OPERATING INSTRUCTIONS

No. EB 1066B/6

for

F.M. SIGNAL GENERATOR

TYPE TF 1066B/6

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1 GENERAL INFORMATION

1.1 INTRODUCTION

The TF 1066B/6 and TF 1066B/6R Signal Generators give c.w., f.m. and a.m. outputs and are intended for making standard measurements and tests on apparatus operating in the v.h.f. and u.h.f. bands. Apart from the normal applications for f.m. receivers, they are particularly suitable for testing multi-channel telemetry equipment requiring a signal source which provides high modulating frequencies and wide deviations with low distortion.

A frequency coverage of 10 Mc/s to 470 Mc/s is provided in five ranges. The clear hand-calibrated tuning scale permits precise frequency setting but, for greater accuracy, a crystal calibrator is incorporated with marker pips available at 1 Mc/s intervals.

Calibrated incremental frequency shifts may be made; either in preset steps or by using the continuously variable control. In each case the amount of shift is indicated by a meter.

F.M. deviations up to 400 kc/s (depending on the carrier range) can be obtained. Two internal modulation frequencies may be selected and the wide frequency response of the modulator permits the use of high frequency external modulating sources. Either internal or external amplitude modulation can be produced to a depth of at least 40%. Accurate monitoring facilities are provided for each type of modulation.

The r.f. output level of the Signal Generator is controlled by a constant impedance piston-attenuator. The attenuator dial is direct reading in terms of source e.m.f. or voltage developed across a 50 Ω load.

There are two versions of this Signal Generator; TF 1066B/6, intended for bench mounting and TF 1066B/6R, suitable for mounting in a 19 inch rack.

1.2 DATA SUMMARY

FREQUENCY

Range:	10 to 470 Mc/s in five bands:- 10 to 22 Mc/s, 22 to 50 Mc/s, 50 to 115 Mc/s, 115 to 270 Mc/s, 270 to 470 Mc/s.
Calibration Accuracy:	±1%.
Crystal Calibrator:	Provides check points every 1 Mc/s with markers every 10 Mc/s. Accuracy ±0.02% at each check point.
Fine Tuning:	Uncalibrated control provides cover of approximately 25 kc/s to over 100 kc/s total depending on carrier frequency.
Frequency Stability:	Drift is not greater than 0.015% in a 10 minute period after 1 hour warm-up.
Attenuator Reaction:	Negligible below 50 mV; not greater than 0.1% above.
Incremental Frequency Control:	Carrier shift is variable from -100 kc/s to +100 kc/s by continuous and stepped control. The stepped control has three negative and three positive positions, each with independent preset adjustments, and one zero-shift position. Shift is monitored by meter with two ranges, -20 to +20 kc/s and -100 to +100 kc/s.
Incremental Accuracy:	±15% of full scale at all carrier frequencies. Above 115 Mc/s, the 15% accuracy applies after use of the correction chart supplied. Direct accuracy without chart above 115 Mc/s is ±20% of full scale.
Spurious Signals:	There are no sub-harmonics of the carrier frequency.

1.2 (continued)

R.F.OUTPUT:

Level: The source e.m.f. is continuously variable from 0.2μV to 200mV. The attenuator dial shows the source e.m.f. both directly and in decibels relative to 1μV. The dial cursor can be positioned to indicate voltage across a 50Ω load instead of source e.m.f.

Output Accuracy: Overall, ±2dB.

Source Impedance: 50Ω; v.s.w.r. not greater than 1.25 using the 20dB pad TM 4919, or 1.6 using the 6dB pad TM 4919/1.

Stray Radiation: Negligible; permits full use of lowest output.

FREQUENCY MODULATION

Internal: Modulation frequencies: 1 and 5 kc/s. Deviation variable to 100 kc/s maximum on ranges A and B, 400 kc/s on ranges C and D, and 300 kc/s on range E. Deviation indicated on meter with three ranges: 0 to 20 kc/s, 0 to 100 kc/s and 0 to 400 kc/s.

External: Modulation frequency range: 30 c/s to 100 kc/s. Deviation as for INTERNAL. Input requirements: 25V across 5kΩ or more for maximum deviation.

Deviation Accuracy: Deviation ranges 0 - 20kc/s and 0 - 100 kc/s: ±10% of full scale at all carrier frequencies. Above 115 Mc/s the 10% accuracy applies after use of the correction chart supplied. Direct accuracy without chart above 115 Mc/s is ±20% at full scale.

Deviation range 0 - 400kc/s: ±15% of full scale at all carrier frequencies. Above 115 Mc/s the 15% accuracy applies after use of the correction chart supplied. Direct accuracy without chart above 115 Mc/s is ±20% of full scale.

Accuracy over external modulation frequency range is within 12% of accuracy at 1kc/s.

1.2 (continued)

Modulation Distortion: Distortion introduced by the modulator is not greater than 10% at the maximum deviation quoted above. Between 215 and 265 Mc/s distortion is not greater than 5% at maximum deviationfor modulation frequencies 1 kc/s and above.

A.M. on F.M. Typically, less than 5% modulation depth at maximum deviation.

Residual F.M.: The f.m. due to hum and noise is less than 100 c/s deviation.

AMPLITUDE MODULATION

Internal: Modulation frequencies: 1 and 5 kc/s. Modulation depth variable up to least 40% and indicated on a meter scaled 0 to 50%.

External: Modulation frequency range: 30 c/s to 15 kc/s. Modulation depth as for INTERNAL Input requirements: 12V across 270 kΩ for 50%.

Modulation Depth Accuracy: ±5% modulation.

F.M. on A.M. For 30% a.m. varies typically from 15 kc/s at 10 Mc/s to 60 kc/s at 100 Mc/s.

Residual A.M. The a.m. due to hum and noise is better than 50 dB below 30% modulation.

POWER SUPPLY: 200 to 250 and 100 to 130 V, 40 to 60 c/s, 90 W. Fuses in mains, h.t., and l.t. circuits.

DIMENSIONS & WEIGHT: (in case for bench use)

Height	Width	Depth	Weight
15½ in	21 in	10½ in	54 lb
(39.5 cm)	(53.5 cm)	(27 cm)	(24.5 kg)

1.3 ACCESSORIES

ACCESSORIES SUPPLIED

(1) 50 Ω coaxial, Type N, plug for R.F. OUT socket.

(2) Jack plug, Igranic Type P.40, for PHONES socket.

(3) Correction chart for the MODULATION and INCREMENTAL FREQUENCY MONITOR.

ACCESSORIES AVAILABLE

(1) OUTPUT LEAD Type TM 4824
50 Ω. Type N plug - Type N plug, 3 ft long.

(2) 20 dB PAD Type TM 4919
50 Ω, Type N plug - Type N socket.

(3) 6 dB PAD Type TM 4919/1
50 Ω, Type N plug - Type N socket.

(4) MATCHING PAD Type TM 4918
50 Ω to 75 Ω, Type N socket - Belling Lee L734/P plug

(5) MATCHING PAD Type TM 4916
50 Ω to 300 Ω balanced, Type N socket - solder tags.

(6) D.C. ISOLATING UNIT Type TM 4917
Type N socket - crocodile clips.

(7) COAXIAL FUSE Type TM 5753.
To prevent damage to the Signal Generator in the event of accidental application of r.f. or h.t. power to the circuit under test.

Overload protection:	Burns out at 0.4 W.
Insertion loss:	Nominally 0.5 dB.
V.S.W.R.	1.35 or less when terminated with a matched 50 Ω load. 1.6 or less when terminated with TF1066B/6 attenuator via 20 dB pad TM 4919.
Connector:	Type N.
Fuse:	1/16 A Littelfuse Cat.No.361.062. 10 spares are supplied.

2 OPERATION

2.1 PREPARATION FOR USE

Take off the transparent plastic cover, if one is supplied with the instrument. If the cover is not completely removed when the instrument is operated, overheating may occur.

BENCH OR RACK MOUNTING

The TF 1066B/6 is supplied in a case and is intended for bench mounting. The TF 1066B/6R is fitted with a dust cover and is suitable for mounting in a 19 inch rack.

<u>CAUTION</u> When fitting the instrument to a rack, or upon removal or refitting of the dust cover, ensure that the attenuator is turned to the maximum output position (fully retracted).

Either version should be so positioned that the ventilating holes, at the rear and underneath, are not obstructed.

When mounting the Signal Generator the usual precautions against microphonic modulation should be taken. Although every effort has been made, in the design, to minimize this type of effect, it is not possible, under adverse environmental conditions, to eliminate it entirely. Thus for applications where a particularly low level of spurious modulation is required, it is an advantage to stand the Signal Generator on a sponge-rubber or felt mat and to reduce the a.f. output of any receiver to a minimum.

SUPPLY VOLTAGE

Before connecting the instrument to the mains supply make sure that the mains adjustment tapping panel is set correctly for the local supply voltage. Access to the panel is obtained by opening the left-hand hinged door at the rear of the case of the TF 1066B/6 or by removing the dust cover of the TF 1066B/6R. The panel consists of four two-pin plugs which make contact with the mains transformer connections through a reversible masking plate.

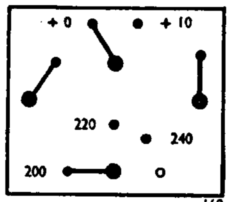
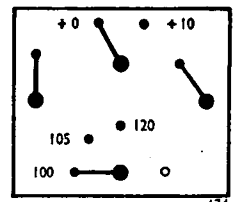
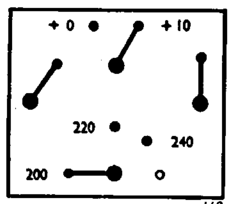
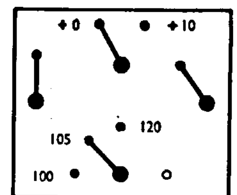
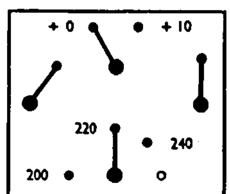
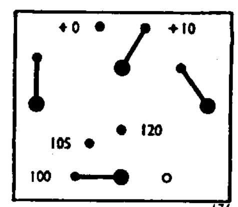
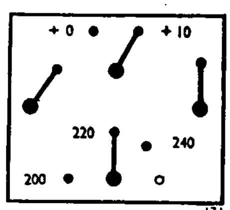
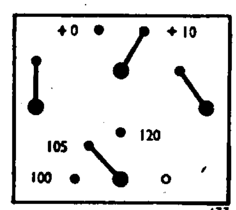
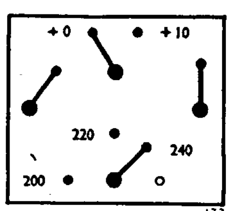
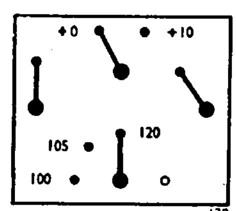
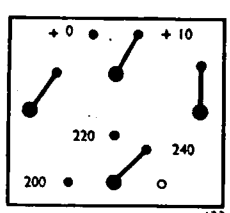
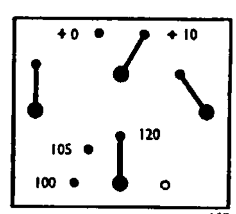
The instrument is normally despatched with its mains input adjusted for 240V operation. To change the mains tappings from one within the 200 - 250V range to one within the 100 - 130V range, or vice versa, it is necessary to reverse the masking plate. The arrangements of the two-pin plugs corresponding to all the possible mains input voltages are shown in the diagram SUPPLY VOLTAGE PLUG SETTINGS which follow this page.

METER ZEROING

Adjust the set zero screws at the top of the CARRIER LEVEL and the MODULATION AND INCREMENTAL FREQUENCY monitors to bring each pointer to the left-hand zero mark.

