

December 3, 1982
Supersedes: none

To: ALL INSTRUMENT SALES AND SERVICE OFFICES (PT01)
From: NETWORK MEASUREMENTS DIVISION (45)
SANTA ROSA, CALIFORNIA (PL14)
Subject: 83540B 2.0 to 8.4 GHz RF PLUG-IN

DESCRIPTION

The 83540B RF plug-in is compatible with the 8350A sweep oscillator, covering frequencies from 2.0 to 8.4 GHz in a continuous sweep. The specified maximum leveled output power is +13 dBm with ≤ 7 kHz peak residual FM. The 83540B uses a YIG Tuned filter which is built into the YIG Tuned Oscillator (YFO) to reduce harmonics 45 dBc. The 83540B has internal leveling standard. The available options are:

- Option 002 — Internal 70 dB Step Attenuator
- Option 004 — Rear Panel RF Output

The 83540B U.S.A. list price is \$10,250. The first customer shipment is September 1, 1982.

SUPPORT STRATEGY

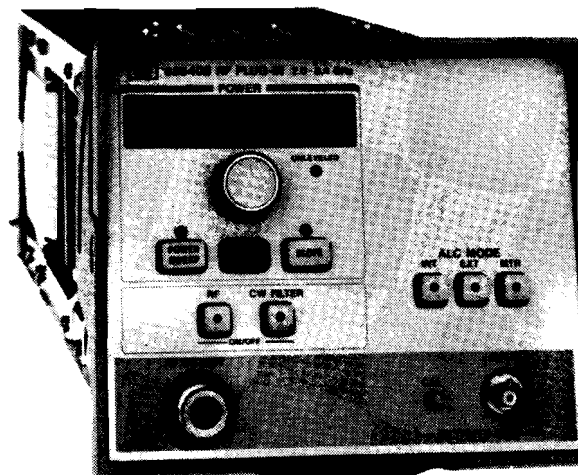
The repair strategy is bench repair to the component level. There are two microcircuits, both of which are on the Rebuilt Exchange program (Blue Stripe). See Attachment I for a list of HP part numbers and prices.

WARRANTY

The 83540B carries the standard instrument product warranty, one year return to Hewlett Packard.

TRAINING

There is no additional service training planned for the 83540B. Thirty-five tech-



nicians have been trained worldwide to service the 8350A and its series of RF Plug-ins. The 83540B is identical to the 83540A with the exception of the RF path. See simplified block diagram (Attachment II).

LITERATURE

The first customer shipments are being made with the first edition manual (HP Part Number 83540-90008). The final manual will be distributed in April, 1983.

BASIC SUPPORT DATA

The expected failure rate for the 83540B is less than 10% with a mean time to repair of less than four hours, ARC \$450. The calibration cycle will be once a year with a calibration time of less than three hours.

SUPPORT EQUIPMENT

A list of service accessories and recommended test equipment to support the 83540B is provided in Attachment III.

PARTS SUPPORT

A parts stocking recommendation will be sent to CPC and PCE for those parts that are unique to the 83540B. This will include both purchased and fabricated parts. The expected number of repairs per region per quarter are

shown in Attachment IV.

