DATRON

DATRON WORLD COMMUNICATIONS INC.

Manufacturer of the TRANSWORLD® Line of Radio Products

TW7000

THE TOTAL SYSTEM SOLUTION FOR YOUR HF COMMUNICATIONS REQUIREMENTS

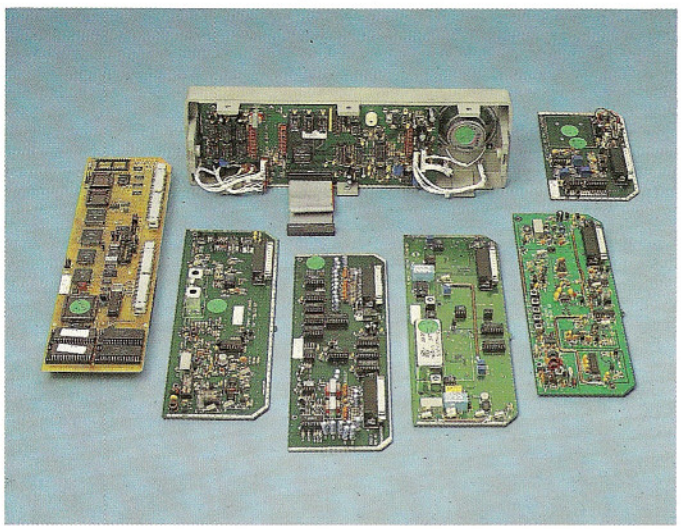
TW7000 Transceiver

The TRANSWORLD® TW7000 Series is an advanced transceiver system which provides the total system solution for all your HF requirements.

The system is reliable, easy to use and provides long distance voice and data transmission capability over the 1.6-30 MHz high frequency (HF) range. The knowledge and experience gained from 20 years in the HF radio business was used to develop this completely new product family which utilizes the very latest in electronic and packaging technologies.

Using multiple microprocessors and new technologies such as Digital Signal Processing (DSP) and Direct Digital Synthesis (DDS), the TW7000 provides built-in features such as Automatic Link Establishment, Voice Enhancement, and Encryption. These powerful technologies and features have been carefully balanced with the need for ease of operation, high reliability, simple maintenance, and affordability.

1. 256-Channel Memory (Expandable to 1000)
2. Plug-in Modular Circuitry
3. Custom Liquid Crystal Display
4. 1.6 to 30 MHz in 10-Hz Steps
5. Full Alphanumeric Keypad
6. Computer Interfaces and Printer Port
7. Full Remote Control
   - Extended Front Panel
   - ISDN
   - FSK
   - Computer Control
8. Multimode Operation
   - SSB
   - CW
   - FSK
   - AME
   - PCS
9. Plug-In Options
   - 1045 ALE
   - TRANSCALL ALE
   - Encryption
10. Dual Audio Connectors
11. Continuous Duty Rating
12. Expansion Ports for Options



La serie TW7000 es un sistema transreceptor de tecnología avanzada el cual provee la solución total a nivel de sistema para todo requerimiento de altas frecuencias (H.F.).

El sistema es confiable, de fácil uso y proporciona la capacidad de transmisión de voz y datos en el rango de altas frecuencias de 1.6 a 30 MHz. Transworld ha utilizado sus conocimientos y experiencia de más de 20 años en el campo de las comunicaciones de H.F. para desarrollar esta nueva y completa familia de productos la cual utiliza la más avanzada tecnología electrónica disponible en la actualidad.

Mediante el uso de multiples microprocesadores y nuevas tecnologías, tal como el D.S.P. (procesador digital de señal) y D.D.S. (sintetización-digital-directa), el TW7000 es capaz de proveer establecimiento de enlace automático, mejoramiento de voz y encripción. Éstas altas tecnologías y valiosas capacidades han sido logradas manteniendo una fácil operación, alta confiabilidad, fácil mantenimiento y bajo costo de adquisición.

L'émetteur-récepteur série TW7000 est un système avant-gardiste totalement intégré répondant à l'ensemble de vos besoins en matière de transmissions HF.

