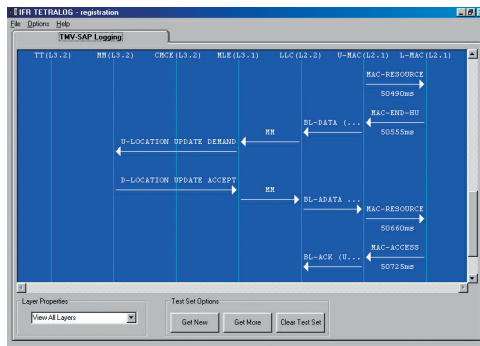


# Wireless

## 81532 TETRALOG MS Protocol Analyzer for 3900

**AEROFLEX**  
A passion for performance.



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

- Base station emulation provides active control of MS
- 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

*TETRALOG is a valuable 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 Aeroflex 3900 Radio Test Set.*

*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 - Active Logging of MS, TMO and DMO Capturing and analyzing data**

Data capture is straightforward and is performed by simply connecting the mobile to the 3900 via its RF connection and selecting MS or DM on the 3900 for logging of trunked mode or direct mode signalling respectively. 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.

### **TETRALOG - Useful Passive Logging of TETRA Base Stations (BS)**

Although primarily targeted at active logging of MS protocol, it is also possible to use TETRALOG in conjunction with a 3900 fitted with BS parametric test option 111 to capture, analyse and decode where possible Base Station signalling in close proximity off-air.

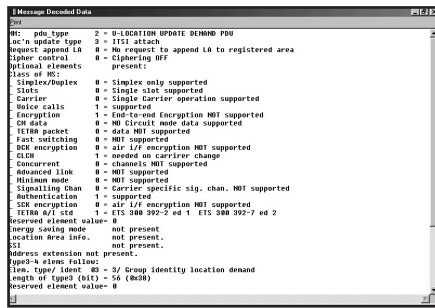
### **Viewing MSC's and decoded messages**

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 3900 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.



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 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

**TMO (MS)** protocol signaling functions supported 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 & 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 signaling 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 (1)

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)

**DMO (DM)** protocol signaling functions supported include:

Call Types

Mobile Originated (MO) and Mobile Terminated (MT):

Group

Open group (Broadcast)

Private

Presence check MO/MT and MT acceptance/rejection

Emergency

Transmit request and transmission end

Explicit/implicit(reservation time) clear down

Inter- MNI for all call types

Short Data Service

Mobile Originated (MO) and Mobile Terminated (MT)

SDS Types 1,2,3, 4 (simple and TL)

Status messages

### 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 Aeroflex is only licensed and enabled to initially capture the raw log data from a single identified test set.

## Peripheral requirements

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

To carry out active logging requires a 3900 Digital Radio Test Set with option 110 TETRA MS for trunked signalling, option 112 TETRA DM for direct mode signalling and option 111 for base station signalling.

A RS-232 null modem cable is required for connection between the 3900 test set and the PC. This can be supplied as an optional accessory. See under Accessories.

## Ordering information

When ordering please quote the full ordering number information below and also the serial number of the 3900 the application is to be used with for testing for testing.

## ***VERSIONS AND ACCESSORIES***

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*When ordering please quote the full ordering number information*

### **Ordering Numbers**

81532            TETRALOG MS Protocol Analyzer  
(Supplied on CD ROM)

### **Optional Accessories:**

46884/650      RS-232 Null modem cable

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## **NOTES**

- (1) Cell re-selection functions require two test sets and a power splitter.
- (2) 81532 can also be utilized with an IFR 2968 TETRA Radio Test Set (if licensed) but the functionality will be restricted to that detailed in the 81514 data sheet. Note that the 2968 also requires option 30.

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