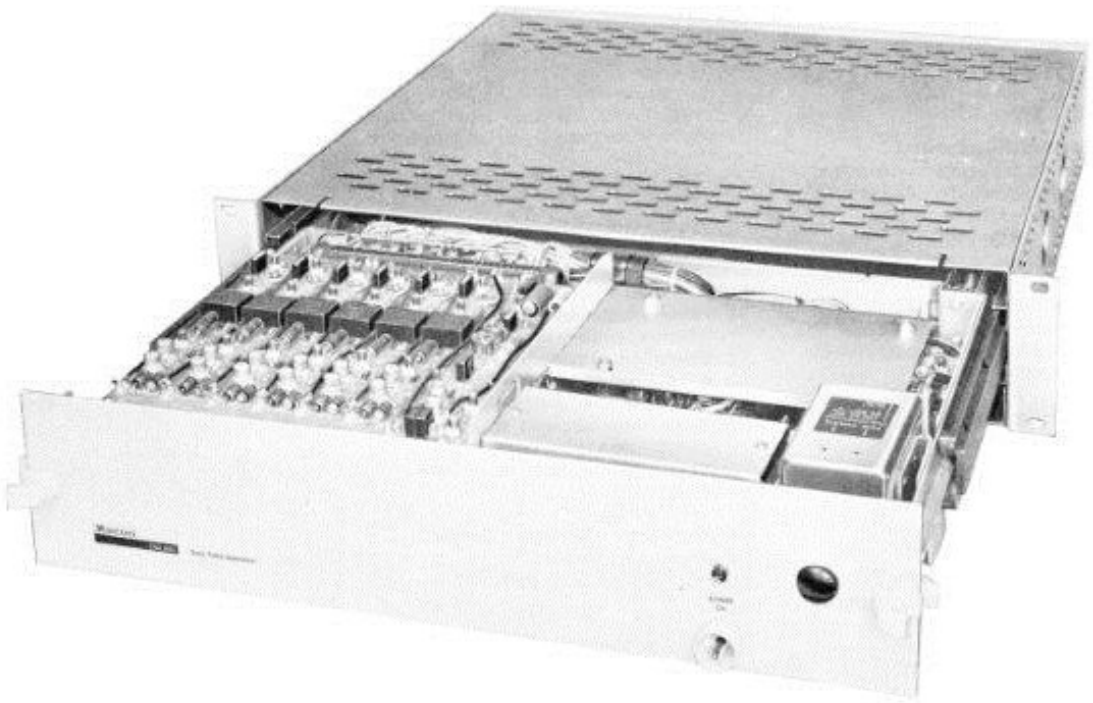
Marconi Broadcasting Studio Systems

Digital Sync Generator B3615



Features

- 625 PAL, 525 NTSC or 525 PAL colour
- 525 or 625 monochrome
- Digital circuits
- Highly stable subcarrier
- Minimum jitter
- Single and dual arrangements
- Local or remote control
- Optional Monosync output
- Optional grating and dot output
- Optional Genlock (minimal disturbance)
- Optional subcarrier Phase-shifter
- Can accept external Rubidium standard
- Plug-in printed boards

Description

The Marconi digital sync generator is designed to provide a highly stable range of standard television pulses for 525 line or 625 line CCIR Television systems. The unit is 89mm (3·5in) high and mounts in a standard 483mm (19in) rack. The entire unit may be pulled out on runners for servicing, so that no extension boards are necessary.

Pulse outputs are :

Line drive, field drive, mixed blanking, mixed sync, burst gating (burst flag), PAL ident, subcarrier and 12·5Hz square wave. An optional monosync output is also available as an alternative to standard pulses. An optional grating and dot output can also be provided if required, or alternatively a subcarrier phase shifter.

The equipment system is built in three separate units. These are :

The Sync Generator
The Changeover Unit
The Genlock Remote Control Panel

The sync generator is a self contained unit with housing for up to seven printed boards.

