

# Wireless

## 2944B Communications Service Monitor

**AEROFLEX**  
A passion for performance.



A new, cost effective RF testing tool for the RF professional who demands more from a communications service monitor

- Proven performance backed by IFR's long history of RF test excellence
- Full span spectrum analyzer with tracking generator and offset tracking
- Fast Auto-tune to transmit signal
- 0.5 ppm TCXO standard
- Duplex RF output levels down to -141 dBm
- SSB phase noise better than -95 dBc/Hz
- Color transfective superfast LCD with rapid refresh rate for easy monitoring and real time adjustment
- Narrow and broad band power meters
- Full function audio analysis tools
  - Audio bar charts
  - Audio voltmeters
  - Audio S/N meters
  - Audio distortion meters
  - Audio frequency meters
- Rugged lightweight package
- Accurate power measurements to 150 W
- 5 W protection on all RF ports standard

*The 2944B Communications Service Monitor is the lightest, most rugged service monitor available with a full performance spectrum analyzer as standard. For field work the 2944B provides an excellent combination of instruments for all types of maintenance work. In the workshop, it provides all of the performance you would expect for exacting measurements.*

### Full Featured, High Accuracy, Low Cost

Designed for the wireless communications professional, the 2944B, shown with optional bail arm, includes high powered accuracy and features at a very affordable cost. RF professionals involved in day-to-day AM/FM measurements can use the 2944B to perform all of their transmitter and mobile unit measurements without having to pay for "extras" that add cost to other service monitors.

### Field Operation

At under 12 kg (25 lbs.), the 2944B is the lightest RF Communications Service Monitor on the market. Using the proven Aeroflex look and feel of the 2945A series, the 2944B is ideal for carrying. The side handle ensures that the instrument is clear of stairs when ascending buildings and the depth is suitable for the 2944B to be operated comfortably when it is placed on the floor.

A large color transfective (improved sunlight readable) display aids operation under harsh viewing conditions.

With the optional bail arm, the 2944B allows a stowage cover to be fitted over the front panel for storage of adapters and further protection to the instrument's front panel. A selection of cases are available including a hard transit case, standard soft carrying case or an integrated soft carrying/optional case allowing full operation without removal from the protective case.

### Internal Battery

Utilizing NiMH technology the internal battery option provides 60 minutes operation in the field.

Compact and light the 2944B is equally at home in the field as on a bench.

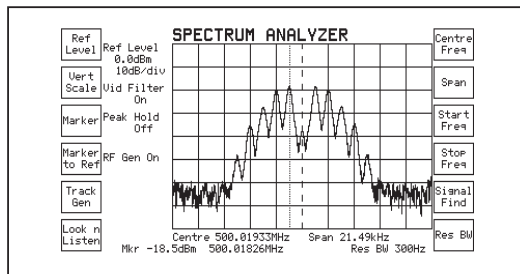
For the very latest specifications visit [www.aeroflex.com](http://www.aeroflex.com)

## Fast Warm Up - Fast Results

The standard TCXO allows results to be made reliably within a minute of switch on. Where even better stability is required, an optional OCXO is available. Stored settings may be recalled from internal memory allowing fast and straightforward setup.

## Fast Full Performance Spectrum Analyzer - Provided as Standard

The spectrum analyzer provides spans from 100 Hz per division to full span and has a fully adjustable reference level. Speed is comparable to analog analyzers, allowing real time adjustments over the displayed dynamic range. With the tracking generator provided as standard, duplexers and filters can be aligned quickly and easily. An offset facility provides testing of equipment with frequency translation. Channel stepping can be performed by defining an increment and then using the FREQ  $\uparrow\downarrow$  keys. This is particularly useful when testing multi-channel systems.



