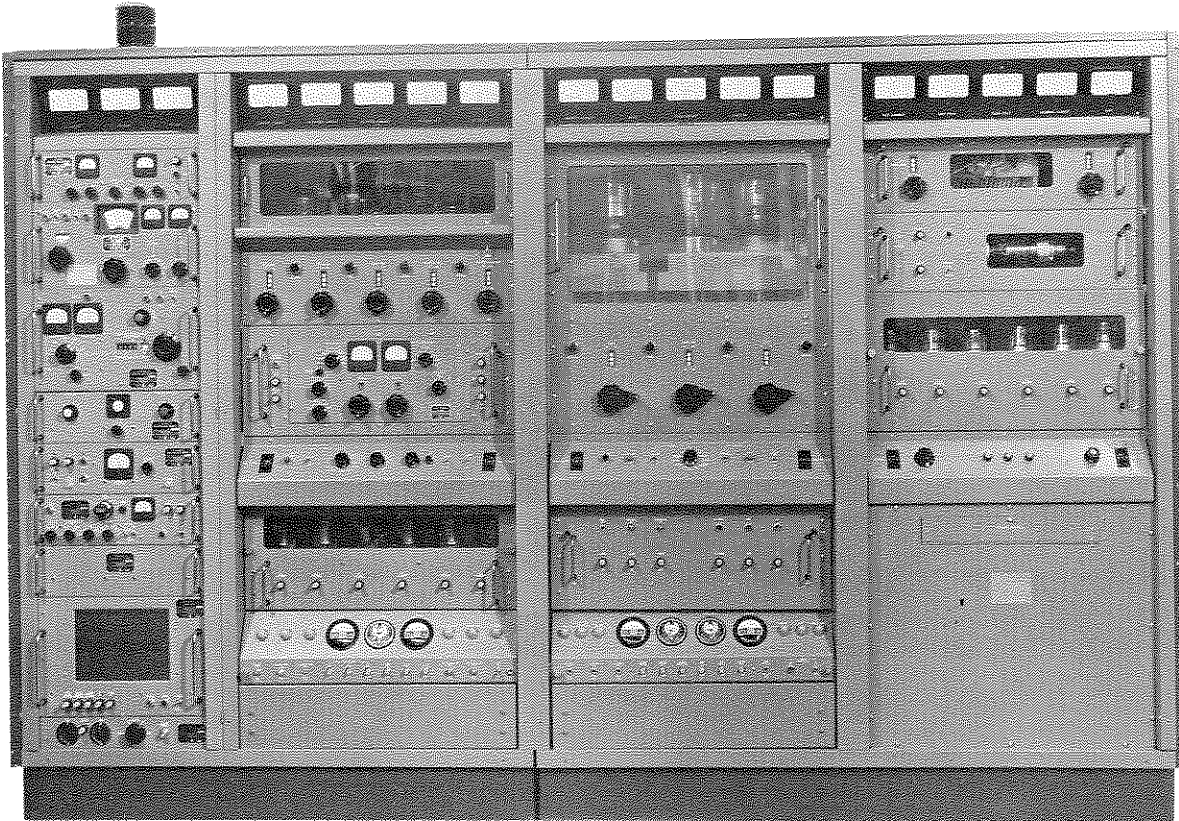


## TECHNICAL BULLETIN NUMBER 1006

Synthesized General Purpose Transmitter  
TMC Model GPT-40KE  
AN/FRT-40B



TMC MODEL GPT-40KE (AN/FRT-40B) RADIO TRANSMITTER

TMC Model GPT-40KE (AN/FRT-40B) is a general purpose synthesized transmitter, providing SSB, ISB, AM, CW, FSK and FAX modes of operation in the frequency range of 2 to 28 mc.

Model GPT-40KE is conservatively rated at 40,000 watts PEP, 20,000 watts average power outputs. Under conditions of a 64 tone voice frequency modulation, the GPT-40KE will deliver approximately 100 kw PEP on a 20% duty cycle with better than 35 db signal to distortion ratio, or 200 kw PEP on a 10% duty cycle.

GPT-40KE features synthesized frequency control with 100 cps incremental tuning throughout the tuning range, with stability and accuracy of 1 part in  $10^8$  for a 24 hour period. The synthesizer may be operated from a station standard if desired. In the event of failure of the synthesizer, the exciter provides an emergency frequency stability of 1 part in  $10^6$  per day. Also, should low power transmission be required or for emergency conditions, a 10 kw and 1 kw trans-

## Synthesized General Purpose Transmitter

mission capability is readily available from the IPA section. The 10 kw IPA driver stage uses a grounded grid ceramic type tube for higher efficiency, while the final tube is a 6697 protected by a hydrogen thyratron crowbar. All amplifier stages are linear. The over-all minimum bandwidth of the transmitter produces greater than 20 kc between 3 db voltage points over the entire frequency range.

Front panel bandswitching and tuning reduces frequency changeover time to a minimum (no plug-in components or mechanical adjustments). Bandswitches are of the self-cleaning type.

The GPT-40KE contain all power supplies and ventilation equipment. The modular design lends itself to ease of installation, maintenance and repairs, such as: drawers on tilting slides, a front panel interlock circuit continuity indicators, blown fuse indicators, and bias and overload protection with automatic recycling and audio alarm.