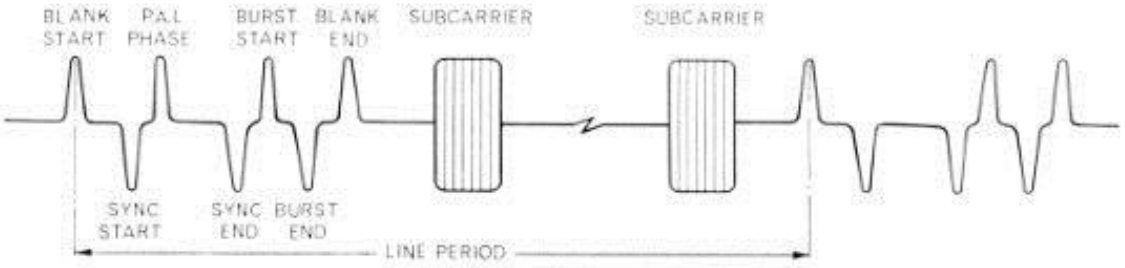
The equipment has been designed for maximum stability, and subcarrier drift will be less than 1 Hz in three months in 625 PAL systems. Jitter on the sync pulse will be less than 1 ns, enabling multiple generation VTR recordings to be made with ease.

Optional Genlock and colour lock boards enable the sync generator to be frequency/phase locked accurately to selected remote signals. The Genlock has a 'pre-phasing' control to enable a colour sync generator to be phased to a monochrome signal. The maximum locking time will be four seconds and in most cases considerably less. Should the remote signal fail the SPG automatically reverts to local lock.

The alternative monosync output board is designed for large studio installations and supplies a standard monosync waveform as shown on page 2. This waveform is designed to work with the Marconi Monosync Decoder B20-3609 (See TD3609).

The optional grating and dot printed board provides an electronic grating output for use in converging colour monitors. Several alternative patterns are available which are selected by internal links, these are : 20×20, 24×24, 48×48 and 17×14 grating or dot or grating and dot. Horizontal and vertical shift controls are provided.

The Sync Generator changeover panel B10-3615 is designed for 483mm (19in) rack mounting between two sync generators and is powered from the No.1 generator. The second generator is fully powered and is on standby so that if the No.1 generator fails it is automatically brought into use. Indicator



Monosync Output Waveform (optional printed board)

lamps are built into the changeover control buttons and a remote changeover button is provided on the Genlock Remote Control Panel.

Description of printed boards

Colour clock pulse board
This board accepts the subcarrier input and subtracts the 25Hz offset (on PAL versions). It also includes part of the necessary arithmetic in conjunction with the Pulse Logic to produce line and field outputs.

Mono clock pulse board
A substitute board instead of the Colour Clock Pulse board for monochrome versions of the sync generator.

Pulse logic board
This accepts 7MHz pulses from the Colour Clock or Mono Clock and by means of dividers produces line and field pulses of predetermined width.

Output amplifier board
Accepts logic level pulses from the Pulse Logic board and converts these to either 2V or 4V pulses into 75Ω outputs.

Monosync output board
This is an alternative board to the standard output amplifier and produces two outputs of standard 1V Monosync waveform, into 75Ω. One of the outputs can be fed to an optional delay board of variable delay 0–3·15μs for timing purposes.

The associated Decoder is described in TD 3609.

Genlock board
An optional board, the main function of which is to bring line and field pulses into phase with a selected remote input by miscounting the logic circuits. This board is needed in both colour and monochrome applications. It also feeds the remote burst to the colour lock board.

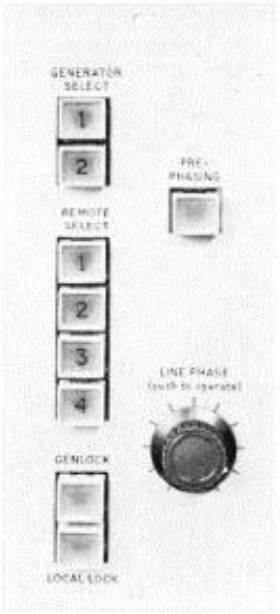
Colour lock board
Separates burst and produces subcarrier locked either to the local subcarrier crystal reference or to the remote burst.