Fiable et facile à utiliser, ce système permet la transmission de la voix et des données sur de grandes distances dans la plage des hautes fréquences (1,6 à 30 MHz). Grâce à son savoir-faire et à son expérience, fruits de 20 années de travail dans le domaine de la transmission HF, Transworld a pu mettre au point cette toute nouvelle gamme de produits tirant le maximum des plus récents développements en matière d'électronique et de mise sous boîtier.

L'utilisation de nombreux microprocesseurs et de nouvelles technologies telles que le traitement des signaux numériques (DSP) et la synthèse directe des signaux (DDS), l'émetteur-récepteur TW7000 est en mesure d'offrir notamment l'établissement automatique de liaison et le chiffrement des données. Ces remarquables percées technologiques s'équilibrent parfaitement à la facilité de fonctionnement, à la fiabilité, à la facilité d'entretien et au bas prix de l'appareil.

TW7000 Features

Multimode Capabilities

All standard modes, including USB, LSB, CW, PCS and AME, are available. A wideband data option is provided for high-speed data capability. The optional DSP module allows a number of customized functions including voice enhancement.

Reliable Multi-Level Power Amplifier

Output power is conservatively rated at 125-W PEP, 100-watts average, in continuous keydown operation. Three front-panel-programmable levels are available which default to 5, 20, and 125 watts. Complete VSWR protection is provided.

Advanced Receiver Design

Designed to cope with today's crowded, noisy HF spectrum, the TW7000's receiver performance is on a par with most dedicated surveillance receivers.

Microprocessor Control

Two high-performance processors are used to control the operation of the TW7000. In addition to the main radio controller, a second processor is used in the front-panel assembly so that the latter can be removed and used as a remote-control head for the transceiver.

Direct Digital Synthesizer

An advanced, fast-switching DDS circuit is the heart of the TW7000 synthesizer. It provides a low-noise and spurious output, and permits fast scanning and high resolution. Although 10-Hz channel spacing is standard, the synthesizer is capable of operating in 1-Hz steps for special applications.

Alphanumeric Keypad

The standard front-panel keypad has full alphanumeric capability.

Alphanumeric Display

The TW7000 has a high-resolution, backlit, custom LCD display which indicates channel number, frequency, time, clarifier offset, mode, and relative signal strength/output power, as well as the status of the installed options. Two alphanumeric lines display the BITE status, sub-menu data, and can also be used to compose or receive ALE orderwire or data messages. A 24-hour clock/timer is optional.

Modular Construction

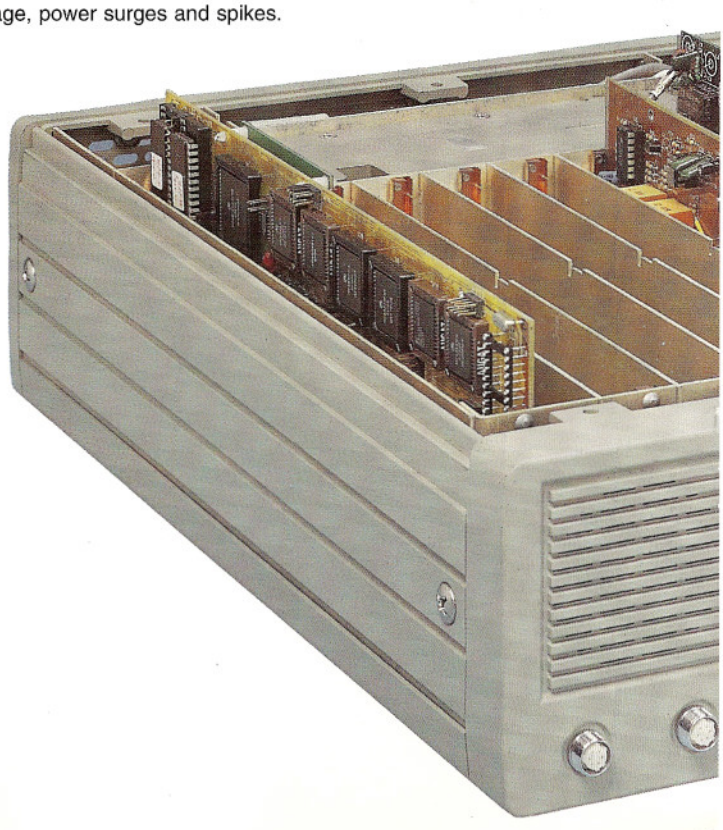
The utilization of a "no-harness, full plug-in" packaging concept permits easy field-level repair and upgrades, as well as quick installation of any option card.

