ABN 43 064 478 842

231 osborne avenue clayton south, vic 3169
PO box 1548, clayton south, vic 3169
t 03 9265 7400 f 03 9558 0875
freecall 1800 680 680
www.tmgtestequipment.com.au

Test & Measurement

- sales
- rentals
- calibration
- repair
- disposal

Complimentary Reference Material

This PDF has been made available as a complimentary service for you to assist in evaluating this model for your testing requirements.

TMG offers a wide range of test equipment solutions, from renting short to long term, buying refurbished and purchasing new. Financing options, such as Financial Rental, and Leasing are also available on application.

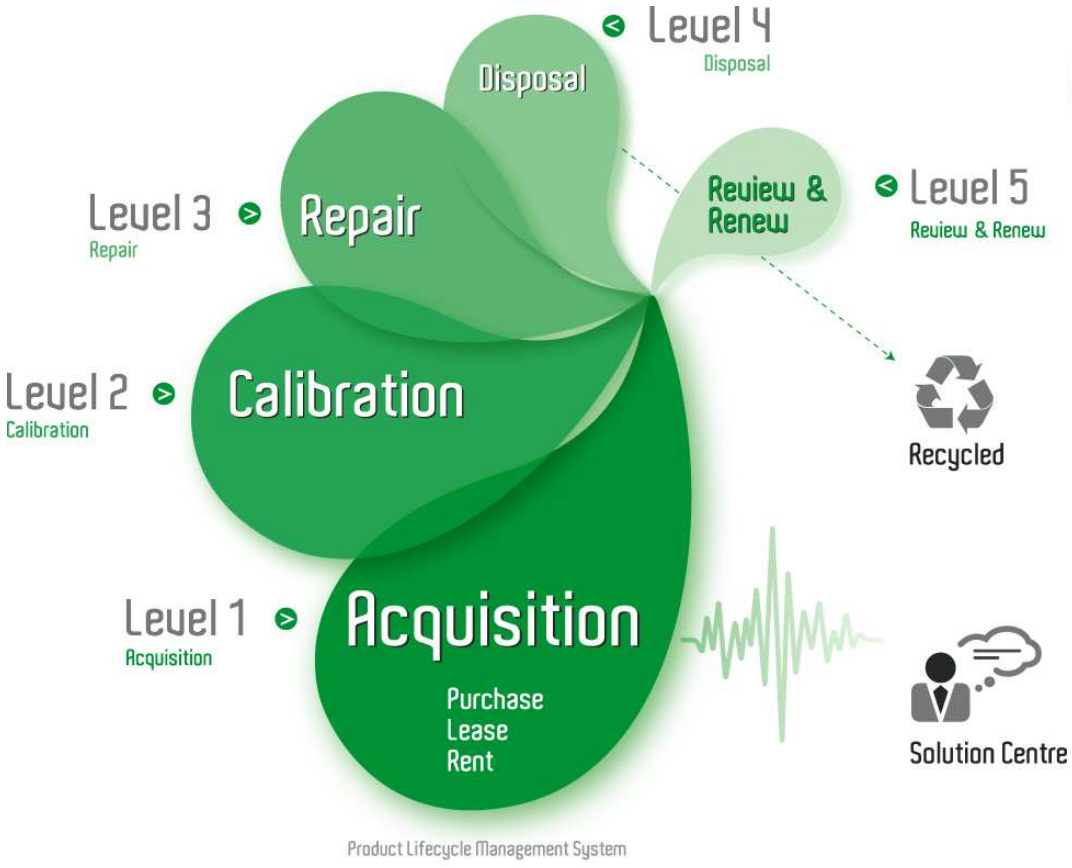
TMG will assist if you are unsure whether this model will suit your requirements.

Call TMG if you need to organise repair and/or calibrate your unit.

If you click on the "Click-to-Call" logo below, you can all us for FREE!

