Fig. 1 10 kHz to 1024 MHz AM/FM Signal Generator 2017

2. Output levels from 0.2 μV to 4 V e.m.f. are available in the c.w. or f.m. modes (up to 2 V e.m.f. in the a.m. mode) and the user is offered a choice of five output level calibrations which are switch selectable on the front panel.

3. Frequency stability in the locked mode is determined by a high quality reference oscillator within the instrument and facilities are provided for the use of an external reference when this is preferred.

4. Comprehensive amplitude and frequency modulation facilities are provided using either an internal modulation oscillator or an external source. High quality pulse modulation and slow sweep facilities are also provided.

5. Memory facilities allow up to ten complete instrument settings to be stored and recalled for later use.

6. The frequency counter display can also be used for the measurement of external signals in the range 10 Hz - 512 MHz.

Tuning

7. In the manual mode the frequency display gives an active indication of the output frequency. Tuning takes place by means of the RANGE selector switch and the rotary TUNE and FINE TUNE front panel controls. Depressing the LOCK key reverts the system to a synchronizer whose setting will be the last measured frequency indicated on the display.

8. Accuracy is within ±2 parts in 10^7 over the temperature range of 0 to 40°C. An external frequency standard of 1 MHz may be used where better stability is required or to ensure consistency when a number of instruments are used in an area.

Output

9. RF levels can be set by means of the keyboard control or varied manually by rotary control if preferred.

Modulation

10. Frequency and amplitude modulation are provided by the internal oscillator giving a choice of two fixed frequencies, 400 Hz and 1 kHz, and a further 3 variable ranges from 20 Hz to 20 kHz which are controlled from the front panel MODULATION OSCILLATOR controls.

PERFORMANCE DATA

Characteristic	*Performance*
Carrier frequency	
▸ 16. Range	10 kHz - 1024 MHz in 9 ranges. (1) 10 kHz to 4 MHz (2) 4 MHz to 8 MHz (3) 8 MHz to 16 MHz (4) 16 MHz to 32 MHz (5) 32 MHz to 64 MHz (6) 64 MHz to 128 MHz (7) 128 MHz to 256 MHz (8) 256 MHz to 512 MHz (9) 512 MHz to 1024 MHz
Selection	
Manual :	Frequencies may be selected manually using the 11 turn main tuning control with separate 3 turn fine tune control.
Keyboard :	Keyboard provides for entry of up to 8 significant digits, decimal point and frequency units. A manually tuned frequency may be locked by pressing the LOCK key.
Indication	7½ digit, LED seven segment display.
Resolution	10 Hz up to 128 MHz. 100 Hz above 128 MHz.
Accuracy	
Unlocked :	±(1 digit + reference standard error).
Locked :	Equal to the reference standard accuracy.

Stability

Locked mode : Refer to Internal Reference Standard. (Less than 7 seconds is required for the generator to regain frequency lock after a frequency change is made.)

Frequency sweep

17. Sweep rate : Single shot sweep for use with X-Y plotter. Maximum sweep width one carrier frequency range. 30 - 150 seconds for a full range sweep adjustable by a front panel control.

Horizontal output : 1 - 9 V over one frequency range.

RF output

18. Level

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

0.13 µV to 4 V e.m.f. (-131 to +19 dBm) c.w., f.m. and pulse mode.

0.13 µV to 2 V e.m.f. (-131 to +13 dBm) a.m.

Selection

Manual : Two concentric knob controls : switched coarse attenuator with 6 dB steps and a continuously variable fine attenuator with 8 dB range.

Keyboard : Allows entry of up to 4 significant digits, decimal point, sign and units.

Indication : 3½ digit, LED, seven segment display with illuminated legend showing e.m.f., p.d., dBµV e.m.f., dBµV p.d. and dBm. Units are selected by a front panel switch.

Total level accuracy (for levels above 1 µV p.d.) ±1 dB up to 512 MHz.
±2 dB up to 1024 MHz.

Output impedance 50 Ω; VSWR <1.15:1 up to 256 MHz,
<1.25:1 up to 512 MHz,
<1.35:1 up to 1024 MHz at r.f. output levels below 0.5 V e.m.f.

RF leakage Less than 1 µV generated in a 50 Ω load by a 2 turn 25 mm loop, 100 mm or more from the case of the generator.

Reverse power protection Protects the generator output system against accidental reverse power from a transmitter of up to 50 W capacity, 10 kHz - 1024 MHz or applied d.c. of up to ±40 V.

Amplitude modulation

19. Carrier frequency range — 10 kHz - 400 MHz, usable to 1024 MHz.

Modulation depth — Up to 99% in 1% steps. 2 digits, LED seven segment display. Entered via the keyboard or remote programming.