BITE Capability

Automatic BITE capability, with fault isolation to the module level, is standard in the TW7000. BITE status messages, which cover a variety of possible failure modes, are presented on the display. This allows even unskilled operators to troubleshoot the radio at the field level.

Failsafe Input-Power Protection

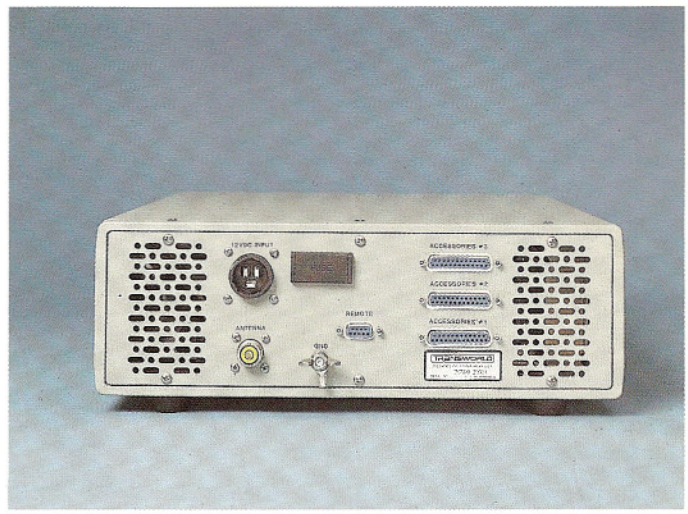
The TW7000 is fully protected against reverse polarity, over/under voltage, power surges and spikes.