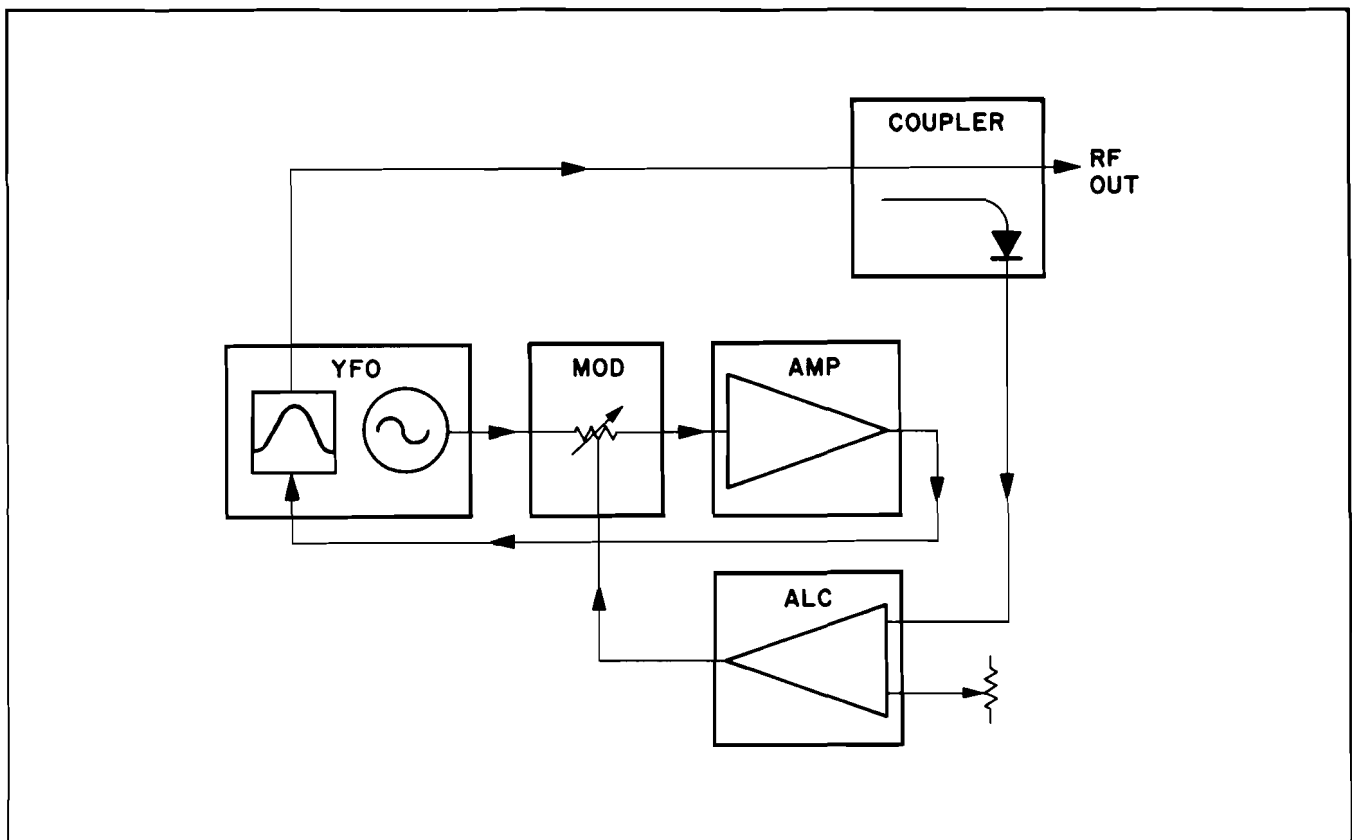
ATTACHMENTS

- I. Rebuilt Exchange Parts
- II. Simplified RF Block Diagram
- III. Service Accessories Available and Recommended Test Equipment
- IV. Projected Repairs by Region
- V. Basic Support Data
- VI. Parts Stocking Recommendation
- VII. 8350A Family Prioritized Stocking Recommendation

Attachment I. Rebuilt Exchange Parts

Description	Part Numbers		New Price	Exchange Price
	New	Restored		
YIG Oscillator 2.0—8.4GHz	5086-7250	5086-6250	4000	1950
Modulator/Amp 2.0—8.4 GHz	5086-7249	5086-6249	1650	900

Attachment II. Simplified RF Block Diagram



Attachment III. Recommended Test Equipment

Instrument	Critical Specifications	Recommended Model	Use ¹
Sweep Oscillator	No substitute	HP 8350A	P,A,T
Digital Voltmeter (DVM)	Range: 50V to +50V Accuracy: $\pm 0.01\%$ Input Impedance: $\geq 10M$ Ohms	HP3455A	P,A,T
Oscilloscope	Dual Channel Bandwidth: dc to 100 MHz Vertical Sensitivity: ≤ 5 mV/Div Horizontal Sweep Rate: $\leq 0.1 \mu$ S/Div X vs. Y Display Mode	HP 1740A	P,A,T
Frequency Counter	Frequency Range: 2.0 to 8.4 GHz	HP 5343A	P,A
Spectrum Analyzer	Frequency Range: 2.0 to 18 GHz Residual FM: ≤ 100 Hz Must have auxiliary IF output when used with the HP 8901A Modulation Analyzer	HP 8565A or HP 8566A	P,T
Modulation Analyzer	(May be used in addition to Spectrum Analyzer). Frequency Range: Must cover auxiliary IF Output frequency of Spectrum Analyzer used. Residual FM: ≤ 10 Hz	HP 8901A	P,T
Swept Amplitude Analyzer	Capable of Transmission and Reflection measurements. Power Resolution: ≤ 0.25 dB/Div	HP 8755C	P,A
Display Mainframe	Compatible with HP 8755C Swept Amplitude Analyzer and HP 8750A Storage-Normalizer	HP 182T, TR	P,A
Detector	Compatible with Swept Amplitude Analyzer Frequency Range: 2.0 to 8.4 GHz Power Range: -20 to +10 dBm	HP 11664A	P,A
Storage-Normalizer	Compatible with Display Mainframe and Swept Amplitude Analyzer	HP 8750A	P,A
Frequency Meter	Frequency Accuracy: $\leq 0.17\%$ Calibration Increments: ≤ 2 MHz Frequency Range: 2.0 to 4.0 GHz 4.0 to 8.4 GHz	HP 536A HP 537A	P,A P,A

