

SPECIAL DISPLAYS

Measurement overflow or Noise Figure reading greater than 32 dB.

Data not ready.

The HP 8970B cannot continue until it gains control of the Sys. Interface Bus. (See 49.0-49.3 SP in manual.)

HP-IB

HP-IB OUTPUT FORMATS

HP-IB code H0 (43.0 SP): ± DDDDD E ± NN CR LF

HP-IB code H1 (43.1 SP): ± DDDDD E ± NN, ± DDDDD E ± NN, ± DDDDD E ± NN CR LF

HP-IB code H2 (43.2 SP): ± DDDDD E ± NN, ± DDDDD E ± NN, ± DDDDD E ± NN CR LF

Errors: ± 90DDD E + 06 CR LF

Reserved Number: + 90000 E + 06 CR LF

Used for the "—" special display and for a blank display.

HP-IB STATUS BYTE:

Bit	7	6	5	4	3	2	1	0
Condition	Extended Status	RQS	Instrument Error	Control on SIB	SRQ on SIB	HP-IB Code Error	Cal Complete	Data Ready

EXTENDED STATUS BYTE:

Condition	0 (always)	Power on Cycle	Plot is Done	Fine Tune Done	Coarse Tune Done	Needs Coarse Tune	Frequency not Tuned	Needs Fine Tune
HP 8971B								

SPECIAL FUNCTIONS

HP-IB RELATED SPECIAL FUNCTIONS

DATA OUTPUT SELECTION

43.0 (H0) NOISE FIGURE Only.

43.1 (H1) Frequency (Left Display), INSERTION GAIN, NOISE FIGURE.

43.2 (H2) Output Cal Data.

SERVICE REQUESTS

(See Status Byte.)

44.0 (Q0) Clear SRQ Mask.

44.7 (RM) Set SRQ Mask (4).

44.9 (RE) Set extended SRQ Mask (0).

(OS) Output Status Bytes.

(RS) Reset both Status Bytes.

TRIGGER SELECTION

30.0 (T0) Free Run.

30.1 (T1) Hold.

30.2 (T2) Execute.

HP 8970B/HP 8971B SPECIAL FUNCTIONS

SIDE BANDS

17.0 (B4) Enable HP 8971B SSB3.

17.1 (B5) Disable HP 8971B YIG Filter for DSB Operation.

17.2 (CF) Display and enter System LO Cross-over Frequency.

HP 8970B INPUT IF (MODES 1.5-1.9)

19.2 (S2) HP 8971B Internal Band 2 IF (SSB2) (700 MHz)

19.3 (S3) HP 8971B Internal Band 3 IF (SSB3) (450 MHz)

HP-IB AND SYSTEM INTERFACE BUS (SIB) ADDRESSES

40.0 Display and enter HP 8970B Address.

40.1 (EA) Display and enter Sys LO Address.

40.2 (HT) Display and enter HP 8971B Test Set Address.

40.3 (HP) Display and enter Plotter Address.

40.4 (HS) Display and enter System Interface Bus (SIB) Address.

40.5 (HC) Display and enter Pass Control Address.

40.6 (PT) Display and enter Pass Through Device Address.

40.7 (VP) View HP 8970B Pass Through Address.

HP 8971B FINE TUNE CONTROL

36.0 (FT) Fine tune HP 8971B in Cal.

36.1 (FD) Disable fine tune in Cal.

36.2 (FW) Disable fine tune, no warnings.

36.3 (PF) Perform fine tune.

36.4 (FF) Fine tune at current freq.

CORRECTED MEASUREMENT WARNINGS

39.0 (DG) Enable E21 in modes 1.5-1.9.

39.1 (EG) Disable E21 in modes 1.5-1.9.

HP 8970B MEASUREMENT MODES

CALIBRATION AND MEASUREMENT SETUP (MODE 1.0)

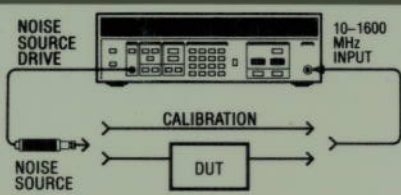
MODE 1.0 (1.0 SP)
10-1600 MHz measurement, no sys LO or frequency conversion.

a. Press 1.0 SP.

b. Set frequency parameters.

c. Calibrate as shown.

d. Insert device under test (DUT) and measure.



