

# QF1320 BROADBAND SWEEP OSCILLATOR

## 1. GENERAL INFORMATION

The QF1320 Broadband Sweep Oscillator is an advanced sweep oscillator covering the frequency range of 10 ~ 2000 MHz, which sets new standards in sweeper performance and versatility. It offers many features such as ease of operation, broadband coverage, all sweep functions ( Full Sweep,  $\Delta F/CW$  Sweep, Start/Stop Sweep ), digital frequency display and etc. The Sweep Oscillator finds extensive applications as the most common source of swept RF signals in systems measuring network impedance and transmission characteristics. Combined with different test equipment, measurements of various microwave and RF devices (active or passive networks) and electronic equipment as well as frequency response are available.

The QF1320 Sweep Oscillator consists of two main parts: the mainframe and the RF Plug-in. The mainframe provides control signals for various sweep functions (Full Sweep, Start/Stop Sweep,  $\Delta F/CW$  Sweep, CW Vernier), blanking signals, marker signal and 1 KHz square wave signal, and DC voltages for the instrument as well. The RF Plug-in is a compact RF source. It enables broadband and linear sweep and flat power output by adopting technologies of YIG oscillation, frequency multiplication, frequency mixing over wide band, directional detection, automatic level control and etc.

In addition, the Sweep Oscillator has extensive modulation capabilities, offering both frequency modulation of high deviation and pulse modulation with an external phase-lock loop, the instrument provides very high frequency stability and extends its usefulness in a variety of microwave tests when used with a network analyzer.

Outputting auxiliary signals needed for displays, the instrument can work with a common oscilloscope or a general purpose display, offering faster and visual measurements and data readout.

## 2. SPECIFICATIONS

### 2.1 Frequency Characteristics

- |       |                     |   |
|-------|---------------------|---|
| 2.1.1 | Frequency Range:    | 10 ~ 2000 MHz (single band )                            |
| 2.1.2 | Frequency Display:  | 3 <sup>1</sup> / <sub>2</sub> digits                    |
| 2.1.3 | Frequency Accuracy: |   |
|       | CW:                 | $\leq \pm 1\%$ of the upper end of the band plus 10 MHz |
|       | Sweep:              | $\leq \pm 1\%$ of the upper end of the band plus 15 MHz |
| 2.1.4 | Sweep Width:        |   |
|       | Start/Stop Sweep:   | 10 ~ 2000 MHz, continuously adjustable.                 |

	Full Sweep:	10 ~ 1950 MHz
	$\Delta F$ Sweep:	$\pm 100$ MHz, $\pm 10$ MHz
2.1.5	Sweep Width Accuracy:	
	Start/Stop Sweep:	$< \pm 1\%$ of the upper-frequency end of the band plus 15 MHz
	Full Sweep:	$< \pm 1\%$ of the upper-frequency end of the band plus 20 MHz
	$\Delta F$ Sweep:	$\pm 10$ MHz ( $\times 1$ range ) $\pm 3$ MHz ( $\times 0.1$ range )
2.1.6	CW Vernier:	$\pm 100$ MHz, $\pm 10$ MHz
2.1.7	CW Vernier Accuracy:	$\pm 10$ MHz ( $\times 1$ range ) $\pm 3$ MHz ( $\times 0.1$ range )
2.1.8	Sweep Time:	0.01s/0.1s/1s/10s/100s/ $\pm 20\%$
2.1.9	CW Frequency Error Caused by line Voltage Variation:	$\pm 400$ KHz
2.1.10	Cw Frequency Error Caused by Output Level Variation:	$\pm 200$ KHz
2.2	Output Characteristics	
2.2.1	Max. Leveled Output Power:	$> 10$ mW below 1800 MHz $> 8$ mW above 1800 MHz
2.2.2	Flatness (Internally Leveled):	$\pm 1.5$ dB
2.2.3	Adjustment Range (Internally Leveled):	0 ~ 10 dB (continuously adjustable)
2.2.4	Flatness (Externally Leveled):	
	External Power Meter:	$\pm 1$ dB
	External Crystal Detector:	better than that of internally leveled (depending on the type of external detector and directional coupler used)
2.2.5	Equivalent Source Impedance:	50 $\Omega$
2.2.6	SWR of Equivalent Source Impedance:	$< 1.8$
2.3	Frequency Spectrum Characteristics	
2.3.1	Relative Harmonics:	$< -25$ dB
2.3.2	Relative Non-harmonics:	$< -25$ dB
2.3.3	Residual FM in 10 KHz BW:	50 KHz ( peak )
2.4	Modulation Characteristics	
2.4.1	External FM Modulation Frequency:	0 ~ 1 MHz ( up to 2 MHz )
2.4.2	Deviations for EXT. FM:	0 ~ 100 Hz $\pm 75$ MHz 100 ~ 500 KHz $\pm 5$ MHz 500 KHz ~ 1 MHz $\pm 1$ MHz
2.4.3	FM Sensitivity:	$> 20$ MHz/V
2.4.4	External Phase-lock	