TW7000 Options

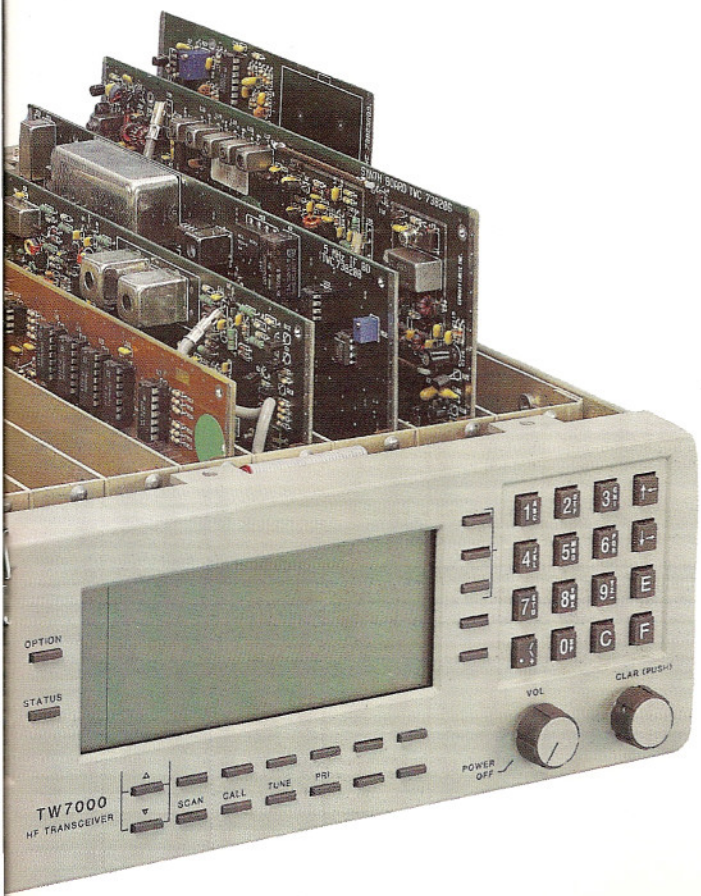
Remote-Control Capability

A variety of remote-control capabilities are offered. An extended front panel control can be used as a controller for short-distance operation. Full-function remote control is available using either the ISDN protocol (medium distances) or FSK tones (unlimited distances) over any voice-grade 2- or 4-wire line. The TW7000 is also capable of full computer control utilizing a variety of interface standards.



Dual ALE Capability Options

In addition to the widely used and cost-effective TRANSCALL system, the TW7000 also offers a full FED-STD-1045 compatible system which provides advanced features such as high-speed scanning, sounding, link-quality analysis, and send/receive orderwire message capability. Both of these ALE options provide selective calling as well as "best-available-channel" selection.



DSP Voice Enhancement

The optional plug-in Digital Signal Processor (DSP) Voice Enhancement option makes it possible to tailor the TW7000's features and performance characteristics to a wide variety of specialized applications.

High-Speed Data Option

The optional high-speed data option permits reliable transmission of high-speed data, Group III FAX or video images, even under uncertain HF propagation conditions. This option has been designed to the U.S. MIL-STD-188-110A serial-tone protocol and provides up to 4800 bps data-transfer rates (or 2400 bps with full-error correction). When used in conjunction with the ALE option and the TW9200 "DATACOM" Message Terminal, this integrated system provides a cost effective, fast and reliable solution to long-distance data communications requirements.

Encryption Option

These options provide either high-level digital encryption of both voice and low speed data communications or medium level voice scrambling.

TW7000 Specifications

GENERAL

Frequency Range:	Receive:	100 kHz - 30 MHz.
	Transmit:	1.6 to 30 MHz.
Channel Spacing:	10 Hz, standard.	
Channels:	256, standard, expandable to 1000.	
Frequency Entry:	Keypad-controlled.	
Display:	Backlit Alphanumeric LCD.	
Tuning:	Up and Down pushbuttons, variable frequency steps.	
Scanning:	Multiple scan groups, operator selectable scan rates.	
Antenna Impedance:	50 ohms.	
Frequency Stability:	± 1 ppm -30 to 60 ° C; optional ± 0.1 ppm.	
Operating Modes:	J3E (USB, LSB), H3E (AME), PCS, J2A (CW standard); simplex or semi-duplex.	
Duty Cycle:	Continuous.	
Input Power:	13.8 Vdc, nominal; 11.0 to 15.5 Vdc, operational.	
Input Power Protection:	Reverse polarity, transient and under/over voltage.	
Size (H x W x D):	4 in. x 13 in. x 17 in. (10.2 cm x 33 cm x 43 cm).	
Weight:	21 lbs. (9.5 kg).	

TRANSMITTER

Power Output:	125 W PEP, 100 W average; three levels, programmable from front panel.
Intermodulation:	-32 dB.
Harmonics:	-60 dB, 2 to 30 MHz.
Carrier Suppression:	-50 dB.
Sideband Suppression:	-55 dB.
VSWR Protection:	Protected against antenna mismatch including open and short circuit.

RECEIVER

Clarifier:	Digital ± 600 Hz in 10 Hz steps.
Receiver Protection:	Can withstand +43 dBm input without damage.
Sensitivity:	0.5 for 10 dB SINAD (1.6 - 30 MHz).
IF Rejection:	-80 dB.
Selectivity:	SSB: 300-2700 Hz at -6 dB.
Spurious:	Per FED-STD-1045.
Attenuator:	+20 dB switchable.
Audio:	5 W min. into 4 ohms.
High-level Audio:	0 dBm into 600 ohms.
AGC:	Not more than 3 dB change in audio output for input signals from -103 to +13 dBm.
Squelch:	Syllabic.