SUPPLY VOLTAGE PANEL

Masking plate and links must be positioned according to supply voltage, as shown:—

200-250 volts a.c. SUPPLY	LINKS		LINKS	100-130 volts a.c. SUPPLY
200 V	 168		 174	**100 V**
210 V	 169		 175	**105 V**
220 V	 170	To change voltage range,  remove all links and reverse masking plate	 176	**110 V**
230 V	 171		 177	**115 V**
240 V	 172		 178	**120 V**
250 V	 173		 179	**130 V**

SUPPLY VOLTAGE PLUG SETTINGS

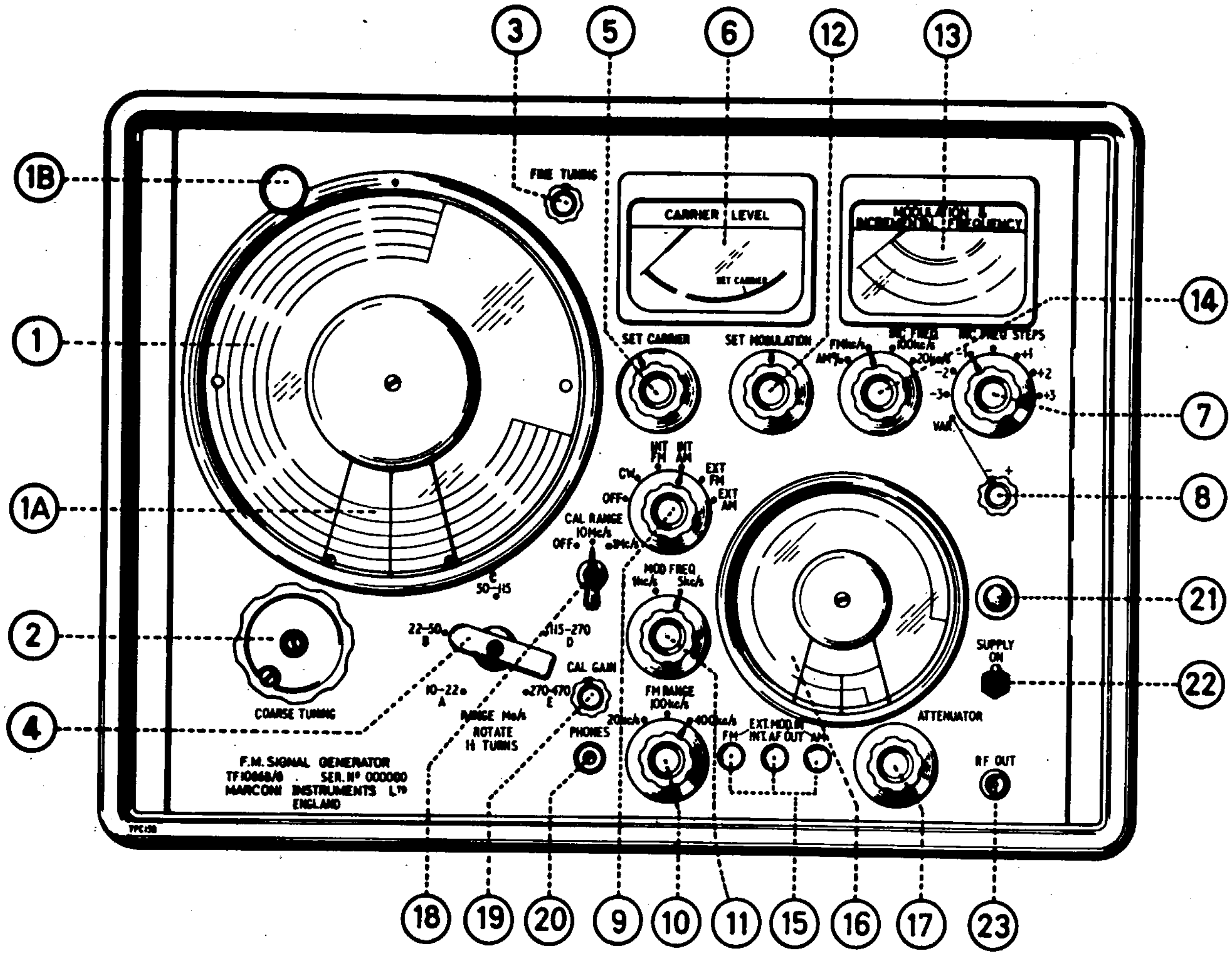


FIG. 2·1

TITLE	DRG. No.	ISS
CONTROLS OF TF 1066B/6	TLA 41273	1
MARCONI INSTRUMENTS LIMITED	SHEET ______ OF ______ SHEETS	

2.2 CONTROLS

(1) MAIN TUNING DIAL
1A CURSOR
1B CURSOR LOCKING SCREW

(2) COARSE TUNING CONTROL

(3) FINE TUNING CONTROL For making small uncalibrated frequency adjustments.

(4) RANGE CONTROL To change from one band to another rotate the control through one-and-a-fifth turns per band until it locates positively, with the knob pointing to the required frequency band.

(5) SET CARRIER CONTROL For bringing the carrier to a predetermined level, indicated by (6).

(6) CARRIER LEVEL MONITOR

(7) INCREMENTAL FREQUENCY STEPS CONTROL Shifts the carrier frequency in six preset steps to a maximum of 100 kc/s in either direction.

(8) INCREMENTAL FREQUENCY VARIABLE CONTROL Provides continuously variable shift of carrier frequency up to a maximum of 100 kc/s in either direction.

(9) MODULATION SELECTOR

(10) F.M. RANGE SWITCH Sets the deviation range.

(11) MODULATING FREQUENCY SWITCH Operates on a.m. and f.m.

(12) SET MODULATION CONTROL Adjusts f.m. deviation or a.m. depth.

(13) MODULATION AND INCREMENTAL FREQUENCY MONITOR Indicates f.m. deviation, a.m. depth, and stepped or variable incremental frequency shift.

(14) MONITOR SELECTOR SWITCH Selects the function required for monitor (13).

(15) EXTERNAL MODULATION TERMINALS Input terminals for external modulating sources or for external incremental frequency shift voltages. They act also as output terminals for the internal a.f. oscillator.

2.2 (continued)

(16) ATTENUATOR DIAL Direct reading for source e.m.f. or p.d. across a 50 Ω load, in terms of voltage and dB referred to 1 μV.

(17) ATTENUATOR CONTROL

(18) CRYSTAL CALIBRATOR RANGE SWITCH Selects 1 Mc/s or 10 Mc/s markers.

(19) CRYSTAL CALIBRATOR GAIN CONTROL

(20) PHONES JACK For monitoring the calibrator check points.

(21) PILOT LAMP

(22) SUPPLY SWITCH

(23) R.F. OUTPUT SOCKET Accepts Type N plug.

2.3 QUICK OPERATIONAL CHECK

The following sequence of operations will enable you to get the feel of the controls and to check that the r.f. oscillator, modulation circuits, monitor and crystal calibrator are working.

(1) Tuning

Switch to SUPPLY ON.

Set the INC. FREQ. switch to its central 'zero' position, and the FINE TUNING control to mid travel.

Turn the frequency RANGE switch to band B (22 to 50 Mc/s).

Adjust the COARSE TUNING control for an indication of 30 Mc/s against the cursor on the tuning dial and set the modulation selector to C.W.

Bring the pointer of the CARRIER LEVEL meter to the SET CARRIER mark by adjusting the SET CARRIER control, and note that the control is within, say, the middle third of its travel.

2.3 (continued)

(ii) Crystal Calibrator

Turn the crystal CALibrator RANGE switch to 10 Mc/s, plug in pair of high resistance head phones into the PHONES socket and slightly adjust the COARSE TUNING control until a beat note is heard.

Retune to 32 Mc/s, using the COARSE TUNING control and turn the CALibrator RANGE switch to 1 Mc/s. Again make slight adjustments to the COARSE TUNING control until a beat note is heard.

(iii) Incremental Frequency

Set the monitor selector switch to INC. FREQ. 20 kc/s and the INCREMENTAL FREQUENCY STEPS control to VAR.

Advance the continuously variable incremental frequency control and observe that the beat note changes pitch and disappears. There should now be a deflection on the MODULATION AND INCREMENTAL FREQUENCY monitor, indicating the frequency shift produced.

(iv) Frequency Modulation

Return the INCREMENTAL FREQUENCY STEPS control to its centre zero position and turn the crystal calibrator off using the CAL RANGE switch. Set the modulation selector switch to INT. F.M., the monitor selector switch to F.M. kc/s and the F.M. RANGE switch to 100 kc/s. Advance the SET MODULATION control and observe that full scale deflection of the MODULATION AND INCREMENTAL FREQUENCY monitor can be obtained.

(v) Amplitude Modulation

Set the modulation selector switch to INT. A.M. and the monitor selector switch to A.M.%. Adjust the SET MODULATION control for an indication of 40% modulation depth on the MODULATION and INCREMENTAL FREQUENCY monitor.

2.4 C.W. OPERATION

(i) Tuning

Switch to SUPPLY ON and allow time to warm up.

Select the required frequency band by means of the RANGE control. For best frequency stability allow a stabilizing period of 10 minutes after range changing.

Turn the INC. FREQ. STEPS control to the zero position.

Adjust the COARSE TUNING control until the approximate frequency required appears against the cursor on the tuning dial.

Final adjustment, to bring the frequency precisely to a particular point on the characteristic of a tuned system under test, can be made with the FINE TUNING control.

(ii) Calibration

For maximum accuracy switch on the crystal calibrator and select the frequency interval at which markers are required (10 Mc/s or 1 Mc/s). Plug headphones into the PHONES jack. Readjust the COARSE TUNING control for zero beat at the nearest crystal marker point.

Set the CURSOR coincidence with the selected marker frequency by slackening the locking knob and rotating the whole frequency dial cover and cursor. Re-tighten the locking knob. At certain frequencies additional markers of much lower amplitude may be heard. These correspond to 0.5 Mc/s intervals and, if required, they may be used as extra calibration points.

(iii) Output Level

Turn the modulation selector to C.W. and adjust the CARRIER control so that the pointer of the CARRIER LEVEL meter coincides with the SET CARRIER mark.

Adjust the ATTENUATOR control for the required output.

2.5 INCREMENTAL TUNING

(i) Continuously variable

Turn the INC. FREQ. STEPS control to VAR and check that the monitor selector switch is set to the appropriate sensitivity INC. FREQ. position. Adjust the continuously variable incremental frequency control until the required frequency shift is indicated on the corresponding scale of the MODULATION AND INCREMENTAL FREQUENCY monitor.

For maximum accuracy above 115 Mc/s carrier frequency, apply the correction given by the curves on the CORRECTION CHART for DEVIATION AND INCREMENTAL FREQUENCY MONITOR.

(ii) Stepped

The incremental frequency steps are set, in the factory, to give zero shift. To set up your own choice of steps, see Section 4.5.

When the steps have been set up the INC. FREQ. STEPS control may be used to give positive or negative preset shifts of carrier

Stepped increments are indicated by the MODULATION AND INCREMENTAL FREQUENCY monitor with the same accuracy as for continuously variable control. For greater accuracy the steps can be setup against a standard frequency r.f. source.

NOTE: If an external circuit, connected between the EXT. MOD. F.M. and earth terminals, offers a d.c. path, the potential divider circuit controlling the frequency shift will be shunted and the accuracy of the incremental steps will be affected.

(iii) External

Incremental frequency shifts can be produced by the application of an external voltage between the EXT MOD F.M. and earth terminals. This may be useful for the production of stepped frequency shifts additional to those already set up in the Signal Generator.

Set the INC. FREQ. switch to VAR, the continuously variable control to mid-travel and connect a suitable voltage source between the EXT MOD F.M. and earth terminals.

The voltage required for a frequency shift of 100 kc/s is approximately 60V. If frequency shifts both above and below the centre frequency are desired, provision must be made for both positive and negative-polarity voltages.

2.5 (continued)

The frequency shift produced is indicated on the appropriate scale of the MODULATION AND INCREMENTAL FREQUENCY monitor.

To preserve the accuracy of the internal incremental frequency steps, remove the external d.c. shift circuit from the EXT. MOD. F.M. terminals when it is not in use.

(iv) Modulator Hysteresis

When making incremental frequency shifts by any of the methods described above, you may find some inconsistency of results due to the inherent hysteresis of the ferrite modulator.

The effects of this hysteresis are only of significance when the direction of shift is reversed. If the shift is increased to a particular value from the true (neutralized) zero and then further increased, the problem does not arise.

Errors due to hysteresis will generally be small - of the order of 5% of the shift - and can be eliminated by 'wiping' or neutralizing the magnetic circuit of the modulator before making a reversal of frequency shift. As a point of good practice, neutralization should also be carried out before commencing any measurements involving use of the incremental frequency controls.

To neutralize the modulator, first set the incremental shift to zero and apply f.m. to the carrier; then, having set the deviation initially to maximum, reduce it slowly to zero. With the modulator now neutralized it may be advisable to check that the Signal Generator is still correctly tuned to the centre frequency of the equipment under test.

The following example shows the points, in a typical sequence of incremental shifts, at which it is desirable to neutralise the modulator.

Example: In a receiver response investigation, it is required to shift the carrier +50, +75, +100 kc/s; then to drop back in frequency and re-check results at +50 kc/s. Do this by:

(i) neutralizing at zero shift;
(ii) setting to +50 kc/s;
(iii) setting to +75 kc/s;
(iv) setting to +100 kc/s;
(v) returning to zero and neutralizing again;
(vi) setting to +50 kc/s.

2.6 F. M. OPERATION

The accuracy of the deviation indication and the waveform of the demodulated signal may tend to deteriorate slightly when carrier shift is applied by means of the incremental frequency controls. It is generally advisable, therefore, to keep the INC. FREQ. STEPS control in its zero position when using frequency modulation.

