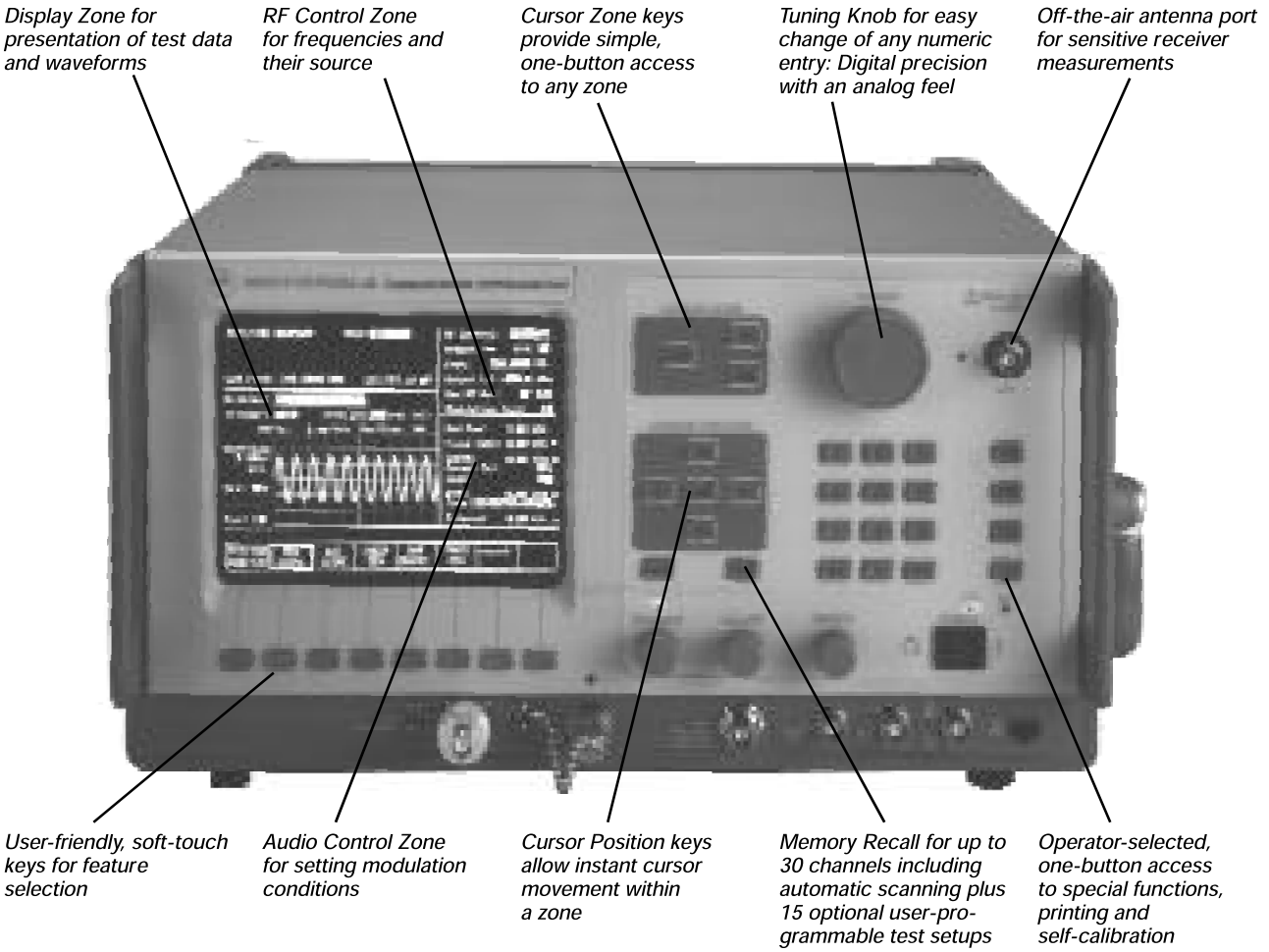
The Motorola R-2600: A Basic Description.



The R-2600: The optimum test for two-way radios, cellular phones and pagers.

Motorola Communications Test Equipment is pleased to present the R-2600. If you need to calibrate, maintain, service or design radio communications equipment – and that means everything from two-way radios, cellular telephones or pagers – the Motorola R-2600 is for you.

Because of its unique design, the R-2600 allows you to perform many complex functions from the same piece of equipment. This "one box" design is particularly helpful in remote sites where use of multiple pieces of heavy equipment are impractical – or impossible.

Featuring user-programmable storage locations for fast, easy access to the most frequently used channel information, the Motorola R-2600 gives users the flexibility to create customized test set-ups. It also provides digitized displays for storage and printout, "soft keys" and windowing for ease of operation, autoranging capabilities with both analog/digital readouts and signaling encoding/decoding functions.

