

## Frame/Signalling Analyzer

The PA-41 Frame/Signalling Analyzer is a field service instrument designed for commissioning, maintenance and trouble-shooting 2Mbit/s circuits. It is a combined frame and signalling analyzer and has two receivers allowing both directions of a 2 Mbit/s circuit to be monitored simultaneously. The instrument also has one transmitter for frame generation.

### PA-41 offers a wide range of applications, including

- Framed monitoring in both directions simultaneously
- Framed end-to-end testing
- Drop and insert testing
- Multiplexer/Demultiplexer testing
- Digital Cross Connect testing
- Automatic Protection Switch testing
- Unframed end-to-end testing
- Clock slips measurements
- Round trip delay measurements

The PA-41 provides a versatile, future-proofed test platform which can easily be enhanced with future test functions by the use of software options.

Field upgrade packages allow the user to upgrade the PA-41 base software functions without the need to send the instrument to a service center.

### PA-41 software options include:

- Channel Associated Signalling simulation and analysis (MFC R2, DTMF, DECADEIC)
- Signalling System No. 7 protocol analysis (TUP, ISUP and national variants)
- ISDN-PRI D-CHANNEL protocol analysis (7 variants)
- DASS/DPNSS signalling analysis
- M.2100 (BER) analysis
- ETSI V5.1/V5.2 analysis

### PC cards

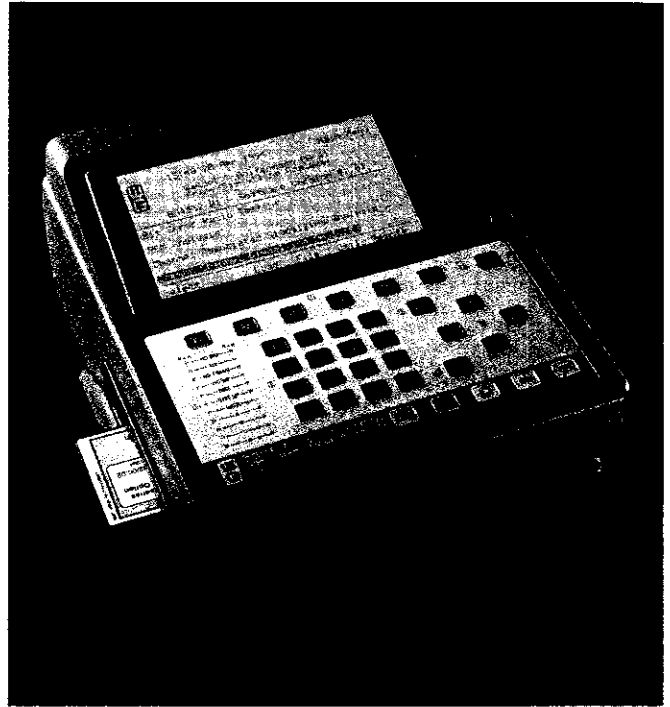
PC cards can be inserted into the PA-41. The RAM card provides the capability to store test results for further analysis on a PC or on another PA-41. Instrument set-ups can also be stored.

The ROM card provides the capability to load option software into the PA-41. This provides flexibility, enabling extra applications, features and upgrades to be added in the future.

PC card files may be copied to/from a PC or another PA-41 using the PC Link utility software and serial cable.

### Remote Operation

Complete remote operation of the PA-41 is possible via the V.24 interface. Additionally, a delayed start and test duration can be set-up using the programmable timer.



### WG TSM-10 Remote Operation Software

TSM-10 software provides remote operation of test equipment through a visual faceplate representation of the selected remote test unit (RTU). More than one RTU of the same type can be operated with a single version of TSM-10 using multiple windows. For more information, please refer to WG TSM family.

### WG TSM-15 Test Set Manager Software

TSM-15 is a full remote test system manager. Multiple test sessions can be controlled by TSM-15 over remote links. For more information, please refer to WG TSM family.