CALIBRATION AND MEASUREMENT SETUP (MODE 1.1 AND 1.2)

MODE 1.1 (1.1 SP)
Variable-frequency sys LO, frequency conversion in measurement system but not in DUT.

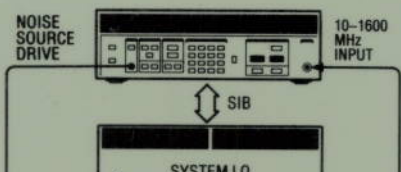
a. Verify minimum requirements (see above).

b. Press 1.1 SP.

c. Set frequency parameters (including fixed IF, 3.0 SP).

d. Calibrate as shown.

e. Insert DUT and measure.



MODE 1.2 (1.2 SP)

Fixed-frequency sys LO, single sideband, frequency conversion in measurement system but not in DUT.

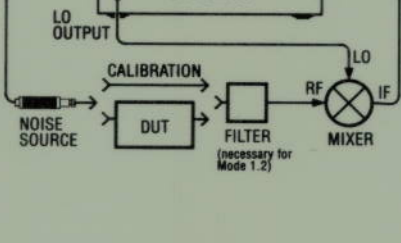
a. Select single sideband offset (2.1 or 2.2 SP).

b. Press 1.2 SP (left display shows E33 until step c. is performed).

c. Set frequency parameters (including fixed LO Frequency, 3.1 SP).

d. Calibrate as shown (external filtering is required).

e. Insert DUT and measure.



CALIBRATION AND MEASUREMENT SETUP (MODE 1.3 AND 1.4)

MODE 1.3 (1.3 SP)
Variable-frequency sys LO, frequency conversion in DUT (for testing mixer or receiver).

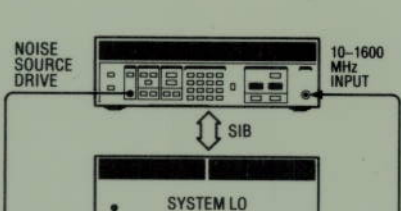
a. Verify minimum requirements (see above).

b. Press 1.3 SP.

c. Set frequency parameters (including fixed IF, 3.0 SP).

d. Calibrate as shown.

e. Insert DUT and measure.



MODE 1.4 (1.4 SP)

Fixed-frequency sys LO, variable IF, frequency conversion in DUT (for testing mixer or receiver).

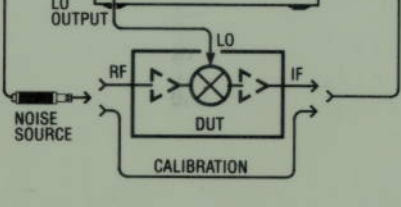
a. Set frequency parameters (including fixed LO Frequency, 3.1 SP).

b. Press 1.4 SP.

c. Calibrate as shown.

d. Insert DUT and measure.

e. Left display shows IF frequency.

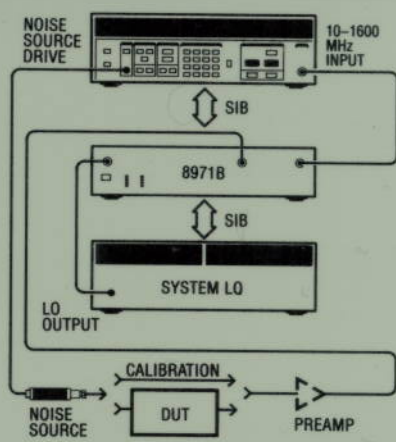


HP 8970S MEASUREMENT MODES

CALIBRATION AND MEASUREMENT SETUP (MODE 1.5)

MODE 1.5
10 MHz to 18 GHz measurement. Measurement system is optimized for SSB measurement. DSB operation is permitted from 2.4 to 18 GHz. Some LO's using heterodyning techniques may have too much noise below 2.4 GHz.

- Select mode, press 1.5 SP.
- Set frequency parameters using HP 8970B controls.
- Select system LO, press 41.X SP.
- Calibrate as shown.
- Insert DUT and measure.



CALIBRATION AND MEASUREMENT SETUP (MODES 1.6 AND 1.7)

MODE 1.6 (EXTERNAL CONTROLLER REQUIRED)

Variable-frequency user-controlled LO, fixed IF. 18 to 99.9 GHz measurement (depends on frequency range of user-controlled LO).