Cellular Option

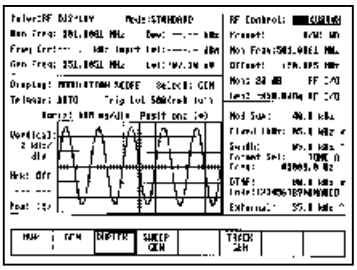
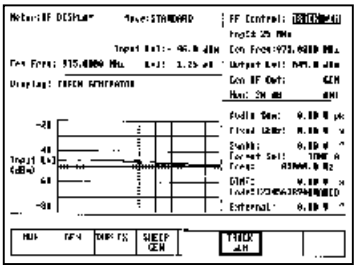
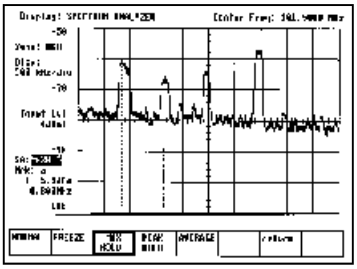
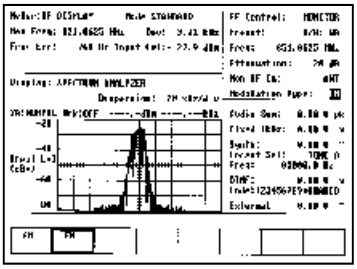
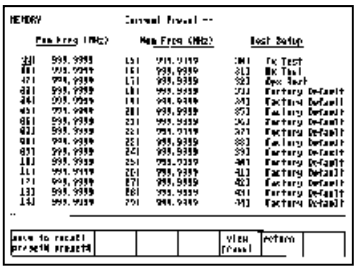
When the "Cellular Option" is installed, the R-2600 tests cellular personal, portable, transportable and mobile radiotelephones by simulating fixed end (cell-site) signaling. The R-2600 is capable of testing in several formats: AMPS, EAMPS, NAMPS, TACS, ETACS, JTACS and NTACS.

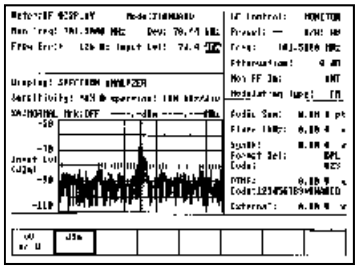
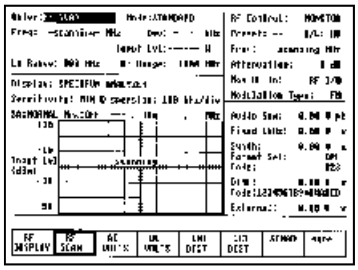
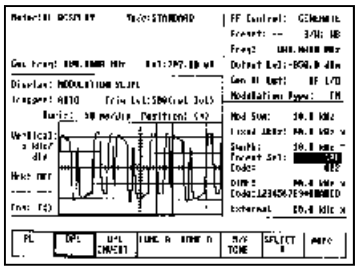
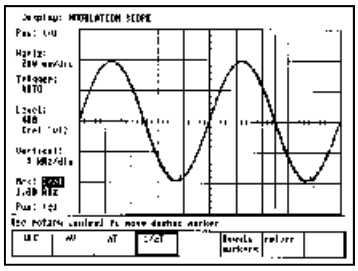
Additionally, with the "Cellular Option," the Motorola R-2600 features a cellular AUTO TEST that allows the user to push one key to activate a powerful and efficient ***go/no-go*** test of the subscriber radio.

Versatile & Rugged

The R-2600 is rugged enough to withstand heavy use in the field. And it's designed to save you time and help you work more efficiently, which improves your profit.

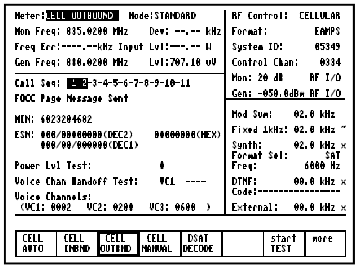
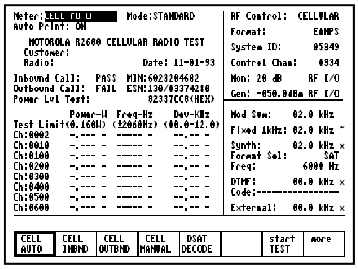
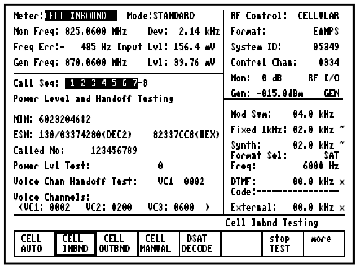
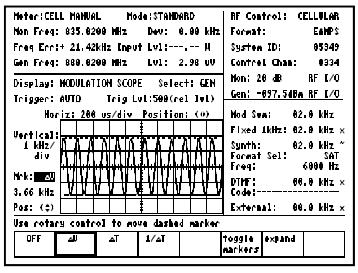
The Motorola R-2600. Whether used in your shop, at your customers' site or in a remote location, it's the test you can trust.