*High performance spectrum analyzer provided as a standard feature*

## From 2 $\mu$ W to 150 W

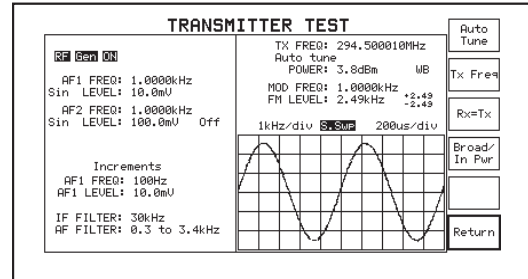
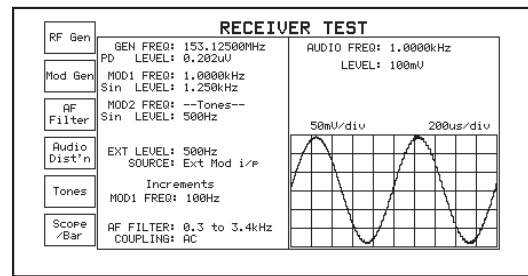
The 2944B will measure the power of low level signals such as those encountered when monitoring off-air signals or those found when probing a circuit. 150 W measurement is provided without the need for external attenuators, so high power base stations can be measured directly. Measurement accuracy of better than 10% is guaranteed all the way down to 5 mW on the N-Type connector, allowing radios to be qualified at low power levels.

## Accurate RF Signals

The signal generator provides coverage from 400 kHz to 1.05 GHz with +5 dBm output (+7 dBm overrange) and fast switching speed. Level accuracy is  $\pm 2$  dB at all levels above -127 dBm.

## Duplex - Provided as Standard

Full duplex operation is provided by the 2944B allowing testing of duplex radios as well as simultaneous testing of repeater transmit and receive paths. There are no restrictions to the duplex offset.



*2944B provides full duplex capability*

## Remote Control - RS-232 or GPIB

Remote control is provided with an RS-232 interface as standard. An IEEE-488.2 interface (OPT5) can be fitted where other instruments are required to operate in a system with the 2944B.

## Printing Made Easy

With the parallel printer port interface (OPT4), screen dumps, automatic test results or previously stored results may be sent to any parallel printer. These facilities are available as standard using the serial RS-232 interface. A screen capture facility is available so any screen displayed can be saved direct to a PC, via the serial port, as a bitmap file.

A single trace dump command allows fast transfer of the spectrum analyzer, OBW or transient analysis trace to be transferred as 249 ordinate values for detailed post-processing and analysis.

## Audio Analysis

Full featured audio analysis tools include; audio bar charts, audio voltmeter, audio S/N meter, audio distortion meter and audio frequency meter. A comprehensive range of filters is provided as standard, including band pass, low pass and high pass. The direct measurement of CTCSS is possible with the 300 Hz LP filter, even with speech present. Two full range audio generators are provided as standard for internal modulation or audio sources.

## Comprehensive Oscilloscope

Analysis of audio signals, whether from the demodulated signal or the audio input direct, can be viewed for further inspection. The oscilloscope can either be combined with the measurement screen in the Tx, Rx or AF test modes or 'zoomed' to a full screen display. Different levels of persistence can be selected to allow short or long term effects to be captured.

## Tones Generation and Decoding

The tones menus now include full remote control so that radio workshops can further automate their tasks. These and other improvements are in response to user feedback and allow better control of the tones from the top level screens.

# SPECIFICATION

## GENERAL INFORMATION

Certain characteristics are shown as typical. These provide additional information for applying the instrument, but are unwarranted.