### Level and Frequency Measurements

Coding law ..... A-law to CCITT Rec. G.711  
Level measurements ..... - 80 dBm0 to + 5 dBm0  
Frequency measurements ..... 0.1 kHz to 3.99 kHz

### Clock difference measurements

Line rate resolution ..... 1 bit/s  
Line rate difference resolution ..... 0.125 bit/s  
Bar graphs ..... 0 to 8 UI  
Count of ..... bit slips, frame slips

### Round trip delay

Delay measurement resolution ..... 1 µs  
Max. delay measurements ..... 10 s

### Error and Alarm Indication

Audio and separate LED indication of the following alarms and errors for both receivers:  
- No signal, AIS, Frame Sync loss, MF Sync loss, Distant Alarm, Distant MF alarm  
Two LED's, one for each receiver, are programmable for the following alarms and errors:  
- FAS errors, Code errors, CRC errors, All ones, All zeros, Sync loss, Slips, Byte Sync loss  
Four separate LED's, one for each abcd bit, are provided for each receiver.

### Printer and Remote Control

Interface ..... V.24 9-pin DTE  
Clock rates ..... 300, 600, 1200, 2400  
4800, 9600, 19200 baud  
Code ..... CCITT 5 (ASCII)  
Bits per character ..... 7 or 8  
Flow control ..... none, CTS, XON/XOFF, slow (8 char/sec)  
Parity ..... 7 bits per char: none, odd, even, mark or space  
8 bits per char: none, odd or even

### Front Panel

Display ..... 42 char. x 16 line 'black on white' LCD  
with backlight  
Keyboard ..... Hex, keypad, 4 cursor keys, 6 softkeys  
backlight, PRINT, security, MAIN MENU, EXIT  
ON and OFF keys  
Contrast ..... 2 dedicated keys

### BERT Stores/Memory

10 test results stores each containing numeric results and histograms.  
Histogram storage capacity ..... 60 days with 1 hour resolution, or 60 hours with 1 minute resolution  
10 configuration stores each containing instrument set-up configurations

### RAM/ROM Card Interface

RAM or ROM cards conforming to JEIDA version 4.0 and above can be inserted into the PA-41. The RAM card provides the capability to store test results. The ROM card provides the capability to load application software into the PA-41.

### PC Link

The PA-41 may be connected to a PC using the serial port for file transfer to/from the PC.

### General Specifications

Power Supply  
Batteries, rechargeable (fitted) ..... 6 x Ni-Cd, C-size cell  
Operating Time (using fully charged batteries) ..... 5 hrs approx. (in Monitor mode)  
2 hrs approx. (in BERT mode)  
Charging time ..... 14 hrs approx. (instrument off)  
Battery Low ..... warning before auto switch-off  
Auto switch-off ..... 4 minutes after last action  
(not if test running or LNT-6 connected) or battery very low  
External supply ..... from LNT-6  
Temperature range ..... Operating: 0 to + 50 °C  
Storage: - 20 to + 60 °C

### Languages

Either ..... English, German, French, Italian  
or ..... English, German, French, Spanish

### Dimensions

(height x depth x width) ..... 115 x 245 x 206 mm

Weight ..... 3 kg approx.

### Ordering information

#### PA-41 Frame/Signalling Analyzer <sup>1) 2)</sup>

BN 4532/15

#### Equipment Case

BN 4527/00.02

with cut-out for PA-41, LNT-6 and telephone handset

#### Accessories (available at extra cost)

Printer Cable

K 1524

RAM card 512 k

BN 4532/00.21

RAM card 1 MB

BN 4532/00.22

Telephone Handset

BN 4527/00.03

Equipment Case

BN 4527/00.01

with cut-out for PA-41, LNT-6, telephone handset, printer and A.C. mains charger

1) complete with a. c. adaptor/charger LNT-6 and shoulder strap.