(i) INTERNAL

Switch on, tune, and set output as for C.W.

Turn the modulation selector switch to INT. F.M. and the monitor selector switch to F.M.

Select the modulating frequency required.

Turn the F. M. RANGE switch to the deviation range required and adjust the SET MODULATION control until the MODULATION AND INCREMENTAL FREQUENCY monitor indicates the required deviation.

NOTE: The maximum deviation range to 400 kc/s is only available on the frequency ranges C and D; see DATA SUMMARY Section 1.2.

To achieve maximum accuracy of deviation settings, at carrier frequencies above 115 Mc/s, a correction to the monitor reading should be made. Curves showing the corrections are included on the CORRECTION CHART FOR DEVIATION AND INCREMENTAL FREQUENCY MONITOR, which is normally stowed in the left-hand handle recess.

A.F. Output

When the modulation selector is set to INT. F.M. the internal modulating signal is available at the EXT. MOD. F.M. and earth terminals. This output may be used as a convenient synchronizing signal when the Signal Generator is used in conjunction with a cathode-ray oscilloscope. At a deviation of 100 kc/s the output level is of the order of 20V r.m.s. Do not leave a d.c. path between the terminals; see final paragraph of Section 2.5 (ii).

(ii) EXTERNAL

Switch on, tune and set output as for C.W.

Turn the modulation selector switch to EXT.F.M. and the monitor selector switch to F.M.

Set the F.M. RANGE switch to the deviation range required.

2.6 (continued)

For external modulation, this does not affect the sensitivity of the modulation circuits, but selects the appropriate monitor sensitivity range.

Connect the external a.f. signal source to the EXT. MOD. F.M. and earth terminals, and adjust the input level to give the required deviation as indicated on the MODULATION AND INCREMENTAL FREQUENCY monitor. The input level required for full deviation is approximately 25V, the input impedance being 5kΩ. Do not leave a d.c. path between the terminals; see final paragraph of Section 2.5 (ii). At carrier frequencies above 115 Mc/s a correction to the monitor reading should be made, in the same manner as for internal modulations.

2.7 A. M. OPERATION

(i) INTERNAL

Set the modulation selector switch to INT. A.M. and turn the SET MODULATION control to minimum (fully counter-clockwise).

Switch on, tune and adjust the output as for C.W.

Turn the monitor selector switch to A.M. Select the modulation frequency required.

Adjust the SET MODULATION control until the MODULATION AND INCREMENTAL FREQUENCY monitor indicates the required percentage modulation. The movement of the SET MODULATION control may cause a change in the deflection of the CARRIER LEVEL monitor; do not re-adjust the SET CARRIER control to bring the pointer back to the SET CARRIER mark.

A.F. Output

When the modulation selector is set to INT. A.M., the internal modulating signal is made available at the EXT. MOD. A.M. and earth terminals. This output may be used as a synchronizing signal when the Signal Generator is used in conjunction with a cathode-ray oscilloscope. At 40% modulation depth, the output level is of the order of 10V r.m.s.

(ii) EXTERNAL

Set the modulation selector switch to EXT. A.M.

Switch on, tune and adjust the output as for C.W.

2.7 (continued)

Turn the monitor selector switch to A.M.

Connect the external a.f. source to the EXT. MOD. A.M. and earth terminals and adjust the input level until the required modulation depth is indicated on the MODULATION AND INCREMENTAL FREQUENCY monitor. If this action causes a change in the deflection of the CARRIER LEVEL monitor, do not re-adjust the SET CARRIER control to bring the pointer back to the SET CARRIER mark.

2.8 R.F. OUTPUT ARRANGEMENTS

The r.f. output circuit of the Signal Generator should be regarded as a zero impedance voltage source in series with a resistance of 50 Ω. This is shown in fig. 2.2 where:

E is the indicated source e.m.f.

R_o is the source resistance.

Z_L is the external load impedance.

V_L, the voltage developed across the load is given by

$$V_L = E \frac{Z_L}{R_o + Z_L}$$

or, for purely resistive loads

$$V_L = E \frac{R_L}{R_o + R_L}$$

Table 2.1 shows the conversion factors for obtaining the load voltage from the indicated e.m.f. at different load impedances.

When using a correctly matched, i.e. 50 Ω output lead its output end can be regarded as an extension to the output socket on the Generator and wide variations of load impedance do not seriously affect the calculated load voltage obtained from Table 2.1. Standing waves produced by the mismatched load can, for most purposes, be ignored.

For greatest accuracy - if the additional attenuation can be tolerated - use the 20 dB Attenuator Pad Type TM4919 between seriously mitmatched loads and the output lead. This ensures that the lead is correctly terminated, and also attenuates any extraneous noise induced in the lead.

The attenuator dial gives a direct reading of the output level, provided that the carrier level has been correctly set. It has two scales; one calibrated in units of voltage and the other is dB referred to 1 µV.

2.8 (continued)

The cursor carries two hairlines; one vertical and one inclined at an angle corresponding to a 6 dB movement of the dial.

On one side of the cursor the inclined hairline is marked E.M.F. FROM 50 Ω SOURCE and indicates the output level in terms of source e.m.f. The vertical hairline is marked -6dB and gives the effective source e.m.f. when the output is taken via the 6 dB attenuator (Type TM4919/1).

On the other side of the cursor the vertical hairline is marked E.M.F. INTO 50 Ω LOAD and thus reads the potential developed across a 50 Ω load. The inclined hairline is marked -6dB and gives the correspond load voltage when the 6dB Attenuator is used.

To reverse the cursor; extract the centre screw and remove the dial window, spun metal cover and spring at the centre of the dial. The cursor may now be reversed and the window components re-assembled.

MATCHING TO HIGH IMPEDANCE LOADS

To present a load that is greater than 50 Ω with a signal derived from a matched source, a resistor R_s is added in series with the Generator output. The value of R_s is given by the difference between the load and the Generator impedances, that is

$$R_s = R_L - R_o$$

The voltage across the load, V_1, is given by

$$V_L = \frac{E}{2}$$

For the special case of a 75 Ω load a Matching Pad, Type TM4918, is available as an accessory and consists basically of a 25 Ω resistor with coaxial connectors for insertion in series with the output lead.

MATCHING TO LOW IMPEDANCE LOADS

To present a load that is less than 50 Ω with a signal derived from a matched source, a resistor R_p is added in parallel with the Generator output. The value of R_p is given by

$$Rp = \frac{R_o R_L}{R_o - R_L}$$

The effective source e.m.f., is now different and is given by

$$E_1 = E \frac{R_p}{R_o + R_p}$$

and the voltage across the load, V_L, is given by

$$V_L = \frac{E_1}{2}$$

TABLE 2.1

LOAD ohms	To find load voltage: Multiply E. M. F. by	or	Subtract dB
10	0.167		15.5
20	0.286		10.9
30	0.375		8.5
40	0.445		7.0
50	0.50		6.0
60	0.55		5.2
70	0.58		4.7
75	0.60		4.4
80	0.62		4.2
90	0.64		3.8
100	0.67		3.5
120	0.71		3.0
150	0.75		2.5
200	0.80		1.9
300	0.86		1.3
500	0.91		0.8
600	0.92		0.7
800	0.94		0.5
1000	0.95		0.4
2000	0.98		0.2
4000	0.99		0.1

2.8 (continued)

MATCHING TO BALANCED LOADS

Equipment whose input circuit is in the form of a balanced winding can be fed from the Generator by using two series resistors as shown in fig. 2.5. This method makes use of the auto-transformer effect of the centre-tapped winding and is not suitable for resistive balanced loads.

The values of R (for use in the centre conductor) and R_2 (for the earth lead) are given by

$$R_1 = \frac{R_L}{2} - 50$$

$$R_2 = \frac{R_L}{2}$$

USE OF ATTENUATOR PADS

The matching methods described above cause the output end of the r.f. lead to be mismatched. To avoid the errors in apparent e.m.f. or output impedance which might thus arise at higher frequencies, due to the presence of standing waves, the 20 dB Attenuator (Type TM4919) should be inserted at the output end of the r.f. lead. With the Attenuator in circuit, variations of load impedance between zero and infinity cause the effective value to depart from the correct value by as little as 1 Ω.

For all applications of the Signal Generator it is recommended - provided that the reduced output e.m.f. can be tolerated - that the 20 dB Attenuator be permanently connected to the output end of the r.f. lead. Apart from the benefits of load isolation described above, the effect of noise picked up in the lead is much reduced. This is of particular advantage when making signal-to-noise ratio tests on receivers at low input levels.

If, for a particular application, a 20 dB loss is not acceptable, the 6 dB Attenuator will give satisfactory results in most instances.

The Attenuator Pad reduces the effective source e.m.f. by a factor of 10, or 2, depending on whether the 20 dB or the 6 dB Attenuator is used. The figures for load voltage obtained from table 2.1 must, therefore, be reduced by the appropriate factor.

2.8 (continued)

The effective e.m.f. is given by

$$E' = \frac{E}{10} \quad \text{for the 20 dB Attenuator}$$

or

$$E' = \frac{E}{2} \quad \text{for the 6 dB Attenuator}$$

hence the load voltage, V_L, becomes

$$V_L = \frac{E}{10} \cdot \frac{R_L}{R_L + R_o} \quad \text{for the 20 dB Attenuator}$$

or

$$V_L = \frac{E}{2} \cdot \frac{R_L}{R_L + R_o} \quad \text{for the 6 dB Attenuator}$$

When matching to loads other than 50 Ω, the matching resistor must be inserted on the output side of the Attenuator; the expressions given on page 16 then become

(a) 20 dB Attenuator

For series matching, $V_L = \frac{E}{20}$

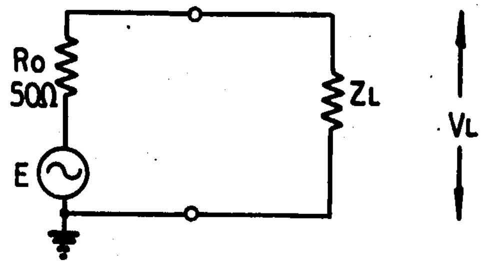
For parallel matching $V_L = \frac{E_1}{20} = \frac{E}{20} \quad \frac{R_p}{R_p + R_o}$

(b) 6 dB Attenuator

For series matching, $V_L = \frac{E}{4}$

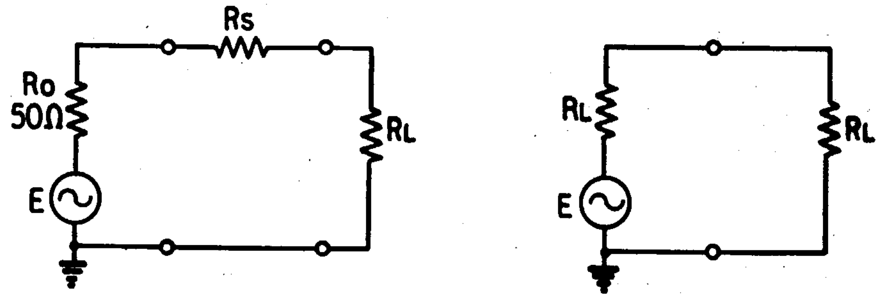
For parallel matching, $V_L = \frac{E_1}{4} = \frac{E}{4} \quad \frac{R_p}{R_p - R_o}$

FIG. 2·2



EQUIVALENT OUTPUT CIRCUIT

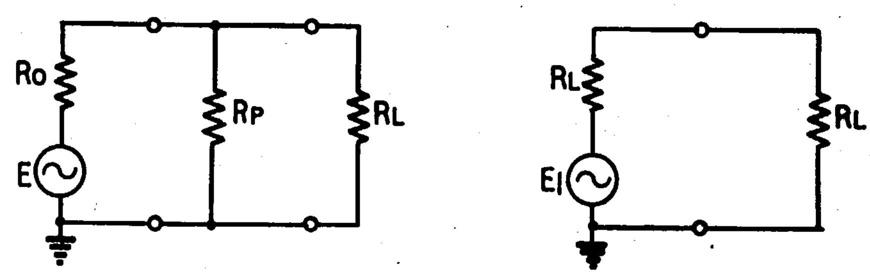
FIG. 2·3



SERIES RESISTOR IN CIRCUIT

EQUIVALENT CIRCUIT

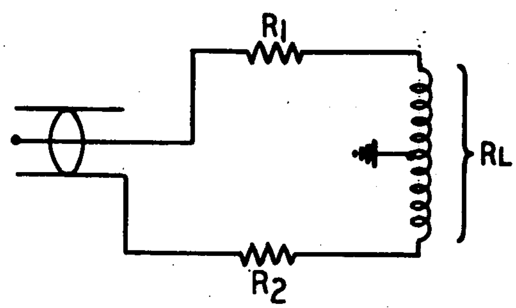
FIG. 2·4



PARALLEL RESISTOR IN CIRCUIT

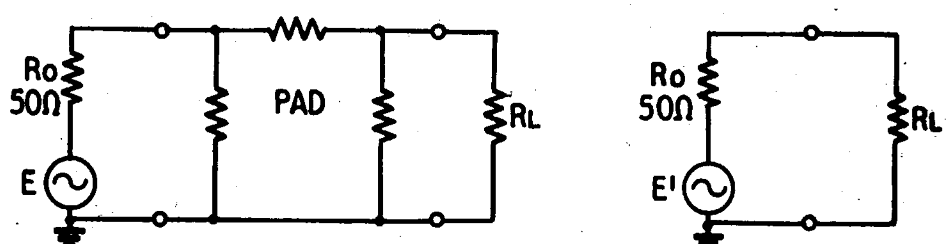
EQUIVALENT CIRCUIT

FIG. 2·5



BALANCED LOAD MATCHING

FIG. 2·6



PAD IN CIRCUIT

EQUIVALENT CIRCUIT

TITLE	DRG. No.	ISS.
MATCHING CIRCUITS FOR TF1066B/6	TLA 41150	
MARCONI INSTRUMENTS LIMITED	SHEET........ OF......... SHEETS	

