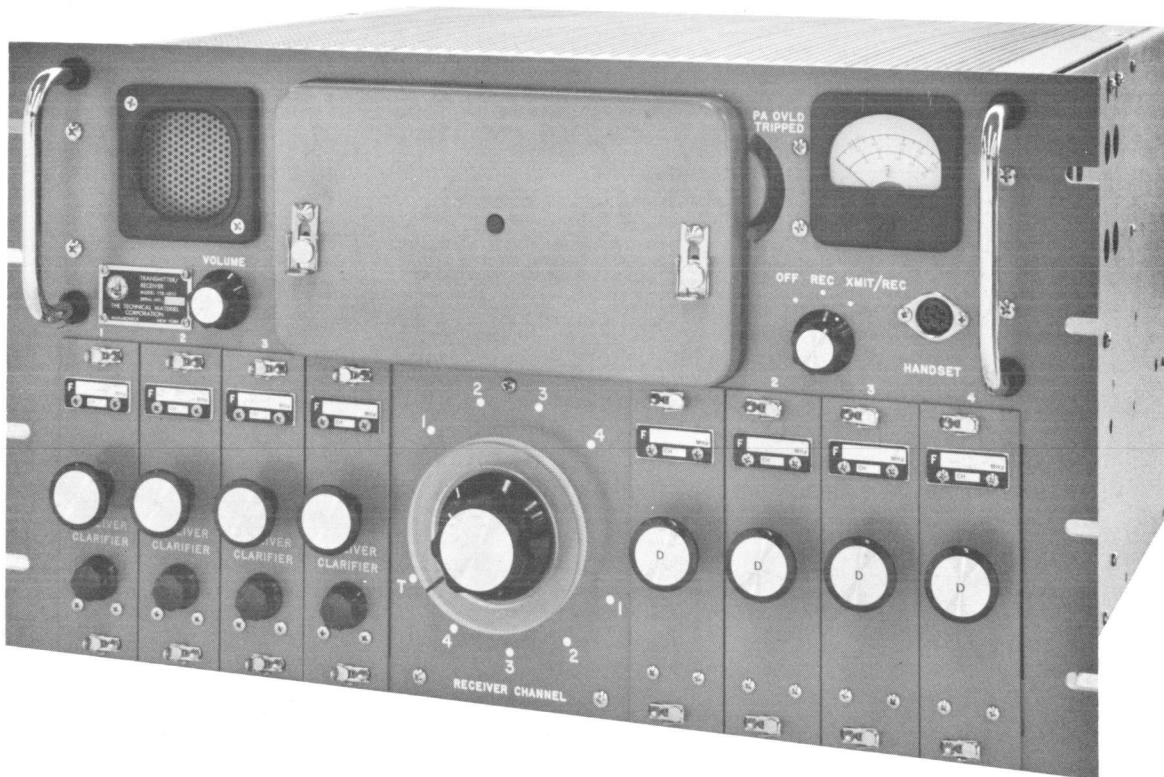


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TMC TECHNICAL BULLETIN 1004D

Transistorized SSB Transmitter Receiver  
TMC Model TTR-20 ( )



- \* Solid State.
- \* 100 watts PEP Output.
- \* Local or Remote Control.
- \* Crystal Controlled Channels.
- \* VOX, PTT Operation.
- \* Integral Power Supply.
- \* Integral Speech Processor.
- \* Complete 2-32 MHz Coverage.

Transistorized SSB Transmitter Receiver  
TMC Model TTR-20( )

The Technical Materiel Corporation's Model TTR-20( ) series of four channel SSB Transmitter/Receivers was designed for all military, commercial, and private requirements between 2 and 32 MHz, including both mobile and fixed services. Modes of operation include upper or lower sideband, CW, AME, or MCW. All is solid state, except for the driver and the final output linear amplifier. The flexibility of this unit permits it to be used either as a transceiver (simplex operation on one frequency), or as a transmitter/receiver (duplex operation on separate transmitting and receiving frequencies simultaneously).

The transmitter section has oven controlled, or temperature compensated, carrier oscillator and oven controlled conversion oscillators. A special plug-in extender module is provided to permit dynamic testing or tuning of send and receive modules in an extended position.