Accuracy (At 1 kHz modulation rate) — Better than ±3% depth up to 80% depth.

Envelope distortion (using internal 1 kHz modulation oscillator) — Less than 2% t.h.d. up to 30% depth. Less than 3.5% t.h.d. up to 80% depth.

External modulation

Frequency range : — 20 Hz to 50 kHz d.c. coupled.

Frequency response : — ±0.5 dB, 20 Hz to 50 kHz in levelled mode. ±0.3 dB, 20 Hz to 50 kHz in unlevelled mode. ◄

Input level : — 0.5 V - 1.5 V r.m.s. into 600 Ω to set reference level, indicated by an illuminated legend in the levelled mode only.

1 V r.m.s. into 600 Ω to set reference level in unlevelled mode.

Frequency modulation

20. Deviation — Entered via the keyboard or remote programming. 3 digits, LED, 7 segment display.

RF range	*Maximum deviation*
1	40 kHz
2	40 kHz
3	80 kHz
4	160 kHz
5	320 kHz
6	640 kHz
7	1.28 MHz
8	2.56 MHz
9	200 kHz

Accuracy — ±4% of deviation selected ±50 Hz.

Distortion — Using the internal 1 kHz fixed modulation oscillator, less than 2% t.h.d. at maximum deviation on each r.f. range.

External modulation

Frequency range : — 20 Hz to 125 kHz (d.c. coupled) at maximum deviation and up to 260 kHz at half maximum deviation.

Frequency response : — ±0.5 dB, 20 Hz to 125 kHz in levelled mode. ±0.3 dB, 20 Hz to 125 kHz in unlevelled mode. ◄

Input level :	0.5 V - 1.5 V r.m.s. into 600 Ω to set reference level, indicated by an illuminated legend in the levelled mode only. 1 V r.m.s. into 600 Ω to set reference level in unlevelled mode.

Internal modulation oscillator

21.	Frequency	20 Hz to 20 kHz, continuously variable in 3 decade ranges. Also 2 fixed frequencies, switch selected, of 400 Hz and 1 kHz.
	Accuracy	±5% for fixed frequencies.

Pulse modulation

▶ 22.	Carrier frequency range	4 MHz to 1024 MHz. ◀
	Pulse/carrier rise time	Less than 25 ns for carriers above 25 MHz.
	Pulse duration	100 ns to infinity.
	Carrier suppression	Better than 70 dB up to 80 MHz, 50 dB up to 512 MHz.
	Additional carrier level error	±2 dB.
	Input characteristic	Positive-going modulation up to +1 V input. Saturation level +1.1 V. Maximum input +5 V. Input impedance 50 Ω. Effective bandwidth d.c. to 15 MHz reduced below 25 MHz carrier.

Frequency counter (external mode)

23.	Frequency range	10 Hz to 520 MHz.
	Resolution	1 Hz from 10 Hz to 10 MHz, 10 Hz from 1 MHz to 100 MHz, 100 Hz from 10 MHz to 520 MHz.
	Sensitivity	100 mV p.d. into 50 Ω, 1 MHz to 520 MHz. 100 mV p.d. into 1 MΩ, 10 Hz to 10 MHz.
	Accuracy	±1 digit + reference standard error.

Internal reference standard

24. Temperature stability — Better than ±2 in 10^7 over the operating temperature range 0 to 40°C.

Warm up time — Within 0.5 p.p.m. of final frequency within 5 min. from switch on at ambient 20°C.

Spurious signals

25. Carrier harmonics — Better than -27 dBc. Typically better than -40 dBc.

Carrier sub-harmonics — For carrier frequencies up to 512 MHz no carrier sub-harmonics are generated. -60 dBc above 512 MHz.

Non-harmonic components — For carrier frequencies between 4 MHz and 1024 MHz no non-harmonically related signals are generated. -50 dBc below 4 MHz.

FM on c.w. (CCITT telephone psophometric weighting) — Less than 3 Hz equivalent deviation up to 512 MHz and 6 Hz up to 1024 MHz. Reduces by approximately 6 dB per octave as the carrier frequency is reduced (down to 4 MHz).

AM on c.w. (-3 dB bandwidth 20 Hz to 20 kHz) — Less than -70 dBc. Equivalent to less than 0.06% modulation depth.

Single sideband phase noise (at 20 kHz offset) — Better than -135 dBc/Hz at 20 kHz offset from carrier at 470 MHz. For typical performance at other offsets and carrier frequencies see Fig. 2, Sideband noise curves.

