The industry standard for fast, effective analog wireless testing, including high performance spectrum analysis, AMPS, EDACS and advanced paging test features

- Split Screen digitized full scan spectrum analyzer to 1 GHz
- EasyCom™ software allows simplified testing of land mobile transceivers
- EasySpan™ automated test software allows you to display and capture spectrum analyzer and tracking generator sweep information
- LIVE-REF and REF-LIVE comparisons for spectrum analyzer display
- Digitized full scan oscilloscope to 50 kHz
- Enhanced PCMCIA for easy data analysis
- Optional AutoCell-NT automated cellular base station test software
- High speed EDACS data capture capabilities with up to 50 user defined set-ups
- Full paging test for analog paging formats and advanced digital paging with the AC510 option
- Optional independent tracking generator
- 200 W power measurement capability
- RS-232 control interface with optional IEEE-488 (GPIB)

**Fast Effective Wireless Test Solutions**

The COM-120B has become an industry recognized standard in Communication Service Monitors. A tough, portable monitor with a full performance spectrum analyzer and digital oscilloscope, the COM-120B combines over 20 instruments into one unit, the versatile COM-120B offers a cost effective alternative to higher cost test sets.

**Unique Split Screen Spectrum Analyzer**

The COM-120B offers a split screen dual display spectrum analyzer. This feature allows you to view two signals or the same signal in two different ranges simultaneously. In addition, the spectrum analyzer can be viewed along with the RF Generator or RF Receiver screens giving you full control over testing details at one glance.

**RF Solutions**

For RF testing professionals, the fully independent generator and receiver functions yield truer signal tracing, expanded analyzer capabilities and cross band duplex testing. In addition, the COM-120B boasts an impressive set of standard features:

- Digitized oscilloscope
- RF and Auxiliary RF Generator
- 2 µV receiver sensitivity
- Frequency Selective RF Counter
- RF Frequency Error Meter
- FM Deviation Meter
- ΦM Deviation Meter
- AM Modulation Meter
- RF Power Meter
- RF Level Meter
- Distortion Meter
- SINAD Meter with 0 - 55 dB range
- LIVE-REF and REF-LIVE on the Spectrum Analyzer and Oscilloscope, Average, peak hold and min hold can be displayed independently
- The FM and ΦM Deviation Meters allow toggling of the deviation meter from the standard mode to the ± peak mode. The measurement shows the + and - peak deviation as two separate readings

**EDACS and LTR Testing**

The EDACS™ option provides a comprehensive system test for both repeaters and terminals.

The EDACS™ option also incorporates:

- High speed data capture which reads EDACS data as soon as the COM-120B’s DSP decodes valid EDACS messages.
- Individual Call System All-Call decodes a dual message on the inbound control channel.
- Support for Narrow-band (900) MHz testing.
- User definable frequencies as channels.

http://www.ifrinternational.com
COM-120B

- Expanded storage capability that allows users to store and recall up to 50 EDACS™ system test set-ups.

The CLEARCHANNEL LTR™ trunking option allows the COM-120B to be configured to simulate LTR repeater systems. The test set can perform system encode/decode functions as well as Home and Next repeater access procedures.

Full Paging Support

The standard COM-120B performs encode/decode of 2-tone and sequential tone testing, as well as tone squelch, DCS and DTMF. The flexibility of the COM-120B is enhanced with optional analog/digital signaling. This feature allows you to test the following formats:

- CCIR
- CCI RH
- CCIR H4
- EEA
- EIA
- NATEL
- ZVEI
- DZVEI
- DDZVEI
- EURO
- 5/6 TONE
- POCSAG

Adding the AC510 option enables the COM-120B to encode advanced digital paging formats including Flex™, Golay Sequences Code (GSC) and NEC D3.

Analog Cellular Solutions

The COM-120B may be configured with an optional AMPS Mobile Station testing feature which is designed to verify proper operation of AMPS handsets and mobiles. Flexible testing includes both automatic and manual test functions.

Complex Testing Made Simple

Even with its impressive list of testing capabilities, the COM-120B retains the simplicity that has earned the respect of thousands of dedicated users. A modem capability turns the COM-120B into a remote controlled instrument. Tests can now be initiated remotely by simply plugging in a modem.

For more specialized testing, the COM-120B programmable test function may be used to create custom test applications. Using the COM-120B’s TMAC programming language, complex tests can be reduced to simple “one-touch” test procedures.

And with its intuitive internal/external data file storage and retrieval system, complex testing is simple and efficient. This system allows users to create user-defined tests and customized results logs. It also gives you the flexibility to store data internally or download test results to a PC.

RS-232 or IEEE-488 (GPIB) Remote Testing Ability

Fully automated or remote testing abilities in a stand alone or multiple instrument environment can be realized with the standard RS-232 interface or with the IEEE-488 (Option 13) interface.

Power Tests from 2 mW to 200 Watts

The COM-120B provides low level measurements with high power protection for measuring off air signals as well as direct base station power measurements up to 200 Watts. The antenna input is protected to 10 Watts with a built in alarm to notify you if you are in an overload condition.