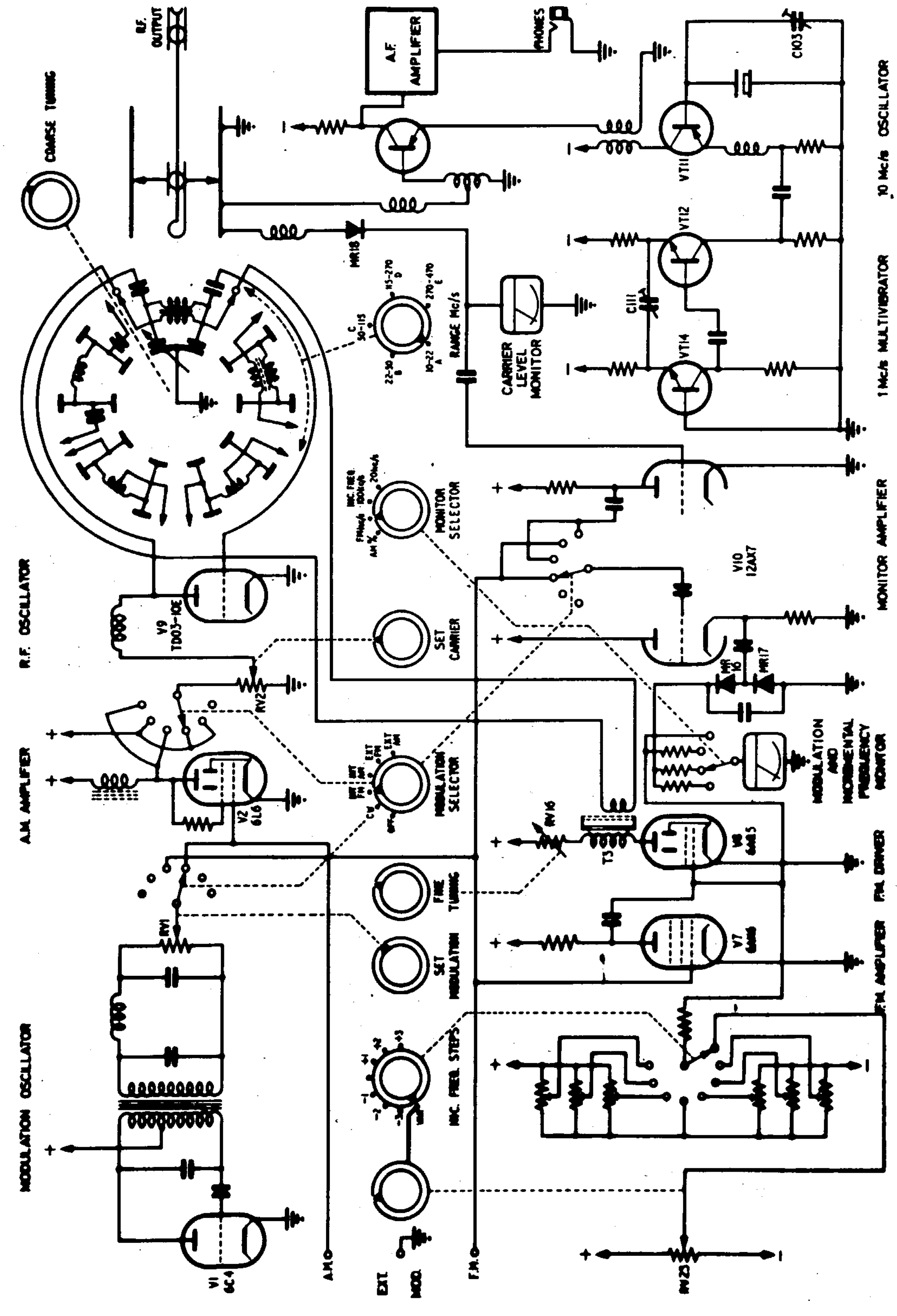


FIG. 3·1

TITLE	DRG. No.	ISS
FUNCTIONAL DIAGRAM OF TF 1066B/6	TLA 41274	1
MARCONI INSTRUMENTS LIMITED	SHEET .... OF .... SHEETS	

3 CIRCUIT SUMMARY

This section is intended to be read in conjunction with the Functional Diagram (Fig.3.1) and the Circuit Diagram (XD37340).

3.1 R. F. OSCILLATOR

A disk-seal triode, V9 (TD03-10E), connected in a form of shunt-fed Colpitts circuit generates the output frequency. The elements of the tuned circuit are mounted on a turret; there being, for each band, a separate inductor and tuning-capacitor stator-assembly which rotate about the common tuning-capacitor rotor-plates. The appropriate tuned circuit, for the selected band, is connected to the oscillator valve by a pair of coupling capacitors (C51, C52), which are formed by extensions of the tuning-capacitor stator-plates meshing with other plates attached to the frame of the r.f. unit.

The output from the oscillator is fed to a mutual inductance type of piston attenuator. A resistance-capacitance network fitted to the pick-up element of the attenuator maintains a sensibly constant output impedance, irrespective of frequency.

All leads into the r.f. units are filtered to minimize stray radiation; the component values of the filter in the feed to the f.m. modulator valve (V8) being carefully chosen to maintain good a.f. response whilst giving adequate r.f. rejection.

The output level is adjusted by the SET CARRIER control RV2 which varies the oscillator anode voltage.

3.2 MODULATORS

V1 (6C4) functions as a Hartley oscillator to provide the internal modulating signal. Connected across the oscillator output, the SET. MOD. CONTROL RV1 adjusts the signal level passed to either the a.m. amplifier or the f.m. amplifier.

The a.m. amplifier, (V2 (6L6) operates as an anode modulator; the output being applied to the anode of the r.f. oscillator valve.

Frequency modulation is achieved by means of a ferrite reactor, T3. In this type of modulator the inductance of a small r.f. coil is varied by permeability changes in its ferrite core. This core completes the magnetic circuit of an l.f. inductor whose winding carries the a.f. modulating current. The core is biased to a suitable point on its B/H

3.2 (continued)

characteristic by the standing anode current of the driver valve, V8 (6AQ5). The ferrite reactor is coupled to the r.f. tuned circuit in use; and thus variations of current through the l.f. winding produce corresponding variations of frequency.

To maintain constant deviation despite changes of frequency, the modulating signal is applied to the f.m. amplifier, V7 (6AK6) via a series of fixed and preset resistors, selected by sections, d and e of switch SE (which form part of the range control) and via potentiometer, RV13 (which is ganged to the main tuning control). From the output of the f.m. amplifier, which provides voltage gain, the modulating signal is fed to the driver valve, V8 (6AQ5).

3.3 FINE TUNING AND INCREMENTAL FREQUENCY CIRCUITS

The FINE TUNING control, RV16, is connected in series with the anode and screen supply to the driver valve. Changes to the value of this control affect the standing anode current and consequently by the action of the ferrite reactor cause small changes to the carrier frequency.

Known values of frequency shift are produced by applying d.c. potentials to the driver valve via the f.m. tracking controls. These potentials are derived from the +280V and -108V supplies by preset potential dividers, RV17 - RV22, and potentiometer RV23; giving stepped or continuously variable frequency increments respectively.

3.4 MONITORS

The r.f. output is detected by rectifier MR18 and the resulting d.c. component is indicated by the CARRIER LEVEL meter, M1. When the carrier is amplitude modulated there is also an a.f. component which is fed via V10 (12AX7), the individual sections of which function as an R-C coupled amplifier and a cathode follower respectively, to the voltage-doubler rectifier consisting of the diodes MR16, MR17. Thus the MODULATION AND INCREMENTAL FREQUENCY meter M1 indicates the modulation level; the scale being calibrated directly in terms of percentage modulation.

When the instrument is switched to give frequency modulation, the modulating signal is applied direct to the input of the cathode follower section of V10 and hence the meter, M1, indicates the amplitude of the a.f. signal. Because the f.m. tracking network is so adjusted to give deviation proportional to the level of the modulating signal, the meter is scaled directly in terms of frequency deviation.

For monitoring incremental frequency shifts the meter, M1, operates as a simple voltmeter; the deflection being produced by the shift voltage.

3.5 CRYSTAL CALIBRATOR

The calibrator consists of a 10 Mc/s crystal oscillator, VT11 (2N1748A) to which is locked a 1 Mc/s multivibrator, VT12 and VT14 (2S102). The multivibrator, in turn, modulates the 10 Mc/s oscillator at 1 Mc/s intervals.

A coupling coil, L22, within the r.f. box picks up the Signal Generator carrier frequency which is mixed with the calibrator r.f. output by VT10 (2N1742). Transistors VT13, VT15 and VT16 (ACY20) amplify the resulting audio beat frequency which is passed to the PHONES socket, JK1.

3.6 POWER SUPPLIES

The windings of the mains transformer primary may be interconnected in such ways as to accept input voltages from 100 to 130V and 200 to 250V.

The main h.t. supply is derived from two series-connected bridge rectifier circuits via V3 (6CD6G) acting as a series stabilizer controlled by V5 (6AK5) and the reference tube V4 (5651).

A separate bridge rectifier provides the negative h.t. line, stabilized by V6 (OB2).

Besides the normal l.t. supplies, a separate stabilized, d.c. supply is provided for the heaters of the frequency modulator and r.f. oscillator valves. In this case, VT2 (2N1553) acts as a series stabilizer and the reference potential is obtained from a Zener diode, MR15 (Z2A47).

4 SERVICING NOTES

4.1 ACCESS TO COMPONENTS

The case of the TF 1066B/6 may be removed by taking out four screws at the rear. The dust cover of the TF 1066B/6R may be similarly removed after the three rear fixing screws have been extracted.

To obtain access to the inside of the r.f. box, besides the bottom and rear cover plates, the top cover carrying the calibrator unit must be removed. Each plate may be freed by slackening the screws around the edges and sliding off the retaining strips.

Care must be taken, when refitting the calibrator unit, to ensure that the wire probe plug into the r.f. box locates in its corresponding socket.

4.2 CIRCUIT VOLTAGES

The following voltages were taken, using an Avometer Model 8, on a typical TF 1066B/6.

Transformer windings - a.c. (r.m.s.) readings with nominal mains input.

HT1	175	V
HT2	175	V
HT3	240	V
LT1	6.3	V
LT2	6.3	V
LT3	14-0-14	V

Valve electrodes - d.c. readings taken with respect to earth.

Valve	Electrode	Pin No.	Voltage	Conditions
V1	anode	1,5	240	operating
(6C4)	control grid	6	-37	as 1 kc/s
	cathode	7	7.9	oscillator
V2	anode	3	236	modulation
(6L6)	screen grid	4	234	selector set to
	cathode	8	22.5	INT. A.M.
V3	anode	top cap	460	nominal
(6CD6G)	screen grid	8	450	mains
	control grid	5	252	input
	cathode	3	280	

4.2 (continued)

Valve	Electrode	Pin No.	Voltage	Conditions
V4 (5651)	anode	1,5	85	nominal mains input
	cathode	2,4,7	0	
V5 (6AK5)	anode	5	252	nominal mains input
	screen grid	6	122	
	control grid	1	84	
	cathode	2,7	85	
V6 (OB2)	anode	1,5	0	nominal mains input
	cathode	2,4,7	-104	
V7 (6AK6)	anode	5	126	modulation selector set to INT. F.M.
	screen grid	6	162	
	cathode	7	10.5	
V8 (6AQ5)	anode	5	260	FINE TUNING control at mid travel
	screen grid	6	260	
	cathode	2	24	
V9 (TD03-10E)	anode	-	50 to 130 depending on frequency	CARRIER LEVEL monitor at SET CARRIER mark
	cathode		0	
V10 (12AX7)	anode	1	110	
	cathode	3	6	
	anode	6	280	
	cathode	8	70	

4.2 (continued)

Transistor terminals - d.c. readings measured with respect to earth.