TMG Corporate Website **TMG Products Website**

Click-to-Call
TMG Now

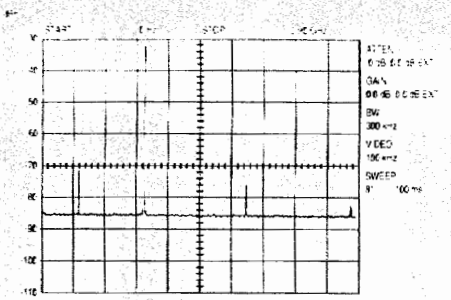


AN900 Series Spectrum Analyzers

AN920 RF Spectrum Analyzer

Features:

- 9 kHz to 2.9 GHz frequency range
- 3 Hz to 30 MHz resolution bandwidth
- +30 to -135 dBm amplitude range
- FM/AM receiver with built-in speaker and headphone jack
- 10, 20, 50%/div AM and 1 kHz to 5 MHz/div FM scales
- 1 Hz resolution frequency counter
- High speed time domain sweep with pretrigger and posttrigger
- Digital storage oscilloscope and FFT spectrum analyzer
- Extended frequency range with external mixers
- Automatic limits testing
- 99 trace and 99 setup memory registers
- AC, DC, or optional battery operation
- Optional built-in tracking generator
- Optional built-in quasi-peak detector



Wide frequency range covers LF through PCN bands.

Accurate, digitally synthesized tuning over a frequency range of 9 kHz to 2.9 GHz makes the AN920 an ideal measurement tool for communications testing requirements including applications in the new frequency allocations for wireless telecommunications and PCN equipment.

Even when operating over wide spans, the AN920's built-in frequency counter makes it possible to perform accurate frequency measurements at resolutions as fine as 1 Hz.

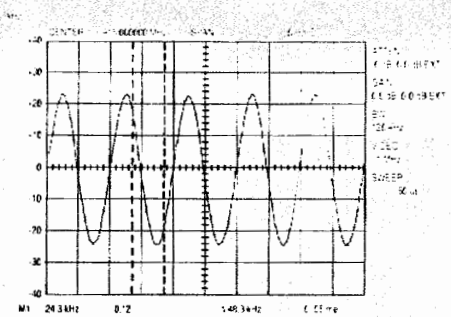
Bandwidth selections handle narrow and wideband signals.

10 MHz and 30 MHz resolution bandwidth selections enable accurate examination of wideband signals from sources such as spread spectrum radios or pulsed radar.

Closely-spaced signal components are easily resolved with 3, 10, 30, or 100 Hz digital resolution bandwidth selections. Seven windowing function choices allow the user to match the digital bandwidth characteristics to the desired signal measurement results. The 3 Hz filter yields an average displayed noise level of less than –135 dBm.

Five other standard bandwidth selections from 300 Hz to 5 MHz provide a multitude of intermediate span/bandwidth combinations.

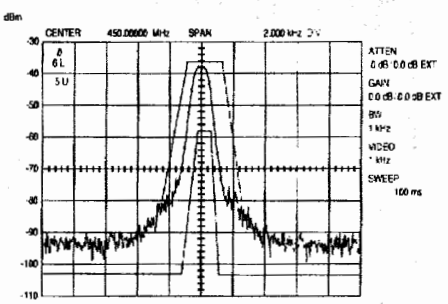
Option 08 provides additional resolution bandwidth selections of 200 Hz, 1 kHz, 9 kHz, 120 kHz, and 1 MHz plus a built-in Quasi-Peak detector.



FM/AM receiver measures modulation levels.

Preset receiver functions provide standard narrow band and wide band FM and AM detection and measurement. A user-definable function allows a custom receiver function to be defined from available analog resolution bandwidth and video bandwidth selections.

Modulation scales of 10, 20, and 50% per division AM and 1 kHz to 5 MHz per division FM allow direct measurement of the modulation component of carrier signals to a maximum of ±20 MHz of FM deviation or ±200% AM.



Limits test function detects and captures erroneous signal conditions.

A unique limits test mode continuously tests signals against displayed upper or lower limit threshold traces. A limit trace violation causes one or more user specified actions to occur including automatic storage of the offending trace into memory with time and date stamp for later recall and analysis.

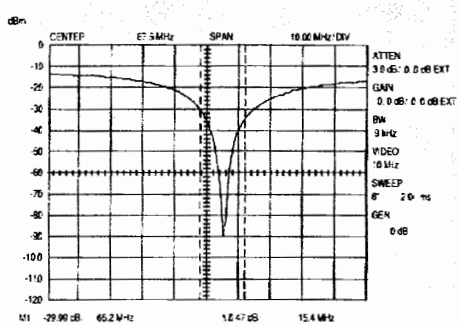
Limit traces can be loaded into the AN920's memory from an external controller or conveniently created directly on screen with the unique Create function.