## RF SIGNAL GENERATOR

### FREQUENCY

#### Frequency Range

400 kHz to 1.05 GHz

#### Resolution

10 Hz

#### Indication

10 digit display

#### Setting

Keyboard entry, delta increment/decrement function and rotary control

#### Accuracy

As frequency standard

### OUTPUT LEVEL

#### Output Level Range

N-Type socket: -141 to -21 dBm

BNC socket: -115 to +5 dBm (overrange to +7 dBm)

#### Resolution

0.1 dB

#### Indication

4 digits plus sign (dBm, dBμV, μV, mV PD/EMF)

#### Accuracy

±2 dB for levels above -127 dBm on N-Type socket up to 1 GHz

#### Atten Hold Facility (CW and FM modes)

Allows user to define start point for seamless generator operation across a range of up to 20 dB (guaranteed 10 dB minimum)

#### Reverse Power Protection

N-Type: 50 W for 10 minutes, normal operation

150 W for 1 minute at 20°C

Overload indicated by audible and visual warning

BNC: 5 W Overload indicated by audible and visual warning

#### Output Impedance

Nominally 50 Ω

### VSWR

#### N-Type

Better than 1.2:1 up to 500 MHz

Better than 1.35:1 up to 1.05 GHz

#### BNC

Better than 2.2:1 up to 1.05 GHz

### SPECTRAL PURITY

(If you require even better spectral purity than that specified here, please consider the 2948B)

### Residual FM

<15 Hz RMS (0.3 to 3.4 kHz) up to 500 MHz

<20 Hz RMS (0.3 to 3.4 kHz) up to 1.0 GHz (with OCXO)

### Harmonics

Better than -20 dBc

### Spurious Signals

Better than -30 dBc (±10 kHz to 1.5 MHz offset from carrier frequency or over range 600 to 700 MHz)

Better than -40 dBc from 400 kHz to 1 GHz

### SSB Phase Noise (20 kHz offset)

Better than -95 dBc/Hz up to 1 GHz

### RF Carrier Leakage

Less than 0.5 μV Potential Difference generated in a 50 Ω load by a 2 turn loop 25 mm from the case. Output level less than -40 dBm into a sealed 50 Ω load.

## AMPLITUDE MODULATION - INTERNAL

### Frequency Range

400 kHz to 1.05 GHz

### AM Depth Range

0 to 99%

### Resolution

1%

### Indication

2 digits

### Setting

Keyboard entry, delta increment/decrement function and rotary control

### Accuracy

For carrier frequencies from 1.5 MHz to 400 MHz

±7% ±1 digit for modulation frequency of 1 kHz

±10% ±1 digit for modulation frequencies from 50 Hz to 5 kHz

±15% ±1 digit for modulation frequencies from 50 Hz to 15 kHz

### Distortion

Less than 2% at 1 kHz for 30% AM, CCITT weighted

### Modulation Frequency

5 Hz to 33 kHz

## AMPLITUDE MODULATION - EXTERNAL

### Input Impedance

Nominally 10 kΩ in parallel with 40 pF

### Frequency Range

As internal AM

### Modulation Frequency Range

As internal AM

### Sensitivity

1 V RMS for 0 to 100% AM

## FREQUENCY MODULATION - INTERNAL

### Frequency Range

400 kHz to 1.05 GHz

**Maximum Deviation**

0 to 75 kHz

**Indication**

3 digits

**Setting**

Keyboard entry, delta increment/decrement function and rotary control

**Accuracy**<sup>(1)</sup>

±5% ± 10 Hz at 1 kHz modulating frequency

±10% at modulating frequencies from 50 Hz to 15 kHz

**Distortion**

<1% at 1 kHz for deviation of 5 kHz, CCITT weighted

**Modulation Frequency Range**

5 Hz to 33 kHz

**Resolution**

25 Hz

**Pre-emphasis**

750 μs selectable

**FREQUENCY MODULATION - EXTERNAL****Input Impedance**

Nominally 10 kΩ in parallel with 40 pF

**Frequency Range**

As internal FM

**Modulation Frequency Range**

DC to 100 kHz

**Pre-emphasis**

750 μs selectable

**Sensitivity**

1 Volt RMS for 0 to 75 kHz deviation

**MICROPHONE INPUT****Input Level**

2 mV to 200 mV (AGC levelled)

**Input Impedance**

Nominally 150 Ω

**Press To Talk (PTT)**

When using the optional microphone in Tx Test mode, the PTT will switch instrument to Rx Test.