Feature	Description	Benefits
Duplex 	Full output level control from -130 dBm to 0 dBm over the entire range of the instrument is available from the RF I/O port (-130 dBm up to -50 dBm) and the generator port (-80 dBm to 0 dBm). Variable offsets from 0 to +/-55 MHz in 5 kHz steps are keypad selectable.	The duplex generator provides enhanced capability to service equipment such as repeaters and full duplex radios, including cellular telephones. Full RF level control as well as full internal and external modulation capability allow receiver (desensitization) and transmitter tests to be performed simultaneously through one port if desired. Storage of test setups is available in memory for instant recall.
50 MHz Tracking Generator 	Combining the capabilities of the sweep generator and the spectrum analyzer into a Tracking Generator function allows the user to view the performance characteristics of many RF filter devices. Display range is operator selectable from a 200 kHz window up to a 50 MHz window anywhere in the 400 kHz to 1 GHz spectrum.	Diagnosis and adjustment of critical receiver front ends, IFs, helical filters, cavities, combiners and duplexers can be made in a few minutes, quickly and easily with the flexibility of the R-2600's Tracking Generator at your fingertips.
Spectrum Analyzer (See and Hear)™ 	The built-in Spectrum Analyzer of the R-2600 will display a window of RF spectrum anywhere within the 400 kHz to 1GHz operating range of the unit. The EXPAND soft key enlarges the display to fill the CRT and retains complete audio, dispersion and center frequency control. **Optional Markers/100 MHz Window** Functional markers include the following features: • Freeze • Max Level Hold • Peak Level Hold • Absolute Level Hold & Frequency • Delta Level & Frequency • Averaging Display	The significant advantage of spectrum visibility, while being able to hear and store for detailed analysis through use of multiple markers (optional) received signals, is provided to the user. The Tuning Knob retains control of the center frequency even in the EXPAND mode to perform fast sweeps or fine tuning. This allows the technician to quickly locate and identify signal carriers. This full screen spectrum analyzer is a very powerful and effective tool for the technician.
Terminated RF Wattmeter 	RF power anywhere in the operating range of 400 kHz to 1 GHz is automatically measured by the Communications System Analyzer tuned to that frequency. The built-in RF load dissipates up to 125 watts for one minute. If a high power transmitter should be keyed into the unit for any longer, the CRT display changes to read "WARNING RF OVERLOAD" thus warning the technician to un-key.	Provides calibrated RF power measurements to eliminate the need for a separate wattmeter. The CRT display also includes frequency error and modulation level simultaneously.
Programmable Test Memory 	**Channel Presets** - The unit has 30 memory locations which can be used to store preset channel information. Channels can be easily selected individually or automatically scanned over a user defined range. **Programmable Test Setups** (Optional) - The user can easily program and store up to 15 of the most commonly used test setups, including all test conditions, measurement display formats and levels. These memory positions operate fully independently from the channel presets.	**Channel Presets** - Quickly recall and access often used channel location information to speed testing. Scanning allows automatic monitoring and measurement of activity on channels of interest. **Programmable Test Setups** (Optional) - Significantly reduce the number of key presses required to set up the more commonly used test setups, greatly increasing operator efficiency and promoting uniform test procedures. The user can also assign a custom name to the test for easy recall.

Feature	Description	Benefits
Signal Strength Meter 	In addition to reading frequency error and modulation, a digital readout calibrated signal strength meter has been included. Sensitivity is specified to -100 dBm at the antenna port for FM signals and extends up to 125 watts at the RF I/O port. The CRT display will automatically convert to a terminating “watts” display as the level increases.	This feature, in conjunction with an external antenna, allows remote monitoring of distant transmitters to check for antenna, transmission line or P.A. problems. Many technicians also find this feature convenient in performing propagation studies to identify weak coverage areas.
RF Scan/RF Counter Function 	RF Scan operates in the monitor mode and provides a function similar to a 1 GHz counter. This feature automatically scans a user defined frequency range to lock to the signal applied. Any RF carrier above 20 MHz can be located within 5 seconds or less and the reception displayed with digital readouts.	It is possible to locate and identify the operating frequencies of multi-channel radios. This feature allows the technician to conveniently and immediately verify the programming of a multi-channel radio PROM. By automatically tuning the R-2600 receiver to the detected carrier, immediate measurement data can be taken without having to enter new frequency data via the keyboard. The 1 GHz counter on your bench is now obsolete.
Signaling Simulator: Encoder and Decoder 	The System Analyzer includes the capability of encoding and decoding PRIVATE LINE (PL), DIGITAL PRIVATE LINE (DPL) and single tone sequences as well as multi-tone sequences including DTMF signals, 5/6 tone paging, Select V and up to 20 sequential tones. Decoding displays include tone frequencies and time durations of the individual tones. The unit can also encode tone remote signaling.	The signaling capability of the R-2600 reaches a broader range of service applications with its decode capability. This gives the service technician a more flexible test instrument which aids in servicing paging equipment and specialized signaling encoders as well as mobile, portable and other radio products. The signaling simulator can perform a full system check-out faster, with more accuracy than ever before.
General Purpose & Modulation Oscilloscope 	This Oscilloscope has a 50 kHz bandwidth for audio waveform analysis. The display can be triggered over the full screen range to a fixed reference level. Triggering in both automatic and normal modes is provided for synchronizing the horizontal timebase to the vertical input signal. Internal or external inputs allow observation of both generated and monitored modulation signals. Soft keys provide for an enlarged full screen display. OPTIONAL MARKERS Functional markers include the following features: • Delta Voltage • Delta Period • Delta Frequency	Recovered audio or internally produced audio can be displayed visually for deviation measurements. Additionally, detection of an asymmetric modulation or audio distortion can be achieved with waveform analysis. With internal and external triggering and a freeze display single sweep, this unit duplicates many features of more expensive scopes. Optional markers allow detailed analysis to measure waveforms displayed on the CRT. The EXPAND function provides an uncrowded, easy to interpret view of the signal for quick analysis.

