



# TRC 9600

## Software programmable VHF/FM ECCM 10 W airborne radio

*Available now.*

- Frequency range: 30 to 88 MHz
- Output power: 10 W, 5 W, 0.5 W
- Power supply: 28 V DC
- Remote operation via RCU or MIL STD 1553-B interface
- Easy to use
- Very high level of ECM and ESM resistance
  - Fast and full band frequency hopping (FFH)
  - Free channel search (FCS)
  - Mixed mode (Automatic choice of FFH or FCS)
  - Built-in TRANSEC/COMSEC for all modes
  - Increased anti-jamming protection in voice with vocoders (up to 70% jammed dwells)
- Interoperability via STANAGs 4204 & 4292, STANAGs 4448 & 4449, STANAGs 4198 & 4479 and X mode crypto interface
- Digital technology, software programmable without opening the radio set
- Traffic types optimized for each application
  - Voice: 4800, 2400, 800 bps vocoding
  - Eurocom 16 kbps CVSD coding, analog.
  - Data: 7 resident modes available
- Wide range of advanced user services
- Part of a complete and multi-role system offering a perfectly-suited answer to the major requirements
  - Combat networks
  - Weapon systems communications with fast TDMA mode
  - Packet data modes for Command and Control (C2) and Situation Awareness (SA) system

*Field proven*



# Digital technology

## A complete VHF tactical radio-communications system

The TRC 9600 is an ECCM VHF airborne transceiver designed to equip the ground forces helicopters and other aircrafts. It consists in:

- TRC 9610 transceiver (fixing ARINC 404, or AER 300),
- TRC 9620 control unit

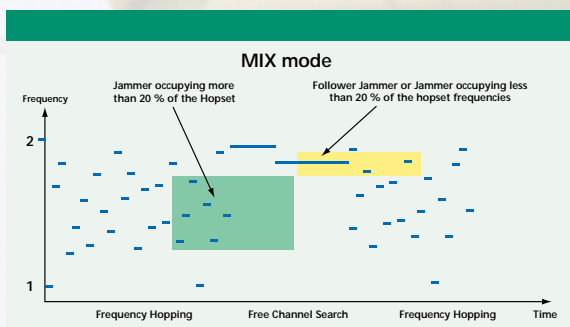
The TRC 9600 is part of a complete family of ECCM VHF radio-communication transceivers, fully interoperable, ranging from a 2 W lightweight TRC 9100 handheld radio to a 10 W airborne radio, and including:

- 5/10 W TRC 9200 manpack/vehicular radio,
- TRC 9300 compact modular vehicular radio,
- TRC 9300 A/B/C vehicular modular radios with single (50 W) or dual fit (5 W + 50 W or 50 W + 50 W) versions for VRC 12 drop-in replacement with direct compatibility with VIC1 or SOTAS intercoms,
- 50 W TRC 9500 integrated vehicular radio.

**At several hundreds hops/s, PR4G is the fastest VHF ECCM hopping radio in service today.**

## A very high level of ECM and ESM resistance

PR4G is the only radio to offer **3 inter-operable ECCM modes**: Fast Frequency Hopping (FFH), Free Channel Search (FCS) and an automatic (FFH/FCS) Mixed mode (MIX). Used in the same net, these 3 ECCM modes constitute **a formidable challenge to EW attacks**.



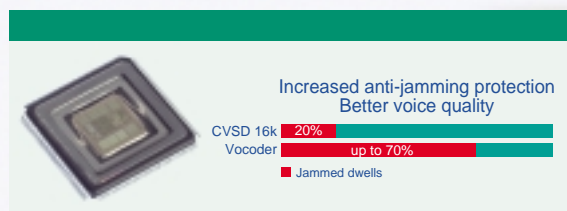
**In Mixed mode, each transceiver automatically selects the mode, FFH or FCS, best-suited to the radio-electric environment.**

All digital voice and data traffic is encrypted with a built-in high security COMSEC device which provides anti-spoofing and anti-intrusion protection

## A wide range of traffic types available

**Unique in the market**, the integrated multi-rate vocoder ASIC (option) allows to offer **3 additional digital voice modes**:

- ACELP 4800 bps for a better quality than usual 16 kb/s CVSD codec,
- LPC 10e 2400 bps (STANAG 4198) to maintain transmission when jamming disables 16 kb/s CVSD
- **800 bps (STANAG 4479) to deliver clear voice with up to 70% of frequencies jammed.**



The PR4G supports various **data transmission modes optimized for each application** and features integrated powerful correction codings.

