2944 Communications Service Monitor

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

- ***Automatically tunes to transmit signal***
- ***Proven performance backed by IFR's long history of RF test excellence***
- ***0.5 ppm TCXO standard***
- ***Duplex RF output levels down to -141 dBm***
- ***SSB phase noise better than -95 dBc/Hz***
- ***Dual audio generators from 10 Hz to 25 kHz***
- ***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***
- ***Full span spectrum analyzer with optional tracking generator and offset tracking***
- ***Accurate power measurements to 150 W***
- ***5 W protection on all RF ports standard***

The 2944 Communications Service Monitor is the lightest, most rugged service monitor available with a full performance spectrum analyzer as standard. For field work the 2944 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 2944, shown with optional bail arm (OPT30), includes high powered accuracy and features at a very affordable cost. RF professionals involved in day-to-day AM/FM measurements can use the 2944 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 2944 is the lightest RF Communications Service Monitor on the market. Using the proven IFR look and feel of the 2945A series, the 2944 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 2944 to be operated comfortably when it is placed on the floor.

With the optional bail arm, the 2944 allows a stowage cover to be fitted over the front panel for storage of adapters and further protection to the instrument's front panel. Full operation is possible from the "ever-ready" case so that your instrument is protected from transit damage.

Battery - Carry a Spare

The battery fits neatly into the "ever-ready" case and is easily replaced with a spare when discharged. There is no memory effect associated with the battery, even when partially discharged.

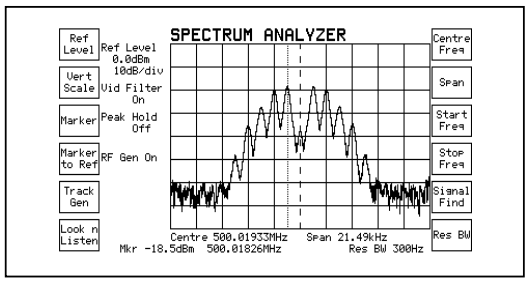
Fast Warm Up - Fast Results

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 (OPT3). 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 optional tracking generator, 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 ⇧⇩ keys. This is particularly useful when testing multi-channel systems.



High performance spectrum analyzer provided as a standard feature

From 2 µV to 150 W

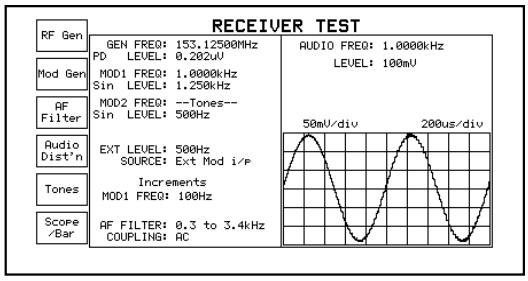
The 2944 will measure the power of low level signals such as those encountered when monitoring off-air signals or those found when probing a circuit. 150 W measurement is provided without the need for external attenuators, so high power base stations can be measured directly. Measurement accuracy of 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.

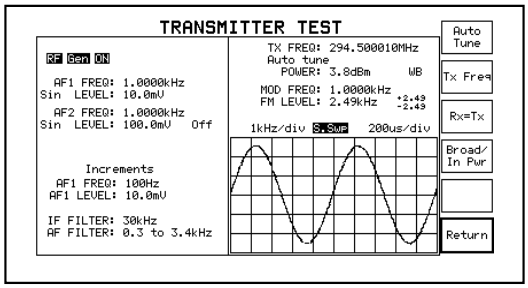
Accurate RF Signals

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 ±2 dB at all levels above -127 dBm.

Duplex - Provided as Standard

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





2944 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 2944.

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.

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

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 2948)

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

20 Hz to 20 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 [1]

±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

20 Hz to 25 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

Input Impedance

Nominally 1 MΩ in parallel with 40 pF

Frequency Range

DC and 20 Hz to 50 kHz

AC only 20 Hz to 50 kHz

Level Ranges

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

Digital readout also in mW (user selectable)

Resolution

1 mV or 1% of reading

Indication

3 digits and bar-chart

Accuracy

±3% ±3 mV ±1 digit

Audio Frequency Meter

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

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

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

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

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

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

300 Hz, 3 kHz, 15 kHz Low pass

300 Hz to 3.4 kHz Bandpass

300 Hz High pass

750 µs de-emphasis

50 kHz Low pass (No filters applied)

Audio Analyzer General Features

Tones Mode

RF Frequency Meter

Frequency Range

100 kHz to 1.05 GHz (manual tune)

10 MHz to 1 GHz (auto-tune)

Resolution

1 Hz or 10 Hz, 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)

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)

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)

±10% ± resolution up to 1 GHz

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

Sensitivity

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

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

Audio & Modulation Filters

300 Hz, 3 kHz, 15 kHz Lowpass

300 Hz to 3.4 kHz Bandpass

300 Hz Highpass

750 µs de-emphasis

50 kHz Lowpass (No filters applied)

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

Resolution

1% AM

Indication

2 digits and bar-chart

Accuracy [1]

±5% ±1 digit at 1 kHz

±8.5% ±1 digit, 50 Hz to 10 kHz

Demodulation Distortion [1]

