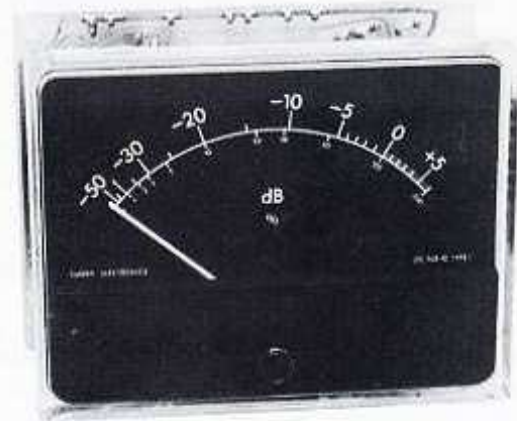


PEAK PROGRAMME METERS

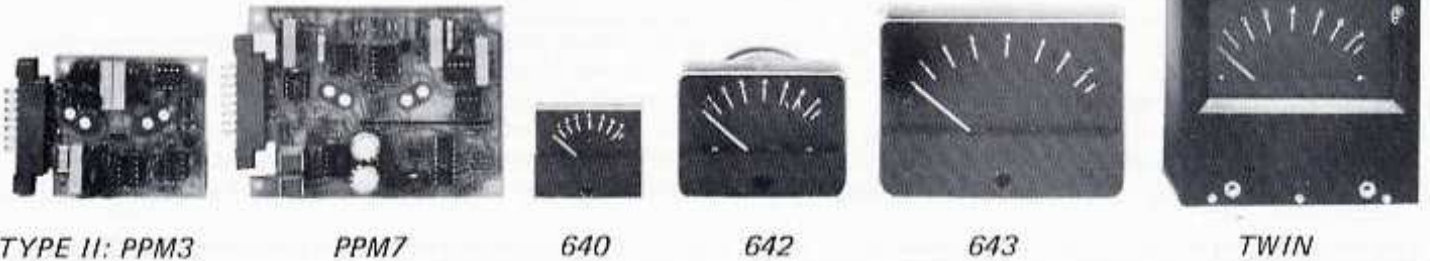


Type II Illuminated Box



Type I 643 with PPM8

The Peak Programme Meter concept was originally developed by the BBC for checking modulation depths at transmitters and modern derivatives to the specifications of IEC268-10, BS5428-9, are widely used in broadcasting and sound recording. The standards define attack and decay characteristics and logarithmic meter scaling with positive and negative peak detection, as some sounds are asymmetrical by up to eight decibels.