Feature	Description	Benefits
AM, FM Signal Generator	When the GENERATE mode is selected, the RF modulation method, carrier frequency, bandwidth, composite audio modulation and RF signal level output are displayed on the CRT.	Receiver testing time is reduced. This flexible, self calibrating signal generator is complimented by the simultaneous display of all necessary control information.
Off-the-Air Sensitive Receiver	The 2 microvolt sensitivity of the R-2600 is available through the antenna port. This allows off-the-air monitoring of remote transmitters operating up to 1 GHz. Variable squelch aids in picking up weak signals but can be set tighter to ensure the proper S/N ratio for measurement accuracy.	This enables frequent preventive maintenance system degradation parameter checks or interference identification without leaving the shop, thus reducing service costs.
Graphic Screen Print and Self Calibration	These commands are provided as immediate action functions. Dedicated keys on the front panel provide easy access.	Graphic screen print provides hardcopy of test data, improving the quality of customer documentation. Self calibration ensures measurement accuracy of RF input, output and modulation at the touch of a button.
RS-232/Serial Printer Interface (Standard)	A full bi-directional RS-232 port is standard and includes the capability of responding to serial input command vocabulary and return measurement results as a serial output stream. Included are user-selectable baud rates (up to 9600 bps) and start, stop and parity bit selection. In addition, this dual function port can drive an optional serial printer to print out data and graphic displays.	Remote monitoring of cell sites and off-the-air measurements of radio equipment located at distant, out of range sites can be performed without ever leaving the shop. Users with large volume repetitive testing requirements can write their own programs to cut their test time costs. Printed results can be used as part of the service shop's internal quality control system, and can be used to demonstrate performance to the radio equipment user.
IEEE-488 Interface (Optional)	The necessary interface hardware and software for IEEE-488 bus operation.	IEEE-488.2 compatible interface capability enables the System Analyzer to perform fully automated testing. Any one of various programmable controllers are suitable for this application.
Cable Fault (Optional)	Cable fault and length are new RF measurement features which help the technician to isolate cable defects. Supported by on-screen prompts and user-selectable Help messages, the technician can quickly set up and accurately determine the distance to a fault on a coaxial cable. The distance to fault (or cable length) is computed and displayed in feet or metric units.	Cable fault locating techniques are mandatory for site servicing, where visual inspection is not practical, safe or effective in detecting hidden or cold-flow damage. The semi-automatic operation of the cable fault finder eliminates the need for mathematical formulae and manual calculations, maximizing the technician's onsite productivity.

Cellular Radio Test Options

Feature	Description	Benefits
Dynamic Call Processing with Complete RF Signal Path Control 	Tests the subscriber radio under actual signaling conditions. Subscriber unit proper responses automatically checked for accuracy. RF signal path adjustable to simulate weak or strong signal paths.	Subscriber radio performance can now be verified and documented without using the customers' expensive airtime for testing. Complete control over the RF interface allows simulation of strong and weak signal paths to help insure no customer call backs.
Auto Test 	Name, radio I.D., etc. customized on printout. Start/end control of the test is done by pressing a single soft key. Inbound and outbound tests are performed with PASS or FAIL results measured against test limits you enter. ESN (in Hexidecimal and Decimal) as well as Mobile Identification Number (MIN) displayed. Automatic power level test for all eight (8) power levels shown as PASS/FAIL. Power level data is available in the AUTO PRINT selection. Power, frequency and deviation table shows results of up to eight (8) selected voice channel HANDOFFS.	Very powerful and efficient ***go/no-go*** test of the subscriber radio. Simple one key start/stop operation for improved testing productivity. Customized screen "Print" (PRT) and expanded "Auto Print" features allow you to assure your customers that you have thoroughly tested their radio and that it meets or exceeds the manufacturers' specifications and the margin of performance necessary to perform to their satisfaction.
Inbound/Outbound Test 	Tests the ability of the subscriber radios' ability to initiate/receive a call to/from the system. It places the radio on a voice channel where full measurement capabilities of the analyzer can be used to make more extensive measurements. Status Indicator showing call processing steps. ESN, MIN and called number (inbound) displayed. Easy Manual Handoff. Power tests (up to 8 levels).	Easy to read! Entire large screen CRT devoted to cellular testing. Provides a more comprehensive level of testing to ensure that the radio will work properly under all types of system conditions. Access to standard metering and graphic screens provides a diagnostic capability beyond ***go/no-go*** testing.
Manual Testing 	Convenient channel number entry sets up the unit for manual testing. Subscriber radio must be put into its internally controlled manual test mode.	Provides full access to the analyzers accurate diagnostic measurement capability for troubleshooting and repair.