Software Options Simplify Testing

For those requiring automated test capability, several applications software packages are available:

- EasyCom-B (AC1022)
- AutoCell - NT (AC1037)
- EasySpan (AC1009W)

Can store, display and manipulate spectrum analyzer and tracking generator sweep information to a PC running windows.

All IFR software can be downloaded using the PCMCIA memory card or through the RS-232 interface using a PC controller. The COM-120B is compatible with popular accessories from other manufacturers including the Optoelectronics Super Scout and the STI 9100 series mobile signal analyzers.

Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>RF Signal Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Range</td>
<td>250 kHz to 999.9999 MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>100 Hz</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Same as Master Oscillator</td>
</tr>
</tbody>
</table>

Output Level

<table>
<thead>
<tr>
<th>Output Level</th>
<th>(T/R and AUX Connectors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range (T/R)</td>
<td>-130 to -20 dBm (Simplex mode) -130 to -40 dBm (Duplex mode)</td>
</tr>
<tr>
<td>Range (AUX)</td>
<td>-130 to +13 dBm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 dB</td>
</tr>
</tbody>
</table>

COM-120B

http://www.ifrinternational.com
**Audio Data Generators**

**AF GENERATOR #1**

- **Frequency Range**: 5 Hz to 20 kHz (sine wave only) 5 Hz to 10 kHz (other wave shapes)
- **Frequency Resolution**: ±0.1 Hz
- **Frequency Accuracy**: Same as timebase ±0.1 Hz
- **Output Accuracy (High Lvl)**: ±0.01 Vpk
- **Output Resolution (High Lvl)**: ±0.01 Vpk
- **Output Accuracy (Low Lvl)**: ±0.1 mVpk (<10 kHz), ±0.03 Vpk (<10 kHz) ±7% full range ±0.25 mVpk (<10 kHz), ±0.03 Vpk (<10 kHz)
- **Output Range (Low Lvl)**: 1 mVpk to 250 mVpk (into 150 Ω)
- **Output Resolution (Low Lvl)**: 1 mV
- **Output Accuracy (Low Lvl)**: ±4% full range ±0.25 mVpk (<10 kHz, ±0.03 Vpk < level ±1 mVpk)
- **THD**: <0.7% (1 kHz sine wave, 2.5 Vpk, 150 Ω load) <1% sine wave (all other frequencies/levels)

**Waveshapes**
- Sine, Ramp, Square, Triangle

**AF GENERATOR #2**

- **Frequency Range**: 5 Hz to 20 kHz (sine wave only) 5 Hz to 10 kHz (other wave shapes)
- **Frequency Accuracy**: ±0.2 Hz
- **Output Accuracy (High Lvl)**: ±0.01 Vpk to 2.5 Vpk (into 150 Ω)
- **Output Resolution (High Lvl)**: ±0.01 Vpk
- **Output Accuracy (High Lvl)**: ±3% full range ±0.25 mVpk (±0.03 Vpk)
- **Output Range (Low Lvl)**: 1 mVpk to 250 mVpk (into 150 Ω)
- **Output Resolution (Low Lvl)**: 1 mV
- **Output Accuracy (Low Lvl)**: ±4% full range ±0.25 mVpk (±0.03 Vpk < level ±1 mVpk)
- **THD**: 0.7% (2.5 V peak, into 150 Ω)

**DTMF Generator**

- **Output Range (High Lvl)**: 0.01 Vpk to 2.5 Vpk (into 150 Ω)
- **Output Resolution (High Lvl)**: 0.01 Vpk
- **Output Accuracy (High Lvl)**: ±10% full range ±0.5 mVpk (<30 mV)
- **Output Range (Low Lvl)**: 0.1 mVpk to 25 mVpk (into 150 Ω)
- **Output Resolution (Low Lvl)**: ±0.01 mVpk
- **Output Accuracy (Low Lvl)**: ±10% full range ±0.25 mVpk (1 mV to 30 mV)

**Modes**
- Continuous, single shot

**Digits**
- 16 (0-9, *, #, A, B, C, D)

**Mark/Space Timing**
- 25 to 999 msec

**Mark/Space Timing Resolution**
- 1 msec

**Mark/Space Timing Accuracy**
- ±20%
in the 200 W range or the COM-120B’s power term module temperature exceeds 105°C

**Receive Level Meter**

**Range**
-101 to -30 dBm (15 kHz IF BW)
-80 to -30 dBm (300 kHz IF BW)

**Accuracy**
±3 dB

**Frequency Range**
250 kHz to 999.999 MHz (The received frequency must be within the IF bandwidth of the COM-120B)

**Distortion Meter**

**Range**
1 kHz to 30 kHz (DC, AC and GND)

**Resolution**
1 kHz sine wave

**Signal Level**
0.03 to 200 VRMS (SCOPE/DVM input)
0.15 to 15 VRMS (AUDIO/DATA IN)

**SINAD Meter**

**Ranges**
50 mV to 200 V in a 1-2-5 sequence
**Range (DC)**
10 mV to 200 VDC (SCOPE/DVM input)
**Range (AC)**
10 mV to 200 VRMS (SCOPE/DVM input)
150 mV to 15 VRMS (AUDIO/DATA IN)