TYPE II: PPM3

PPM7

640

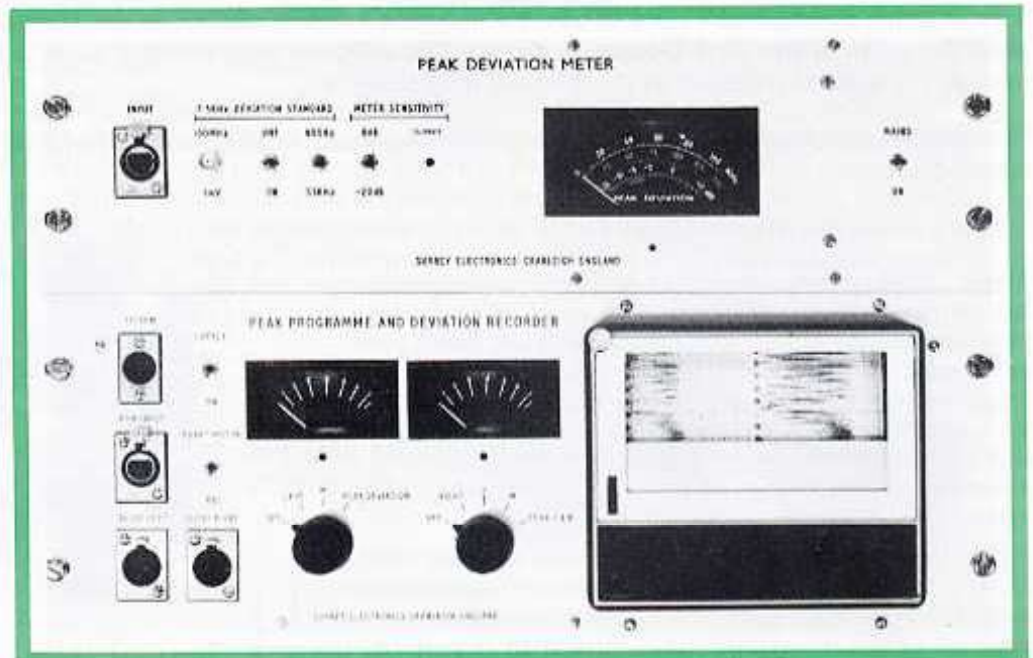
642

643

TWIN

PEAK DEVIATION METER & CHART RECORDER

- RACK MOUNTING OR FREE STANDING UNITS FOR MONITORING THE DEVIATION OF MONO OR STEREO FM BROADCAST STATIONS AND CHARTING DEVIATION OR AUDIO LEVELS



PEAK DEVIATION METER

The Peak Deviation Meter is used with its high impedance probe for off-air monitoring in conjunction with a receiver. The 7.5 kHz deviation standard is based on a Bessel null and is thus a fundamental standard which allows calibration of the meter with the particular receiver in use. Modulation of the deviation standard with 400 Hz and 53 kHz is to check the receiver's frequency response and the 400 Hz modulation is also useful for setting up output levels of FM receivers, being below frequencies affected by the pre-emphasis curve. If several meters are used together then only one need have the deviation standard fitted.

Without the probe head and deviation standard the meter is used for measuring the level of mono or multiplex at transmitters fed from stereo coders of rebroadcast receivers.

The illuminated meter is scaled in kHz, percent and decibels and a switch increases the sensitivity by 20 dB for accurate level measurements of stereo pilot tone and signalling tones.

The peak detector has a very fast attack time, so checking on limiter spikes or other transients which could occupy an excessive bandwidth. Meter ballistics are defined and the fall back rate is chosen to give a display similar to the peak programme meter.

PEAK DEVIATION METER SHORTENED SPECIFICATION

Meter		Probe	
Accuracy	± 0.3 dB @ 0dB (75 kHz) mark	Gain	Unity ± 0.1 dB
Frequency response at all levels	± 0.3 dB 20 Hz–53 kHz	Frequency response	± 0.1 dB 20 Hz–53 kHz
Sensitivity adjustment range	± 10 dB by 10 turn calibrate preset	Input impedance	500 k Ohms, 30 pF
Rise time—reading relative to 0 dB mark	5 kHz continuous 0dB 5 kHz 100, 10, 5ms bursts –0.5 dB ± 0.5 dB 20 kHz 250 μ s burst –3 dB ± 0.75 dB 50 kHz 100 μ s burst –8 dB ± 1 dB	Deviation standard	
Fall back time	8.7 dB/s	Frequency	100 MHz (70 MHz, OIRT)
Input impedance	2 k Ohms unbalanced	Amplitude and impedance	1mV in 75 Ohms
		Modulation	400 Hz, 53 kHz (and 3.118 kHz internally switched)
		Deviation	7.5 kHz ± 0.3 dB
		Self checking	3.118 kHz gives first Bessel carrier null

PEAK PROGRAMME AND DEVIATION CHART RECORDERS

These units make continuous chart recordings of either audio inputs or a dc input which can be fed from the Peak Deviation Meter. Two channel (illustrated) and single channel versions are used by the BBC and IBA for checking programme levels and the performance of links, lines and transmitters.

The audio inputs are charted to IEC268–10A and BS5428 PPM standards. On the single channel version the selector switch allows monitoring of Left, Right, Sum, Difference, Peak of Left and Right or Peak Deviation.

The chart recorder uses pressure sensitive paper and is a continuous recording type with a servo driven stylus. The electronics stores the true peak amplitude of the signal, applies this slowly to the stylus to avoid overshoots, holds to make a mark and runs the stylus down slowly. The hold time has been chosen to be long enough to avoid scuffing the paper by too frequent stylus movements yet short enough to display the dynamic range of the signal.