Communications System Analyzer for Cellular Base Station Testing and Optimization

The R-2600CSP is an enhanced R-2600C modified for higher accuracy and includes several features which are optional on the base model. This unit is ideally suited for manually testing analog cellular base station equipment from any manufacturer or for automating the test of Motorola's analog cellular infrastructure equipment. The Motorola R-2600CCBS Cellular Base Site Test System automates the maintenance and alignment of Motorola LD-Mixed and HD-II series cellular equipment operating in EAMPS/NAMPS as well as TACS/UTACS and ETACS systems. This complete test system includes the R-2600CSP, the comprehensive CBS Autocal PC-based software program and an accessory kit with the cables, adapters and ancillary equipment needed to optimize the cell site. For automated test of Motorola's latest SuperCell line of cellular infrastructure equipment, the R-2600CSP is controlled by the Local Maintenance Facility (LMF) Terminal available from the Motorola Cellular Infrastructure Group.

CBS Autocal Optimization Program

Feature	Description	Benefits
RF Automatic Testing	Tests the base site per the Motorola Optimization Manual automatically. Fully optimizes all Signaling and Voice transceivers as well as Scan Receivers and RDMs. 6-Way automatic RF switch simplifies complete testing of all six antenna inputs. Also included is an antenna system test that calculates antenna VSWR and return loss measurements, while providing a graph of performance over frequency.	Site performance can now be evaluated in less time than previously possible. Complete automatic control of the exact recommended RF testing mechanics eliminates the opportunities for measurement and calibration errors. A complete and comprehensive test system to ensure optimum RF system performance.
Upload/Download Site Configurations	Communicates directly with the site BSC via the RS-232 port of a portable computer. Site configuration can be downloaded or recalled from saved configuration files. In addition, site data can be easily modified in the field utilizing plain English prompts.	Eliminates the time consuming task of translating HEX data. Configurations can be pretested to eliminate errors in the field.
Terminal Mode	Available at the touch of a function key, terminal mode allows direct communication between the service technician and the site BSC.	Real time communications can be accessed at any time during the automatic optimization procedure. Terminal mode simplifies troubleshooting and permits the technician to analyze test failures quickly and easily.
EAMPS/NAMPS/ETACS/UTACS/ NTACS Equipped	Recommended by Motorola Cellular field service for the RF optimization and maintenance of Motorola LD/HDII Base Stations.	Confidence that your field service organization is equipped with the best available service optimization and maintenance capability.
PC-Based with Data Storage	Sophisticated test system software is configured for IBM compatibles and requires dual serial ports, a 3.5" floppy disk drive, a minimum 20 Meg hard drive (60 Meg recommended) and DOS 5.0.	All RF test and measurement data is automatically stored for future reference. Having access to a printer in the field is no longer mandatory. Multiple site data can be electronically consolidated for later review and analysis.

R-2600CSP Communications System Analyzer

Feature	Description	Benefits
Improved Measurement Accuracy	Several important features have been included as standard capabilities in the R-2600CSP, including: • ± 6% Wattmeter • ± 1dB Signal Generator • ± 0.6dBM RDM Absolute Signal Strength Accuracy • ± 0.1dB Relative Signal Strength Accuracy	The improved measurement accuracy produces increased wattmeter and signal generator accuracy. Thus, the R-2600CSP has the capability to accurately test the site according to Motorola's specifications.
LPA Option Features	The LPA option includes these extra features: • Thermal Power Meter (± 6% accuracy for single and multiple carrier measurements) • Enhanced Spectrum Analyzer – Markers (absolute and delta) – Freeze, peak hold, max hold and average functions	The LPA option provides the functionality and performance required by Motorola for LPA testing.

