M3TR

Multiband
Multimode
Multirole

Tactical Radio

The Software Radio –
secure communication
for the digital battlefield

ROHDE&SCHWARZ

M3TR

M3TR, a software radio system with open architecture, provides a unique approach to joint, combined and coalition operation using line of sight (LOS) and beyond line of sight (BLOS) transmission.

M3TR represents a new generation of affordable, high-performance digital radios, meeting these stringent interoperability needs.

M3TR is designed for use with military and civilian legacy radios / waveforms, and additionally offers advanced data waveform capabilities to ensure the timely dissemination of battlespace C4I, global navigation information and situational awareness mapping.

Latest technology and innovative system architecture of M3TR provide flexible growth capability through preplanned product improvement, (P³I), and enable the customer to benefit from future technologies through the evolutionary acquisition process.

Multiband

For applications making use of various services and networks, different types of radio units were previously required. With just

The frequency flexibility of M3TR meets various national and international regulations, thus providing global operation in changing missions and environments

Multimode

A software radio not only offers flexible network solutions but also integrates existing national or company standards to a single unit. Thanks to optimized protocols and waveforms, M3TR attains highest throughput rates for digital voice, data, video and position location.

MILITARY WAVEFORMS

available or prepared for

- BLOS: ALE to MIL-STD-188-141A+B, AM, FM, SSB, ISB, STANAG 4285, EPM to STANAG 4444, SECOM H
- LOS: HQ I, II, SECOM V, SATURN, SECOS, SATCOM

HIGH DATA RATE WAVEFORMS

- Beyond line of sight (BLOS): MR 3000H up to 9.6 kbps user rate, MIL-STD-188-110 A+B
- Line of sight (LOS), VHF/FM, V/UHF up to 64 kbps, open for future extensions
- Civil waveforms, prepared for: TETRA, ATC HF Datalink, VHF ATC (25/8.3 kHz), VHF AM, VHF/FM public services (12.5/5 kHz)

SECURITY

- Embedded COMSEC
- Compatible with various external COMSEC devices

DIGITAL VOICE

Vocoders adapted to the mode of operation and bandwidth.

HF	30	VHF	300	UHF	3000 MHz

1,5 ... 108 118 137 225 400 MHz

HF/VHF-FM: 1,5...108 MHz ➡ MR3000H

VHF-FM/V/UHF: 25...512 MHz ➡ MR 3000U

two radios (MR3000H, MR3000U), M3TR covers the whole spectrum from shortwave to the UHF band, and thus allows interoperability as well as uniform and reduced inter-service logistics.

Multirole

The multirole features of software radio are mainly determined by its ease of integration into tactical communication networks. In addition to its use as a functional terminal in the respective subnet, eg CNR or PRN, it can also act as an interface between the individual sub-nets. M3TR can be used on diverse platforms and features interfaces to fixed networks such as ISDN, WAN, LAN, as well as intelligent gateway and relay functions, such as autorouting of a selective call for subscribers outside the network.

- CNR – Combat Net Radio
- PRP – Packet Radio Services
- RAP – Radio Access Point
- REN – Relay
- TETRA – Terrestrial Trunked Radio
- GPS: EPM Synchronisation and position location
- Gateway/Interface:
  – to WAN / LAN
  – between HF / VHF / UHF-nets
  – EUROCOM

Key features

- Extended Requency Range
  MR3000H: 1,5 to 108 MHz
  MR3000U: 25 to 512 MHz
  full range covering
- High data rate up to 64 kbit/s for real-time data and video
- Internet / Intranet access via IP-interface (UDP/TCP)
- Software configurable and reprogrammable with Pre Planned Product Improvement (P³I)
- Simultaneous voice and data transmission over one channel

- OTAM: (Over The Air Management: wireless rekeying, zeroing and reprogramming of radios by ciphered transmission and access protection
- Independent selective links in one net with full orthogonality including:
  – Point to Point (two way)
  – Multipoint (two way)
  – Multicast
  – Broadcast
- MULTIHOP Range extension
- Integrated GPS time and position report
- Removable control panel with integrated handset functionality

Logistics and readiness (ARM)

- Minimum volume and weight for drop-in replacement programs
- Highest autonomy by strict power saving management
- Built-in test down to module level with remote diagnostic
- Common logistic concept for reduced life cycle costs

