



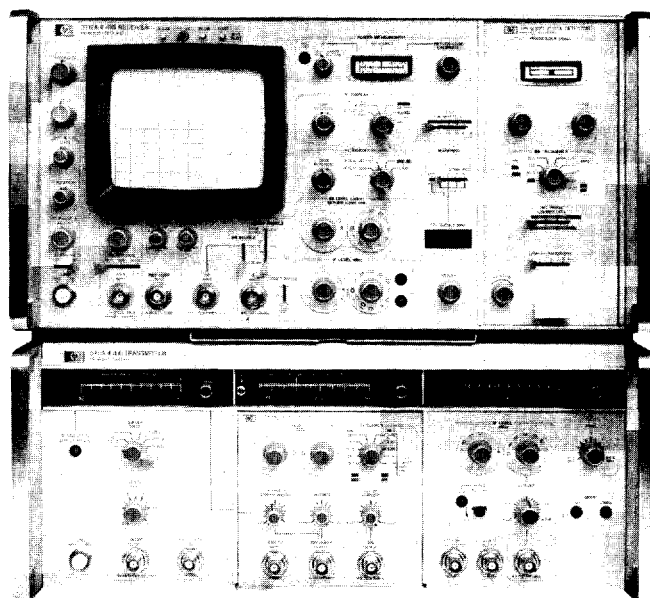
# TELECOMMUNICATIONS TEST EQUIPMENT

## Microwave Link Analyzers and Accessories

Models 3711A/3712A, 3710A/3702B, 3743A, 3750A

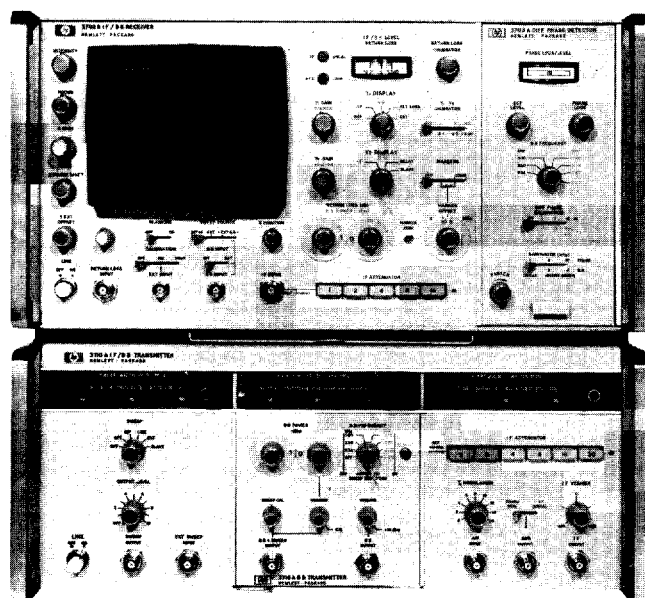
- Test analog and digital radios
- Isolate and characterize causes of intermodulation distortion in wideband FM microwave radios
- Baseband and IF interfaces
- 70/140 MHz or 70 MHz only IF capability
- Selectable combinations of BB test tones

70/140 MHz IF MLA System



3711A IF/BB Transmitter  
3791B BB Transmitter (Plug-in)  
3712A IF/BB Receiver  
3793B Diff. Phase Detector (Plug-in)

70 MHz IF MLA System



3710A IF/BB Transmitter  
3715A or 3716A BB Transmitter (Plug-in)  
3702B IF/BB Receiver  
3703B or 3705A Group Delay Detector (Plug-in)

Two versions of the Microwave Link Analyzer (MLA) are available: the 70 MHz IF 3710A/3702B System, and the dual 70/140 MHz IF 3711A/3712A System. For microwave radio stations employing both 70 and 140 MHz intermediate frequencies, the dual IF MLA is an economical way of providing a complete range of dedicated measurements at both IF's.

The 3710A/3702B and 3711A/3712A MLA's isolate and characterize causes of intermodulation distortion in wideband microwave radios. They have applications in both analog and digital radio systems. Measurements performed by the MLA's include:

- BB power, gain, and loss
- IF power, gain, and loss
- modulator/demodulator deviation sensitivity
- modulator/demodulator linearity
- modulator/demodulator group delay
- swept IF amplitude response
- swept IF group delay
- swept IF return loss
- BB and IF differential gain (HF linearity)
- BB and IF differential phase (HF group delay)
- BB return loss

When used with the 8620C/86200 Series RF Sweeper system (equipped with the MLA interface option) and the 3730B RF Down Converter, the swept measurements of the basic MLA's can be extended to RF. Pages 576 and 577 give further details about this RF instrumentation (3730B and 8620C).

Apart from the dual 70/140 MHz IF capability, with the full range of measurements available at both frequencies, the 3711A/3712A MLA has many other refinements over earlier systems. These include an improved marker system, an IF input frequency counter, improved input sensitivity at  $-19$  dBm, a slope control, a 16 dB dynamic display range, and X-Y Recorder facilities.