**Resolution**
3 ½ digit

**Accuracy**
±5% full scale ±1 digit (SCOPE/DVM input)
±7% full scale ±5 mV ±1 digit (AUDIO/DATA IN)

**Frequency Range**
200 kHz to 999.999 MHz (characteristics below 250 kHz are not specified)

**Resolution**
100 Hz

**FREQUENCY SPAN**

**Ranges**
1 kHz to 100 MHz per division in a 1-2-5 sequence and zero span

**Accuracy**
+5% of span width

**Vertical Resolution**

**Level**

**Settings**

**Display**
Log, 2 and 10 dB per division

**Vertical Resolution**
1 dB

**Dynamic Range**
60 dB

**Bandwidth Switching Error**
<3 dB

**Log Linearity**
±2 dB (referenced to -40 dBm, 15 to 35°C)
±3 dB (referenced to -40 dBm, 0 to 15°C and 35 to 50°C)

**Input Attenuator**
0, 30 dB (ANT connector)

**HORIZONTAL**

**Ranges**
100 µs to 200 ms per division (1-2-5 sequence)

**Accuracy**
1 % full scale, 500 data points, 10 major divisions

**Resolution**
1 % full scale

**Input Impedance**
1 MΩ, unbalanced (nominal)

**Spectrum Analyzer**

**Center Frequency**
250 kHz to 999.999 MHz

**Tunable Range**
0 Hz to 999.999 MHz (characteristics below 250 kHz are not specified)

**Resolution**
100 Hz

**Operational Modes**
Normal, Split Screen

**Scan Width RBW**
5 kHz to 100 MHz per division in 100 Hz steps

**Baseband Switching Error**
<3 dB

**Log Linearity**
±2 dB (referenced to -40 dBm, 15 to 35°C)
±3 dB (referenced to -40 dBm, 0 to 15°C and 35 to 50°C)

**Input Attenuator**
0, 30 dB (ANT connector)

**Operations Mode**
Off, PC (input/output)

**Baud Rate**
100, 150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400

**Stop Bits**
1, 2

**Parity**
Odd, Even, None

**Handshake**
None, Xon/Xoff, CTS/RTS

**Master Oscillator**

**TCXO**
Frequency
10 MHz

**Uncertainty**
±0.1 ppm

**Temperature Stability**
±0.2 ppm (0 to 50°C)

**Ageing Rate**
±0.5 ppm/year

**Power Requirements**

**Line Voltage**
90 to 130 VAC (50 to 400 Hz)
180 to 265 VAC (50 to 60 Hz)

**DC Input**
12 to 30 VDC

**Power Consumption**
AC 180 W maximum
DC 150 W maximum
DC 90 W typical

**General Characteristics**

**Operating Temperatures**
0 to 50°C

**Dimensions**
400 mm (15.75 in) W, 190 mm (7.5 in) H, 429 mm (16.875 in) D (without bail handle and front panel cover)
440 mm (17.32 in) W, 190 mm (7.5 in) H, 537 mm (21.125 in) D (with bail handle and front panel cover)

**Weight**
17.3 kg (38.5 lb) (without options, lid, accessories)

**Versions and Accessories**

**Ordering Numbers**

**Version**
120B-3 COM-120B Service monitor; 30 kHz IF Filter
120B-3-C 120B-3 with Certificate of Calibration
120B-3T 120B-3, 0.01 ppm OCXO time base
120B-3T-C 120B-3, 0.01 ppm OCXO time base with Certificate of Calibration
120B-8 COM-120B, SSB Receive filter
120B-8-C 120B-8 with Certificate of Calibration
120B-8T 120B-8 with 0.01 ppm OCXO time base
120B-8T-C 120B-8 with 0.01 ppm OCXO time base with Certificate of Calibration

**Accessories**
AC 510 Paging encoder (FLEX)
AC 1009W EasySpan for Windows (Waveform Transfer Software)
AC 1022 EasyCom-8
AC 1023 Applications library
AC 1025 EasySweep (req AC3012)
AC 1037 Autocell-NT (req 120E or 120F)
AC 1009R Telescopic antenna
AC 3001 Internal rechargeable battery
AC 3007 Data generator/BER meter
AC 3209 CRC Signaling
AC 3011 Digital/Analog Sampling
AC 3012 Tracking generator
AC 3013 IEEE-488
AC 3014 CLEAR CHANNEL LTR
AC 3015 AMPS Mobile station test (req 120E or 120F)
AC 3016 EDACS
AC 4010 Return loss bridge (5 MHz to 1 GHz)
AC 3865 Microphone
AC 3916 MPT-1327 Trunking
AC 3917 7.5 kHz IF Filter
AC 3918 Soft padded carrying case

**CLEARCHANNEL LTR** is a registered trademark of Transcrypt International, Inc.
**EDACS** is a registered trademark of Ericsson, Inc.
**Flex** is a registered trademark of Motorola, Inc.
**Windows** is a registered trademark of Microsoft Corporation.
**EasyCom-4M, EasySweep and EasyScan** are copyrighted by IFR Systems, Inc.