Specifications

Operating/Display:

Modes:	AM/FM Monitor AM/FM Generate Audio Synthesizer Spectrum Analyzer Duplex Generator Sweep Generator Frequency Counter Digital Voltmeter Wattmeter Oscilloscope Signal Strength Meter SINAD/Distortion Meter

RF Signal Generator:

FREQUENCY	
Range:	400 kHz - 1 GHz
Resolution:	100 Hz
Accuracy:	Refer to Accuracy of Master Oscillator
Stabilization Time:	.1 Second
OUTPUT	
Range FM:	-130 dBm to 0 dBm
Range AM:	-130 dBm to -3 dBm
Accuracy:	±2 dB from -80 dBm to -130 dBm (RF I/O PORT) ±4 dBm for all other output levels and ports. 3 MHz to 1 GHz
SWEEP GENERATOR	
Range:	400 kHz - 1 GHz
Resolution:	100 Hz
Output:	-130 dBm to 0 dBm
Sweep Width:	Selectable up to ±5 MHz of center freq.
Scope Coupling:	Synchronized scope trace to the sweep signal
Accuracy:	Same as Signal Generator
DUPLEX GENERATOR	
Range:	400 kHz - 1 GHz
Resolution:	100 Hz
Output:	-130 dBm to 0 dBm
Frequency Offset:	0 MHz to ±55 MHz in 5 kHz steps
Accuracy:	Same as Signal Generator
SPECTRAL PURITY	
Spurious:	-35 dB within ±20 MHz of selected carrier frequency. Additional fixed spurs at an absolute level of <90 dBm at harmonic frequencies of 5 MHz. (These can affect level and modulation measurements when operated at low levels at or very near these specific frequencies.)
Harmonics:	-20 dBc

FM MODULATION	
Deviation:	99.5 kHz
Accuracy:	5% of setting ±25 Hz @ 1 kHz (NB) 5% of setting ±250 Hz @ 1 kHz (WB)
Residual FM:	20 Hz max @ 300 Hz to 3 kHz from fc
External/Internal Frequency Range:	5 Hz to 20 kHz, ±2 dB
AM MODULATION	
Range:	0-90%
Accuracy:	10% of modulation
Residual AM:	1.0% max @ 300 to 3 kHz from fc
External/Internal Frequency Range:	100 Hz to 10 kHz, ±1 dB
PHASE MODULATION	**(Optional)**
Range:	0.5 to 10 radians
Accuracy:	±8% at 1 KHz
Resolution:	.1 radians (.01 below 2.00 radians)
External/Internal Frequency Range:	300 to 3000 Hz

Audio Modulation Synthesizer:

Modulation types:	1 kHz tone, PRIVATE LINE, DIGITAL PRIVATE LINE, Single Tone, DTMF, Two-Tone Paging, 5/6 Tone Paging, International Select V, 20 Tone General Sequence, Tone Remote Control, External inputs from both a supplied microphone and BNC input.
Frequency Range:	10 Hz to 20 kHz ±1 dB
Mod Output Level:	Programmable into 7.95 v peak
Mod Output Impedance:	100 ohms nominal
1 kHz Tone Distortion:	Not to exceed 1%
External Modulation Inputs:	Front panel microphone and a BNC jack are summed.
BNC Input Impedance:	600 ohms nominal
Microphone Supplied:	HMN-1056D
Microphone Input Conditioning:	Internal audio limiting providing IDC and pre-emphasis.

Specifications

RF Receiver:

FREQUENCY	
Range:	400 kHz - 1 GHz
Resolution:	100 Hz
Accuracy:	Refer to Accuracy of Master Oscillator
Spurious Response:	40 dB typical
SENSITIVITY (Above 10 MHz)	
Narrowband FM:	2.0 uV for 10 dB EIA SINAD
Wideband FM:	10 uV for 10 dB EIA SINAD
FREQUENCY ERROR METER	
Type of Display:	Autoranging
Resolution:	1 Hz
FM DEVIATION MEASUREMENT	
Demod Range:	Up to ±5 kHz in Narrowband Up to ±75 kHz in Wideband
Accuracy:	±5% plus peak residual FM
Frequency Response:	Selectable per the following: Low Pass Filters 20 kHz, 3kHz, 300Hz High Pass Filters 5 Hz, 300 Hz, 3kHz
Demodulated Output level:	.8 v peak per 1 kHz peak Deviation in Narrowband and per 10 kHz Deviation in Wideband
Demodulation Output Impedance:	100 ohms nominal
Deviation Alarm:	Audible, set via keypad in 100 Hz increments
AM MODULATION MEASUREMENTS	
Demodulation Range:	0 to 100%
Accuracy:	±5% for levels below 80%
Frequency Response:	Selectable per the following: Low Pass Filters 20 kHz, 3 kHz, 300 Hz High Pass Filters 5 Hz, 300 Hz, 3 kHz
Demodulated Output Level:	.8v peak per 10% AM modulation
PHASE DEMODULATION MEASUREMENTS (Optional)	
Demod Range:	Narrowband = 1 radian Wideband = 10 radians
Accuracy/ Frequency Response:	±5% ±0.1 rad, ± residual noise at 1 kHz, ±7.5% ±0.1 rad, ± residual noise 300 Hz to 3.5 kHz

Metering and Measurement:

SPECTRUM ANALYZER - SEE AND HEAR™	
Frequency Range:	400 kHz to GHz
Dispersion:	Selectable from keypad per following: 200 kHz window - (20 kHz per div) 500 kHz window - (50 kHz per div) 1 MHz window - (100 kHz per div) 2 MHz window - (200 kHz per div) 5 MHz window - (500 kHz per div) 10 MHz window - (1 MHz per div)
Optional:	20 MHz window - (2 MHz per div)* 50 MHz window - (5 MHz per div)* 100 MHz window - (10 MHz per div)* * SEE AND HEAR™ not functional
Dynamic Range:	60dB
Bandwidth:	Automatically selected: 6 kHz - (100 kHz per division & below) 30 kHz - (200 kHz per division & below)
Display Range:	+50 to -95 dBm
Optional Markers:	Freeze, Max Hold, Peak Hold Delta or Absolute level and frequency
SIGNAL STRENGTH INDICATOR	
Range:	3 MHz to 1 GHz
Accuracy:	±4 dB
Sensitivity:	-100 dBm (antenna port rating)
WATTMETER (RF I/O PORT)	
Frequency Range:	3 MHz to 1 GHz
Measurement Range:	.1 watt to 125 watts
Input Impedance:	50 ohms with maximum VSWR of 1.5:1
Accuracy:	±10%
Protection:	Over temperature alarms
TRACKING GENERATOR	
Frequency Range:	400 kHz to 1 GHz
Tracking Display Sweep Range:	200 kHz window - (20 kHz per div) 500 kHz window - (50 kHz per div) 1 MHz window - (100 kHz per div) 2 MHz window - (200 kHz per div) 5 MHz window - (500 kHz per div) 10 MHz window - (1 MHz per div) 20 MHz window - (2 MHz per div) 50 MHz window - (5 MHz per div)
Display Range:	0 to -80 dBm

Specifications

Metering and Measurement continued:

CABLE FAULT	**(Optional)**
Method:	Standing Wave Analysis
Measure:	Fault distance, cable length
Reading:	Feet and meters
Accuracy:	10%
OSCILLOSCOPE	
CRT Size:	9 cm x 11 cm (approx. 7 inch diagonal) raster scan display with four intensity levels
Frequency Response:	0 to 50 kHz
Vertical Input Ranges:	Selectable per the following: 10 mV, 20 mV, 50 mV, 100 mV, 200 mV, 500 mV, 1v, 2v, 5v, 10v per division
Accuracy:	5% of full scale all ranges
Sweep Ranges:	Selectable per the following: 20 usec, 50 usec, 100 usec, 200 usec, 500 usec, 1 msec, 2 msec, 5 msec, 10 msec, 20 msec, 50 msec, 100 msec, 200 msec, 500 msec, 1 sec per division
Trigger:	Automatic, normal and single sweep
Optional Markers:	Delta Voltage, Delta Frequency, Delta Period
DIGITAL VOLTMETER	
Meter Type:	RMS
Frequency Range:	DC plus AC of 50 Hz to 20 kHz
DC Voltage Ranges:	1.0V, 10.0 V, 100 V full scale
Accuracy:	1% full scale ±1 least significant digit
AC Voltage Ranges:	1.0V, 10.0 V, 70 V full scale
Accuracy:	5% full scale ±1 least significant digit
Freq. Response:	3 dB end points @ 50 Hz and 20 kHz
FREQUENCY COUNTER	
Frequency Range:	5 Hz to 500 kHz plus Auto Tune
Period Counter Range:	5 Hz to 20 kHz
Input Level:	.1 v RMS minimum input level
Resolution:	.1 Hz, 1 Hz, 10 Hz, 100 Hz and 1 kHz varying by frequency range
Auto Tune:	Monitor mode, 20 MHz to 1 GHz unit will scan and find signals greater than -30 dBm
Accuracy:	See **TIME BASE**

SINAD/DISTORTION METER	
Input Level:	.1 V to 10 V RMS
SINAD Accuracy:	±1 dB at 12 dB SINAD
Distortion Range:	1% to 20%
Distortion Accuracy:	±0.5% of distortion of ±10% of reading whichever is greater
Optional:	C-Message Filter; CCITT Filter w/600 ohm switchable load
TONE SEQUENCE DECODE	
Modulation Types:	PRIVATE LINE, DIGITAL PRIVATE LINE, Single Tone, DTMF, Two-Tone Paging, 5/6 Tone Paging, International Select V, 20 Tone General Sequence.
Frequency Accuracy:	±3% from 300 Hz to 3 kHz
Duration Accuracy:	±12 msec for tones greater than 30 msec and 300 Hz

RS232 PORT (Requires special cable)/Optional IEEE-488 Bidirectional port provided with capability to respond to serial (optional parallel) input command vocabulary to activate functions and return measured results. Baud rates to 9600 BPS with selectable start and parity bits.