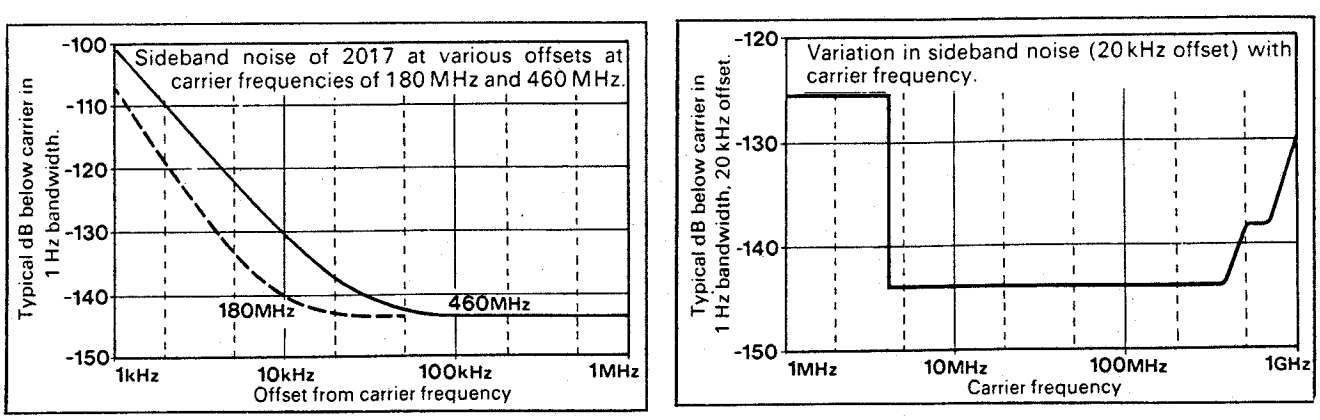

Fig. 2 Sideband noise curves

Auxiliary facilities

26. Remote operation — All major front panel functions may be remotely controlled via the GPIB (see Chap. 1, p.1*).

Subsets : Complies with the following subsets as defined in IEEE 488-1978 : SH1,AH1,T5, TE0,L4,LE0,SR1,RL1,PP0,DC1,DT0,C0,E1.

Outputs

Modulation oscillator : Front panel socket providing approximately 1 V r.m.s. into 600 Ω.

Frequency standard : Rear panel socket may be used as internal standard output or external standard input as selected by adjacent switch. 1 MHz, t.t.l. compatible.

Inputs

External frequency standard : Switch selected input accepting at least 4 V p-p at 1 MHz. Input impedance approximately 1 kΩ.

Power requirements

27. AC supply voltage — 105 V to 120 V ±10% or 210 V to 240 V ±10%.

Frequency — 45 to 65 Hz.

Consumption — 140 VA maximum.

Safety regulations

28. This instrument complies with Publication IEC 348.

Radio frequency interference

29. This instrument conforms with the requirements of EEC Directive 76/889 as to limits of r.f. interference.

Limit range of operation

30. Temperature — 0 to 55°C.

Conditions of storage and transport

31.	Temperature	$-40^{\circ}C$ to $+70^{\circ}C$.
	Humidity	Up to 90% relative humidity.
	Altitude	Up to 2500 m (pressurized freight at 27 kPa differential i.e. 3.9 lbf/in^2).

Dimensions and weight (approximately)

		With handles & feet	Without handles & feet
32.	Height :	195 mm (7.7 in)	178 mm (7 in).
	Width :	453 mm (17.8 in)	419 mm (16.5 in).
	Depth :	543 mm (21.4 in)	491 mm (19.3 in).
	Weight :	29 kg (63 lb).	

ACCESSORIES

33. Supplied accessories

	Code no.
AC supply lead	43129-071D
Operating manual H 52017-900K (Vol. 1)	46881-388D

Optional accessories

Service manual H 52017-900K (Vol. 2)	46881-389T
Rack mounting kit	46883-482E
Maintenance kit	54711-032H
Comprising :	
Extender cable 14 way (Ribbon cable)	43129-591M
Extender cable 16 way (Ribbon cable)	43129-592C
Extender lead (AS3) } Edge-connector type	43129-618W
Extender lead (AS4) } Edge-connector type	43129-619D
Extender lead (AS5) } Edge-connector type	43129-620S
RF connector assy. (Maintains logic box r.f. connection when in servicing position)	43129-625X
GPIB lead assy.	43129-189U
Marconi Instruments GPIB manual H 54811-010P	46881-365R
Adapter; type N male to BNC female	54311-092P
RF connecting cable TM 4969/3; 50 Ω, 1.5 m (5 ft) BNC	43126-012S
GPIB IEEE/IEC connector adapter	46883-408K

For Service Manuals Contact
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