Another major contribution is the provision of an interface for the 8501A Storage-Normalizer. Use of this instrument with the 3711A/3712A MLA provides digital averaging and normalizing facilities. Further, measurement limit masks and adjustment instructions can be displayed on the MLA screen when a desk-top computing controller is used with the Storage-Normalizer.

A series of options are available with the MLA's, including:

- test-tone frequencies
- connectors
- balanced 124  $\Omega$  baseband impedance
- sweep frequencies
- variable phase output of sweep signal

**Options** (3711A/3712A and 3710A/3702B MLA's)

To compile a suitable MLA System for your application, select *one* of the following combinations:

**70/140 MHz IF**— 3711A/3791B/3712A/3793B.

**70 MHz IF with low- and high-frequency test-tones**— 3710A/3716A/3702B/3705A.

**70 MHz IF with low-frequency test-tones only**— 3710A/3715A/3702B/3703B.

**Connector Options**

(3711A/3791B/3712A/3710A/3716A/3715A/3702B only)

Option	BNC	Siemens Large	Siemens Small	WECO 477B	WECO 560A
Std	•				
002		•			
003			•		
004				•	
005*					•

\* Available with 3711A/3791B/3712A only.

**Test-tone (BB) Options**

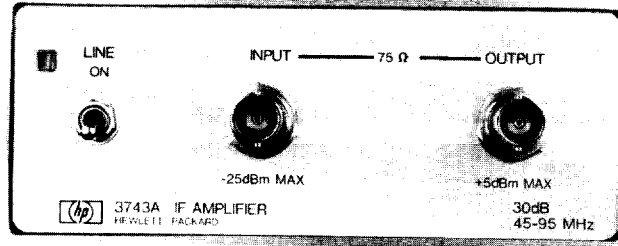
(3791B/3793B/3716A/3715A/3705A/3703B only)

3791B/ 3793B/ 3716A/ 3705A Options	Test-tone Frequencies										
	83.333 250 & 500 kHz	92.593 277.778 & 555.556 & 277.778 kHz	55.556 92.593 & 277.778 kHz	2.4 MHz	3.50 MHz	3.58 MHz	4.43 MHz	4.50 MHz	5.60 MHz	8.20 MHz	12.39 MHz
Std	•										
010		•		•							*
011		•		•							*
012		•		•							*
013	•			•							*
014	•			•	•						*
016	•			•							*
018	•			•							*
019	•			•							*
021*		•		•							*
022	•			•							*
210*			•	•							*
211*			•	•							*
212*			•	•							*
221*			•	•							*
3715A/ 3703B Options											
Std 009	•										

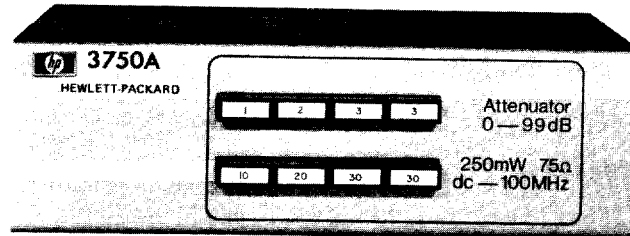
\* Available with 3791B/3793B only.

**Sweep Frequency Options** (3711A/3710A only)

Option	70 Hz	LINE	Opt			
			70 Hz	50 Hz	100 Hz	18 Hz
Std	•	•				
006	•	•	•			
007	•	•		•		
015	•	•			•	



3743A IF Amplifier



3750A Attenuator

**Miscellaneous Options**

- 008** (3711A/3710A only) Variable phase sweep output.
- 015** (3793B/3705A only) Additional phase detector bandwidths of 90 and 180 Hz—must be used with 18 Hz sweep rate on 3711A or 3710A IF/BB Transmitter.
- 020** (3712A only) CRT graticule illumination.
- 908** (3711A/3712A/3710A/3702B only) Rack mounting kit.
- 910** Extra manuals.

**3743A IF Amplifier**

- Improve MLA IF input sensitivity to -40 dBm.
- Frequency range 45 to 95 MHz.
- Group delay <0.3 ns.
- Amplitude flatness <0.2 dB.
- Return loss >26 dB (75 Ohm).
- Noise figure ≤8 dB.

**3750A Attenuator**

- Impedance 75 Ohm.
- Attenuation range 0 to 99 dB, in 1 dB steps.
- Frequency range dc to 100 MHz.

**Ordering Information**

	Price
<b>70/140 MHz system</b> (3711A/3791B/3712A/3793B)	\$26,570
<b>70 MHz system with low- and high-frequency test-tones</b> (3710A/3716A/3702B/3705A)	\$18,000
<b>70 MHz system with low-frequency test-tones only</b> (3710A/3715A/3702B/3703B)	\$17,975
<b>3743A IF Amplifier</b>	\$1,581
<b>3750A Attenuator</b>	\$654