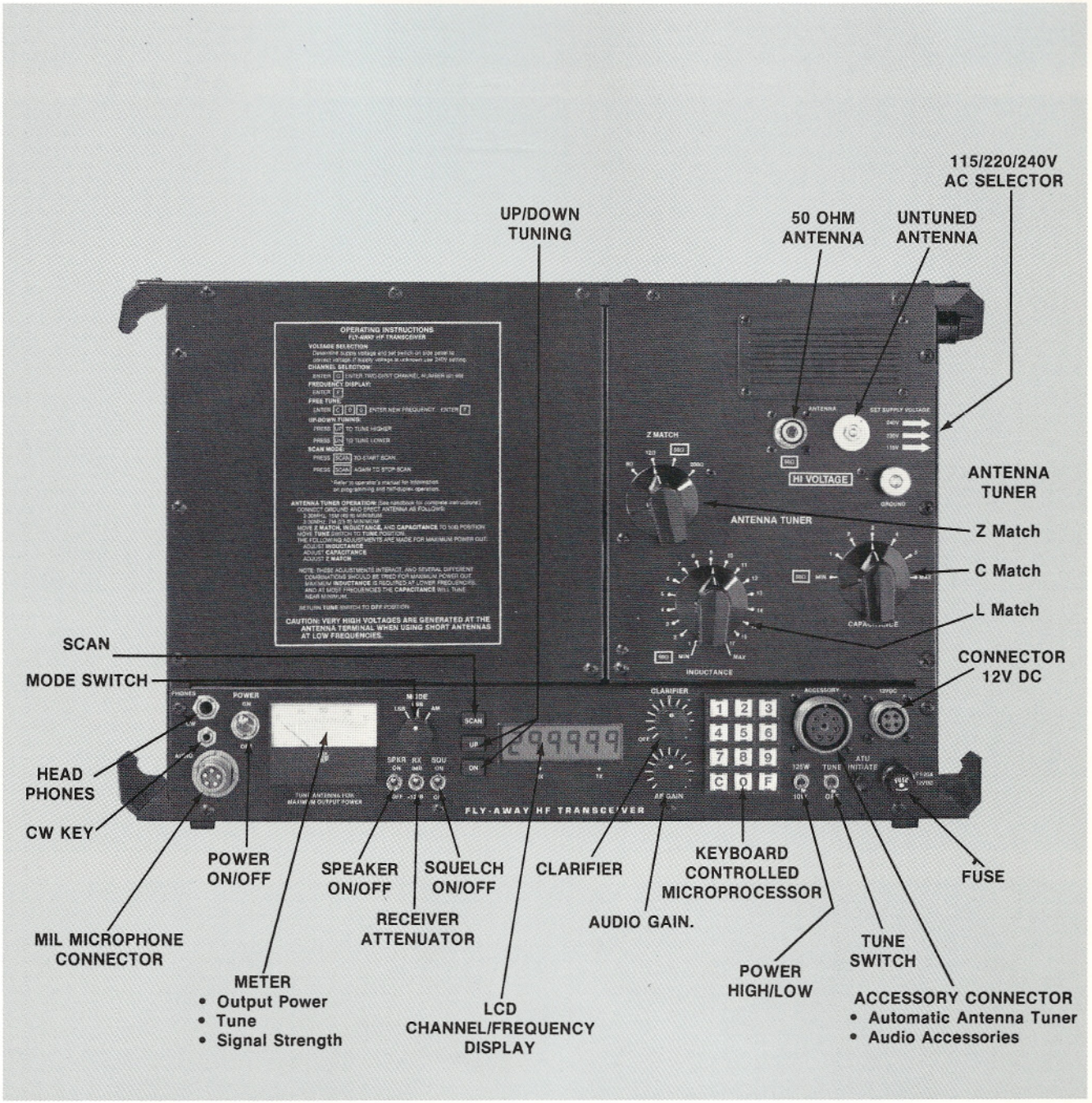
TRANSWORLD TW100F

"FLY-AWAY" 1.6-30MHz SSB TRANSCEIVER

- Self Contained System
- Underseat Fly-Away Package
- Built-in Antenna Coupler
- Internal Shock Mounts
- 1.6-30MHZ, 100Hz Steps
- Direct 115/230 VAC or 12VDC
- Optional Battery Pack
- Microprocessor Controlled
- All Solid State
- Continuous Tuning + 100 Channels
- Simplex/Half-Duplex Operation
- Liquid Crystal Display
- Keypad Entry
- U.S. Design & Manufacture
- F.C.C. Type Accepted**
- 125 Watts PEP Output**
- High Dynamic Range Receiver
- Noise Immune Squelch
- Modular Construction