High speed triggered sweep displays time domain data for accurate analysis.

Perform time domain measurements at sweep rates as fast as 200 ns / Div. A total of ±300 divisions of pretrigger and posttrigger range enables accurate time interval measurements at digitizing rates up to 25 Megasamples / sec. A comprehensive set of triggering functions, including TV line and TV field, provide stable displays of signals for easy measurement and analysis.

Interfaces provide direct output to plotter or computer.

Standard RS-232 and IEEE-488 interfaces output screen data directly to HPGL-compatible plotters or enable the AN920 to be connected to an external controller for remote operation. The IEEE-488 interface is compatible with the IEEE-488.3 (SCPI) command set.



Optional, built-in tracking generator performs swept measurements.

Scalar swept measurements over a 100 kHz to 2.9 GHz frequency range are possible when the AN920 is equipped with the option 02 built-in tracking generator. Built-in normalization functions simplify gain or loss measurements.

Logical control layout enhances user productivity.

Operation of the AN920 is accomplished without shift keys, multiple function controls or deeply layered softkey functions. For added operator convenience, up to 99 control setups can be stored in nonvolatile memory for single button recall and execution.

GENERAL CHARACTERISTICS

Dimensions	40.64 cm (16") wide (including handle); 19.05 cm (7.5") high; 55.88 cm (22") deep
Weight	20.4 kg (45 lbs) without options

POWER REQUIREMENTS

AC Line	85 to 135 Vac or 170 to 265 Vac, 50 to 400 Hz, <300 W
External DC	11 to 30 Vdc (<15 A at 12 V)
Battery Pack (AC7244)	12 V, 10 A/Hr, rechargeable
Operating time per charge	>30 minutes

TRACKING GENERATOR (Option 02)

Frequency Range	100 kHz to 2.9 GHz
Flatness (at −10 dBm)	±2.0 dB, 100 kHz to 1 MHz; ±1.5 dB, 1 to 2.9 MHz
Output Level	0 to −70 dBm in 1 dB steps
Attenuator Accuracy	±1 dB or 0.05 dB/dB
Nonharmonic Spurious	<−30 dBc
Harmonics	<−20 dBc
Leakage (Dynamic Range)	−120 dBm

QUASI-PEAK DETECTOR (Option 08)

Selected Bandwidth	Frequency Range	Charge Time*	Discharge Time*	Display Time*
200 Hz	10 to 150 kHz	45	500	160
9 kHz	150 kHz to 30 MHz	1	160	160
120 kHz	30 MHz to 1 GHz	1	550	100

**Time is given in ms ±20%*

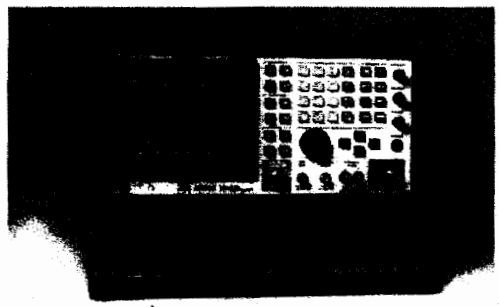
ENVIRONMENT

Temperature/Humidity	Mil-T-28800D 3.7.2, Class 5, Style C
Operating Temperature	0 to 50 degrees C
Storage Temperature	−40 to 71 degrees C
Temperature Change	1 degree C per minute for specified accuracy
Vibration/Shock	Mil-T-28800D 3.7.4 and 3.7.5, Class 5, Style C
Altitude	
Operational	3,048 meters (10,000 ft)
Nonoperational	12,192 meters (40,000 ft)

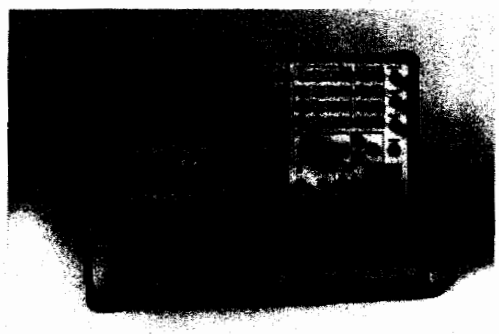
EMI COMPATIBILITY

Conforms to	Mil-Std-461C, part 4 for CE01, CE03, RE02, CS01, CS02, CS06, and RS03