- Common human machine interface
- Reduced training required, assisted by multimedia training material
- Software development according MIL-STD-498
- Excellent flexibility

SECOM: The smart adaptive hopping waveform for LOS and BLOS

The embedded COMSEC/TRANSEC for voice and data provides:
- Fast frequency hopping
- Digital fixed frequency (DFF)
- Free channel search mode

- Mix mode
- Intelligent hopping mode
- Advanced customer-tailored key and frequency management
- Protected synchronization method

5th generation technology
for the digital battlefield

Current modes of operation
and softkey section

Volume control

Mode switch

Rotary switch for fast
access to
preprogrammed
channels/nets

VOL.

RX/TX
RX.
OFF

2   3
1   4
MAN   5
         6
MORE   7
  9   8

TX
FAULT
PLAIN

P/PRC

36[8]E
NET
MET

1
ABC

2
DEF

6
PQR

7
STU

SQL   PWR

Softkeys

User-defined function
keys for fast access to
modes of operation

Menu number and status
display section

Easy-to-read backlit
graphical display

Clear or
discard input

Confirm input

Infrared
data I/O
eg for cloning

Menu navigation

∧ = First or upper
menu (Home)
v = Last menu (End)
< = Previous menu
> = Next menu

Alphanumeric
data-entry keypad

-525 ⊗ MR 3000H

HAIL
26   0,5 W
SQT DAS V/D

CLR
ESC

ENT

3
GHI

4
JKL

5
MNO

8
VWX

9
YZ-

0
*#?