Attachment III. Recommended Test Equipment

Instrument	Critical Specifications	Recommended Model	Use ¹
Attenuator	Attenuation: 3 dB ± 0.5 dB Frequency Range: 2.0 to 8.4 GHz Maximum Input Power: ≥ +20 dBm Type-N Connector	HP 8491B Option 003	P
Attenuator	Attenuation: 6 dB ± 0.5 dB Frequency Range: 2.0 to 8.4 GHz Maximum Input Power: ≥ +20 dBm Type-N Connector	HP 8491B Option 006	P
Attenuator	Attenuation: 10 ± 0.5 dB Frequency Range: 2.0 to 8.4 GHz Maximum Input Power: ≥ +20 dBm Type-N Connector	HP 8491B Option 010	P,A
Attenuator	Attenuation: 20 ± 0.5 dB Frequency Range: 2.0 to 8.4 GHz Maximum Input Power: ≥ +20 dBm Type-N Connector	HP 8491B Option 020	P
Adjustable Short	Frequency Range: 1.8 to 12.4 GHz Impedance: 50 ± 1.5 Ohms	Maury Microwave ² 1953-2	P
Adapter	APC-7 to Type N(m)	HP 11525A	P
Adapter	APC-3.5(f) to Type N(m)	Amphenol ³ 131-7018	P
Directional Coupler	Frequency Range: 2 to 8.4 GHz Mean Output Coupling: ≥ 20 dB Output Coupling Variation: ≤ ± 1 dB Minimum Directivity: ≥ 26 dB	HP 779D	P
RMS Voltmeter	dB Range: -20 to -70 dBm (0 dBm = 1 mW into 600 Ohms) Frequency Range: 10 Hz to 10 MHz Accuracy: ±5% of full scale	HP 3400A	P
Air Line Extension (2 required)	Impedance: 50 Ohms Frequency Range: dc to 8.4 GHz Reflection Coefficient: 0.018 + 0.001 (times the frequency in GHz)	HP 11567A	P
Step Attenuator	Frequency Range: dc to 8.4 GHz Incremental Attenuation: 0 to 70 dB in 10 dB steps Calibration Accuracy: ≤ ± 0.1 dB at all steps	HP 8495A Option 890	P