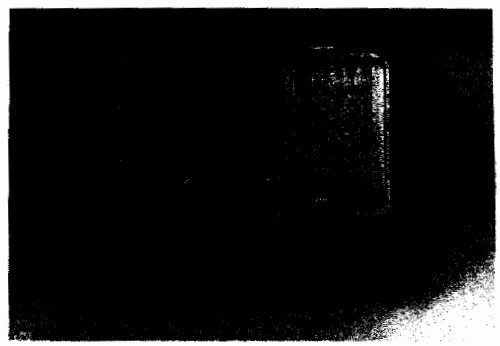
OTHER IFR SPECTRUM ANALYZERS



AN930 9 kHz to 22 GHz



AN940 9 kHz to 26.5 GHz



A-7550 10 kHz to 1.0 GHz

IFR SYSTEMS Inc. reserves the right to make design changes without notice.

the best is cost effective

CRAFTED WITH PRIDE IN USA

IFR SYSTEMS, INC.
10200 West York Street / Wichita, Kansas 67215-8935 U.S.A.
Phone 316/522-4981 / 1-800-835-2352
FAX 316/522-1360

Litho U.S.A. 0294

AN920
specifications

NOTE: The AN920 requires 15 minutes of warm-up time to meet specifications. Specifications only apply with TIME CALIBRATION set to ENABLE in the Analyzer Configuration Screen Options Menu or immediately after manually activating a TIME CALIBRATION. Specifications and features are subject to change without notice.

FREQUENCY

Frequency Range	
Internal Mixing	0 Hz to 2.9 GHz
External Mixing	3 GHz to 1300 GHz
Frequency Readout Accuracy	±(3% of Span Width + Frequency Standard Accuracy + 50% of RBW)
Frequency Span	
Range	0 Hz, 10 Hz/Div to 290 MHz/Div continuously variable plus full span (290 MHz/div)
Accuracy	±5% of indicated span
Sweep	
Time	
(Span >200 Hz/Div)	1 ms to 10 s/Div in 1-2-5 sequence
(Span = 0)	200 ns/Div to 10 s/Div in 1-2-5 sequence (Resolution reduced <2 μs/Div)
Accuracy	±1% >1 μs/Div
Trigger Source	Internal (video), external (front panel), external (rear panel) or line (ac input)
Trigger Mode	Free Run, Auto, Normal or Single
Trigger Coupling	AC, DC, High-Pass Filter, Low-Pass Filter, TV line, TV field
Trigger Bandwidth	>5 MHz (−3 dB) (at EXTERNAL INPUT Connector)
Trigger Level Range	
Video	Adjustable over 8 divisions, positive or negative polarity
External Front	−2.5 V, −1.0 V, −0.5 V, 0.0 V, 0.5 V, 1.0 V, 2.5 V; nominal
External Rear	+2.5 V nominal
Trigger Sensitivity	
Internal	1 division
External Front	200 mVp
External Rear	+2 V (TTL)
Trigger Delay	0 to ±300 divisions at Sweep Time/Div to a maximum of ±200 seconds (Span=0)

Frequency Counter		
Resolution	1 Hz, 10 Hz, 100 Hz, 1 kHz	
Accuracy	±(Frequency Standard Accuracy + Counter Resolution)	
Sensitivity (at 100 MHz with 0 dB attenuation)	<−85 dBm with 3 kHz RBW, <−65 dBm with 5 MHz RBW	
Frequency Reference		
Temperature Stability	±0.2 ppm ±0.02 ppm (Option 09)	
Aging		
First Year	±2 ppm ±1 ppm (Option 09)	
Thereafter	±1 ppm ±0.5 ppm (Option 09)	
Residual FM (peak to peak in 20 ms, Spans <1 MHz/Div, 100 Hz Video Filter)	<10 Hz	
Noise Sidebands	10 kHz	30 kHz
(Span <100 kHz/Div)	offset	offset
0.1 to 1.0 GHz	−97 dBc/Hz	−101 dBc/Hz
1.0 to 2.9 GHz	−92 dBc/Hz	−95 dBc/Hz
System Related Sidebands (at 300 Hz RBW)	<−65 dBc	