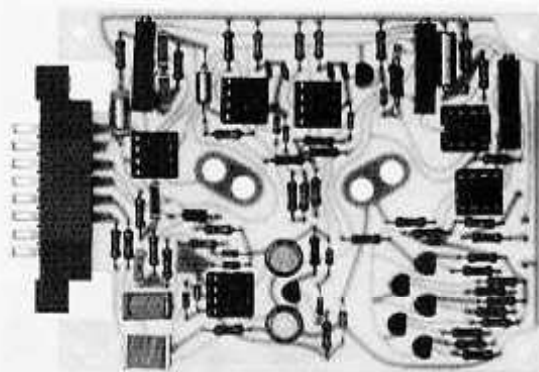
The charting arrangement used allows the presence of compression on programme material to be seen in both the Peak Programme and Peak Deviation modes. The effect of hard limiters, such as on transmitters, can be seen as well as the general standard of programme level control.

A more detailed leaflet is available giving full specifications and examples of charts recorded on different types of programme.

TYPE I PPM8 DRIVE CIRCUITS

Type I PPMs display a very wide dynamic range and are particularly suited to use with wide range digital recordings. The attack and decay rates are faster than on Type II PPMs and the display is more acceptable to committed VU users. The higher deflections given by low level sounds reduce the temptation for operators to gain ride unnecessarily while the faster attack time allows monitoring of transients which might be at risk of clipping or overloading.

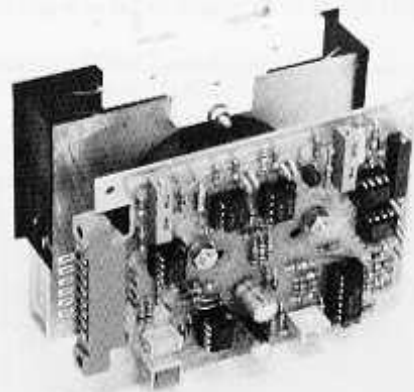
PPM8 has a floating input and operates with special Surrey meter movements which uniquely provide an even fall-back with good scale expansion where needed. PPM8 is not suitable for use with any other meter dials.



TYPE II PPM3 AND PPM7 DRIVE CIRCUITS

PPM7 is manufactured under licence from the British Broadcasting Corporation and, apart from the digital stereo PPM9 (AM20/5), is the only drive circuit allowed for monitoring main programme outputs.

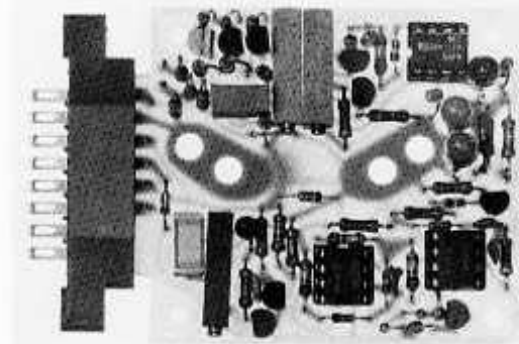
Intended for use in the most critical monitoring applications it possesses excellent temperature and long term stability. Fully meeting IEC268-10A and BS5428-9 this drive circuit fulfils the requirements of BT, EBU, IBA and broadcasting organisations of other countries. It accepts a balanced or unbalanced input at line level or -20dB and a -42dB strap is provided for checking noise levels.



PPM7 mounted on 643 movement

PPM3 provides a similar performance for unbalanced signals, though balanced inputs may be accommodated by the addition of a 1:1 transformer. PPM3 will provide identical readings to PPM7 so it can offer significant economies on mixers, with PPM3s used for the channel meters and PPM7s for the main balanced outputs. Both types may be used in equipment which will be required to pass IBA Code of Practice inspection.

PPM3 and PPM7 have fall back times matched closely enough to allow boards to be used on TWIN movements without pairing. The boards have three non-interactive 20 turn presets for zero, full scale deflection and gain, together with a sealed single turn preset to allow precise setting at Mark 1½. They maintain a flat frequency response and accurate bipolar rectification at all PPM Marks and will not suffer loss of accuracy or zero drift in high radio frequency fields.