Attachment III. Recommended Test Equipment

Instrument	Critical Specifications	Recommended Model	Use¹
Function Generator	Frequency Range: 0.1 Hz to 10 MHz Sine wave and square wave output Output Level: 10 V p-p into 50 Ohms Output Level Flatness: ≤ ± 3% from 10 Hz to 100 kHz ≤ ± 10% from 100 kHz to 10 MHz	HP 3312A	P,A,T
Power Meter	Power Range: -20 to +10 dBm (No substitute when used for external power meter leveling).	HP 432A	P,A
Thermistor Sensor (Used with HP 432A)	Frequency Range: 2.0 to 8.4 GHz Maximum SWR: ≤ 1.75	HP 8478B	P,A
Power Meter	Power Range: 1 μW to 100 mW	HP 436A	P,A
Power Sensor (Used with HP 436A)	Frequency Range: 2.0 to 8.4 GHz	HP 8481A	P,A
Crystal Detector	Frequency Response: 2.0 to 8.4 GHz Maximum Input Power: 100 mW	HP 423B	P,A
Power Splitter	Frequency Range: 2.0 to 8.4 GHz Output Port Tracking: ≤ 0.25 dB Maximum Input Power: +20 dBm	HP 11667A	P,A
Band Pass Filters	Frequency Range: 4 to 8 GHz 6 to 8 GHz 8 to 12.4 GHz	HP Part No. 0960-0402 HP Part No. 0960-0200 HP Part No. 0960-0403	A A A
DC Power Supply	DC Output: 0 to 6.5 Vdc ± 0.05 Vdc	HP 6213A	A
50 Ohm Termination	Type N, 50 Ohms ± 0.5 Ohms	HP 909A	P,A
Delay Line Discriminator	Refer to Figure 1-3.		
PC Board Extender	44-pin, extends printed circuit boards	HP Part Number 08350-60031 (each)	T
RF Plug-in Extender Cable	Extends RF Plug-in Interface Connector (J2)	HP Part Number 08350-60034	T
RF Plug-in Extender Cable	Extends RF Plug-in Power Supply Interface Connector (J3)	HP Part Number 08350-60035	T

¹ P = Performance Test; A = Adjustments; T = Troubleshooting

² Mauray Microwave Corp., 8610 Helms Ave., Cucamonga, CA 91730

³ Amphenol North America, Bunker-Ramo Corp., RF Operations, 33 E. Franklin St., Danbury, CT 06810

Attachment IV. 83540B Projected Repairs

	NEELY	EAST	MIDWEST	SOUTH	EUROPE	JAPAN	ICON	Total
Q1	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0
Q4	1	1	1	1	1	1	0	5
Total	1	1	1	1	1	1	0	6

Attachment V. Basic Support Data

Division 4500 Model # 83540B Date 8/30/82

A. ROUTINE PREVENTATIVE MAINTENANCE

- 1. PM Frequency 0 per year
- 2. Average PM Time 0 hours
- 3. Total PM Time 0 hrs/yr

B. CALIBRATION

- 1. Calibration Frequency 1 per year
- 2. Average Calibration Time 3 hours
- 3. Total Calibration Time 3 hrs/yr

C. REPAIR

- 1. Estimated Failure Factor .10 failures/yr
- 2. Average Repair Time 4 hours
- 3. Total Repair Time .4 hrs/yr
- 4. Estimated Parts Charge 210 \$/repair
- 5. Total Parts Charge 21.00 \$/yr

D. SPECIAL COSTS NOT COVERED ABOVE (Period Overhauls, Expensive Parts, PM Supplies, Vendor Repairs, Special Calibrations, etc.)

- 1. Describe Costs _____

- 2. Total Labor House _____ hrs/yr
- 3. Total Parts Charge _____ \$/yr
- 4. Additional Costs _____ \$/yr

E. COMMENTS

Note: Data should be based on 2000 hours per year of instrument use under environmental and operating conditions similar to those at your division.

Attachment VI. Parts Stocking Recommendation

HP Part Number	CD	Description	6 Month Demand		Recommended List
			CPC	PCE	
83540-00006	9	Dress Front/Panel	1	1	40.00
83540-20015	2	Cable -- RF YFO/COUP	0	0	27.00
83540-20016	3	Cable -- RF AMP/YFO	0	0	25.00
83540-60017	8	Marker Board Assy.	0	0	340.00
83540-60018	9	ALC Board Assy.	1	1	500.00
83540-90006	8	O & S Manual	0	0	25.00

Attachment VII. 8350A Family Prioritized Parts Stocking Recommendation

Priority	HP Part Number	CD	Description	Reason	Instrument
1	1813-0100	7	+5VA Regulator	Update	8350A
2	5061-5304	2	RF Output Conn.	Update	83590A/92A
3	1826-0758	8	Analog Multiplier	Fail Rate	RF Plug-ins
4	1826-0690	7	-10V/-15V Regulator	Fail Rate	8350A
5	08350-60052	3	64-pin Ribbon Cable	Fail Rate	8350A
6	08350-60010	3	Power Supply Cable	Fail Rate	8350A
7	83525-60025	9	64-pin Ribbon Cable	Fail Rate	83525A/B
8	1826-0610	1	Analog Switch	Fail Rate	RF Plug-ins
9	1826-0471	2	Op Amp	High Usage	All
10	1820-1730	6	Data Latch	High Usage	All