Ordering information pertaining to the TTR-20( ) is set forth below to allow the customer to select appropriate transmit and receive modules:

RECEIVE MODULES

1. 2-4 MHz.
2. 4-8 MHz.
3. 8-16 MHz.
4. 16-32 MHz.

TRANSMIT MODULES/AMPLIFIERS

- A. 2-4 MHz.
- B. 4-8 MHz.
- C. 8-16 MHz.
- D. 16-24 MHz.
- E. 24-32 MHz.

If, for instance, a customer wishes to select an upper sideband unit with two modules in the 2-4 MHz range, one module in the 4-8 MHz range, and one module in the 8-16 MHz range, he would order a TTR-20U-1123-AABC. The suffix "U" following the "20" indicates "upper sideband". Suffices "L" and "U/L" would be used to order "lower sideband" or "upper and lower sideband", respectively. Line voltage and frequency, 115 or 230 volts, 50 or 60 Hz, must also be specified.

The unit is configured for standard 19 inch relay rack mounting unless otherwise specified. *The options, which are separately priced, are indicated in detail at the end of the TECHNICAL SPECIFICATIONS portion of this bulletin. It is, however, important to here note that, for marine mobile applications, the TTR-20( ) may be ordered with the transmitter arranged for only AME emission on the distress frequencies.*

TMC TECHNICAL BULLETIN 1004D

Transistorized SSB Transmitter Receiver  
TMC Model TTR-20( )

TECHNICAL SPECIFICATIONS, TMC MODEL TTR-20( ), RECEIVER AND TRANSMITTER

(continued)

POWER REQUIREMENTS: 230 watts transmit, key down.  
25 watts transmit standby, receiver on.  
8 watts receive only.  
12 watts each oven, in addition to above.

LOOSE ITEMS: One test extender for transmit and receive RF modules.  
Mating plugs for all connections.

COMPONENTS AND CONSTRUCTION: All equipment manufactured in accordance with U.S. military specifications wherever practicable.

TECHNICAL SPECIFICATIONS, TMC MODEL TTR-20( ), RECEIVER ONLY

INPUT IMPEDANCE: Nominal 50 ohms unbalanced.

SENSITIVITY: One microvolt for 15 db, signal plus noise-to-noise ratio.

FREQUENCY STABILITY: No more than 20 Hz change for a 15°C change in temperature within the range of 0°C to 50°C ambient temperature.

INTERMODULATION: Intermodulation distortion products are down a minimum of 35 db from PEP of a two tone test with 100 microvolts at the antenna.

IF SELECTIVITY: ±2 db, 350-3350 Hz.

AGC CHARACTERISTICS: Delayed AGC. Output change less than 10 db for a 100 db increase above one microvolt at the antenna input.

SQUELCH: Threshold adjustable squelch. AGC activated relay has contacts brought to the rear panel for remote indication of receiver signal activity.

AUDIO OUTPUT LEVEL: One milliwatt into 600 ohm line available for headset, extended service, or telephone handset.  
500 milliwatts into 3.2 ohm speaker.

TMC TECHNICAL BULLETIN 1004D

Transistorized SSB Transmitter Receiver  
TMC Model TTR-20( )

TECHNICAL SPECIFICATIONS, TMC MODEL TTR-20( ), RECEIVER AND TRANSMITTER

- FREQUENCY RANGE: 2 to 32 MHz by crystal-controlled plug-in RF modules.
- MODES OF OPERATION: Standard USB, AME, CW and MCW, or side-band with carrier 20 db below peak power. Simplex operation, by use of coaxial antenna transfer relay, or duplex operation with separate receive and transmit antennas.  
*Optional front panel selectable SSB (upper or lower).*
- TUNING: Front panel switches provide selection of any one of four transmit/receive or transceiver channels. Output tuning circuit will accommodate a load of up to 2:1 VSWR.
- SAFETY FEATURES:
- 1 - PA magnetic operated circuit-breaker on the front panel.
  - 2 - All DC operating voltages fused.
  - 3 - Transformer primary fused.
  - 4 - Oven supply lines fused.
  - 5 - Interlock on output modules prevents accidental operation when no module is in place.
- ANTENNA TRANSFER RELAY: An antenna transfer relay is provided to permit operation of the unit to send and receive on the same antenna. This relay may be by-passed if simultaneous transmission and reception on separate frequencies, using separate antennas, is desired.
- INSTALLATION DATA:
- Size: 10 1/2 inches High x 19 inches Wide x 16 1/2 inches Deep.  
Weight: Approximately 65 lbs., less the cabinet and slides.
- PRIMARY POWER: 115 or 230 volts AC  $\pm 10\%$ , 50/60 Hz, single phase. Voltage must be specified in advance in order that the appropriate crystal ovens may be provided.