	Sensitivity:	$\geq 6$ MHz/V
2.4.5	Internal AM ON/OFF Ratio:	$\geq 25$ dB
2.4.6	External AM ON/OFF Ratio:	$\geq 25$ dB
2.5	Sweep Characteristics	
2.5.1	Sweep Modes:	Auto, Manual, Trigger, Single.
2.5.2	Sweep Functions:	Full Sweep, Start/Stop Sweep, $\Delta F$ Sweep, CW Vernier.
2.6	Power Supply	
2.6.1	Line Power:	$220\text{ V} \pm 10\%$ , $50\text{ Hz} \pm 4\%$
2.6.2	Maximum Power Consumption:	$\approx 90$ VA
2.7	Dimensions:	$440 \times 500 \times 165$ (mm)
2.8	Weight:	20 kg

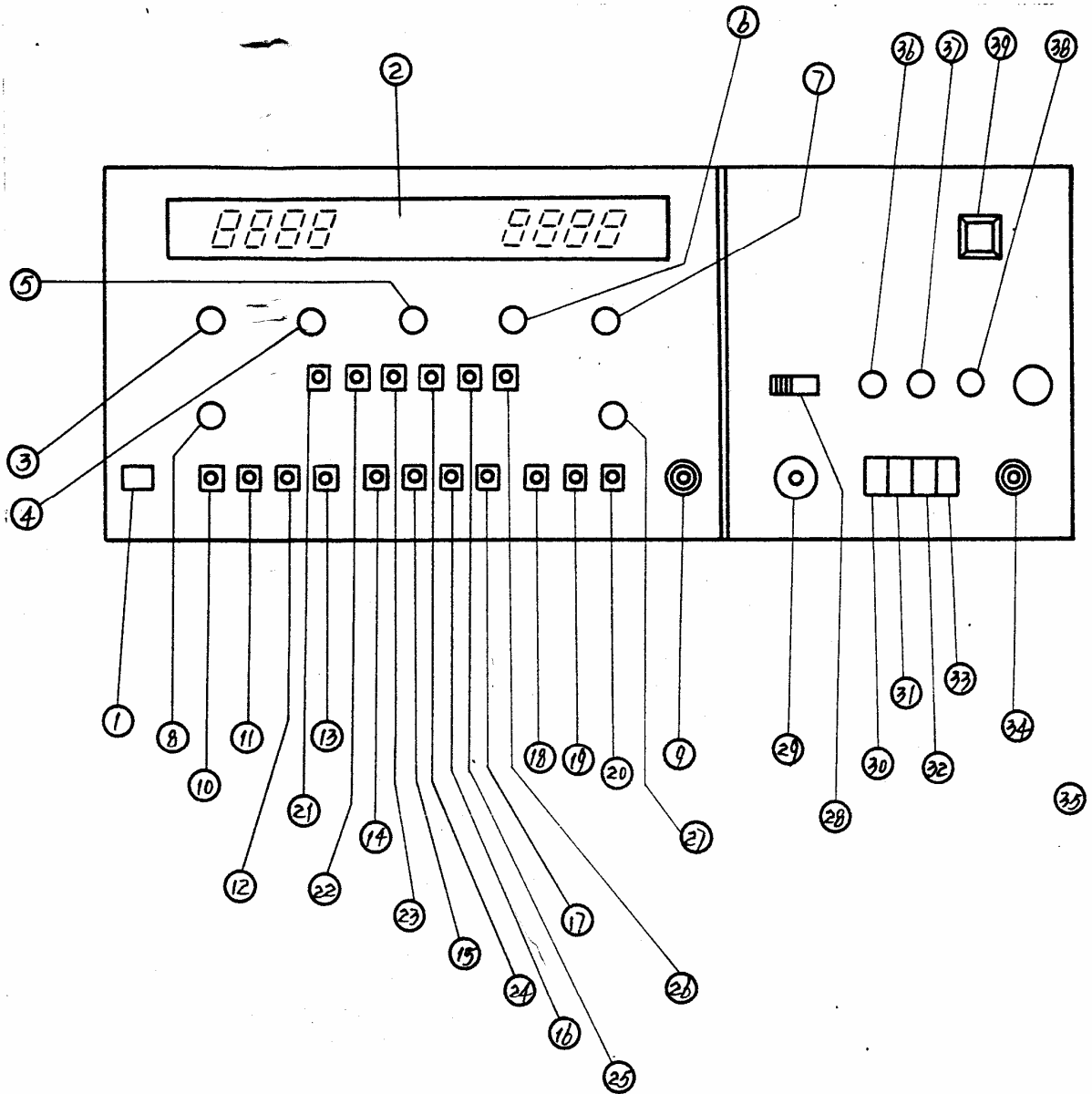


Fig.3. Front Panel Features

- (1) POWER SWITCH. Press it to turn on the instrument.
- (2) LED DISPLAY. The LEDs on the left side indicate Start frequency, those on the right side indicate Stop frequency. In CW mode, the two groups of LEDs indicate the CW frequency.
- (3) START SWEEP FREQUENCY CONTROL. Adjust Start Sweep frequencies.
- (4) STOP SWEEP FREQUENCY CONTROL. Adjust Stop Sweep frequencies.
- (5) CW CONTROL. Adjust CW frequencies.

- (6)  $\Delta F$  SWEEP CONTROL. Adjust  $\Delta F$  Sweep width.
- (7) CW VERNIER CONTROL.
- (8) SWEEP TIME CONTROL.
- (9) SWEEP VOLTAGE OUTPUT.
- (10) 0.01s ~ 0.1s SWEEP TIME.
- (11) 0.1s ~ 1s SWEEP TIME.
- (12) 1s ~ 10s SWEEP TIME.
- (13) 10s ~ 100s SWEEP TIME.
- (14) EXT. TRIGGER.
- (15) INT. TRIGGER.
- (16) LINE TRIGGER.