Grating and dot board
This optional board accepts sync and blanking at logic level and produces grating and dot output. The horizontal and vertical centring controls are mounted on the board.

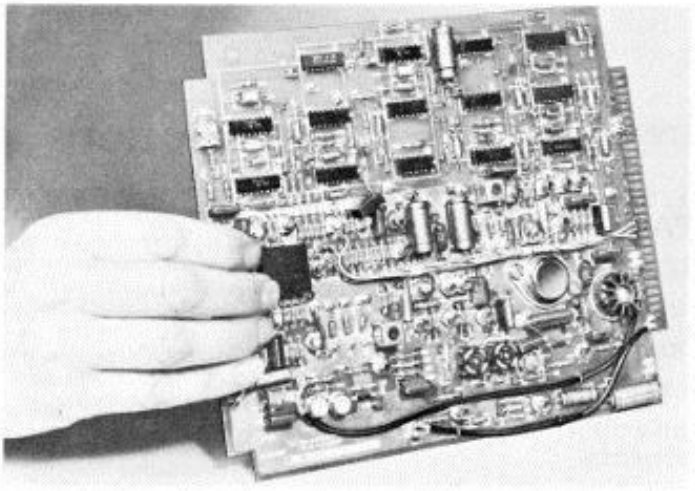
Ordering Information

In order to ensure that you are supplied with equipment exactly to your requirements please make sure that the ordering information is clear. When ordering please state

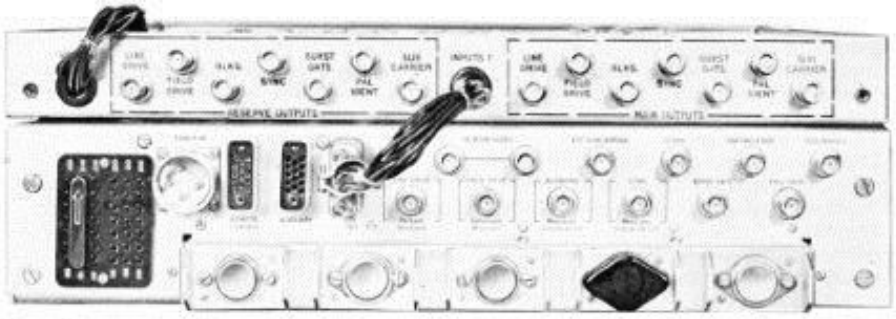
1 Television standard employed and whether colour or monochrome.
2 Single or dual system.
3 A.C voltage employed.
4 If Genlock is required.
5 If monosync output is required and whether delayed or not.
6 If optional grating and dot generator is required.
7 If remote control is required.
8 If additional handbooks are required.
9 If spares are required.
10 If Subcarrier Phase-shifter is required.