**AUDIO VOLTMETER**

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**Input Impedance**

Nominally 1 MΩ in parallel with 40 pF

**Frequency Range**

DC and 50 Hz to 50 kHz

AC only 50 Hz to 50 kHz

Polarized DC (below 1 Hz)

**Level Ranges**

0 to 100 mV to 0 to 30 V RMS in a 1, 3, 10 sequence

Digital readout also in mW, dBm, dBv, dBr (user selectable)

External load R selectable compensation for 4, 8, 16, 75, 100, 150, 300, 600, Ohms

Peak hold facility

**Resolution**

1 mV or 1% of reading

**Indication**

3 digits and bar-chart

**Accuracy**

±3% ±3 mV ±1 digit

**AUDIO FREQUENCY METER**

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**Frequency Range**

20 Hz to 20 kHz

**Resolution**

0.1 Hz at <10 kHz

1 Hz at 10 kHz and above

**Indication**

5 digits

**Accuracy**

As frequency standard ±1 digit ± resolution

**Sensitivity**

50 mV

**AUDIO SINAD METER**

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**Frequency**

1 kHz

**Range**

0 to 18 dB and 0 to 50 dB

**Resolution**

0.1 dB

**Indication**

3 digits and bar-charts

**Accuracy**

±1 dB

**Sensitivity**

50 mV (100 mV for 40 dB SINAD) reading suppressed if audio voltage is <5 mV

**AUDIO DISTORTION METER**

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**Frequency**

1 kHz

**Range**

0 to 10%, 0 to 30% and 0 to 100%

**Resolution**

0.1% distortion

### Indication

3 digits and bar-charts

### Accuracy

±5% of reading ±0.5% distortion

### Sensitivity

50 mV (100 mV for 1% distortion) reading suppressed if audio voltage is <5 mV

## AUDIO S/N METER

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### Range

0 to 30 dB and 0 to 100 dB

### Resolution

0.1 dB

### Indication

3 digits and bar-chart

### Accuracy

±1 dB

### Sensitivity

50 mV (100 mV for 40 dB S/N) reading suppressed if audio voltage is <5 mV

## AUDIO OSCILLOSCOPE

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### Operating Modes

Single with digital storage on screen or repetitive sweep

### Frequency Range

DC to 50 kHz, 3 Hz to 50 kHz AC coupled

### Voltage Range

10 mV to 20 V per division in a 1, 2, 5 sequence

### Voltage Accuracy

±5% of full scale

### FM Ranges

±75, 30, 15, 6, 3 and 1.5 kHz deviation full scale, ±10% accuracy

### AM Ranges

20, 10 and 5% per division, ±10% accuracy

### Timebase

50 μs/div to 5 s/div in a 1, 2, 5 sequence

### Graticule

10 Horizontal by 6 Vertical divisions

### Special Features

Built in anti-aliasing circuitry and variable decode trigger level

## AUDIO BAR-CHARTS

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### Bar-chart Displays

AF Voltage, SINAD, Distortion, S/N

### Vertical Resolution

2% of full scale

### Ranging

Auto-ranging, range hold or manual selection

1, 2, 5, sequence with hysteresis

### Audio and Modulation Filters

Lowpass filters

Four independently configurable lowpass filters LP1, LP2, LP3, LP4 that can be set to any frequency cut off point from 250 Hz to 20000 Hz (excluding the band 1001 Hz to 2999 Hz)

50 kHz Lowpass (no filters applied)

750 μs de-emphasis

Highpass filters

50 Hz Highpass, 300 Hz Highpass

Bandpass filters

Any combination of LP1, LP2, LP3, LP4 and the highpass filters

### Audio Analyzer General Features

Tones Mode

## RF FREQUENCY METER

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### Frequency Range

100 kHz to 1.05 GHz (manual tune)