- (17) SINGLE TRIGGER.
- (18) EXT. SWEEP MODE. By pressing it, adjust the START, STOP CONTROLS to set required sweep frequency range.
- (19) AUTO SWEEP MODE. Press it, the sweep frequency range is fixed (10 ~ 1950 MHz).
- (20) MANUAL SWEEP MODE. By pressing it, adjust the CW CONTROL to change CW frequency.
- (21) START/STOP SWEEP. By pressing it, the CW marker frequency is displayed.
- (22) FULL SWEEP.
- (23) CW.
- (24) MARKER.
- (25)  $\Delta F$  SWEEP.
- (26) CW VERNIER.
- (27) MANUAL SWEEP CONTROL.
- (28) RF OUTPUT ON/OFF.
- (29) RF OUTPUT.
- (30) ALC ON/OFF. When pressed, ALC is off.
- (31) INT. ALC MODE. By pressing it, the internal ALC circuit is enabled.
- (32) EXT. ALC MODE. By pressing it, the external ALC circuit is enabled.
- (33) POWER METER MODE. Press it, the ALC circuit leveled by the power meter is enabled.
- (34) EXT. ALC INPUT.
- (35) Lock bolt of the RF Plug-in.
- (36) EXT. ALC CONTROL. In Ext. ALC mode, change the gain of external ALC circuit to obtain required frequency response.
- (37) EXT. POWER METER GAIN CONTROL. Adjust the external power meter's ALC gain to obtain required frequency response.
- (38) POWER LEVEL CONTROL. Adjust RF output level.
- (39) UNLEVELED INDICATOR. When the variation of RF output level exceeds its specifications, the lamp lights.