TIME BASE	
Standard TCXO:	Aging 1 ppm/yr, Temperature 1 ppm
Optional OCXO:	Aging .5 ppm/yr, Temperature .05 ppm

Power and Environmental:

AC:	100-130 VRMS or 200-260 VRMS@ 50 Hz to 440 Hz
DC:	+11 to +16 VDC
Battery Option:	13.6 V, 50 minutes typical
Dimensions:	8.5" high x 16" wide x 17" deep (21.6 cm x 40.7 cm x 43.2 cm) excluding accessories, battery pack and cover
Weight:	33 pounds (Basic model excluding accessory cover)
Temperature:	0 C to +50 C (operating) -40 C to +85 C (storage)

Interface Ports:

Printer/Remote Control:	RS-232 DB25 (female)
Color Monitor:	Standard CGA, RGB, DB9 (female)

Model Nomenclature

R-2600 Basic Models:

R-2600C	Basic model (with TCXO)
R-2600CHS	Basic model (with OCXO High Stability Timebase)
R-2600CNT	Basic model (with Tracker deleted)
R-2600CNTHS	R-2600CNT (with OCXO Timebase)
R-2600CSA	Cell Site Test Unit with standard accuracy (without accessories or test software)

Factory Installed Option Chart
(Order as additional line items with Basic Model R-2600C)

EAMPS ONLY	RLN-4259A
ETACS ONLY	RLN-4260A
JTACS, NTACS	RLN-4261A
EAMPS, NAMPS	RLN-4262A
CABLE FAULT	RLN-4306A
IEEE 488.2	RLN-4329A
C-message Filter	RLN-4034A
CCITT Filter	RLN-4361A
Hi Performance Spectrum Analyzer/ Marker Package	RLN-4423A
Phase Mod/Demod	RLN-4418A
Progr. Test Setup Memory	RLN-4485A

Accessories Supplied:

Oscilloscope Probe	RTL-4011A
BNC to N Adapter	58-84300A98
DC Power Connector Kit	RPX-4097A
Antenna	TEKA-24A
Microphone	HMN-1056D
Signal Generator Termination (50 Ohm)	58-80386B73
Operator Manual	68-80386B72
Power Cord	30-80397A62
Spare RF Fuses	GG6530277C002

Optional Accessories

Battery Pack	RPN-4000A
Canvas Case	15-80357B77
Transit Case	A-001
Maintenance Manual	RLN-4120C
RF Detector Probe	RTL-4075A
RF 50 Ohm Terminated Probe	58-80345B96
Telescoping Antenna	RTA-4000A
RGB Cable (DB9 male to DB9 male)	30-80387B60
RS-232 Interface Cable (DB25 male to DB9 Female)	30-80387B59
RS-232 Adapter for Computer Port (DB9 male to DB25 female)	RLN-4438A
Serial/Parallel Dot Matrix Printer	RLN-4375A
Serial Printer Cable (Special) (DB25 male to DB25 male)	30-80387B58
Rubidium Standard	R-1192A
CBS Accessory Kit	REX-1083A
CBS Auto Test Software (Motorola)	RVN-5001A

R-2600CCBS Cell Site Testing Models:

R-2600CBS	Complete Test System for Motorola LD/ HDII Cellular Base Station Optimization, which includes:
✓R-2600CSP	Customized Communications System Analyzer In addition to the standard R-2600 features and accessories, these models also include: • Enhanced accuracy specifications (see below) • Selectable 600-ohm DVM input impedance • Antenna Select Firmware to Control RF Switch • High Stability Oscillator • Cellular Subscriber Test Option • Lower Noise Floor on Spectrum Analyzer • Cable Fault Option
✓REX-1083A	Accessory Kit: The accessory kit contains items needed to interface the R-2600CSP to a Motorola HD-II or LD-Mixed cellular base station: a remote control six-way RF switch, a directional coupler, RF test cables, audio test cables and assorted RF attenuators and adapters.
✓RVN-5001A	Software Package Includes Optimization Software (3.5" disk) & Operators Manual

Recommended Option - Order with an R-2600CSA, R-2600CSP or an R-2600CCBS.

RLN-4486A	LPA Test Option for CBS – includes the Thermal Power Meter and Enhanced Spectrum Analyzer Option and REX-4348 LPA Accessory Kit. The LPA kit includes additional ancillary equipment needed for Motorola LPA testing: a thermal power head and cable, a step attenuator, additional RF attenuators and adapters.

Recommended Optional Equipment - Purchased Separately

R-1192A	10 MHz Rubidium Standard ERC Model 130 or Equivalent – Required for RDM frequency verifications and adjustment.

Additional Specifications for R-2600CSP Models:

Wattmeter (RF I/O Port)
Frequency Range: 820-960 MHz
Measurement Range: 1 watt-50 watts
Accuracy: 6%
RF Signal Generator (RF I/O Port)
Frequency Range: 820-960 MHz
Output Accuracy FM: 1 dB;-50 to -126 dBm
RF Signal Strength Accuracy:
0.6 dB, 0 to +2.0 dB @ 3 MHz
RF Signal Strength Accuracy:
0.1 dB, -10 to -13 dBm @ 900 MHz
Antenna Select Firmware to control RF Switch