Transistor	Collector Voltage (V)	Emitter Voltage (V)	Conditions
VT1	-6.7	-0.3	
VT2	-6.7	0	
VT3	-0.4	+1.2	
VT10	+1.2	0	10 Mc/s oscillator operating
VT11	-23.5	-4.6	crystal removed
VT12	-2.0	-3.5	switched to 1 Mc/s
VT13	-5.6	-5.5	
VT14	-0.2	-3.2	switched to 1 Mc/s
VT15	-14.6	-1.8	
VT16	-13.4	-2.3	

Crystal calibrator pin 9	-24 V
pin 11	-23.9 V
junction R104/R113	-22.8 V
junction R107/R126	-5.5 V

4.3 INCREMENTAL FREQUENCY STEPS

The stepped incremental frequency shifts are set up by six preset potentiometers mounted on a panel at the rear of the instrument. Access to these controls is obtained by opening the right hand hinged door at the rear of the case of the TF1066B/6 or by removing the dust cover of the TF1066B/6R.

To set up any particular step turn the INC. FREQ. STEPS switch to the required position and the monitor selector switch to whichever of the INC. FREQ. positions gives the more suitable sensitivity for the desired shift. Adjust the INC. FREQ. STEP pre-set control corresponding to the selected step until the MODULATION AND INCREMENTAL FREQUENCY monitor indicates the required shift.

If the steps are to be used at carrier frequencies in the two highest ranges, due allowance should be made, when setting up, for the corrections given by the curves on the CORRECTION CHART FOR DEVIATION AND INCREMENTAL FREQUENCY MONITOR.

Remember that before using the frequency shifts which have been thus set up, it will be necessary to neutralize modulator hysteresis using the procedure outlined in Section 2.5 (iv).

4.4 ADJUSTMENT OF PRESET CONTROLS

The following simplified adjustment procedures are intended to permit the instrument to be set up following component replacement. If information on adjustments not covered by this instruction book is required, please write to or telephone our Service Department or nearest Area Office. Always mention the type and serial numbers of your instrument. (For addresses,see rear cover.)

(i) SET H.T.

Turn the INC. FREQ. STEPS control to the zero position and the monitor selector switch to INC. FREQ. 20 kc/s. Adjust RV14 until the pointer of the MODULATION AND INCREMENTAL FREQUENCY monitor coincides with the centre zero mark of the incremental frequency scales.

(ii) SET L.T.

Connect a suitable d.c. voltmeter across the stabilized l.t. line. Adjust RV15 until the meter indicates 6.3V.

(iii) SET F.M.

(a) This adjustment should be checked if V7, V10, MR16 or MR17 have been replaced.

Set up the Signal Generator for a carrier frequency of about 22 Mc/s (Range A), modulating frequency of 1 kc/s and f.m. deviation range of 100 kc/s. Turn the monitor selector switch to F.M. kc/s. Connect a carrier deviation meter, such as Marconi Instruments Type TF791D, to the R.F. OUT SOCKET. Advance the SET MODULATION control until the external deviation meter indicates a deviation of 100 kc/s. Deviation on each side of the carrier should be checked and, if necessary, a compromise adopted. Then adjust RV24 for an indication of 100 kc/s on the MODULATION AND INCREMENTAL FREQUENCY monitor.

(b) If a replacement for V8 or T3 has been fitted, the following procedure should be adopted. Turn the Signal Generator to about 22 Mc/s (Range A) and switch to the 100 kc/s f.m. deviation range, with a modulating frequency of 1 kc/s. Put the monitor selector switch in the F.M. kc/s position. Turn the SET MODULATION control until a deviation of 100 kc/s is indicated on the MODULATION AND INCREMENTAL FREQUENCY MONITOR. Connect a carrier deviation meter, such as Marconi Intruments Type TF791D, to the R.F. OUT socket and adjust RV12 until the external meter shows a deviation of 100 kc/s. Now retune to about 10 Mc/s and adjust RV7 for an indication of 100 kc/s deviation on the external meter.

4.4 (continued)

Repeat the adjustments to RV12 and RV7, in turn, at the high and low frequency ends of the range respectively, until the best compromise over the whole frequency range is obtained.

The tracking of the other ranges should be corrected in a similar manner. The controls to be adjusted are given in the following table.

Range	Adjust at high frequency end	Adjust at low frequency end
A	RV12	RV7
B	RV11	RV6
C	RV10	RV5
D	RV9	RV4
E	RV8	RV3

The preset controls (RV3 - RV12) associated with these adjustments are grouped together on a panel which is mounted beneath the r.f. box.

(iv) SET A.M.

This adjustment should be checked if V10, MR16, or MR17 have been replaced.

Turn the Signal Generator to about 10 Mc/s (Range A) and with the SET CARRIER control bring the pointer of the CARRIER LEVEL monitor to the SET CARRIER mark. Turn the modulation selector switch to INT. A.M. and the monitor selector switch to A.M.%. Connect an oscilloscope, such as Marconi Instruments Type TF1330, to the R.F OUT socket and advance the SET MODULATION control until the modulation depth, as measured on the oscilloscope, is 40%. Percentage modulation is given by the formula:-

$$M\ (\%) = \frac{D\ max - D\ min}{D\ max + D\ min} \times 100$$

where D max is the peak-to-peak and D min the trough-to-trough amplitude of the oscilloscope display.

Finally adjust RV26 until the modulation depth indicated on the MODULATION AND INCREMENTAL FREQUENCY monitor is 40%.

(v) CRYSTAL CALIBRATOR

To set up the crystal calibrator a standard 10 Mc/s frequency source is required, such as the Marconi Instruments Precision Crystal Calibrator Type TF1374.

4.4 (continued)

Switch on the Signal Generator and allow to warm up for at least one hour. Tune to 10 Mc/s and connect the R.F. OUT socket to the crystal calibrator. Adjust the Signal Generator frequency with the COARSE and FINE TUNING controls for zero beat with the 10 Mc/s standard. Disconnect the TF1374 and turn range switch of the Signal Generator calibrator to 10 Mc/s. Connect a pair of high resistance headphones to the PHONES socket and adjust C103 until the internal crystal oscillator gives a zero beat with the Signal Generator.

Note the dial reading and tune the Signal Generator until the next 10 Mc/s marker is heard. Turn the crystal calibrator range switch to 1 Mc/s and slowly retune the Signal Generator to its original position counting the number of intermediate marker pips between the 10 Mc/s and 20 Mc/s positions. If additional 0.5 Mc/s markers are heard, they should be disregarded. These subharmonic beats may readily be identified by their much lower amplitude.

When correcly set up there are nine intermediate markers corresponding to ten 1 Mc/s intervals. If fewer than nine intermediate markers are heard adjust C111 to increase its capacity. If there are more than nine markers, the capacity of C111 must be reduced.

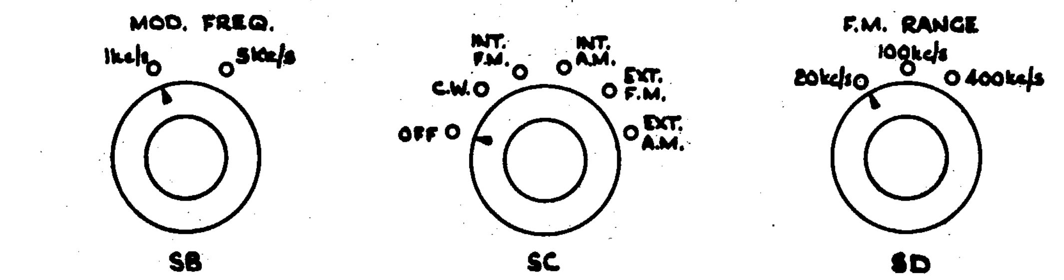
The preset capacitors C103 and C111 are accessible through holes at the rear of the calibrator unit. These holes are normally covered by press studs.

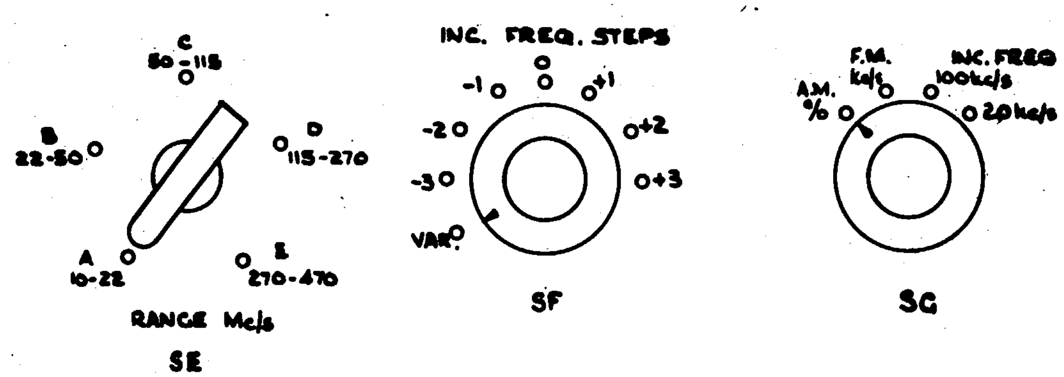
4.5 FUSES

Six fuses are fitted to protect the power supply circuits. They are all mounted on a panel to which access may be obtained by opening the left hand hinged door at the rear of the case of the TF1066B/6 or by removing the dust cover of the TF1066B/6R.

The fuse ratings are given in the following table

FS1	2A
FS2	2A
FS3	2A
FS4	2A
FS5	250mA
FS6	100mA





NOTES

- ✱ — THIS PAIR SHOULD BE TWISTED AND NOT INCLUDED IN CABLEFORM
- d — WIRE TYPE TC20700/5
- x — I.C. SCREENED CABLE TO DEF. 10
- Y — CO-AX CABLE TYPE RG-58C/U
- z — THESE WIRES ARE NOT TO BE INCLUDED IN A CABLEFORM AND SHOULD BE SEPARATED AS FAR AS POSSIBLE FROM EARTH AND CHASSIS.
- k — WIRE TYPE TC20700/19
- f — WIRES INDICATED THUS ARE NOT TO BE IN CABLEFORM. LEADS FROM 'SE' TO R88, 89, 90, 91, & 92 TO BE IN A COMMON SLEEVE, ITEM 179, AND SEPARATE FROM ALL OTHER LEADS.

F.M. SIGNAL GENERATOR TF 1066B/6 & /6R

MARCONI INSTRUMENTS LTD.