5.2.2 Rear Panel Features (Refer to Fig.4)

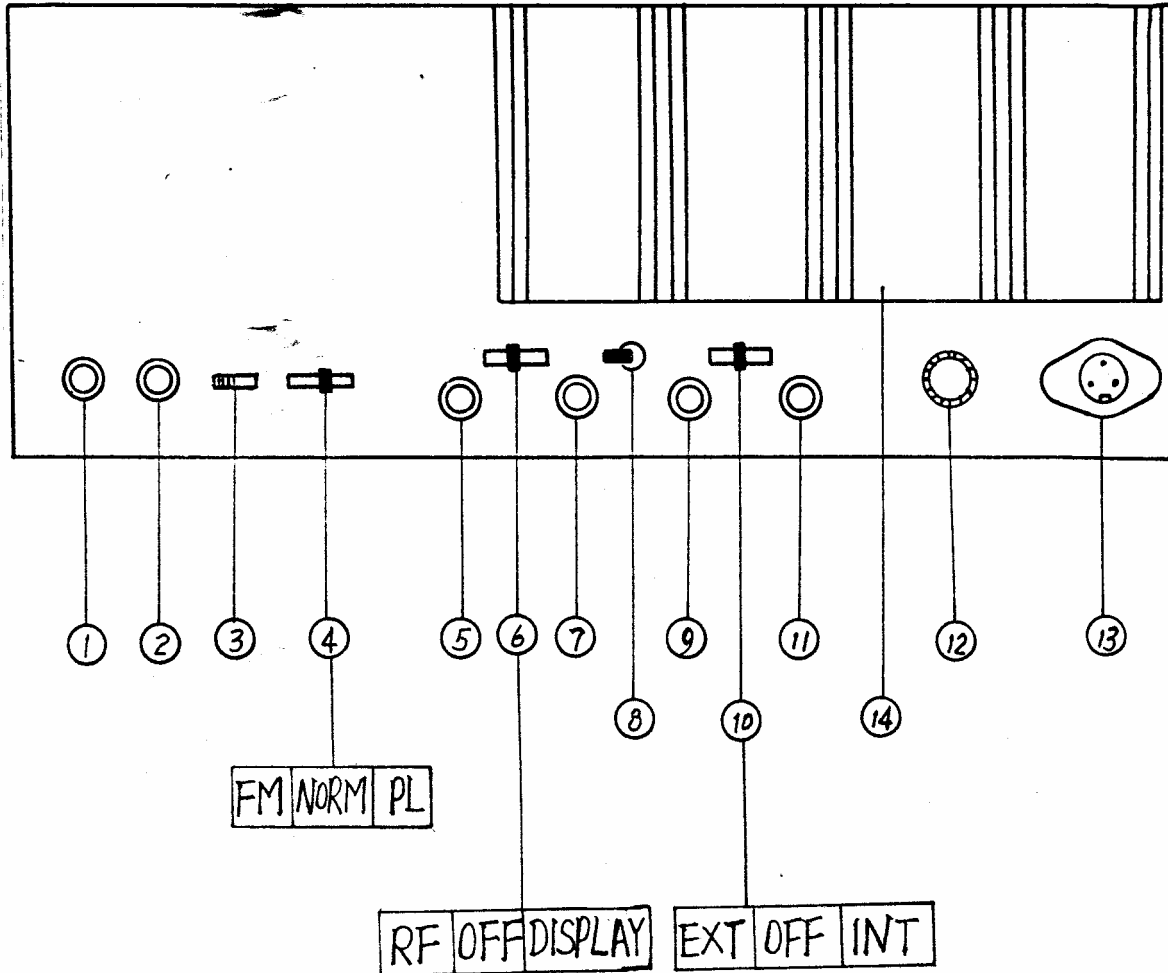


Fig.4. Rear Panel Features

- (1) EXT. FM INPUT.
- (2) SWEEP REFERENCE OUTPUT .
- (3) ALC POLARITY CONTROL.
- (4) RF MODE SWITCH ( FM/NORM/PL ).
- (5) NEGATIVE BLANKING OUTPUT.
- (6) BLANKING (RF/OFF/DISPLAY) SWITCH.
- (7) Z-AXIS BLANKING.
- (8) MARKER SWITCH (ON/OFF).
- (9) EXT. AM INPUT.
- (10) AM SWITCH (EXT/OFF/INT).
- (11) EXT. TRIGGER INPUT.
- (12) FUSE.
- (13) AC LINE POWER.
- (14) HEAT SINK.