- 1 - **Point to point oriented data modes** with user data rate from 50 to 4800 bps :
  - Synchronous data interface, 50 to 4800 bps,
  - Asynchronous data interface, 1200 to 9600 bits/s, to be used with COTS software available with Windows™ operating systems
- 2 - **Network oriented packet data modes** through 4800 bps asynchronous interface, using proprietary protocols and user data rate from 50 to 4800 bps :
  - MOP/MOP E packet modes. MOP E uses CSMA and a random scheduler to avoid contention while accessing the channel.
  - Reconfigurable fast TDMA mode (software option) offers a unique feature. It allows, when used for a weapon system communication means, to engage or to report several targets in less than 1/2 second.
  - Mixed voice-data mode is intended for systems where a radio is shared by voice and data traffic (software option)
  - PAS (Packet Access Service) enables to constitute radio-type ECCM Intranet networks with single-station relay function (software option).

**Packet error-free transmission in FFH mode is achieved at lower data rates with up to 70% of hopping band being jammed**

# Software programmable

# Multi-service

## The widest range of advanced user services

To facilitate communications PR4G features advanced and **exclusive** user services

- Automatic net initiation, late net entry and late traffic entry
- Automatic periodic network synchronization
- **Commander break-in facility**
- **Call waiting**
- Simultaneous multiple selective calls
- Alerts broadcast with alert number and sender ID
- Automatic traffic types recognition (voice/data, data rate, service messages)
- **Passive or active link quality analysis** (to provide information on local jamming)
- Correspondent authentication
- OTAR and net member banishment
- Anti-tampering protection
- **Emergency erasure with report message**
- Automatic and multi-mode voice or data rebroadcast
- Orthogonal frequency hopping for relay stations
- Scanning mode of 8 analog fixed frequencies

## PC based management systems

- Frequency and key generation, loading and copying tools
- Software option packages
- Software downloader

## Interoperability

PR4G is compliant with STANAG 4204 (fixed frequency), STANAG 4292 (for hailing from or to fixed frequency - such as PRC 77 - or other ECCM radios) and has an interface compatible with external crypto device (such as KY 57). Thomson-CSF has successfully developed and tested with SINCGARS and SEM 93 half gateways compatible with STANAGs 4448 and 4449 (in analog or digital modes).

## Digital technology and software programmability

The TRC 9600 benefitted recently from a technological upgrade implementing the latest digital technology: flash memory, more memory capacity and faster digital signal processing. Like all PR4G radios and peripherals, it is software programmable by simple downloading from a PC of a new software.

Its MIL STD 1553-B Interface Processor offers furthermore growth potential to implement additional data transmission protocol.

The PR4G allows to offer a perfectly-suited **multi-role system** for: combat net radios, weapon systems with its fast TDMA mode and tactical internet with its packet data modes **thanks to its software programmability**.

Due to the large customer base, software improvements are moreover made regularly to satisfy new or specific requirements (MMI language,...).

Options include tailored encryption solutions to meet national security requirements.

## Very easy implementation

- Automatic initialization of all the set's parameters via data fill gun,
- Basic operation performed from the TRC 9620 control unit is limited to the use of two control knobs,
- Simultaneous operation (in all modes) of several TRC 9600 units installed on the same aircraft due to the built-in agile proximity filters.