XD 37340

SHEET 1 OF 2 SHEETS

ISSUE NO. 1

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	RESISTORS			R27	330KΩ ± 10% ½W/55°C	F5 SH1	35 TM 7146
R1	2·2KΩ ±10% ½W/55°C	D3 SHT1	24 TM 7146	R28	15KΩ ± 5% 10W	G1 SH.1	9 TM 7140
R2	47KΩ ±10% ½W/55°C	D2 SH.1	25 TM 7146	R29	18KΩ ½W/55°C S.I.C.	F2 SH.1	8 TM 7141
R3	2·2KΩ ±10% ½W/55°C	D1 SH.1	24 TM 7146	R30	33KΩ ½W/55°C S.I.C.	G2 SH.1	9 TM 7141
R4	220KΩ ±10% ½W/55°C	D2 SH.1	26 TM 7146	R31	18KΩ ½W/55°C S.I.C.	F3 SH.1	8 TM 7141
R5	24KΩ ± 7%TE ⅜W/55°C	E2 SH.1	92 TF 1066B/6	R32	56KΩ ½W/55°C S.I.C.	G3 SH.1	10 TM 7141
R6	120KΩ ± 7%TE ⅜W/55°C	E3 SH.1	93 TF 1066B/6	R33	S.I.C.	F3 SH.1	11 TM 7141
R7	100KΩ ⅜W/55°C S.I.C.	K4 SH.1	94 TF 1066B/6	R34	100Ω ± 10% ½W/55°C	F5 SH.1	30 TM 7146
R8	10Ω ± 10% 1W/55°C	E4 SH.1	27 TM 7146	R35	680KΩ ± 10% ½W/55°C	G5 SH.1	36 TM 7146
R9	560KΩ ± 10% ½W/55°C	E2 SH.1	52 TM 7146	R36	47KΩ ± 10% ½W/55°C	G5 SH.1	25 TM 7146
R10	270KΩ ± 10% ½W/55°C	E2 SH.1	28 TM 7146	R37	1·5KΩ ± 5% 1½W/70°C	G6 SH.1	37 TM 7146
R11	1KΩ ± 10% 1W/55°C	F3 SH.1	29 TM 7146	R38	4·7KΩ ± 10% ½W/55°C	G5 SH.1	38 TM 7146
R12	100Ω ± 10% ½W/55°C	F2 SH.1	30 TM 7146	R39	10KΩ ±10% ½W/55°C	G2 SH.1	11 TM 7140
R13	2·2KΩ ± 3% 1½W/70°C	F1 SH.1	31 TM7146	R40	4·7KΩ ±10% ½W/55°C	G2 SH.1	10 TM 7140
R14	1Ω ± 10% 1½W/70°C	F4 SH.1	4 TM 7142	R41	10KΩ ± 10% ½W/55°C	G2 SH.1	11 TM 7140
R15	22Ω ± 10% ½W/55°C	F6 SH.1	32 TM 7146	R42	22KΩ ± 10% ½W/55°C	G3 SH.1	12 TM 7140
R16	22Ω ± 10% ½W/55°C	F5 SH.1	32 TM 7146	R43	22KΩ ±10% ½W/55°C	G3 SH.1	12 TM 7140
R17	1KΩ ± 10% 1½W/70°C	F5 SH.1	33 TM 7146	R44	18KΩ ± 10% ½W/55°C	G4 SH.1	7 TM 7142
R18	10KΩ ± 10% 1W/70°C	F3 SH.1	95 TF1066B/6	R45	100KΩ ± 10% 1W/55°C	G5 SH.1	39 TM 7146
R19	S.I.C.	F1 SH.1	5 TM 7140	R46	22KΩ ± 10% 1W/55°C	G6 SH.1	40 TM 7146
R20	S.I.C.	F1 SH.1	6 TM 7140	R47	68Ω ± 10% ½W/55°C	H4 SH.1	18 TM 7142
R21	10KΩ 1W/55°C S.I.C.	F1 SH.1	7 TM 7140	R48	100KΩ ± 10% ½W/55°C	H5 SH.1	41 TM 7146
R22	10KΩ 1W/55°C S.I.C.	F1 SH.1	7 TM 7140	R49	33KΩ ±10% ½W/55°C	H6 SH.1	42 TM 7146
R23	S.I.C.	F1 SH.1	8 TM 7140	R50	22KΩ ± 10% 1W/55°C	H6 SH.1	40 TM 7146
R24	1KΩ ± 10% ½W/55°C	F4 SH.1	5 TM 7142	R51	1MΩ ± 10% ½W/55°C	H2 SH.1	92 TM 6241/5
R25	1·5Ω ± 10% 1½W/70°C	F4 SH.1	6 TM 7142	R52	820Ω ± 7%TE ⅜W/55°C	H4 SH.1	43 TM 7146
R26	4·7KΩ ± 5% 4½W/70°C	F6 SH.1	34 TM 7146	R53	100Ω ± 7%TE ⅜W/55°C	H4 SH.1	44 TM 7146

DRAWN A.CATO	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62.	APPD.	SHT. 1 OF 10 SHTS.	
TRACED PKY	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 3

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
R54	1MΩ ± 10% ½W/55°C	H1 SH.1	92 TM 6241/5	R81	1MΩ ± 10% ½W/55°C	L5 SH.1	14 TM 7143
R55	47KΩ ± 7%TE ⅜W/55°C	H2 SH.1	45 TM 7146	R82	4·7KΩ ± 10% ½W/55°C	L5 SH.1	38 TM 7146
R56	1MΩ ± 10% ½W/55°C	H2 SH.1	46 TM 7146	R83	470Ω ± 10% ½W/55°C	L5 SH.1	5 TM 7143
R57	270KΩ ± 7%TE ⅜W/55°C	H2 SH.1	47 TM 7146	R84	33KΩ ± 10% 1W/55°C	L6 SH.1	6 TM 7143
R58	1KΩ ± 7%TE ⅜W/55°C	H2 SH.1	48 TM 7146	R85	47Ω ± 5% ¼W	M1 SH.1	19 TM 4819/3
R59	18KΩ ± 10% 2W	H1 SH.1	49 TM 7146	R86	100Ω ± 10% ½W/55°C	M3 SH.1	93 TM 6241/5
R60	68KΩ ± 10% ½W/55°C	J1 SH.1	50 TM 7146	R87	180KΩ ± 10% ½W/55°C	M4 SH.1	51 TM 7146
R61	2-43KΩ ± 5% ½W IN PARALLEL	J4 SH.1	96 TF1066B/6	R88	1KΩ ½W/55°C S.I.C.	M4 SH.1	5 TM 7141
R62	27KΩ ± 10% 1W/55°C	J4 SH.1	97 TF1066B/6	R89	820Ω ½W/55°C S.I.C.	M4 SH.1	12 TM 7141
R63	27KΩ ± 10% 1W/55°C	J6 SH.1	97 TF1066B/6	R90	1·8KΩ ½W/55°C S.I.C.	M4 SH.1	6 TM 7141
R64	47K ± 10% 1W/55°C SIC.	J1 SH.1	96 TM 6241/5	R91	2·7KΩ ½W/55°C S.I.C.	M4 SH.1	7 TM 7141
R65	1KΩ ± 10% ½W/55°C	J2 SH.1	91 TM 6241/5	R92	1·8KΩ ½W/55°C S.I.C.	M4 SH.1	6 TM 7141
R66	10KΩ ± 5% 1W/55°C	J5 SH.1	98 TF1066B/6	R93	47Ω ± 5% ¼W	M2 SH.1	19 TM 4819/3
R67	10KΩ ± 7%TE ⅜W/55°C	K4 SH.1	99 TF1066B/6	R94	4·7KΩ ± 10% ½W/55°C	M5 SH.1	7 TM 7143
R68	56KΩ ± 7%TE ⅜W/55°C	K5 SH.1	53 TM 7146	R95	1MΩ ± 10% ½W/55°C	M5 SH.1	4 TM 7143
R69	1KΩ ± 10% 1W/55°C	K2 SH.1	95 TM 6241/5	R96	2·2KΩ ± 10% ½W/55°C	M6 SH.1	9 TM 7142
R70	150Ω ± 10% ½W/55°C	K3 SH.1	97 TM 6241/5	R97	1·2KΩ ± 10% ½W/55°C	M5 SH.1	8 TM 7143
R71	390KΩ ½W/55°C S.I.C.	K5 SH.1	100 TF1066B/6	R98	580Ω ± 10% ½W/55°C	L5 SH.1	108 TF1066B/6
R72	120KΩ ± 2% ¼W	K4 SH.1	101 TF1066B/6	R99	39Ω ± 5% 1½W 70°C	K1	9 TM 7144
R73	100KΩ ½W/55°C S.I.C.	K4 SH.1	102 TF1066B/6	R100	100KΩ ± 10% ·1W	E3 SH.2	15 TM 7115
R74	47KΩ ± 7% TE ⅜W/55°C	K5 SH.1	103 TF1066B/6	R101	15KΩ ± 10% ·1W	E4 SH.2	16 TM 7115
R75	15KΩ ½W/55°C S.I.C.	K5 SH.1	104 TF1066B/6	R102	5.6KΩ ± 10% ·1W	E6 SH.2	17 TM 7115
R76	330Ω ± 10% ½W/55°C	K3 SH.1	90 TM 6241/5	R103	4·7KΩ ± 10% ·1W	E6 SH.2	18 TM 7115
R77	5·6MΩ ± 2% ¾W/70°C	K4 SH.1	105 TF1066B/6	R104	100KΩ ± 10% ·1W	E1 SH.2	15 TM 7115
R78	480KΩ ± 2% ¼W/70°C	K4 SH.1	106 TF1066B/6	R105	100KΩ ± 10% ·1W	F1 SH.2	15 TM 7115
R79	10KΩ ± 10% ½W/55°C	L3 SH.1	89 TM 6241/5	R106	33KΩ ± 10% ·1W SIC.	F3 SH.2	19 TM 7115
R80	70MΩ ± 20% ⅓W	L4 SH.1	107 TF1066B/6	R107	1KΩ ± 10% ·1W	E4 SH.2	21 TM 7115

DRAWN A.CATO	CHKD	USED ON TF1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62.	APPD.	SHT. 2 OF 10 SHTS.	
TRACED PKY	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 3

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
R108	1KΩ ± 10% ·1W	E6 SH.2	21 TM 7115				
R109	33KΩ ± 10% ·1W	F1 SH.2	20 TM 7115				
R110	10KΩ ± 10% ·1W	F3 SH.2	22 TM 7115				
R111	3·3KΩ ± 10% ·1W	F4 SH.2	23 TM 7115				
R112	3·3KΩ ± 10% ·1W	F6 SH.2	23 TM 7115				
R113	1KΩ ± 10% ·1W	G1 SH.2	21 TM 7115				
R114	220KΩ ± 10% ·1W	G2 SH.2	24 TM 7115		RESISTORS VARIABLE		
R115	22KΩ ± 10% ·1W	G3 SH.2	25 TM 7115	RV1	10KΩ ± 10% 1W	E2 SHT1	113TF1066B/6
R116	10KΩ ± 10% ·1W	G4 SH.2	22 TM 7115	RV2	22KΩ ± 10% 7½W	F2 SHT1	114TF1066B/6
R17	1KΩ ± 10% ·1W	G6 SH.2	21 TM 7115	RV3	10KΩ ± 20% ¼W/70°C	G1 SHT1	13 TM 7140
R118	22KΩ ± 10% ·1W	G2 SH.2	25 TM 7115	RV4	22KΩ ± 20% ¼W/70°C	G1 SHT1	15 TM 7140
R119	4·7KΩ ± 10% ·1W	G3 SH.2	18 TM 7115	RV5	47KΩ ± 20% ¼W/70°C	G1 SHT1	16 TM 7140
R120	3·3KΩ ± 10% ·1W	G4 SH.2	23 TM 7115	RV6	10KΩ ± 20% ¼W/70°C	G1 SHT1	13 TM 7140
R121	3·3KΩ ± 10% ·1W	G6 SH.2	23 TM 7115	RV7	15KΩ ± 20% ¼W/70°C	G2 SHT1	14 TM 7140
R122	68KΩ ± 10% ·1W	H1 SH.2	28 TM 7115	RV8	10KΩ ± 20% ¼W/70°C	G2 SHT1	13 TM 7140
R123	8·2KΩ ± 10% ·1W	H3 SH.2	26 TM 7115	RV9	10KΩ ± 20% ¼W/70°C	G2 SHT1	13 TM 7140
R124	10KΩ ± 10% ·1W	H1 SH.2	22 TM 7115	RV10	10KΩ ± 20% ¼W/70°C	G2 SHT1	13 TM 7140
R125	2·2KΩ ± 10% ·1W	H3 SH.2	27 TM 7115	RV11	10KΩ ± 20% ¼W/70°C	G2 SHT1	13 TM 7140
R126	4·7KΩ ± 10% ·1W	H4 SH.2	18 TM 7115	RV12	10KΩ ± 20% ¼W/70°C	G3 SHT1	13 TM 7140
R127	100KΩ ± 10% ·1W	H3 SH.2	15 TM 7115	RV13	5KΩ ± 10% 3W	H2 SHT1	99 TM 6241/5
R128	15KΩ ± 10% ½W/55°C	K1 SH.2	21 TM 7177	RV14	50KΩ ± 10% 1W	H5 SHT1	60 TM 7146
R129	22KΩ ± 10% ½W/55°C	K4 SH.2	22 TM 7177	RV15	250Ω ± 10% 1W	H4 SHT1	61 TM 7146
R130	680Ω ± 10% ·1W	E4 SH.2	29 TM 7115	RV16	5KΩ ± 10% 2W	H1 SHT1	115TF1066B/6
R131	47KΩ ± 10% ·1W S.I.C.	D6 SH.2	30 TM 7115	RV17	25KΩ ± 20% 1W	H5 SHT1	116TF1066B/6
				RV18	25KΩ ± 20% 1W	H6 SHT1	116TF1066B/6
				RV19	25KΩ ± 20% 1W	H5 SHT1	116TF1066B/6
				RV20	25KΩ ± 20% 1W	H5 SHT1	116TF1066B/6

DRAWN A.CATO	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62	APPD.	SHT 3 OF 10 SHTS.	
TRACED MFW.	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 2