***Parts 81, 83, 90, 97, 120 Watts*



The TRANSWORLD TW100F is a complete portable 125 Watt HF Transceiver System designed for quick and convenient "Fly-Away" operation. Completely self contained in a rugged aluminum skinned attache-type case, and small enough to meet IATA underseat requirements, the powerful TW100F includes all the accessories necessary to quickly establish long distance HF communications from temporary field locations. Included are: AC and DC Power Cables, Ground Strap, Handset, and two section longwire antenna. The TW100F operates directly from 115/230V 50-400Hz AC or 12VDC power sources.

CHANNELIZED OPERATION (CHANNELS 01-99)

PRESS [C] and CHANNEL NUMBER

example [C] [1] [2]

TO DISPLAY CHANNEL FREQUENCY
PRESS [F] Receive or simplex frequency is then displayed.

PRESS [F] Again or press microphone switch and the transmit frequency is displayed.

(The frequency stays the same on simplex channels.)

OPERATIONAL MODES

The transceiver uses internal switches to select the three operational modes. In addition, the coding circuits may be removed so that the transceiver remains permanently in Mode 2 or Mode 3.

MODE 1 The memory channels and the continuous tune channel may be reprogrammed from the keyboard.

MODE 2 The memory channels cannot be changed. The continuous tune channel operates only in the receive mode.

MODE 3 Only the memory channels operate and the frequency cannot be changed or displayed.

CONTINUOUS TUNE — CHANNEL 00

Channel 00 is the continuous tune channel.

ENTER [C] [0] [0]

The transceiver is ready for the entry of a new frequency.

To enter 8034KHz ENTER [8] [0] [3] [4] [0] [F]

The frequency may be changed again. To change to 11563.8KHz

ENTER [1] [1] [5] [6] [3] [8] [F]

To enter a separate transmit frequency enter [F] again.
The complete keystroke sequency to enter 12.5654MHz receive and 13862.8kHz transmit is:

[1] [2] [5] [6] [5] [4] [F] [F] [1] [3] [8] [6] [2] [8] [F]

The transmit frequency is displayed at the end of the sequence.

If no separate transmit frequency is entered, the microprocessor automatically enters the receiver frequency in the transmit memory.

The last frequency stored in Channel 00 is held in memory until changed by the operator.

MEMORY CHANNELS

A lithium battery with a life of 10 years is used to store all channels in permanent memory when the transceiver is switched off. In Mode 1, the memory channels may be changed from the front panel using a special double keystroke entry designed to prevent accidental erasure of the stored information.

UP DOWN TUNING

The [UP] and [DN] tuning buttons are used for continuous tuning. A single press of the switch moves the frequency in 100Hz steps. Holding the switch down activates the automatic tuning. The tuning steps slowly at first and then moves to higher speed. The tuning buttons do not move the transmitting frequency.

SCANNING

Up to 98 channels may be scanned automatically by pressing the [SCAN] button, this button is a toggle, press once to start the scan and again to stop the scan.

Channel scanning starts at Channel 01 and stops at the channel number designated by special keystroke entry. The channel numbers are displayed as scanned.

TW100PP 13.6V PORTABLE POWER SOURCE

The TW100PP is a self contained portable power source for the TW100F Transceiver providing 24 hours of continuous operation under typical operating conditions. The TW100PP is packaged in a rugged matching aluminum case. Seven 2V 25AH "Gates Cyclon Energy Cells" are used to provide at least 13.6V output until completely discharged. A built-in 115V/220V 50/60Hz battery charger recharges the battery in eight hours and switches to float charge at the completion of the charge cycle. The built-in voltmeter shows the percentage charge as indicated by the open circuit battery voltage. The cells are fully sealed, retain 60% charge to −30° C and have an extended service life.

SPECIFICATIONS

NOMINAL VOLTAGE: 13.6V
MAXIMUM CURRENT: 30A
CAPACITY RATING 20°C: 25AH, 0° C: 90%, −30° C: 60%
METERING: 0-20V 3.5 inch panel meter.
BATTERY CHARGER: 115V/230V AC (switch selectable)
CHARGE TIME: 8-10 hours (fully discharged battery)
SIZE: 7" H, 21" W, 13" D (18 × 53 × 33 cm)
WEIGHT: 42 lbs, 20 Kg

TW100PP Portable Power Source

MICROPROCESSOR CONTROL
A high performance microprocessor is used to control the synthesizer in the TW100F. The inputs from the front panel keypad control the selection of the channel frequencies stored in the memory and permit the entry of new frequencies on the free tuning channel. The microprocessor also controls the large easily read Liquid Crystal Display which can be used to show both channel and frequency information. The use of the microprocessor provides great flexibility of control combined with simple operation and programming.