PPM3

The boards will mount on the rear of any single movement or alternatively may be secured by means of the four M3 clearance holes in the corners. Connections are to an eight way gold plated edge connector and are duplicated by solder pins which can be used if desired.

Two meter movements may be driven by either board and this can be useful where a remote indication is required. Slugged operation to the Standards may be added where it is desired to compare levels at distant points by means of telephone conversation. Special high frequency versions are available for use in high speed duplication. Boards are soak tested for seven days on an interrupting supply during production.

ILLUMINATED STEREO TWIN METER BOXES

These are mains powered units which include the highest specification PPM7, 8 or 9 drive circuits. The TWIN movement is flush mounted and illuminated so its coaxially mounted coloured pointers offer an unrivalled method of monitoring programme balance. Sum and Difference metering, which is superior to simple phase metering, is provided by a front panel change over switch. The units meet IEC65-2, BS415 safety and are supplied with a 2.5m IEC connector lead to BS6500. Audio inputs are XLR 3 pole female.

METER MOVEMENTS

To display transient signals accurately it is important for the meter movement to have behaviour defined, particularly in respect of rise time and overshoot. Ernest Turner Electrical Instruments Ltd. manufacture special ballistics meters of excellent quality fully meeting IEC, BS and BBC ED 1497/8/9 for 1mA, 600 Ohms left hand zero. Three sizes of single movement, 640 (46x40mm), 642 (71x56mm) and 643 (102x79mm), are stocked along with flush mounting adaptors and illumination kits. Illumination kits may only be used in conjunction with the adaptors. The TWIN movement (scale 86x54mm) is a flush mounting type and has coaxially mounted red and green pointers for stereo left and right respectively. For monitoring stereo sum and difference they are also available with white and yellow pointers. Movements are all calibrated for non ferrous panels.

The TWIN may be illuminated by mounting two 12V 3W festoon lamps in 1.25 inch open fuse holders (RS412-677 or similar) above the clear panel at the top of the meter. Such bulbs can be under run at 10.5V to give improved lifetimes. Full drawings of meters and mounting details are available.

Type I -50/+6dB

Type IIa BBC 1/7

Type IIb EBU, CCITT N15 -12/TEST/+12dB

PPM8

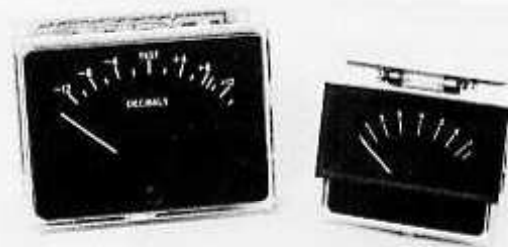
PPM5 hybrid

PPM3 unbalanced

PPM7 balanced

PPM9 digital stereo

Type IIb 643 and Type IIa 642 with flush adaptor and illumination kit.