Please specify the required mains type plug when ordering:

European type plug

BN 4529/00.01

UK type plug

BN 4529/00.02

US type plug

BN 4529/00.03

Australian type plug

BN 4529/00.04

2) Fitted with the Versacon 9 basic connector and BNC insert. If other types of insert are required - see Versacon 9 specification sheet - specify when placing your main order.

## Further options for the PA-41 Frame/Signalling Analyzer

### **SS7 (Australian Telephone User Part – ATUP) Analysis**

provides signalling analysis and decoding to level 4 of the Australian variant of the signalling system number 7 telephone user part (TUP). This option provides call tracing on the called party telephone number and access to the signalling network over the 2 Mbit/s G.703 and 64 kbit/s interfaces.

### **SS7 (Chinese Telephone User Part – CTUP) Analysis**

provides signalling analysis and decoding to level 4 of the Chinese variant of the signalling system number 7 telephone user part (TUP). This option includes decoding of the network management and test messages as well as call tracing.

### **SS7 ISDN User Part (ISUP) analysis (ITU-T Blue Book)**

provides signalling analysis and decoding to level 4 of the SS7 ISDN user part according to the ITU-T Blue Book. This option offers mass storage of recorded data direct to the PCMCIA card offering up to 8 MB of storage.

### **MFC-R2 Simulation & Analysis**

provides monitoring and call simulation using MFC-R2 signalling. A survey mode allows the line status of all 30 telephone channels to be displayed simultaneously and a scan mode automatically searches for and records an active call. Provides call state decoding.

### **ISDN D Channel PRA Analysis to level 3**

providing monitoring and analysis of the ISDN D-channel to level 3. This option offers mass storage of recorded data direct to the PCMCIA card offering up to 8 MB of storage. On-line trigger and filter features are provided together with X.25 packet type and TEI management message decoding.

### **M.2100**

provides Bit Error Ratio testing (BERT) and link performance analysis to ITU-T M.2100. Testing on 2 Mbit/s and  $n \times 64$  kbit/s as per M.2110. Comprehensive set of alarm and error parameters are monitored and results displayed in numerical or histogram format.

### **DASS2 (BTNR 190) Analysis to level 3**

provides monitoring and display of DASS2 (Digital Access Signalling System) messages to level 3. On-line triggering and compelled filter reduce clutter in the data buffer. Off-line find and filter functions assist analysis.

### **DPNSS (BTNR 188) Analysis to level 3**

provides monitoring and display of DPNSS (Digital Private Network Signalling System number 1) messages to level 3. On-line triggering and compelled filter reduce clutter in the data buffer. Off-line find and filter functions assist analysis.

### **MFC-R2 (Generic) Simulation and Analysis**

The MFC-R2 (Generic) signalling analysis option for the PA-41 provides a high level of decode and fault finding functionality. It is for testing when installing and commissioning networks or fault finding on live networks. It is ideal for MFC-R2 signalling in which the line signalling conforms to ITU-T recommendations and the register signalling conforms to a national specification.

### **ETSI V5.1/V5.2 Analysis**

The PA-41 provides a convenient means of fault finding and commissioning V5 equipment. The PA-41 ETSI V5.1/V5.2 analysis package complements other Wavetek Wandel Goltermann test products to provide a complete family of test equipment to cover

a wide range of telecom testing requirements. PA-41 offers mass storage of V5 frames with frame acquisition filtering and triggering features to minimise the amount of unwanted data being recorded in the buffer. V5 call progress can be monitored on-line and detailed analysis of signalling messages may be made off-line using the powerful buffer search and filter facilities. Selected ranges of messages can be stored for later analysis.

The instrument may be connected to a V5 data link with both the forward and backward signal paths being monitored at the same time. Provision is made for access at the 2.048 Mbit/s interfaces with user selectable 64kbit/s timeslots.

### **Channel Associated Signalling (CAS) simulation & analysis**

provides both monitoring of DECADIC and DTMF dialling and telephone call simulation. ABCD line states and higher level call states information is recorded and decoded. Up to 1024 signalling states can be stored in a circular buffer. On-line trigger and filter options are also offered.