Thoroughly field proven, the GPT-40KE is operating at military and commercial installations and in mobile vans and shelters, with adequate shock mounting for such an environment. Balanced or unbalanced operation is provided at the option of the customer. For balanced output, ceramic bowls with 1/2" bolts on 12" centers are provided. For unbalanced output, a 3 1/8" flange is provided. A front panel meter allows direct readings of forward and reflected power for computation of VSWR.

### TECHNICAL SPECIFICATIONS: Model GPT-40KE

FREQUENCY RANGE:	2 to 28 megacycles bandswitched.
OPERATING MODES:	SSB, ISB, CW, AM, FSK and FAX.
POWER OUTPUT:	40,000 watts 2 tone PEP signal to distortion ratio at least 35 db. 20,000 watts 2 tone PEP signal to distortion ratio at least 40 db. 25,000 watts average CW or FS.
OUTPUT IMPEDANCE:	50 or 70 ohms unbalanced. 3 1/8" EIA flange. 600 ohms balanced. Pi-L network will match a load with VSWR of 2:1 maximum.
STABILITY AND FREQUENCY CONTROL:	1. All radio frequency determining elements referenced to a built-in 1 mc standard. 2. Stability of 1 part in 10 <sup>8</sup> per day for ambient temperature change of 15° C within the range of 0-50° C.
TUNING:	All tuning and bandswitching controls are on the front panel (no plug-in components or mechanical adjustments). Self-cleaning contacts on RF bandswitches.
DISTORTION PRODUCTS:	See Power Output.

## TMC Model GPT-40KE

UNWANTED SIDEBAND REJECTION:	500 cps single tone 60 db down from full PEP output.
SPURIOUS SIGNALS:	At least 60 db below full PEP output.
CARRIER INSERTION:	-55 db to full PEP output.
HARMONIC SUPPRESSION:	Second harmonic at least 50 db down from PEP output. Third harmonic at least 65 db down from PEP output.
AUDIO RESPONSE:	CBE-1 Crystal lattice filters flat within $\pm 1.5$ db 350 to 7500 cps. CBE-2 Crystal lattice filters flat within $\pm 1.5$ db 350 to 3300 cps.
AUDIO INPUTS:	600 ohm balanced -20 to +10 dbm continuously adjustable to full PEP output. An unbalanced input can also be applied.
HEAT DISSIPATION:	Maximum 40 kw.
SPECIAL FEATURES:	ALDC (Automatic Load and Drive Control) is provided to improve linearity, limit distortion, and deliver a relatively constant RF output level during high modulation peaks or load changes. Front panel control allows adjustment of the level at which the ALDC takes effect or switching off the ALDC, if desired.
METERING:	Large scale meters are mounted on tilted panels at the top of the units to accurately indicate operation of all critical circuits. These meters are externally illuminated for ease in reading.
ENVIRONMENTAL:	Designed to operate in any ambient temperature between the limits of 0 and 50° C for any value of humidity up to 90%.
COOLING:	Filtered forced air cooling, semi-pressurized cabinet.
SAFETY FEATURES:	Overload and bias protection with automatic recycling and alarm. Safety interlocks are provided on all high voltage points.
NOISE:	Power supply ripple 55 db down from full PEP output. Other, 70 db down from full PEP output.

# TMC Model GPT-40KE

TIS-3 KEYING INFORMATION: FSK 75 bauds (100 wpm) maximum 50V, 100V, 20 ma, 60 ma, all neutral, floating, or either side grounded.  
12-1000 cps shift.  
CW 140 bauds maximum. Same keying voltages as for FSK plus dry contact keying.  
FAX 400 bauds maximum.  
-5 to +5 DCV or 0 to +20 volts for linear shift of 1200 cycles.

PRIMARY POWER 208/230 volts 50/60 cps, 3 phase.

REQUIREMENTS: Maximum 60,000 watts. Primary of transformer may be connected for either DELTA or "Y" input.

INSTALLATION DATA: Weight approximately 7000 lbs.  
Size: 10 1/2' wide, 3' deep, 7' high

NUMBER OF CONTAINERS SHIPPED: 29

SIZE OF LARGEST CONTAINER: 32" x 38 5/8" x 72 1/2"

SHIPPING WEIGHT & CUBE: 10922 lbs. Cube 260.6 cu. ft.

FEDERAL STOCK NUMBER: Without spares F5820-448-0469

INSTRUCTION BOOK: TMC IN-235, MIL

MILITARY NOMENCLATURE: AN/FRT-40B

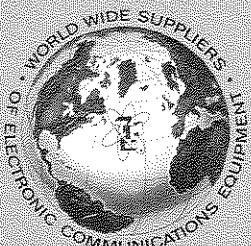
For further information on auxiliary rack components, refer to TB 2010 (SSB 228) for the SBG, and TB 2025 (SSB 245) for the TIS-3.

COMPONENTS AND CONSTRUCTION: All equipment is manufactured in accordance with JAN/MIL specifications wherever practicable.

## ACCESSORY EQUIPMENT:

TMC Model TMA 40K: Provides 2 RF ammeters 0-10 amps each for indicating the RF current in each side of a 600 ohm balanced line. The meters are mounted on a bakelite panel and installed in a metal case that is mounted on top of the transmitter at the 600 ohm feeders.  
(For 600 ohm balanced operation)

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