel.

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## Reducing Spaghetti Mazes

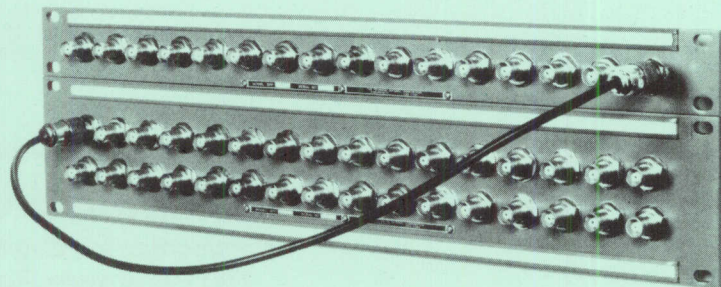
The title of this column may seem a bit overworn but it does convey the image of a problem all of us encounter in the field - excessive cabling. The QDP Quick-Disconnect and SPP Switching Patch Panels go a long way towards solving the problem of mazes by providing direct routing of coaxial cables between equipment. The value of this is immediately apparent in the reduced cost of an installation and the ease with which a technician can isolate a fault. QDP style panels feature patented connectors that dramatically reduce the time spent in making and breaking connections. The SPP style panel extends the basic QDP capability by adding automatic re-routing of signals. Both styles operate from DC to 500MHz with low insertion

loss. All can be supplied with interlock switches to protect both equipment and personnel. Rear panel terminations mate directly to standard connectors such as BNC, UHF, C, N and LC.

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## New Life for Workhorses

Over the past year, TMC has received many orders for the repair and upgrade of older equipment that has operated for over 25 years in the field. TMC equipment from the start has been modular so retrofit with newer and vastly improved designs has proved out to be a low-cost and effective means of upgrading without replacing. This approach is particularly useful when applied to high-power transmitters. The savings in floor space alone is enough to justify retrofit since entire exciter sideracks are replaced by single units. Added benefits come with the conversion of assemblies and components to solidstate, lowering power demand and reducing operating costs. Manually tuned units can be automated and digital sensing circuits overlaid for added control of on-line systems. The whole idea of retrofit is to give new life to workhorse equipment without replacing it with untested designs. The concept has worked very well.



*Quick-Disconnect and Switching Patch Panels*

Washington DC 20005  
655 15th Street, N.W.  
Suite 310  
Mr. A.R. Falola  
InstruCOM, Inc.

The Technical Materiel Corporation  
Customer Service 44  
700 Fenimore Road  
Mamaroneck, New York 10543-2301

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- Boosting Receiver "Pull" - The benefits of receiving preamplifiers
- Expanding Station Capacity - Multicouplers that enhance and protect
- Using WestWind<sup>R</sup> Software - Refining management and control
- Reducing Spaghetti Mazes - Control of cabling and automatic routing
- New Life for Workhorses - Leading older systems into modern times

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