AMPLITUDE

Frequency Range	9 kHz to 2.9 GHz	
Maximum Input Level	0 Vdc, +20 dBm, +30 dBm CW >0 dB input attenuation +50 dBm peak; <10 μs, <1% duty cycle, >0 dB input attenuation	
Displayed Average Noise Level	3 Hz RBW	300 Hz RBW 10 Hz VBW
9 kHz to 100 kHz	<−115 dBm	<−95 dBm
100 kHz to 2.9 GHz	<−135 dBm	<−115 dBm
Gain Compression	<1.0 dB with −5 dBm (0 dB attenuation)	
Amplitude Units		
Logarithmic display	dBm, dBμV, dBmV, dBμV	
Linear display	mW, μW, mV, μV, dBm, dBμV, dBmV, dBμV	
Display Linearity		
5 or 10 dB/Div	±0.15 dB/dB, ±1.5 dB over 8 divisions	
1 or 2 dB/Div	±0.5 dB over 8 divisions	
Linear (<10 MHz RBW)	±2% of Reference Level over 8 divisions	
(10 MHz and 30 MHz RBW)	±10% of Reference Level over 8 divisions (<10 dB IF Gain)	

Frequency Response (relative to REF OUT)	±1.5 dB, 9 kHz to 2.9 GHz (10 dB attenuation)
Resolution Bandwidth	
Range	3 Hz, 10 Hz, 30 Hz, 100 Hz (Digital Resolution); 300 Hz, 3 kHz, 30 kHz, 300 kHz and 5 MHz (at 3 dB); 10 and 30 MHz (at 3 dB) (Linear display and FM modes)
Option 08 additional	1 kHz and 1 MHz (at 3 dB); 200 Hz, 9 kHz and 120 kHz (at 6 dB)
Accuracy	±20%, 300 Hz to 30 kHz; ±30%, 300 kHz to 30 MHz; ±10%, 200 Hz, 9 kHz and 120 kHz
Selectivity	60 dB/3 dB ratio <5:1, 3 kHz, 30 kHz, 300 kHz, 1 MHz, 5 MHz; <12:1, 1 kHz; 60 dB/6 dB ratio <10:1, 9 kHz and 120 kHz; 50 dB/3 dB ratio <10:1, 300 Hz; 50 dB/6 dB ratio <10:1, 200 Hz
Switching Error (referenced to 30 kHz RBW)	±0.5 dB, 1 kHz to 5 MHz; ±1.0 dB <1 kHz; ±2.0 dB 10 MHz, 30 MHz
Video Bandwidth	
Range	10 Hz to 1 MHz in decade steps plus NONE (no Video Filter activated)
Input Attenuator	
Range	0 to 60 dB in 10 dB steps
Accuracy	Greater of ±0.5 dB or ±2% of dB setting
External Offset	0 to 99.9 dB in 0.1 dB steps
Gain	
Range	
<10 MHz RBW	−10 to 65 dB in 0.1 dB steps
10 MHz, 30 MHz RBW	0 to 20 dB in 0.2 dB steps
Accuracy	
<10 MHz RBW	±0.25 dB, 0 to +20 dB; ±0.5 dB, +20 to +65 dB
10 MHz, 30 MHz RBW	±2 dB
External Offset	0 to 99.9 dB in 0.1 dB steps
Reference Level	
Range	−95 to +30 dBm (internal gain and attenuation); −194.9 to +129.9 dBm with external offsets
Resolution	0.1 dB

Spurious Responses	
Harmonic Distortion (−30 dBm input and 10 dB attenuation)	<−70 dBc
Third Order Intermodulation Distortion (−30 dBm input and 10 dB attenuation)	<−80 dBc
Residual Response (input terminated with 50 ohms)	<−90 dBm, 9 to 100 kHz; <−100 dBm, 100 kHz to 2.9 GHz
Other Input Related Spurious (-30 dBm input and 10 dB attenuation):	<−70 dBc
Display Bandwidth	
Linear mode	>5 MHz (−3 dB), 30 MHz RBW; >2.5 MHz (−3 dB), 5 MHz RBW; at <5 μs/Div Sweep Time
Log mode	>1 MHz (−3 dB), 5 MHz RBW; at <20 μs/Div Sweep Time