PPM 3, PPM7 AND PPM8 SPECIFICATION — Fully complies with IEC268-10 and BS5428-9

	Type I PPM8	Type II PPM3 and PPM7
Input impedance	70k Ω balanced, 35k Ω unbalanced	PPM7 300k Ω balanced, 150k Ω unbalanced PPM3 60k Ω unbalanced
	Input protected against static voltages on signal lines	
Input sensitivity for Mark 4		PPM7 0dBV.7; -20 and -42dBV.7 strapable, ± 0.5 dB adjustment PPM3 -14dBV.7, 150mV adjustable
Input sensitivity for 0dB	+6dBV.7, adjustable to +8dBV.7	
Scale law	56dB calibrated range: -50/+6dB	4dB increments between Mark 1 and Mark 7 (-12/+12dB)
Low level performance		Isolated 10ms burst of 5kHz at 30dB below Mark 6 reading gives 3% deflection
Calibration accuracy	-30/+6 ± 0.5 dB; -50/-35 ± 2.0 dB	Mks 2,4,6 ± 0.2 dB; Mks 3,5 ± 0.3 dB; Mks 1,7 ± 0.5 dB
Frequency response at any mark	30Hz - 16kHz ± 1 dB 40kHz -15dB } -30/+6dB	30Hz - 20kHz ± 0.3 dB 10Hz -2dB; 40kHz -1dB
Rise time: response to isolated bursts of sine wave whose steady state amplitude deflects to 0dB Type I, Mark 6 Type II	10ms of 5kHz -1 ± 0.5 dB 5ms of 5kHz -2 ± 1.0 dB 3ms of 5kHz -4 ± 1.0 dB 400 μ s of 10kHz -15 ± 1.5 dB	100ms of 5kHz 0 ± 0.5 dB 10ms of 5kHz -2.5 ± 0.5 dB 5ms of 5kHz -4.0 ± 0.75 dB 1.5ms of 5kHz -9.0 ± 1.0 dB 500 μ s of 10kHz -17.0 ± 2.0 dB
Fall back time	0 to -20dB 1.7 ± 0.15 s Boards matched within 0.5%. Suit use with TWIN movements without special pairing	Mark 7 to Mark 1 2.8 ± 0.15 s
Dynamic linearity and overload characteristic	When above 10ms (Type II also 1.5ms) burst of 5kHz is altered in level between -20dB and +10dB indications change in direct proportion. +30dBV.7 input sustained indefinitely.	
Reversibility error	Bipolar rectification within 0.5dB -20/+6dB, any frequency 10Hz - 20kHz	Bipolar rectification within 0.5dB at all Marks, any frequency 10Hz - 40kHz
Distortion introduced into 600Ω signal line	Supply on or off, 20Hz - 20kHz at +20dBV.7: Less than -70dB, 0.03%	
Temperature stability drift between +10 and +50$^{\circ}$C	Zero $\pm 1\%$ -25dB ± 0.5 dB 0dB ± 0.2 dB	Zero $\pm 1\%$ Mark 2 ± 0.4 dB Mark 4 ± 0.2 dB Mark 6 ± 0.1 dB
Supply and tolerance	+14.5 - 35V at 30mA. For +24V and $\pm 20\%$ variation: Zero $\pm 1\%$, 0dB/Mark 6 ± 0.2 dB	
Supply impedance permissible	Any. Protected against reversed supply polarity	
Radio frequency immunity	No deflection in +120dB μ V/m, 84MHz, 100% amplitude modulated by 1kHz sine wave	
Main and slave movements	Left hand zero, 600 Ω , 1mA full scale deflection	
Edge connector	8-way gold, 3.85mm pitch, supplied, or to solder pins	
Printed circuit dimensions	PPM3 71 x 56, F.C. 52 x 47mm M3; PPM7 and PPM8 102 x 79, F.C. 94 x 68mm M3	
SLUGGED OPERATION	Not applicable	Requires addition of 330 μ F and 150 μ F 6V $\pm 10\%$, 100k Ω $\pm 2\%$ and single pole change over switch

When an isolated 10ms burst of 5kHz tone is applied at such a level that continuous tone would give a reading of Mark 6 then the peak deflection is -10.5dB ± 1 dB relative to Mark 6. If the same signal is repeated continuously at a repetition period of 100ms there will be a steady deflection which is -1dB ± 0.5 dB relative to Mark 6. The fall back is between 3.3 and 4.3 seconds.

SUM AND DIFFERENCE CHANGEOVER BOARD An assembled board 80 x 70mm to suit PPM7 boards or BBC ME12/9 boards. The push change over switch selects Left and Right or Sum and Difference. It has electronic inputs protected against mains or static voltages on signal lines, supply 15-30V at 10mA.

MAINS POWER SUPPLY BOARD A 12VA transformer, ic regulator for 22V at 200mA to suit 24V circuits and dropper resistor to give 10.5V ac meter illumination for good life times. Meets IEC65-2, BS415 safety.

BRIDGING INPUT TRANSFORMER with electrostatic and mumetal screens. A high quality transformer useful for any input requirements needing high signal handling with low distortion.

Ratio and impedance	10k Ohms: 10k Ohms
Frequency response	20Hz - 20kHz ± 0.5 dB
Total harmonic distortion	+12dBV.7, loaded 10k Ohms, 20Hz -65dB, 0.06%
Mumetal can dimensions	30 x 25mm dia. Flying leads, 1/4 inch UNF bush and nut