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	RESISTORS VARIABLE (CONT'D)			C12	1000µF +50% −20% 25V	F4 SHT1	75 TM 7146
RV21	25KΩ ± 20% 1W	J5 SHT1	116TF1066B/6	C13	8µF +50% −20% 500V	F5 SHT1	76 TM 7146
RV22	25KΩ ± 20% 1W	J5 SHT1	116TF1066B/6	C14	8µF ±50% −20% 450V	F6 SHT1	77 TM 7146
RV23	50KΩ ± 10% 1W	J5 SHT1	117TF1066B/6	C15	8µF +50% −20% 450V	F2 SHT1	77 TM 7146
RV24	15KΩ ± 10% 1W	K5 SHT1	64 TM 7146	C16	0.1µF ± 20% 150V	F4 SHT1	14 TM 7142
RV25	1KΩ ± 10% ½W	K3 SHT1	101 TM6241/5	C17	32µF +50% −20% 500V	F5 SHT1	78 TM 7146
RV26	10KΩ ± 10% 1W	M5 SHT1	62 TM 7146	C18	8µF +50% −20% 450V	F6 SHT1	77 TM 7146
RV27	5KΩ ± 10% 1W	M5 SHT1	63 TM 7146	C19	500µF +100% −20% 25V	F4 SHT1	79 TM 7146
RV28	2KΩ ± 20% ½W	L3 SHT2	118TF1066B/6	C20	0.25µF ± 20% 350V	G5 SHT1	80 TM 7146
				C21	0.1µF ± 20% 150V	H2 SHT1	71 TM 7146
				C22	8µF +50% −20% 450V	H5 SHT1	77 TM 7146
				C23	25µF +100% −20% 25V	H3 SHT1	74 TM 7146
				C24	.02µF ± 20% 200V	H2 SHT1	81 TM 7146
				C25	25µF +100% −20% 50V	H1 SHT1	82 TM 7146
				C26	1µF ± 20% 250V	J3 SHT1	83 TM 7146
	CAPACITORS.			C27	0.1µF ± 20% 350V	J2 SHT1	72 TM 7146
C1	.015µF 400V S.I.C.	D1 SHT1	8 TM 1296F	C28	200PF LEAD THRU.	J1 SHT1	5 TM 4883D
C2	500PF 300V A.C.SIC	D2 SHT1	9 TM 1296F	C29	200PF LEAD THRU.	J1 SHT1	6 TM 4883D
C3	.01µF ± 20% 400V	D2 SHT1	69 TM 7146	C30	200PF LEAD THRU.	J1 SHT1	6 TM 4883D
C4	.005µF ± 20% 250V	E2 SHT1	70 TM 7146	C31	4700PF LEAD THRU.	J1 SHT1	6 TM 4883
C5	.005µF ± 20% 250V	E2 SHT1	70 TM 7146	C32	4700PF LEAD THRU.	J1 SHT1	6 TM 4883
C6	0.1µF ± 20% 150V	E4 SHT1	71 TM 7146	C33	4700PF LEAD THRU.	J1 SHT1	5 TM 4883
C7	0.1µF ± 20% 350V	E3 SHT1	72 TM 7146	C34	50PF LEAD THRU.	J2 SHT1	6 TM 4883 L
C8	1µF ± 20% 150V	E2 SHT1	73 TM 7146	C35	50PF LEAD THRU.	J2 SHT1	6 TM 4883 L
C9	25µF +100% −20% 25V	F3 SHT1	74 TM 7146	C36	50PF LEAD THRU.	J2 SHT1	5 TM 4883 L
C10	1000µF +50% −20% 25V	F4 SHT1	75 TM 7146	C37	.005µF ± 20% 250V	K3 SHT1	104 TM6241/5
C11	1000µF +50% −20% 25V	F4 SHT1	75 TM 7146	C38	100PF ± 2% 750V D.C. S.I.C.	K4 SHT1	124TF1066B/

DRAWN A.CATO.	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD37340
DATE 6.9.62.	APPD.	SHT.4 OF 10 SHTS.	
TRACED MFW	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 2

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	CAPACITORS (CONT'D)			C65			
C39	4700PF LEAD THRU	K3 SHT1	5 TM 4883E	C66			
C40	4700PF LEAD THRU.	K3 SHT1	6 TM 4883E	C67			
C41	4700PF LEAD THRU.	K3 SHT1	6 TM 4883E	C68			
C42	1PF ± .5PF 500V	K2 SHT1	102TM6241/5	C69			
C43	0.5PF - 3PF TRIMMER	L3 SHT1	103TM6241/5	C70			
C44	8μF + 50% - 20% 450V	L5 SHT1	77 TM 7146	C71			
C45	6μF ± 20% 150V	L5 SHT1	84 TM 7146	C72			
C46	.05μF ± 20% 250V	L5 SHT1	12 TM 7143	C73			
C47	.05μF ± 20% 250V	L4 SHT1	85 TM 7146	C74			
C48	1PF ± 5PF 750V	L1 SHT1	25 TM 6242/2	C75			
C49	50PF VAR.SPEC.	L2 SHT1	7.8TM6242/2	C76			
C50	2.2PF ± 5PF 750V	L1 SHT1	23 TM 6242/2	C77			
C51	27PF SPEC.	L2 SHT1	23 TM 6241/5	C78			
C52	27PF SPEC.	L2 SHT1	23 TM 6241/5	C79			
C53	500PF LEAD THRU	M3 SHT1	5 TM 4883F	C80			
C54	500PF LEAD THRU.	M3 SHT1	6 TM 4883F	C81			
C55	500PF LEAD THRU.	M3 SHT1	8 TM 4883F	C82			
C56	.002μG ± 20% 350V	M6 SHT1	15 TM 7142	C83			
C57	.005μF ± 20% 250V	M6 SHT1	16 TM 7142	C84			
C58	47PF ± 10% 500V	M1 SHT1	20 TM 4819/3	C85			
C59	200PF SPEC.	M2 SHT1	PART OF TM 6312/1	C86			
C60	0.25μF ± 20% 350V	M5 SHT1	80 TM 7146	C87			
C61	33PF ± 5% 750V	E5 SHT2	12D TM7115	C88			
C62				C89			
C63				C90			
C64				C91			

DRAWN A.CATO.	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62.	APPD.	SHT. 5 OF 10 SHTS.	
TRACED MFW	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 6

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	CAPACITORS (CONT'D)		
C92			
C93			
C94			
C95			
C96			
C97			
C98			
C99			
C100	.001µF − 20% + 80% 500V	D2 SHT2	36 TM 7115
C101	.001µF − 20% + 80% 500V	D2 SHT2	36 TM 7115
C102	220PF ± 5% 125V	E5 SHT2	37 TM 7115
C103	10-45PF TRIMMER.	E5 SHT2	38 TM 7115
C104	.01µF − 20% + 80% 500V	E3 SHT2	39 TM 7115
C105	.01µF − 20% + 80% 500V	E3 SHT2	39 TM 7115
C106	.001µF − 20% + 80% 500V	E3 SHT2	36 TM 7115
C107	100PF ±2% 750V S.I.C.	E5 SHT2	40 TM 7115
C108	8µF − 20% + 100% 25V	E2 SHT2	35 TM 7115
C109	10µF − 20% + 100% 6V	F2 SHT2	41 TM 7115
C110	100µF − 20% + 100% 6V	F3 SHT2	42 TM 7115
C111	10-45PF TRIMMER.	F5 SHT2	38 TM 7115
C112	220PF ± 5% 350V SIC	F5 SHT2	43 TM 7115
C113	.01µF − 20% + 80% 500V	F5 SHT2	39 TM 7115
C114	10µF − 20% + 100% 6V	G2 SHT2	41 TM 7115
C115	100µF − 20% + 100% 25V	G1 SHT2	44 TM 7115
C116	100µF − 20% + 100% 25V	E3 SHT2	44 TM 7115
C117	8µF − 20% + 100% 25V	G2 SHT2	35 TM 7115

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
C118	100µF − 20% + 100% 6V	G3 SHT2	42 TM 7115
C119	.01µF − 20% + 80% 500V	H5 SHT2	39 TM 7115
C120	.1µF ± 10% 150V	H5 SHT2	45 TM 7115
C121	5µF − 20% + 100% 50V	H2 SHT2	46 TM 7115
C122	100µF − 20% + 100% 5V	H3 SHT2	42 TM 7115
C123	100µF − 20% + 100% 25V	G1 SHT2	44 TM 7115
C124	4700PF LEAD THRO'	J1 SHT2	25 TM 7177
C125	4700PF LEAD THRO'	K1 SHT2	25 TM 7177
C126	4700PF LEAD THRO'	J2 SHT2	25 TM 7177
C127	4700PF LEAD THRO'	K2 SHT2	25 TM 7177
C128	4700PF LEAD THRO'	J3 SHT2	25 TM 7177
C129	4700PF LEAD THRO'	K3 SHT2	25 TM 7177
C130	4700PF LEAD THRO'	J3 SHT2	25 TM 7177
C131	4700PF LEAD THRO'	K3 SHT2	25 TM 7177
C132	4700PF LEAD THRO'	J4 SHT2	25 TM 7177
C133	4700PF LEAD THRO'	K4 SHT2	25 TM 7177
C134	.01µF − 20% + 80% 500V	J1 SHT2	26 TM 7177

DRAWN A.CATO.	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62	APPD.	SHT. 6 OF 10 SHTS.	
TRACED MFW	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 4

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	INDUCTORS.			L27	10.4µH	E2 SHT2	10 TM 7115
L1	CHOKE 250MH	E1 SHT1	4 TM 7146	L28	4.1µH	E4 SHT2	11 TM 7115
L2	CHOKE 27H	F1 SHT1	3 TM 7146	L29	COIL	E5 SHT2	12 TM 7115
L3	CHOKE 95µH	J1 SHT1	1 TM 4883D	L30	COIL.	J1 SHT2	15 TM 7177
L4	CHOKE 95µH	J1 SHT1	1 TM 4883D	L31	COIL.	J2 SHT2	15 TM 7177
L5	CHOKE 95µH	J1 SHT1	1 TM 4883	L32	COIL.	J3 SHT2	15 TM 7177
L6	CHOKE 95µH	J1 SHT1	1 TM 4883	L33	COIL.	J3 SHT2	15 TM 7177
L7	CHOKE 95µH	J2 SHT1	1 TM 4883 L	L34	COIL.	J4 SHT2	15 TM 7177
L8	CHOKE 95µH	J2 SHT1	1 TM 4883 L				
L9	CHOKE 6µH	K3 SHT1	1 TM 4883 E				
L10	CHOKE 6µH	K3 SHT1	1 TM 4883E				
L11	CHOKE H.F.	K1 SHT1	107 TM6241/5				
L12	BIFILAR CHOKE.	K2 SHT1	108 TM6241/5	.	VALVES.		
L13	OSC. COIL RANGE D	L1 SHT1	43 TM 6242/2	V1	6C4	D2 SHT1	150 TM 7146
L14	OSC. COIL RANGE C	L2 SHT1	6 TM 6242/2	V2	6L6	F2 SHT1	151 TM 7146
L15	OSC. COIL RANGE E	L1 SHT1	5 TM 6242/2	V3	6CD6G	G5 SHT1	152 TM 7146
L16	OSC. COIL RANGE B	L2 SHT1	2 TM 6242/2	V4	5651	G6 SHT1	153 TM 7146
L17	OSC. COIL RANGE A	L2 SHT1	45 TM 6242/2	V5	6AK5	G5 SHT1	154 TM 7146
L18	ATTEN. COIL.	M2 SHT1	21 TM 4819/3	V6	OB2	G6 SHT1	155 TM 7146
L19	MONITOR COIL.	M2 SHT1	32 TM 6241/5	V7	6AK6	H2 SHT1	156 TM 7146
L20	CHOKE 95µH	M3 SHT1	1 TM 4883F	V8	6AQ5	K2 SHT1	163 TM6241/5
L21	CHOKE 95µH	M3 SHT1	1 TM 4883F	V9	TD03-10E	K2 SHT1	110 TM6241/5
L22	PART OF ASSY.	M1 SHT1	26 TM 6241/5	V10	12 AX7	M5 SHT1	157 TM 7146
L23	COIL	H1	153 TM6241/5				
L24							
L25	COIL.	D3 SHT2	8 TM 7115				
L26							

DRAWN A.CATO.	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD37340
DATE 6.9.62.	APPD.	SHT. 7 OF 10 SHTS.	
TRACED MFW	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 1