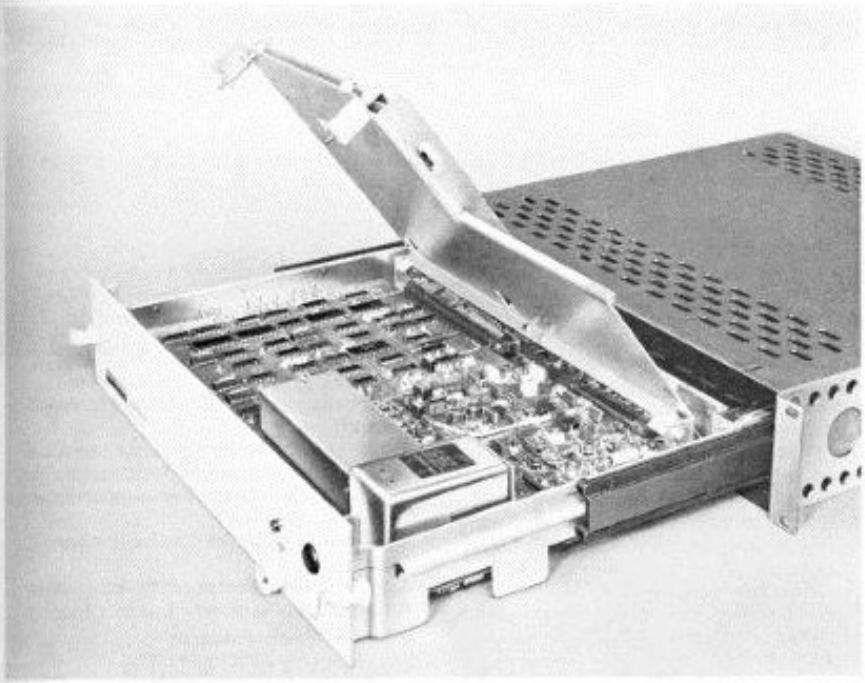
Genlock Remote Control Panel



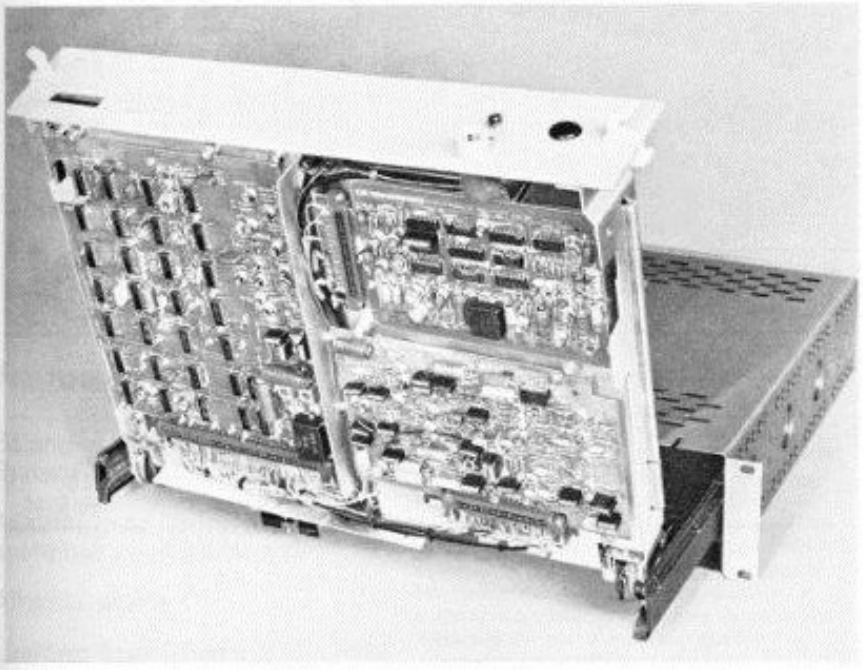
Optional Monosync Coder



Sync Generator and Changeover Unit Rear Panels



Top tray hinged up showing access to Pulse Logic and Colour Clock Boards



Showing access to Genlock, Colour Lock and Grating Generator

Changeover Unit

Data Summary

Power supply: Transformer tapped for 100–125V in 5V steps, and 200–250V in 10V steps 48–61 Hz. Maximum voltage variation on each tap ±6%. Canon E.P.4 connector. 65VA (fully equipped sync generator).

Inputs (all on BNC connectors):

External subcarrier reference: 1V p-p nominal, +6dB to −3dB. Impedance 75Ω, return loss greater than 32dB at subcarrier frequency. Remote video (bridging input) 1V p-p, +6dB to −3dB. Return loss to 2T pulse and bar greater than 32dB.

Monosync subcarrier (from external phase shifter):
1V p-p nominal, +6dB to −3dB. 75Ω impedance. Return loss greater than 32dB at subcarrier frequency.

Outputs (all on BNC connectors):
a) Line drive.
b) Field drive.
c) Mixed blanking.
d) Mixed sync.
e) Burst gating (burst flag).
f) PAL identity.
g) Subcarrier.
h) 12·5Hz square wave.
j) Grating and dot.
k) Monosync (alternative).

Pulse outputs (a, b, c, d, and e):
2V or 4V negative going. Amplitude set by control. Source impedance 75Ω. Return loss greater than 32dB to 2T pulse and bar.