Transistorized SSB Transmitter Receiver  
TMC Model TTR-20( )

TECHNICAL SPECIFICATIONS, TMC MODEL TTR-20( ), TRANSMITTER ONLY

POWER OUTPUT: A minimum of 100 watts PEP.  
50 watts average.

OUTPUT IMPEDANCE: Nominal 50 ohms unbalanced into a load  
with up to 2:1 VSWR.

FREQUENCY CONTROL AND STABILITY: Standard maximum deviation +50 Hz over  
ambient range of 0° to +50°C. *Extension  
of ambient temperature to -30°C optional.  
+10 Hz optional.*

SIGNAL/DISTORTION RATIO; Distortion products are at least 35 db  
down from full PEP output.

UNWANTED SIDEBAND REJECTION: At least 50 db down at full PEP output.

NOISE LEVEL: Better than 40 db below PEP.

CARRIER INSERTION: Automatically preset at -50, -20 and -6  
db from peak envelope power by mode  
selector switch.

SPURIOUS AND HARMONIC SUPPRESSION: 50 db down at full PEP output.

AUDIO RESPONSE: +2 db, 300 to 3000 Hz.

AUDIO INPUT: -20 dbm at 600 ohm balanced or unbalanced,  
telephone handset, carbon mike, and hi-  
or lo- impedance mike with push-to-talk.  
Front panel plug-in or rear panel  
connections.

VOICE OPERATED RELAY: Voice controlled switch includes an anti-  
trip feature with an adjustable threshold  
and gain adjustment.

METERING: Front panel meter monitors PA plate current,  
PA drive, RF output voltage and PA high  
voltage.

OVERLOAD LIMIT: Special built-in circuit prevents over-  
modulation.

Transistorized SSB Transmitter Receiver  
TMC Model TTR-20( )

SEPARATELY PRICED OPTIONS

- KIT-162 Cabinet, shock mounting for vehicular installation of TTR-20( ).*
- KIT-163 Slide mounting for rack servicing of TTR-20( ).*
- CAB-9 Desk cabinet enclosure for TTR-20( ).*
- TPCA-20 Transmitter/Receiver Telephone Control: desk telephone handset with six pushbuttons - four to select required transmitter/receiver tuning modules, and two for selection of upper or lower sideband operation. A loudspeaker and volume control are incorporated within the desk set. DC cabling for "in-house" remote operation is also provided.*
- TTC-1 Transmitter/Receiver Antenna Coupler: provides four position remote tuning of a 35 foot whip and is controlled directly from the TTR-20( ) to tune the antenna to one of four preset frequencies. The tuner unit must be collocated with the whip antenna and is provided in a water-proof housing.*
- THRA-1 Spare Tuning Drawer Storage Panel: provides space for three RF modules, and heater voltage for maintaining crystal ovens of spare modules at operating temperature. Size: 1 3/4 inches High x 19 inches Wide x 17 inches Deep.*
- MK-102-3 (Lo-Z) dynamic microphone, noise cancelling, desk type, with push-to-talk switch.*
- MK-102-4 (Hi-Z), otherwise same as the MK-102-3.*
- HS-100-3C Handset, push-to-talk carbon.*
- HS-100-3D Handset, push-to-talk dynamic.*
- HYB-3 2-wire/4-wire converter (telephone patch).*
- MPA-1 Microphone preamplifier.*

*As previously noted, for marine mobile applications, the TTR-20 may be ordered with transmitter arranged for only AME emission on distress frequencies.*



THE TECHNICAL MATERIEL CORPORATION

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TWX 710-566 1100

MAMARONECK, N.Y. 10543

THE WORLD-WIDE SYSTEM OF REMOTE CONTROLLED COMMUNICATIONS

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