<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

Resolution

10 Hz below 2 kHz deviation

1% above 2 kHz deviation

Indication

3 digits and bar-chart

Accuracy [1]

±5% ±1 digit at 1 kHz modulation frequency

±7.5% ±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 ±10% per 1 kHz deviation

RF Spectrum Analyzer

Frequency Range

100 kHz to 1.0 GHz

Spans

100 Hz/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 ±2 dB ±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

±1 dB ± 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 Bandwidth	Update (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

Δ marker

Sensitivity

2 µV

Audio Generators

FREQUENCY

Frequency Range

10 Hz to 25 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

± 5% + resolution 50 Hz to 15 kHz

Output Impedance

Nominally 5 Ω (minimum load 25 Ω)

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 2944 for sequential tones

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

Tone length 20 ms to 1 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 kΩ

General

Keyboard and Display

Logical color coded keyboard with bright 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 to 240 V (±10%)

AC Supply Frequency

90 - 264 V, 45 to 67 Hz

90 - 132 V, 45 to 440 Hz

Maximum AC Power

190 VA

DC Supply Voltage

11 to 32 V

Maximum DC Power

100 W

Charge Output

13.8 V at 6 A maximum to charge a 12 V sealed lead acid battery

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 EWEC Council Directive 73/23/EEC and Standard IEC/EN 61010-1 : 1993

Complies with IEC 1010-1 , BS EN61010-1 for class 1 portable equipment and is for use in a pollution degree 2 environment. The instrument is designed to operate from an installation category 1 or 2 supply.

Approved to UL3111-1

ENVIRONMENTAL

Rated Range of Use

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

Storage and Transport

Temperature

-40° to +71°C

Altitude

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

DIMENSIONS AND WEIGHT

380 mm wide, 178 mm high, 457 mm deep

15 in. wide, 7 in. high, 18 in. wide

(including handle, feet and covers)

Weight

<11.4 kg (<25 lbs.)

Options and Accessories

600 Ω MATCHING UNIT (OPT1)

INPUT CIRCUIT

Impedance

600 Ω

Return Loss

>21 dB at 1 kHz

Frequency Response

±0.5 dB at 200 Hz to 5 kHz

±2 dB at 100 Hz to 20 kHz

Accuracy of 1:1 input:output ratio

±1% at 1 kHz ± accuracy of 2944

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 Ω

Return Loss

>21 dB at 1 kHz

Frequency response

±0.5 dB at 200 Hz to 5 kHz

±2 dB at 100 Hz to 20 kHz

Level Accuracy

±2% at 1 kHz ± accuracy of 2944

Output Level

1 mV to 2.5 V RMS across 600 Ω

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, DT0, 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 µV 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 µV

TRACKING GENERATOR (OPT28)

Output specification as signal generator. A positive or negative frequency offset can be applied up to 999 MHz

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.

BATTERY PACK

Type

12 V Sealed lead-acid

Connector XLR Type

Capacity

7 AH (30 minutes operation)

Weight

3 kg (6.6 lbs.)

Charge time from instrument

16 hours

Versions and Accessories

When ordering please quote full ordering number information

Ordering Numbers

Versions

2944	Communications Service Monitor

Options

OPT1	600 Ω Matching Unit
OPT3	High Stability OCXO
OPT4	Parallel Interface †
OPT5	GPIB Interface †
OPT8	SSB Demodulator
OPT23	CCITT Filter ††
OPT24	CMESS Filter ††
OPT27	Look and Listen Addition to Spectrum Analyzer
OPT28	Tracking Generator
OPT30	Bail Arm and Front Panel Stowage Cover

Supplied Accessories

AC Supply Lead

DC Supply Lead

Operating Manual

Programming Manual

Optional Accessories

44991/145	Microphone with PTT
43113/021	Battery Pack for 2944
46662/571	'Ever-Ready' Case
46662/616	'Ever-Ready' Case for use with OPT30
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
46880/106	Service Manual

Notes

(1) 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.

IFR - "Working together to create solutions for the world of communications."

IFR is a world leader in developing leading edge test and measurement equipment. The priority at IFR is to understand your communications test needs and respond to them. IFR has the flexibility and expertise to create just the right test solution for you. We understand that just as you are the expert in designing wireless products, we are expert in wireless test.

Combining the quality of our test products with their reliability, excellent price/performance ratio and minimal requirements for maintenance, every IFR test system represents an outstanding lifetime value.

IFR - "Working together with our customers to be flexible and innovative in providing effective test solutions for the rapid design, manufacture and maintenance of communications systems."

The added value IFR includes with each and every test set we sell will make you more productive. We offer a two-year standard warranty on all products and we will continue to support your product for five years beyond its final production. Our outstanding Customer Service Department offers calibration, out-of warranty repairs and consulting. Our Sales and Training Departments offer clear and concise product information with realistic performance specifications, technology training and application training. Our experienced engineers will help you develop application software and through continuous improvement programs, upgrades are always available.

IFR will continue to build upon our technology resources with an aggressive commitment that will enable you to excel in some of the world's most dynamic, high growth markets.

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