CIRCUITRY
The TW100F uses all solid state, broadband circuitry which eliminates all field adjustments and tuning. An upconversion design to the first IF at 75MHz, places images and spurious responses in the VHF range, where they are removed by simple low pass filters. The transmitter spectral purity is ensured by six 7-pole elliptical function filters selected by the channel switch. The second IF is at 1650kHz where the main selectivity is provided by high performance 6-pole crystal filters. The receiver uses a high quality packaged diode balanced mixer with an intercept point of +11dBm. This gives the receiver exceptional dynamic range and freedom from intermodulation and overload. The frequency control system is derived from one stable 5120kHz reference oscillator. A 10kHz phase locked loop covers 76.6 to 105MHz for the first conversion oscillator. The second 100Hz phase locked loop controls a TCXO operating at 73.35MHz to provide downconversion to 1650kHz. Direct loops are used giving great spectral purity and a simple easily serviced design.

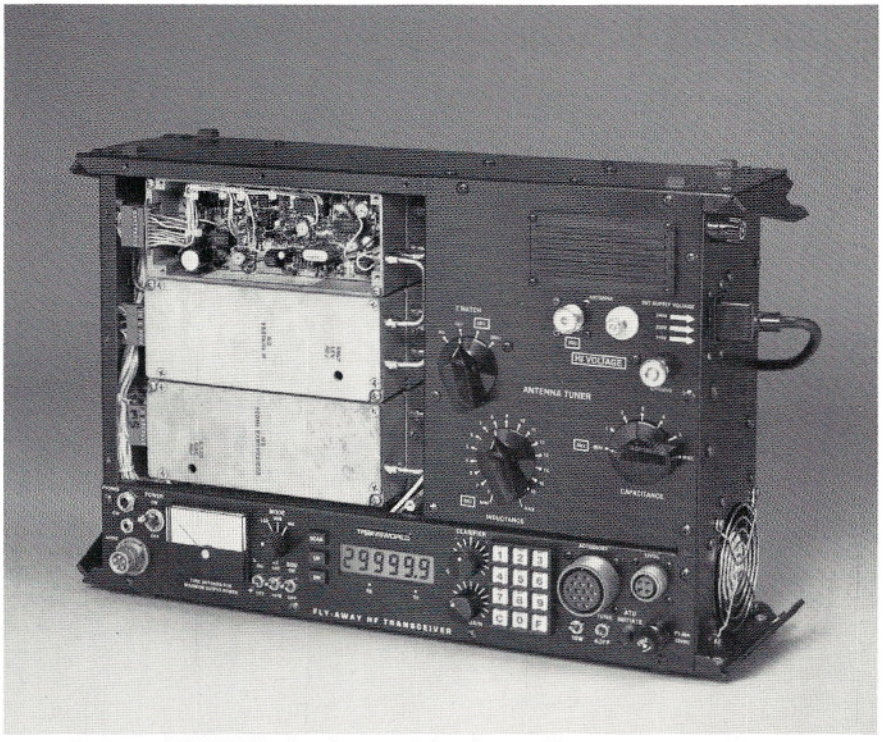
OPERATING MODES
The TW100F Transceiver is supplied for USB and LSB operation in the A3J (SSB), A3H (compatible AM) and A1 (CW) modes. A built-in thermostatically controlled blower gives adequate cooling in these modes. Intermittent "burst" data transmissions are also possible. For continuous FSK transmissions a separate heavy duty power supply is required. The TW100F has demonstrated compatibility with a wide variety of COMSEC equipment designed for HF-SSB (A3J) operation.

CONSTRUCTION
The TW100F is suspended inside its carrying case by a series of shock mounts. This provides exceptional protection from shock, vibration and rough handling. The main circuitry is contained in a series of diecast modules providing RF shielding and environmental protection while permitting easy exchange for field servicing.

ANTENNA TUNER
The transceiver contains an easy to use antenna tuner which will match the output to a wide variety of conventional and field expediant antennas. The simple tuning procedure permits quick and accurate operator tuning, typically in less than 30 seconds. In installations where it is desirable or necessary to remotely locate the antenna, the AT100 or RAT100 Micro-processor-controlled Automatic Antenna Tuners can be utilized. These tuners, which automatically tune a wide variety of antennas in typically one second, can be located up to several hundred feet from the radio. The AT100 is available in a rugged carrying case which matches the TW100F.