MEMORY

Trace Storage Capacity	99 traces (including user defined traces and test limits)
Recall to Display at one time	4 traces
Setup Storage Capacity	99 setups
Macro Program Capacity	64 kbytes

INPUT/OUTPUT

Analyzer Input	Type N Female Connector, 50 ohms nominal
Impedance	VSWR <1.3:1 (>0 dB input attenuation)
External Mixer IF Input	Type SMA Female Connector
Frequency	410.7 MHz at −30 dBm ±3 dB for top of screen display
Compression	1 dB at >−5 dBm
External Input	Type BNC Female Connector
Impedance	1 Megohm and 27 pF nominal
Coupling	AC, DC, GND
Time Domain (Scope)	
Amplitude	5 mV/Div to 5 V/Div (±3% of Full Scale) in 1-2-5 sequence
Frequency Range	dc to >5 MHz (−3 dB) at <5 μs/Div Sweep Time

Frequency Domain (FFT)	
Amplitude	
Gain	0 to 20 dB in 0.1 dB steps
Attenuation	0 to 60 dB in 20 dB steps
Range	2.23 mV to 22.3 V Full Scale (−40 to +40 dBm/50 ohm reference voltage)
Response	+0/−3 dB (0 Hz to 20 kHz)
Dynamic Range	80 dB
Average Noise Level	<1 μV
Spurious	<7 μV
Frequency Range	0 to 20 kHz
Span	10 to 200 Hz/Div continuously variable
Bandwidth	3, 10, 30 or 100 Hz
Trigger function	Selectable external trigger (time-gate) capabilities
Pulse Width	>100 ns
External Rear Trigger Input	10 kohms nominal
Ext Ref Input	Type BNC Female Connector, 1 kohm nominal 10 MHz at 1 to 10 Vp-p
Phones Output	1/8" (0.32 cm) phone jack
External Mixer LO Output	Type SMA Connector, 50 ohms nominal (must be terminated when not in use)
Frequency	3 to 12 GHz
Amplitude	≥+8 dBm
Ref Out (Calibrator)	Type BNC Female Connector, 50 ohms nominal
Frequency	100 MHz
Accuracy	*Same as Frequency Standard*
Amplitude	−30 dBm
Accuracy	±0.5 dB
10.7 MHz IF Output	Type BNC Female Connector, 50 ohms nominal
410.7 MHz IF Output	Type BNC Female Connector, 50 ohms nominal
Ext Display Output	9 pin EGA format for external color display
Video Output	100 mV/Div ±10% into 1 Megohm

Function connector	
External Rear Trigger, pin 8	10 kohms nominal
Upper Limit Relay Drive, pin 13	50V, 200mA maximum
Lower Limit Relay Drive, pin 5	50V, 200mA maximum
Auxiliary Video, pin 7	100 mV/Div ±10% into 1 Megohm
Sweep, pin 14	0 to +5 V ramp ±0.5 V
Sweep Hold, pin 6	TTL Level

IEEE-488 GPIB

Conforms to	IEEE-Standard 488-1987
Implemented Subsets	SH1, AH1, T1, TE0, L2, LE0, SR1, RL2, PP0, DC1, DT1 and C0
Compatibilty	IEEE-488.3 Command Set. High Speed waveform transfer supported.
Plotter Output	HPGL Compatible

RS-232

Type	Half-duplex RS-232 (operates as slave to controller [DTE])
Baud Rate	110, 150, 300, 600, 1200, 2400, 4800, 9600, 19200 or 38400
Handshake Modes	XON/XOFF (Software), CTS/RTS (Hardware)
Parity Check	Odd, Even or None
Data Bits per Word	7 or 8
Stop Bits per Word	1 or 2

RECEIVER

Frequency Range	9 kHz to 2.9 GHz
Sensitivity	5 μV at 100 MHz (30 kHz RBW, 3 kHz Video Bandwidth, 5 kHz deviation FM at 1 kHz rate, 10 dB SINAD) (10 dB IF Gain)
Selectivity	Available analyzer RBW between 200 Hz and 30 MHz
Demodulation	FM, AM (ac or dc)
AM Scales	10%, 20%, 50%/Div
FM Scales	1 kHz to 100 kHz, <10 MHz RBW; 200 kHz to 5 MHz, 10 MHz, 30 MHz RBW; in 1-2-5 sequence