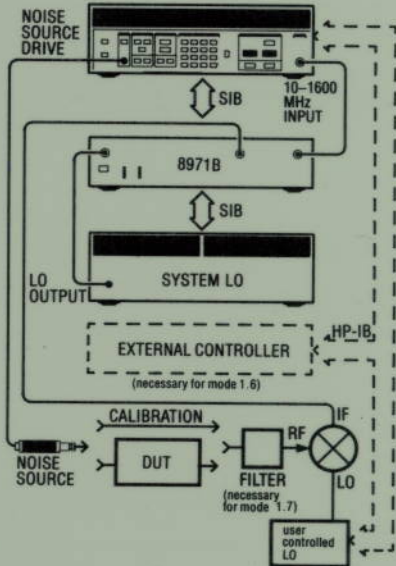
SSB or DSB operation depends on whether an ext. filter is used or not. 2.0, 2.1 and 2.2 SP in this mode, have no meaning. The user LO freq. (offset) is controlled by ext. controller.

- See manual and Product Note.

MODE 1.7 (SINGLE SIDEBAND ONLY)

Fixed-frequency user-controlled LO, variable IF. 18 to 99.9 GHz measurement (depends on frequency range of user-controlled LO).

- Select mode, press 1.7 SP.
- Select sideband offset. Will default to LSB (2.1 SP). For USB, press 2.2 SP.
- Set frequency parameters (including user LO frequency 3.1 SP).
- Select system LO, press 41.X SP.
- Calibrate as shown.
- Insert DUT and measure.



CALIBRATION AND MEASUREMENT SETUP (MODE 1.8 AND 1.9)

MODE 1.8 (EXTERNAL CONTROLLER REQUIRED)

Variable-frequency user-controlled LO, fixed IF. DUT has frequency conversion e.g., mixers, receivers, 18 to 99.9 GHz measurement (depends on frequency range of user-controlled LO).

SSB or DSB operation depends on whether an ext. filter is used or not. 2.0, 2.1, and 2.2 SP in this mode, have no meaning. The user LO freq. is controlled by the ext. controller.

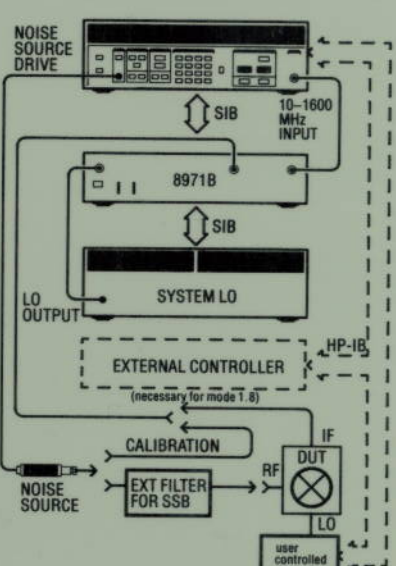
- See manual and Product Note.

MODE 1.9

Fixed-frequency user-controlled LO, variable IF. DUT has frequency conversion e.g., mixers, receivers, 18 to 99.9 GHz measurement (Depends on frequency of user-controlled LO).

SSB or DSB operation depends on whether an external filter is used or not.

- Select mode, press 1.9 SP.
- Set frequency parameters (including user LO frequency 3.1 SP).
- Select sideband operation, DSB, LSB, or USB.
- Select system LO, press 41.X SP.
- Calibrate as shown.
- Insert DUT and measure.



HARDWARE ERROR CODES

Hardware Errors

(Press PRESET and check input signal. See Manual if same error repeats.)

- E10 A/D conversion failed.
- E11 A/D converter overflow. Check 70.0, or 72.0 SP.
- E12 Input overflow. Reduce power.
- E13 IF attenuator calibration failed. ENR must be 11 dB minimum at 30MHz.
- E14 Cannot select proper IF or RF attenuators.
- E18 Frequency calibration failed.
- E19 HP 8971B coarse or fine calibration failed. Check setup or see manual.
- E60-E79 Service related errors. Contact HP Service Center.

E80 "Continuous memory" failure. Press PRESET which will re-initialize ALL special functions to factory shipped conditions.

HP 8971B Specific Errors

E100 HP 8971B Fine tune table will overflow.

E101 HP 8971B Self test failed.

E102 Auto Sweep aborted for longer switch life.

E103-E120 HP 8971B specific errors.