10 MHz to 1 GHz (auto-tune)

### Resolution

1 Hz or 10 Hz, up to 1050 MHz, selectable

0.1 Hz, 1 Hz or 10 Hz up to 999 MHz, selectable

### Indication

Up to 10 digits

### Accuracy

As frequency standard ± resolution

### Acquisition Time

<1 second (manual tune)

Typically 3 seconds (auto-tune)

### Sensitivity

Auto-tuned: 5 mW (N-Type)  
0.05 mW (Antenna port)

Manual Tuned: -34 dBm (N-Type)  
-60 dBm (Antenna port)

Auto or manual control of input attenuator

### VSWR

N-Type: Better than 1.2:1 up to 500 MHz  
Better than 1.25:1 up to 1.05 GHz

BNC: Better than 3:1 up to 1.05 GHz

## RF POWER METER (BROADBAND)

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### Frequency Range

200 kHz to 1.05 GHz

### Dynamic Range

5 mW to 150 W (N-Type)

0.05 to 250 mW (Antenna port)

### Indication Units

W, dBm or dBW

### Indication

3 digits or bar-chart

### Resolution

0.1 dB maximum, typically 1%

### Accuracy (N-Type)

$\pm 10\% \pm$  resolution up to 1 GHz (FM & CW)

### Maximum Continuous Rating

N-Type: 50 W at 20°C

Antenna port: 1 W

### Intermittent Rating

N-Type: 150 W for limited periods, typically 1 minute at 20°C

Overload indicated by audible and visual warning

## MODULATION METER

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### Sensitivity

Auto-tuned: 5 mW (N-Type)  
0.05 mW (Antenna port)

Manual Tuned: -34 dBm (N-Type)  
-60 dBm (Antenna port)

Auto or manual control of input attenuator

### Audio & Modulation Filters

Lowpass filters

Four independently configurable Low pass filters LP1, LP2, LP3, LP4 that can be set to any frequency cut off point from 250 Hz to 20000 Hz (excluding the band 1001 Hz to 2999 Hz)

A 50 kHz Lowpass (no filters applied)

750  $\mu$ s de-emphasis

Highpass filters

50 Hz Highpass, 300 Hz Highpass

Bandpass filter

Any combination of LP1, LP2, LP3, LP4 and the Highpass filters

## AMPLITUDE MODULATION

### Frequency Range

100 kHz to 1.05 GHz

### Modulation Frequency Range

10 Hz to 15 kHz

### AM Depth Range

0 to 99% (manually tuned)

0 to 90% below 100 MHz

0 to 80%, 100 to 400 MHz

Peak hold facility

### Resolution

1% AM

### Indication

2 digits and bar-chart

### Accuracy <sup>(1)</sup>

$\pm 5\% \pm 1$  digit at 1 kHz

$\pm 8.5\% \pm 1$  digit, 50 Hz to 10 kHz

### Demodulation Distortion <sup>(2)</sup>

<2%, at 1 kHz and 30% AM (CCITT weighted)

### Residual AM

<1% (300 Hz to 3.4 kHz)

## FREQUENCY MODULATION

### Frequency Range

100 kHz to 1.05 GHz

### Modulation Frequency Range

10 Hz to 15 kHz

### Deviation Range

0 to 75 kHz

Peak hold facility

### Resolution

10 Hz below 2 kHz deviation

1% above 2 kHz deviation

### Indication

3 digits and bar-chart

### Accuracy <sup>(1)</sup>

$\pm 5\% \pm 1$  digit at 1 kHz modulation frequency

$\pm 7.5\% \pm 1$  digit for modulation frequencies 50 Hz to 10 kHz

### Demodulation Distortion

<2% at 1 kHz and 5 kHz FM (CCITT weighted)

### Residual FM

<30 Hz (300 Hz to 3.4 kHz)

### Demodulation Output Socket

200 mV peak to peak  $\pm 10\%$  per 1 kHz deviation

## RF SPECTRUM ANALYZER

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### Frequency Range

100 kHz to 1.0 GHz

### Spans

1 kHz/division to 100 MHz/division in a 1, 2, 5 sequence or continuously variable

