

**A capture and analysis facility to aid effective development and verification of TETRA Terminal protocol**

- **Captures mobile protocol transactions**
- **Provides comprehensive display and analysis facilities**
- **Graphical display of transactions (MSC's)**
- **Decode, view, print and store messages (PDU's)**
- **Ability to enter and decode individual MAC PDU hex strings**
- **Simple to use Windows™ environment**

IFR TETRALOG is an invaluable tool for developers of TETRA Mobiles. Assisting in protocol development it provides a fast, easy means of capturing, evaluating, proving and diagnosing protocol transactions carried out between the mobile and the IFR TETRA Radio Test Set 2968.

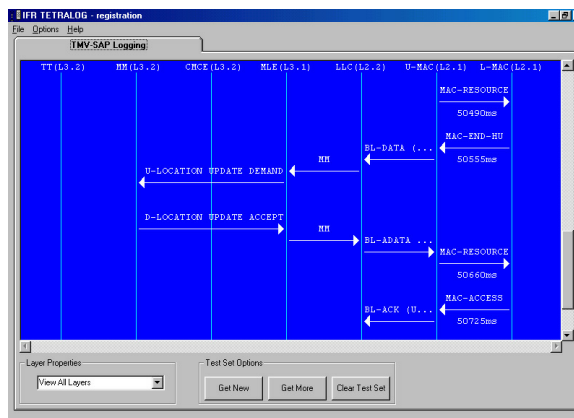
System providers will also find the facilities available useful in evaluating and verifying correct operation of a given radio type to be used on a system.

The PC based application acquires data, analyzes it and displays it graphically in the form of Message Sequence Charts (MSC's). The acquired messages (PDU's) are also fully decoded to produce text files for display, storage or printing.

## TETRALOG

### Capturing and analyzing data

Data capture is straightforward and is performed by simply connecting the mobile to the IFR 2968 via its RF connection and selecting MS test on the 2968. (While in this mode the 2968 will be simulating a TETRA Base Station). The required operations to be logged and analyzed are then



carried out and the data transferred to the PC via the serial port connection on the test set for immediate analysis and display.

### Viewing MSC's and decoded messages

The Message Sequence Chart can display all layers above the TMV-SAP:MM, CMCE, MLE, LLC, U-MAC; alternatively the MSC display can be restricted to higher layers only.

U-MAC messages displayed are labelled with the ETSI EN 300 392-2 PDU name and a relative time stamp or frame numbering information. Timestamp information is displayed in milliseconds and frame numbering information includes Multi-frame number, Frame number and Timeslot number. Messages at other protocol layers are derived from the U-MAC messages. Find facilities are available to assist navigation around detailed MSC's.

U-MAC message sequences can also be displayed on a scaled timeline diagram with selectable resolutions of 5 ms, 50 ms, 500 ms or 5000 ms.

Decoded data (Information Elements) in the messages can be displayed as text, either for single messages or all messages. All CMCE, MM, MLE, LLC and MAC PDU's which are supported by the IFR 2968 are also supported by TETRALOG. All mandatory and optional information elements in the supported PDU's are fully decoded according to ETSI EN 300 392-2 v2.3.2 (March 2001).

```

Message Decoded Elements
-----
msg_type 2 = U-LOCATION UPDATE DEMAND PDU
location update type 0 = U-attach
request append len 0 = No request to append in to registered area
cipher control 0 = Ciphered MFI
optional elements
present:
class of msi:
single/multiple 0 = Single only supported
carrier 0 = Single carrier operation supported
voice calls 1 = supported
encryption 0 = Link-Level Encryption MFI supported
OR data 0 = NO Circuit mode data supported
TMSI packet 0 = data MFI supported
fast switching 0 = MFI supported
DECT encryption 0 = air I/F encryption MFI supported
CLM 0 = channel MFI supported
concurrent 0 = MFI supported
enhanced chan 0 = MFI supported
minimum mode 0 = MFI supported
signalling chan authentication 1 = supported
DE encryption 0 = air I/F encryption MFI supported
TETRA AUI std 1 = ITS 300 392-2 ed 1 ITS 300 392-2 ed 2
reserved element value 0 = not present
group specific info 0 = not present
location area info 0 = not present
address extension 0 = not present
type 0 = MFI supported
len 0 = MFI supported
type 0 = MFI supported
len 0 = MFI supported
length of type data 0 = 0 (empty)
reserved element value 0 = not present
  
```

Decoded data (information Elements)

### Printing and storing facilities

Message Sequence Charts can be selected and printed in their entirety or only the displayed portion selected for print. Decoded data (Information Elements) can be printed either for a single selected message or for all messages within a MSC.

Files can be stored as binary data files or text formatted files containing all of the message decoded data produced by analysis of the data file by the TETRALOG application.

### Entering and decoding individual PDU strings

TETRALOG has a facility allowing the user to enter a single channel decoded TMV-SAP PDU into the IFR TETRALOG application as a string in hexadecimal format.

TETRALOG single TMV-SAP PDU decoding can also be used to decode individual PDUs received from a TETRA BS in BS Test DATA mode and entered manually, or pasted from another Windows™ application.