ENVIRONMENTAL

Temperature, Operating:	-30 to +60 ° C.
Temperature, Storage:	-40 to +70 ° C.
Shock and Vibration:	Per MIL-STD-810E.

OPTIONS, INTERNAL

ALE:	Full-function FED-STD-1045 operational from front panel.
Encryption:	High- or medium-level voice.
Noise Blanker:	Impulse noise type.
High Stability:	± 0.1 ppm, -30 to +60 ° C.
Adaptive:	TRANSCALL/SELCALL, TW100 compatible; TRANSADAPT, PRC1099A compatible.
Remote Control:	Extended control unit for mobile operation. Full function remote for long distances (both feature full ALE capability); computer control.
Remote-only Operation:	Front Panel removable for remote-only operation.
Voice Enhancement:	DSP-based.

Specifications subject to change without notice.
Measurements made at 13.8 Vdc.

System Specifications

AT7000 Antenna Tuner

Frequency Range:	1.6-30 MHz (2-30 MHz operation with 4.6 m antenna).
Antennas:	Whips: 15-35 ft (4.6-10.7 m). Long Wires: 75-150 ft (23-46 m).
Rated RF Input Power:	125 W PEP.
Tuning Time:	Typically 2 seconds.
Primary Power:	12 Vdc at 1.5 A (peak), or 600 mA (average).
Temperature Range:	-30° C to +60° C.
Size (H x W x D):	14 x 11 x 3 in (36 x 28 x 8 cm).
Weight:	6.2 lbs (2.8 kg).
Memory Channel Option:	Stores tune information on 100 channels in non-volatile memory.
Memory Tuning Rate:	20 ms (follows radio scan mode).
Memory Retuning:	Automatically stores new information each time channel is retuned using radio's tune button.

PF7000 AC Power Supply

Primary Voltage:	115/230 auto sensing.
Output:	13.8 Vdc, 20A.
Duty Cycle:	100%.
Over Voltage:	Set at 16 V.
Temperature:	0 - 50° C.
Size (H x W x D):	3.4 x 5.0 x 9.5 in. (8.6 x 12.7 x 24.1 cm)
Weight:	3.75 lbs (1.7 kg).

PS1000 Power Supply

Primary Voltage:	115/230 ±10 % (jumper selectable).
Primary Current:	12 A (230 V), 24 A (115 V).
Frequency:	50 Hz/60 Hz (jumper selectable).
Dc Output Voltage:	28-33 Vdc (10-80 A).
Size (H x W x D):	8.75 x 19 x 17 in. (22.23 x 48.26 x 43.18 cm)
Weight:	126.8 lbs (58.97 kg).

PS7000 Power Supply

Primary Voltage:	115/230 ±10 % (jumper selectable).
Output:	13.8 Vdc, 20A.
Duty Cycle:	100% @ 20A.
Over Voltage:	16 Vdc.
Temperature:	0 - 50° C.
Size (H x W x D):	3.4 x 5.0 x 9.5 in. (8.6 x 12.7 x 24.1 cm)
Weight:	27 lbs (10.4 kg).

RAT1000 Antenna Tuner

Frequency Range:	1.6-30 MHz.
Antennas:	Whips: 16 ft (4.9 m) 3-30 MHz, 32 ft (10.7 m) 2-30 MHz. Long Wires: 75-150 ft (23-46 m).
Rated RF Input Power:	1000 W PEP Average.
Tuning Time:	Typically less than 3 seconds.
Primary Power:	28 Vdc 4 A (peak) 1.8 A (average).
Temperature Range:	-30° C to +55° C.
Size (H x W x D):	13.4 x 19.3 x 11.8 in (34 x 49 x 30 cm).
Weight:	49 lbs (22 kg).
Memory Channels:	Stores tune information on 10 channels in non-volatile memory.
Memory Tuning Time:	200 ms from memory.
Memory Retuning:	Automatically stores new information each time channel is retuned using radio's tune button.