Start - stop facility allows selection of infinitely variable span width

### Resolution Bandwidth

300 Hz, 3, 30, 300 kHz, 3 MHz

### Reference Level (top of screen)

-50 dBm to +52 dBm

0.7 mV to 71 V

### Displayed Dynamic Range

80 dB

### Noise Floor

Typically 75 dB below top of screen



**On Screen Linearity**

Typically  $\pm 2$  dB  $\pm 1$  resolution (10 dB/div)  $> 10$  dB above noise floor

**Vertical Resolution**

0.1 dB on 2 dB/division

0.5 dB on 10 dB/division

**Level Flatness**

$\pm 1$  dB  $\pm$  resolution over 50 MHz span

**Intermodulation Distortion**

Better than 70 dB for two signals at -30 dBm into first mixer

**Sweep Speeds**

10 ms/div to 200 ms/div in a 1, 2, 5 sequence (optimum sweep speed and bandwidth selected according to span or user selectable)

Span	Resolution	Update
	Bandwidth	(Sweeps/sec)
10 kHz	300 Hz	5
100 kHz	3 kHz	9
1 MHz	30 kHz	9
10 MHz	300 kHz	9
100 MHz	300 kHz	5
1000 MHz	3 MHz	5

**Marker Indication**

Level and frequency or delta marker from center line of screen

Single marker for frequency and level display

Marker to center frequency

$\Delta$  marker

**Sensitivity**

2  $\mu$ V

**Tracking Generator Offset/Frequency Range**

0 to 999 MHz/400 kHz to 1000 MHz

**AUDIO GENERATORS****FREQUENCY****Frequency Range**

5 Hz to 33 kHz (sine or square)

**Setting**

Keyboard entry, delta increment/decrement function and rotary control

**Indication**

5 digits

**Resolution**

0.1 Hz below 3.25 kHz

1 Hz above 3.25 kHz

**Accuracy**

0.01 Hz below 180 Hz, 0.1 Hz above 180 Hz

**LEVEL****Level Range**

0.1 mV to 4V RMS

**Setting**

Keyboard entry, delta increment/decrement function and rotary control

**Indication**

4 digits

**Resolution**

0.1 mV below 409 mV

1 mV above 409 mV

**Accuracy**

$\pm 5\%$  + resolution 50 Hz to 15 kHz

**Output Impedance**

Nominally 5  $\Omega$  (minimum load 25  $\Omega$ )

**Distortion**

$< 0.5\%$  at 1 kHz

$< 1\%$ , 50 Hz to 15 kHz

**Signaling Encoder / Decoder**

Sequential tones functions including revert

User defined tones

Encodes and decodes up to 40 tones

CCIR, ZVEI, DZVEI, EEA, EIA or user defined

Any of the tones may be extended

Continuous, burst and single step modes available

Up to two frequency plans may be defined and stored within the 2944B for sequential tones

Any of the standard tone frequency plans may be copied to user defined and modified

Tone length 20 ms to 20 s

Standard tone frequencies may be selected from a menu

Generation and decoding of DTMF tones

Generation and decoding of DCS (Digitally Coded Squelch)

Generation of POCSAG code CCIR No.1 Rec 584

Bit rates from 400 to 4800 bit/s. Inversion available

**AUDIO MONITOR**

Demodulated signals and audio signals may be monitored via the internal loudspeaker and the accessory socket output on the front panel.

**FREQUENCY STANDARD****Internal Frequency Standard (TCXO)****Frequency**

10 MHz

**Temperature Stability**

0.5 ppm, 0° to 40°C

0.6 ppm, 0° to 50°C

**Ageing Rate**

Better than 1 ppm per year

**Warm-up**

1 minute to specified accuracy

## External Frequency Standard Input

### Frequency

1, 2, 5 and 10 MHz

### Input Level

>1 V peak to peak

### Input Impedance

Nominally 1 k $\Omega$

## GENERAL

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### Keyboard and Display

Logical color coded keyboard with color high resolution fast LCD

### Display Size

160 x 85 mm

### RS-232C

RS-232C interface is provided for printing and remote instrument control.