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	TRANSISTORS.			SCA		D1 SHT1	
VT1	2N2063	G4 SHT1	130TF1066B/6	SCB		F1 SHT1	
VT2	2N1553	G4 SHT1	131TF1066B/6	SCC	3 Sec 6 Pos.	E2 SHT1	93 TM 7146
VT3	ACY 20	G4 SHT1	21 TM 7142	SCD		J2 SHT1	
VT4				SCF		L4 SHT1	
VT5				SDA	2 Sec. 3 Pos.	E2 AHT1	134TF1066B/6
VT6				SDC		L5 SHT1	
VT7				SDD		K4 SHT1	
VT8				SEB		M4 SHT1	
VT9				SEC		F2 SHT1	
VT10	2N1742	E2 SHT2	55 TM 7115	SED	3 Sec. 5 Pos.	G2 SHT1	72 TM 6241/5
VT11	2N1748A (PHILCO)	E4 SHT2	56 TM 7115	SEE		G1 SHT1	
VT12	2S102 (TEXAS)	E5 SHT1	57 TM 7115	SEF		F1 SHT1	
VT13	ACY20	F2 SHT2	58 TM 7115	SFA		J6 SHT1	
VT14	2S102 (TEXAS)	G5 SHT2	57 TM 7115	SFC	3 Sec. 8 Pos.	J5 SHT1	135TF1066B/6
VT15	ACY20	G2 SHT2	58 TM 7115	SFE		J4 SHT1	
VT16	ACY20	H2 SHT2	58 TM 7115	SGA	2 Sec. 4 Pos.	K5 SHT1	136TF1066B/6
				SHB	1 Sec. 3 Pos.	L2 SHT2	137TF1066B/6
					TRANSFORMERS.		
	SWITCHES.			T1	Mod.	E1 SHT1	2 TM 7146
SA	D.P.C.O.	D5 SHT1	132TF1066B/6	T2	Mains.	E5 SHT1	1 TM 7146
58AB	1 Sec 2 Pos.	E1 SHT1	133TF1066B/6	T3	Reactor.	K1 SHT1	161 TM6241/5
SBAA		D2 SHT1					

DRAWN A.CATO.	CHKD	USED ON TF1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62.	APPD.	SHT. 8 OF 10 SHTS.	
TRACED MFW	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 1

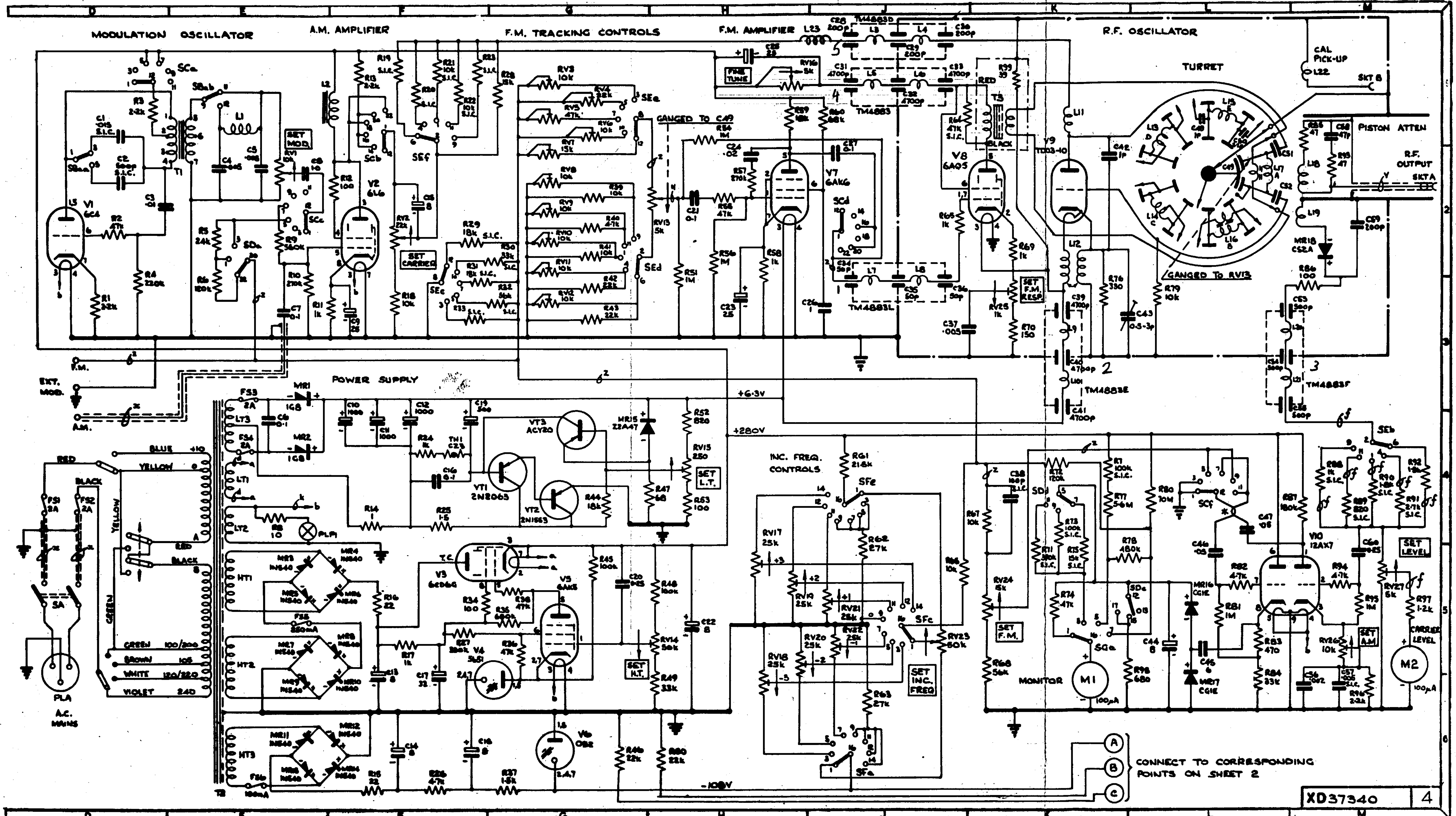
CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	METERS.				RECTIFIERS.		
M1	500Ω 100μA F.S.D	K6 SHT1	4 TF1066B/6	MR1	1G8	E3 SHT1	15 TM 4943CV
M2	500Ω 100μA F.S.D	M5 SHT1	3 TF1066B/6	MR2	1G8	E4 SHT1	6 TM 4943CV
				MR3	IN540	E5 SHT1	7 TM 4943CV
				MR4	IN540	F5 SHT1	8 TM 4943CV
				MR5	IN540	E5 SHT1	10 TM 4943CV
	PILOT LAMP.			MR6	IN540	F5 SHT1	9 TM 4943CV
PLP 1	6.3V 0.15A	E4 SHT1	138TF1066B/6	MR7	IN540	E5 SHT1	11 TM 4943CV
				MR8	IN540	F5 SHT1	18 TM 4943CV
	FUSES.			MR9	IN540	E6 SHT1	16 TM 4943CV
FS1	2A	D4 SHT1	94 TM 7146	MR10	IN540	F6 SHT1	17 TM 4943CV
FS2	2A	D4 SHT1	94 TM 7146	MR11	IN540	E6 SHT1	15 TM 4943CV
FS3	2A	E3 SHT1	94 TM 7146	MR12	IN540	F6 SHT1	14 TM 4943CV
FS4	2A	E4 SHT1	94 TM 7146	MR13	IN540	E6 SHT1	12 TM 4943CV
FS5	250MA	E5 SHT1	95 TM 7146	MR14	IN540	F6 SHT1	13 TM 4943CV
FS6	100MA	E6 SHT1	96 TM 7146	MR15	4.7V ± 10%	G4 SHT1	22 TM 7142
				MR16	CGIE (CV 425)	L5 SHT1	15 TM 7143
				MR17	CGIE (CV425)	L6 SHT1	15 TM 7143
	PLUGS.			MR18	CS2A	M2 SHT1	106TM 6241/5
PLA	3 PIN 5AMP.	DE SHT1	1 TM 2560AU				
PLB	PART OF ASSY.	D3 SHT2	33 TM 7177				
PLC	7 WAY.	K1-4 SHT2	36 TM 7177				
	SOCKETS.						
SKTA	50Ω CO-AXIAL.	M2 SHT1	15 TM 4819/3				
SKTB	PART OF ASSY.	M1 SHT1	26.TM 6241				
SKTC	7 WAY.	K1-4 SHT2	97 TM 7146				

DRAWN A.CATO.	CHKD	USED ON TF1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62.	APPD.	SHT. 9 OF 10 SHTS.	
TRACED MFW.	MARCONI INSTRUMENTS LTD.		

ISSUE NO. 1

CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.	CIR. REF.	DESCRIPTION	GRID	STOCK LIST REF.
	THERMISTORS.						
TH1	BRIMISTOR CZ3	F4 SHT1	23 TM 7142				
	JACKS.						
JK1	PANEL JACK.	L2 SHT2	132TF1066B/6				
	CRYSTALS.						
XL1	10Mc/s QO 1760B 50/A/30	D5 SHT2	54 TM 7115				

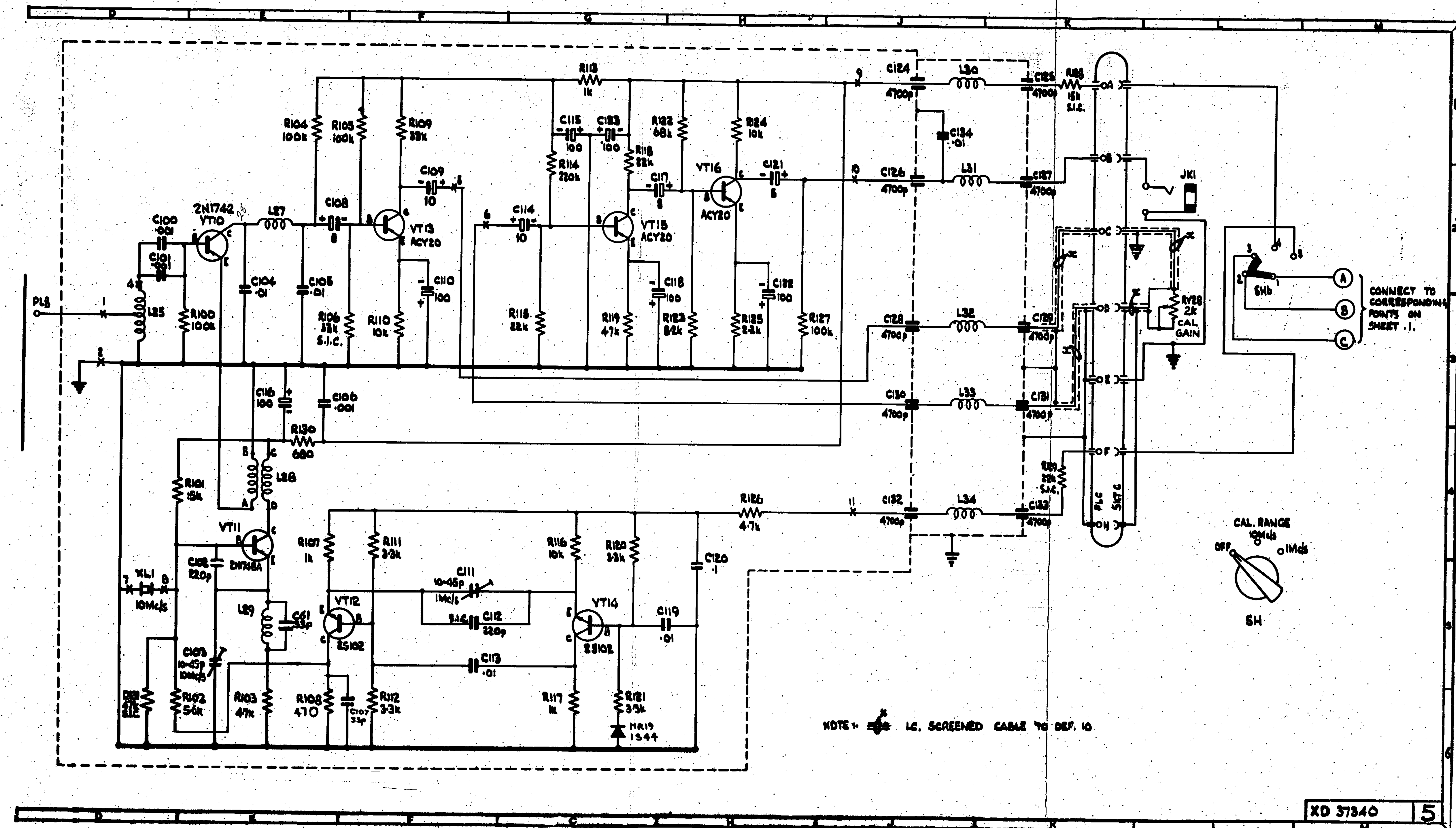
DRAWN A.CATO.	CHKD	USED ON TF 1066B/6	COMPONENT LIST XD 37340
DATE 6.9.62.	APPD.	SHT. 10 OF 10 SHTS.	
TRACED MFW	MARCONI INSTRUMENTS LTD.		



SHEET 1 OF 2 SHEETS

MARCONI INSTRUMENTS LIMITED

F.M. SIGNAL GENERATOR TF 1066B/6 & /6R



SHEET 2 OF 2 SHEETS

MARCONI INSTRUMENTS LTD.

F.M. SIGNAL GENERATOR TF1066B/6 & B/6R