TW500B 500-W Amplifier

Power Output PEP:	500 W PEP, typical, FSK model 400 W, Average CW/FSK.
Modes:	SSB Model (continuous voice operation); FSK Model (600 W DC input - continuous at 30° C ambient).
Intermodulation Distortion:	-30dB, typical.
Harmonics:	43 dB.
Output Impedance:	50 ohm (SO239 Connector).
Power Requirements:	115/230 V, 50/60 Hz AC.
Cooling:	Convection plus fan actuated by 75° C thermostat.
Size (H x W x D):	17.25 x 13.25 x 7.63 in. (43.82 x 33.66 x 19.38 cm)
Weight:	46 lbs (20.87 kg).

TW1000A 1000-W Amplifier

Power Output:	1000 W PEP SSB, 1000 W Avg. FSK, CW.
Duty Cycle:	Continuous transmit.
Intermodulation Distortion:	-30 dB typical (dependent on exciter).
Harmonics and Spurious:	-55 dB.
Power Requirements:	SSB 28 V, 40 A Avg. FSK 28 V, 60-80 A .
Circuit Breaker:	100 A Magnetic.
Weight:	52 lbs (23.6 kg).
Size (H x W x D):	8.8 x 19.0 x 15.4 in. (22.2 x 48.3 x 38.9 cm)
Rack Mount (H x W):	8.75 x 19.0 in. (22.2 x 48.3 cm)

TW9200 Datacom Terminal

Size (H x W x D):	5.1 x 12.6 x 14.1 in. (13 x 32 x 43.5 cm)
Weight:	16 lbs (7.3 kg).
Operating Power:	10-30 Vdc, 50 W maximum (with disk drive). Optional ac supply.
Protocols:	CW, RTTY (Baudot/ASCII), SITOR/ARQ/FEC/SELFEC (Per CCIR 476-2 and CCIR 625), Packet (per AX.25).
Baud Rate:	To 300 baud.
Operating Temperature:	0-45° C.
Audio Interface:	600 ohm 0 dBm nominal.
Tone Frequencies:	Software controlled, 500 to 2500 Hz.
Printer Port:	Centronics parallel interface, DSUB mini.
Keyboard:	100 key QWERTY.
Display:	High contrast, high resolution LCD, color or B/W.
Radio Interface:	RS-232.
Disk Drive:	330-MB hard disk, 3.5 inch 1.44-MB floppy disk.
Operating System:	PC-compatible DOS, Windows 3.1™

Specifications subject to change without notice.

TW7000 Systems

The TW7000 series offers a complete selection of accessories including power supplies, antenna tuners, antennas, etc. The TRANSWORLD® family of standard systems helps users configure packages of hardware. These standard systems come complete with all equipment, cables, audio accessories and antennas. Additional options and accessories can be added to tailor these systems to specific customer needs. Several representative systems are:

TW7000-EC-SYS4 MOBILE SYSTEM

A complete 125-watt HF mobile system which includes a transceiver with a full-function extended control unit, an automatic antenna tuner, whip antenna, all cables, mounting brackets and microphone.

TW7100-SYS1 500-WATT BASE STATION

A complete 500-watt HF base station system that is mounted in a rack cabinet and includes a transceiver, AC power supply, TW500B 500-watt amplifier, ABB broadband antenna, cables and desk microphone, The system is also available with a RAT1000 automatic antenna tuner for use with whip and wire antennas.

TW7000-DATA-SYS1 125-WATT BASE STATION FOR VOICE/DATA TRANSMISSION

A complete 125-watt HF base station for voice or multi-mode (RTTY, CW, ARQ and Packet) data transmission. The system includes a transceiver, AC power supply, TW9200 Datacom Terminal, ABB broadband antenna, cables and microphone. It is also available with AT7000 automatic antenna tuner for use with whip and wire antennas.

TW7500-SYS2 1-KW BASE STATION

A complete 1000-watt HF base station that is mounted in a rack cabinet and includes a transceiver, 1-kW amplifier, power supply, antenna tuner (not shown), 10 m whip antenna, cables and desk microphone. The system is also available with an ABB broadband antenna.

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