Rise and fall times will be skew symmetrical and have a nominal value of 225ns. Overshoot less than 3%.

PAL identity pulse: either 1V p-p square wave or negative pulse 2V or 4V p-p, selectable by links.

12·5Hz square wave: 1V p-p, 75Ω impedance.

Subcarrier: 1V or 2V p-p sine wave. 75Ω source. Return loss greater than 32dB at subcarrier frequency.

Frequency. 625 PAL 4·43361875MHz ±1Hz
525 NTSC 3·579545MHz ±10Hz
525 PAL 3·5761149MHz ±10Hz

Monosync (2 outputs): 1V p-p. Source impedance 75Ω. Return loss greater than 32dB to 2T pulse and bar. Delay variable on one output from 0–3·15μs.

Grating and dot: 1V composite. Source impedance 75Ω. Return loss greater than 32dB to 2T pulse and bar. Rise time 100ns skew symmetrical. Patterns available 20×20, 24×24, 48×48 and 17×14 grating or dot, or grating and dot.

Performance: Subcarrier stability less than 1Hz per three months for 625 PAL and less than 10Hz per three months for 525 NTSC and PAL (limited only by crystal performance). Subcarrier harmonics more than 40dB down.

Jitter on sync leading edge will be less than 1ns as measured on a VTR 'Amtec' unit. Jitter on all other output pulse edges less than 5ns.

Pulse timings (within CCIR and EIA specifications) as shown in the Table below.

PAL identity pulse is a square wave (positive going when burst phase is +135°), or negative going by link selection.

Genlock: Line and field locking is achieved digitally, i.e. the duration of line and field will be modified by altering the number of clock pulses per line and the number of lines per field. A pre-phasing control will allow the line and field pulses to be phased to a remote input. Locking time less than four seconds. Field phasing by the shortest route at the rate of one line per field. Line phasing can be adjusted in steps of 28ns up to a maximum of 0·8μs by external control.

Controls

Genlock/local lock: Two interlocked push buttons with internal lamps to show state of lock.

Remote video selector: Four interlocked push buttons with lamps. Terminated in 75Ω.

Generator selector: Two interlocked push buttons with lamps.

Pre-phasing: Single non-locking push button.

Line phasing: Coarse control internally in 140ns steps over range −1·μs to +7·μs.

Ambient temperature:
i) Storage −20°C to +60°C.
ii) Equipment may be switched on without damage over the range −20°C to +50°C.
iii) Operating range −10°C to +50°C.

DIMENSIONS

	Height	Width	Depth	Weight
Sync Generator	89mm (3·5in)	483mm (19in)	495mm (19·5in)	11·4kg (25lb)
Changeover Panel	44mm (1·75in)	483mm (19in)	495mm (19·5in)	
Genlock Remote Control Panel	205mm (8·1in)	89mm (3·5in)	133mm (5·25in) (includes mating connector)	

All pulse timing in μs

		Line drive	Field drive	Line blanking	Field blanking	Line sync	Equalizing pulse	Broad pulse separation	Burst gate	PAL ident. pulse
625 PAL	Front edge	0 or −1·55	Coincident with field blanking or field sync.	−1·55	−1·55	Time ref. point	0	–	+5·64	0
	Width	4·65 or 6·2	7½ lines or 10 lines	11·98	18–25 lines +11·98	4·65	(5+5) 2·4	(5) 4·65	2·26	4·65 or 64
525 NTSC or PAL	Front edge	0 or −1·55	Coincident with field blanking	−1·55	−1·55	Time ref. point	0	–	+5·78	–
	Width	4·65 or 6·2	9 lines	11	19–21 lines +11	4·65	(6+6) 2·4	(6) 4·65	2·54	4·65 or 63·5 Not NTSC

Marconi Communication Systems Limited

Chelmsford, England CM1 1PL
Telephone 0245 353221 Telex 99201
Telegrams Expanse Chelmsford Telex
A GEC-Marconi Electronics Company

 Printed in England by Lund Humphries 100579/6000+1000