### Connector

9 way female 'D' Type

## POWER REQUIREMENTS

### AC Supply Voltage

100 - 240 V~/108-118 V~ (Limit 90 - 264 V~/98- 132 V~)

### AC Supply Frequency

50-60 Hz/50- 400 Hz (Limit 45- 66 Hz/45- 440 Hz)

### Maximum AC Power

190 VA

### DC Supply Voltage

11 to 32 V

### Maximum DC Power

100 W

## CALIBRATION INTERVAL

2 years

## ELECTROMAGNETIC COMPATIBILITY

Conforms with the protection requirements of Council Directive 89/336/EEC. Complies with the limits specified in the following standards:

IEC/EN61326-1 : 1997, RF Emission Class B, Immunity Table 1, Performance Criteria B

## SAFETY

Conforms with the requirements of EEC Council Directive 73/23/EEC ( as amended ) and the product safety standard IEC / EN 61010-1 : 2001 + C1 : 2002 + C2 : 2003 for Class 1 portable equipment, for use in a Pollution Degree 2 environment. The instrument is designed to be operated from an Installation Category 2 supply.

## ENVIRONMENTAL

### Rated Range of Use

0° to 50°C, up to 95% relative humidity at 40°C

### Storage and Transport

### Temperature

-30° to +70°C

## Altitude

Up to 2500 m (pressurized freight at 27 kPa differential)

## DIMENSIONS AND WEIGHT

### Standard Dimensions

185 mm (7.3 in) height, 400 mm (15.7 in) width, 460 mm (18.1 in) deep (including handle, feet and covers)

### Option 30 Dimensions

185 mm (7.3 in) height, 420 mm (16.5 in) width, 565 mm (22.2 in) deep (including handle, feet and covers)

### Weight

Typically less than 11.4 kg, (<25 lb)

10.5 kg (No options) Less than 13 kg (fully equipped)

## OPTIONS AND ACCESSORIES

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### 600 $\Omega$ MATCHING UNIT (OPT1)

#### INPUT CIRCUIT

##### Impedance

600  $\Omega$

##### Return Loss

>21 dB at 1 kHz

##### Frequency Response

$\pm 0.5$  dB at 200 Hz to 5 kHz

$\pm 2$  dB at 100 Hz to 20 kHz

##### Accuracy of 1:1 input:output ratio

$\pm 1\%$  at 1 kHz  $\pm$  accuracy of 2944B

##### Maximum Input

5 V RMS maximum at 200 Hz to 5 kHz

3 V RMS maximum at 100 Hz to 20 kHz

#### OUTPUT CIRCUIT

##### Impedance

600  $\Omega$

##### Return Loss

>21 dB at 1 kHz

##### Frequency response

$\pm 0.5$  dB at 200 Hz to 5 kHz

$\pm 2$  dB at 100 Hz to 20 kHz

##### Level Accuracy

$\pm 2\%$  at 1 kHz  $\pm$  accuracy of 2944B

##### Output Level

1 mV to 2.5 V RMS across 600  $\Omega$

### HIGH STABILITY INTERNAL FREQUENCY (OCXO) STANDARD (OPT3)

#### Frequency

10 MHz

#### Temperature Stability

Better than 0.05 ppm, 5 to 55°C



**Ageing Rate**

Better than 0.1 ppm per year, after 1 month continuous use

**Warm-up Time**

<10 minutes to within 0.2 ppm at 20°C

**PARALLEL INTERFACE (OPT4)**

Allows direct connection of a parallel printer

Additionally provides four software programmable output lines

**Printer Port****Connector**

25 way female D type

**Printers Supported**

75, 100, 150 dots per inch laser printers, FX 80, FX 100 Epson format

**Accessory Port****Connector**

9 way female D type

**Outputs**

4 independently programmable output lines, each one configurable as a logic line or as a relay contact closure. +5V supply available

**GPIB (OPTION 5)****Capability**

For printing, remote instrument control or for programming of user defined test sequences.