PLN   ADR   MSG

A common digital platform
versatile, affordable, available

ATM

INTERNET
INTRANET

ISDN

RAP Microwave Link

HF-Link

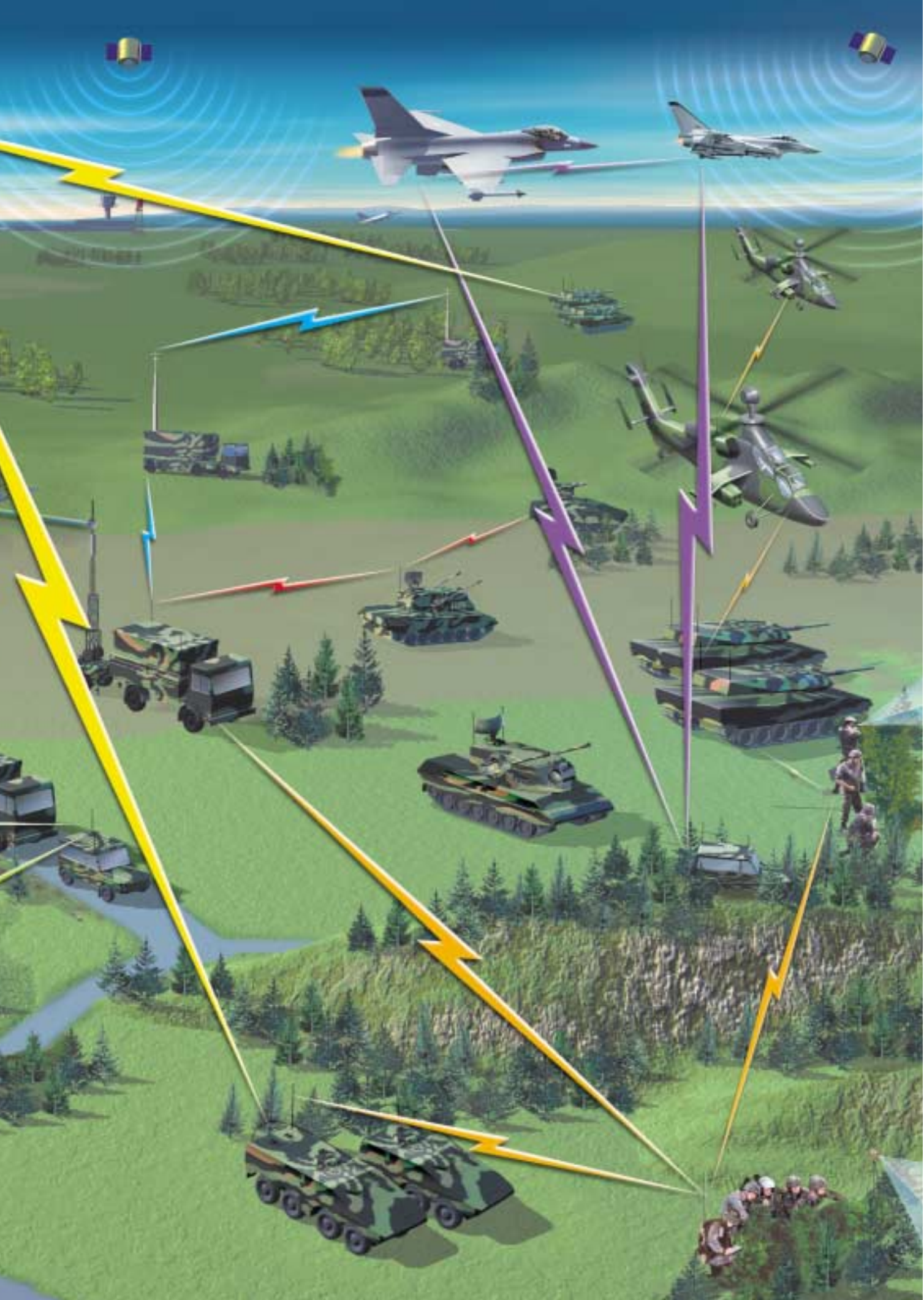**CNR-Net (Combat Net Radio)**

Tetra Access

Monitoring Data

Air Defence

FAC (Forw. Air Control)

Internetworking
Functionality

M3TR is designed to provide exceptional flexibility for networking services, via RF networks on air and into host networks (radio wire integra-tion, RWI).

It offers data routing, switching capability and interfacing to tactical analog and digital networks, LAN and WAN networks, as well as to personal computers and other data terminal equipment.
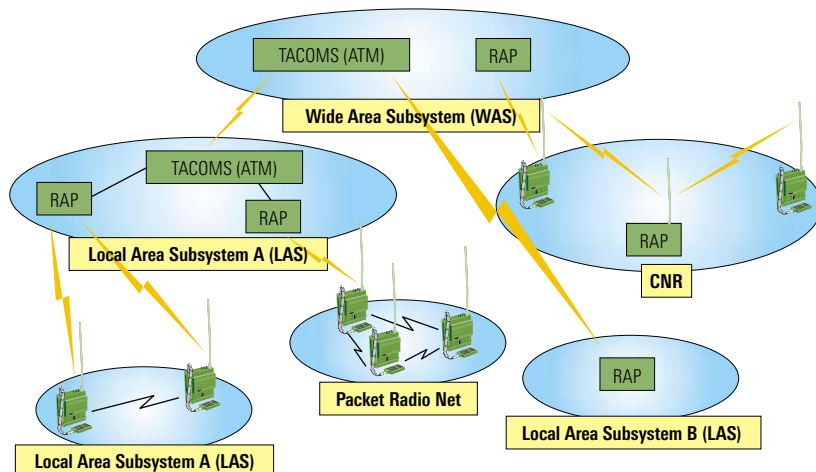The vehicular mount accommodates one or two radio units (jerk and run design) that operate in different networks. Full-duplex and relay functions can thus be implemented.

The vehicular mount includes optional power amplifiers (VHF up to 50 W), co-site filters, and establishes the necessary connections to all submodules. Cabling therefore is not required on the control panels. The integrated remote-control interface allows full remote control, monitoring and servicing of the system.

The LAN interface enables applications such as E-mail, Internet browsing and tactical Internet. Standardized international protocols such as TCP or UDP ensure seamless inter-operability with various platforms, completely independent of manufacturer or operating system.

RAP	Radio Access Point
TETRA	Terrestrial Trunked Radio
REN	Range Extension Node
ATM	Asynchronous Transfer Mode
CNR	Combat Net Radio

TACOMS (ATM)   RAP

Wide Area Subsystem (WAS)

TACOMS (ATM)

RAP   RAP

Local Area Subsystem A (LAS)

RAP

CNR

Packet Radio Net

RAP

Local Area Subsystem B (LAS)

Local Area Subsystem A (LAS)

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