The transceiver provides required interfaces to be connected to:

- aircraft intercom system
- tunable antenna and its logic unit or broadband antenna,
- external encryption unit
- aircraft bus with its MIL STD 1553-B Interface Processor



# Multi-role

## TRC 9600 Technical specifications

### General characteristics

Frequency band	30 to 88 MHz, 25 kHz steps, or 2320 channels
STANAG 4204-compliant F3 modulation	
Modes	Analog Fixed Frequency (AFF) Digital Fixed Frequency (DFF) Fast Frequency Hopping (FFH) Free Channel Search (FCS) Mixed mode (MIX)
BIT	Activated at switch on, permanent monitoring, triggered via front panel
Power supply	28 V DC according to Air 2021 E standard
Consumption	TRC 9610 reception $\leq$ 1,5 A transmission $\leq$ 5 A TRC 9620 $\leq$ 1 A
Weight	TRC 9610 $\leq$ 9 kg TRC 9620 $\leq$ 1,7 kg
Dimensions (W x H x D)	TRC 9610 124 x 194 x 341 mm TRC 9620 146 x 76 x 182 mm
Temperature range	Operational from - 40° C to + 65° C (TRC 9610), -25° + 65° C (TRC 9620), MIL STD 810 E
Humidity	93 % at + 40° C, MIL STD 810 E
Watertightness	Immersion-proof under 1m of water, MIL STD 810 E
Mechanical characteristics	Air 7304/MIL STD 810 E
Vibrations	MIL STD 810 E

### Transmission characteristics

RF output power	10 W, 5 W, 0.5 W
Frequency stability	$\pm$ 2 ppm
Harmonic radiation	Protection better than 50 dB
Spurious radiation	Protection better than 80 dB

### Reception characteristics

Sensitivity	(S + N) / N ratio better than 20 dB for a -113 dBm RF signal
AF output power	200 mW/600 $\Omega$
Audio bandwidth	Voice: 300 to 3000 Hz at $\pm$ 2 dB

### ECCM characteristics

Number of sets of memorized keys	14
Number of memorized frequency plans	7
Synchronization	Fully automatic, extremely robust and independent of external TOD with 3 levels: <ul style="list-style-type: none"> <li>- Initial (cold start) synchronization</li> <li>- Push to talk synchronization</li> <li>- Late traffic entry synchronization</li> </ul> Maximum radio silence: unlimited with initial synchro, 48 h with other synchros

### Types of traffic

Voice	Digitized voice, 16 kbps CVSD coding, Eurocom D/I standard. Analog voice. Vocoded voice at 4800 bps, 2400 bps (STANAG 4198) and 800 bps (STANAG 4479)
Data Transmissions	MIL STD 188-114 or CCITT V24/28 computer interface. All modes feature integrated powerful correction codings except 16 kbps synchronous point to point mode. <p><b>Point to point oriented data modes</b> (with user data rate from 50 to 4800 bps)</p> <ul style="list-style-type: none"> <li>- synchronous data from 50 to 4800 bits/s,</li> <li>- asynchronous data from 1200 to 9600 bits/s for use with COTS software</li> </ul> <p><b>Network oriented packet data modes</b> (Through 4800 bps asynchronous interface, using proprietary protocols. User data rate from 50 to 4800 bps)</p> <ul style="list-style-type: none"> <li>- MOP/MOP E packet modes. MOP E uses CSMA and a random scheduler.</li> <li>- Embedded and reconfigurable fast TDMA mode for a weapon system use (software option)</li> <li>- Mixed voice-data mode is intended for systems where a radio is shared by voice and data traffic (software option)</li> <li>- PAS (Packet Access Service) for radio-type ECCM intranet networks (software option)</li> </ul>

**THALES**  
THALES Communications  
Battlespace Radio

66, rue du Fossé Blanc - BP 156 - 92231 Gennevilliers Cedex - FRANCE  
Phone: +33 (0)1 46 13 20 00 - Fax: +33 (0)1 46 13 21 63  
www.thales-communications.com

Digital  
battlefield