The decoded data can be viewed and printed in the same way as for charts produced from data acquired directly from a Test Set, but will not contain time stamping or frame numbering data. Single fragments of fragmented PDUs will not be decoded fully.

### Protocol functions supported

Current protocol signaling functions supported are to TETRA MoU Interoperability Profile Version 3 (TIPv3) and include:-

Registration (Location Update, all types)

De-Registration

Individual call

Mobile Originated (MO) and Mobile Terminated (MT)

Simplex and Duplex

Hook Signaling and Direct Set-up

Calling Party SSI (MT)

Modification by Called Party (MT)

Rejection by Called Party (MT)

Transmit Request and Transmission ceased

Cleardown from Mobile or from Test set

Group Attachment

Selected Group

No Group

Multiple Groups

Command registration with Group Report

Group Call

Mobile originated (MO) and Mobile Terminated (MT)

Calling Party SSI (MT)

Transmit Request and Transmission ceased

Cleardown from Mobile or from Test set

Emergency Call

Mobile originated (MO) and Mobile Terminated (MT)

Group and Individual

Simplex and Duplex

Hook Signalling and Direct Set-up

Calling Party SSI (MT)

Transmit Request and Transmission Ceased

Cleardown from Mobile or from Test Set

Telephone Call

Mobile Originated (MO) and Mobile Terminated (MT)

Calling Party SSI and ESN (MT)

Cleardown from Mobile or from Test set

Cell-Reselection <sup>(1)</sup>

Undeclared

Unannounced

Announced Type 3

Announced Type 2

Call Restoration

Neighbour Cell Broadcast

Short Data Service

Mobile Originated (MO) and Mobile Terminated (MT)

SDS Types 1, 2, 3, 4

SDS-TL Text Messages

Status (Acknowledged)

### Multiple users

The analysis facilities can be copied and used on multiple PC's to analyze previously captured data files. However, each supplied application from IFR is only licensed and enabled to initially capture the raw log data from a single identified test set.

### Peripheral requirements

PC minimum requirements - IFR TETRALOG requires a PC running either Windows 95™ Windows 98™ or Windows NT™ or higher. The PC must have a free COM port for connection to the IFR Test Set and a CD-ROM drive.

IFR 2968 TETRA Test Set. (Requires OPT 30 TETRA MOBILE and software version 11.00 or greater installed.)

RS-232 null modem cable. Required for connection between the IFR 2968 Test Set and the PC. This can be supplied as an optional accessory. See under Accessories.

### Future proofing/cost of ownership

IFR continues to evolve the protocol capabilities of the 2968 TETRA Test set in line with the evolving TETRA standards. TETRALOG will be maintained to support new features as they become available on the 2968.

Future upgrades to TETRALOG will be available at no further cost provided that the associated 2968 has the latest software release.

### Ordering information

When ordering please quote the full ordering number information below and also the serial number of the IFR 2968 the application is to be used with.

## Versions and Accessories

When ordering please quote the full ordering number information

### Ordering

#### Numbers

81514	TETRALOG	MS	Protocol	Analyzer
			(Supplied on CD ROM)	

### Optional Accessories:-

46884/650	RS-232 Null modem cable
-----------	-------------------------

### NOTES

(1) Cell re-selection functions require two test sets and a power splitter.



**CHINA**

Tel: [+86] (10) 6467 2823

Fax: [+86] (10) 6467 2821

**EUROPE NORTH**

Tel: [+44] (0) 1438 742200

Fax: [+44] (0) 1438 727601

**EUROPE SOUTH**

Tel: [+44] (0) 1438 742200

Fax: [+44] (0) 1438 727601

**FRANCE**

Tel: [+33] 1 60 79 96 00

Fax: [+33] 1 60 77 69 22

**GERMANY**

Tel: [+49] (8131) 29260

Fax: [+49] (8131) 2926130

**HONG KONG**

Tel: [+852] 2832 7988

Fax: [+852] 2834 5364

**LATIN AMERICA**

Tel: [+1] (972) 899 5150

Fax: [+1] (972) 899 5154

**SCANDINAVIA**

Tel: [+45] 9614 0045

Fax: [+45] 9614 0047

**SPAIN**

Tel: [+34] (91) 640 11 34

Fax: [+34] (91) 640 06 40

**UNITED KINGDOM**

Tel: [+44] (0) 1438 742200

Toll Free: [+44] (0800) 282 388 (UK only)

Fax: [+44] (0) 1438 727601

**USA**

Tel: [+1] (316) 522 4981

Toll Free: [+1] (800) 835 2352 (US only)

Fax: [+1] (316) 522 1360

email ***info@ifrsys.com***

web ***www.ifrsys.com***

As we are always seeking to improve our products, the information in this document gives only a general indication of the product capacity, performance and suitability, none of which shall form part of any contract. We reserve the right to make design changes without notice. All trademarks are acknowledged. Parent company IFR Systems, Inc. © IFR 2001.

Part No. 46891/117

Issue 2

05/2001