AUDIO SYSTEM
The TW100F has two features that add greatly to operating convenience. The receiver audio squelch system is designed to respond to voice signals and eliminates much of the background noise, characteristic of HF operation. The transmitter is equipped with a VOGAD which automatically adjusts the gain of microphone amplifier and provides maximum output power regardless of voice level.

FREQUENCY CALIBRATION
All channel frequencies are derived from a single high stability crystal oscillator. If it is ever necessary to adjust the frequency calibration, a single adjustment will set all channel frequencies. A receiver channel is normally assigned to a standard frequency station such as WWV and provides a positive check of the accuracy of calibration.



Internal view of TW100F showing modules (one with cover removed).

TRANSWORLD™ for communications

TW100F

TECHNICAL SPECIFICATIONS

GENERAL

FREQUENCY RANGE: 1.6-30MHz in 100Hz synthesized steps
FREQUENCY ENTRY: Keypad controlled microprocessor
CHANNELS: 100 simplex and half-duplex
CHANNEL PROGRAMMING: Mode 1 Front Panel, Mode 2/3 Internal
CONTINUOUS ENTRY: Channel 00 by keypad entry. Mode 1: Transmit and Receive. Mode 2: Receive only. Mode 3: Disabled
FREQUENCY DISPLAY: 6 digit by keystroke (locked out in Mode 3)
SCANNING: Automatic 2-98 channels
ANTENNA IMPEDANCE: Built-in Antenna Tuner matches to a wide variety of antennas; 50 ohm output for tuned antennas.
TEMPERATURE RANGE: −30° to + 50° C (built-in thermostatically controlled blower)
FREQUENCY STABILITY: ± 0.0001%, ± 20Hz maximum
OPERATION MODES: A3J (USB/LSB), A1 (CW), F1 (teletype - limited duty cycle*)
SIZE: 7" H × 21" W × 13" D (18 × 53 × 33 cm)
WEIGHT: 31 lbs (14 Kg) complete with accessories.

**Extended F1 operation with external power supply.*

POWER SUPPLY

13.6V DC: Receive 600mA. Transmit 10A Average SSB. Internal AC power supply 100/120/220/240V 50-400Hz on SSB/CW.

TRANSMITTER

POWER OUTPUT: Hi 125W PEP, 100W Average, Low 10W PEP/Average (FCC Type Accepted 120W)
ANTENNA MISMATCH: Protected against mismatch including open and shorted antennas
CARRIER SUPPRESSION: Greater than 50dB
UNWANTED SIDEBAND: −60dB at 1kHz typical
SPURIOUS AND HARMONIC SUPPRESSION: Greater than 63dB (except below 2MHz)
AUDIO INPUT: 150 Ohms, VOGAD for constant audio level, 600 ohms 0dBM
AUDIO BANDWIDTH: 300 to 2700Hz (300 to 3100Hz optional)
INTERMODULATION DISTORTION: −32dB typical
ALC: Less than 1dB increase for 20dB increase in audio input
AUDIO COMPRESSION: No significant distortion +30dB above normal
METERING: Relative RF output (calibrated 100W full scale), VSWR (internal connection)

RECEIVER

SENSITIVITY: 0.4uV for 10dB SINAD (front panel 12dB attenuator)
SELECTIVITY: 300 to 2700Hz −6dB at 5kHz typical (optional 300Hz-3100Hz at −4dB)
IMAGE REJECTION: Greater than 80dB
IF REJECTION: Greater than 80dB
CONDUCTED RADIATION: −85dBM
AGC CHARACTERISTICS: Less than 6dB audio increase from 3uV to 300,000 uV
INTERMODULATION: −85dB (+11dBM intercept point)
CLARIFIER: ± 125Hz minimum
SQUELCH: Audio derived, noise immune
AUDIO OUTPUT: 4W into 3 ohms, internal loudspeaker, separate 600 ohm output
METERING: Relative signal strength

STANDARD ACCESSORIES

Military handset, DC battery cable with clips, ground (earth) strap with clip, wire antenna kit (two sections), AC power cord.

OPTIONAL ACCESSORIES

CW Key, Headset, Hand Microphone, Tape Dipole Antenna, Automatic Antenna Tuner, Rechargeable Battery Pack, TW5250 High Speed Selective Calling

Specifications subject to change without notice.

TRANSWORLD™ for communications

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