Complies with the following subsets defined

IEEE-488:- SH1, AH1, T6, L4, SR1, RL1, DTO, EI, DC1

**SSB DEMODULATOR (OPTION 8)**

The SSB demodulator allows signals to be demodulated either via the internal loudspeaker or via the accessory socket. Provides demodulation of SSB signals (upper and lower sideband).

**Frequency Range**

400 kHz to 1 GHz

**AF Demodulation Range**

10 Hz to 15 kHz

**Distortion**

Typically less than 3% at 1 kHz (300 to 3.4 kHz)

**Detection Range**

2  $\mu$ V to 150 W

**Features**

Automatic detection of USB or LSB. BFO can be used for tuning of carrier for AM and FM radios.

**CCITT FILTER (OPT23)**

Allows a CCITT filter to be inserted into either the demodulated audio path or the audio input path

**CMESS FILTER (OPT24)**

Allows a CMESS filter to be inserted into either the demodulated audio path or the audio input path

**LOOK AND LISTEN (OPT27)**

Provides simultaneous spectrum display and demodulation of the centre frequency for span widths of 100 kHz, 200 kHz, 500 kHz and 1 MHz

Sensitivity 2  $\mu$ V

**BAIL ARM/FRONT COVER (OPTION 30)**

Provides a bail arm carrying handle and front panel cover and storage area. The bail arm will also provide additional viewing angles when mounted on a bench.

**INTERNAL BATTERY (OPTION 32)****Type**

12 V NiMH

**Capacity**

Typically 60 minutes operation

**Weight**

1.8 kg

**Charge Time From Instrument**

4 hours

Temperature Range

5-35 C charge

0-50 C discharge

## **VERSIONS AND ACCESSORIES**

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When ordering please quote full ordering number information

### **Ordering Numbers**

#### **Versions**

2944B            Communications Service Monitor

#### **Options**

OPT1            600  $\Omega$  Matching Unit

OPT3            High Stability OCXO

OPT4            Parallel Interface †

OPT5            GPIB Interface †

OPT8            SSB Demodulator

OPT23           CCITT Filter ††

OPT24           CMES Filter ††

OPT27           Look and Listen Addition to Spectrum Analyzer

OPT30           Bail Arm and Front Panel Stowage Cover

OPT32           Internal Battery

#### **Supplied Accessories**

AC Supply Lead

DC Supply Lead

Operating Manual

Programming Manual

#### **Optional Accessories**

44991/145       Microphone with PTT

46662/779       Soft carrying case (suitable for all 294x, except early units being used with external battery)

46662/571       Soft carrying/operational case

46662/616       Soft carrying/operational case for use with option 30

54112/163       Hard Transit Case

54431/023       20 dB AF Attenuator (BNC)

54421/001       BNC Telescopic Antenna

46884/650       Serial Port to PC Control Cable (9 way)

46884/649       Serial Port to PC Control Cable (25 way)

46884/648       RS-232 Printer Cable (25 way)

59999/170       RF Directional Bridge

46880/118       Service Manual

#### **Notes**

<sup>(1)</sup> At low modulation levels the residual AM/FM may become significant.

†            Options 4 and 5 cannot be fitted together.

††          Options 23 and 24 cannot be fitted together.

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**CHINA**

Tel: [+86] (10) 6467 2716  
Fax: [+86] (10) 6467 2821

**EUROPE**

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

**HONG KONG**

Tel: [+852] 2832 7988  
Fax: [+852] 2834 5364

**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



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[www.aeroflex.com](http://www.aeroflex.com)  
[info-test@aeroflex.com](mailto:info-test@aeroflex.com)



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