



No 26 - Autumn 1986 **The Quarterly for BBC Engineering Staff**

m[JJ{jJ Engineering at IBC 86



The BBC stand at IBC 86

The 11th International Broadcasting Convention was held, once again, in Brighton at the end of September. The convention had outgrown the Metropole Hotel, so this year's event expanded into the recently re-opened Grand Hotel and the Brighton Centre. It would be impossible to describe all of the new products and techniques on display, although HDTV, digital processing, and lightweight camera-recorders were high on the list of exciting exhibits. The BBC stand in Hall 6 of the Metropole Hotel was packed with the latest research and designs techniques, and the following pages describe them in more detail.

The cost of electricity required to operate the transmitters of the BBC's domestic MF networks is substantially in excess of Elm p.a. even after the

installation of modern transmitters with high conversion efficiency. Various means of further improving efficiency whilst maintaining the quality on the reproduced programme have been considered from time to time, and the BBC is currently investigating a system which operates by regulating the output power of the transmitter dynamically according to the level of the modulating signal. In this system, termed 'Dynamic Carrier Control' (DCC), the amplitude of the radiated signal is compressed as modulation levels increase, both carrier and side-bands being controlled to maintain the modulation index. Virtually all receivers contain an automatic gain control (agc) capable of compensating for this compression introduced at the transmitter.

A compressor using digital signal processing has been designed and constructed for use in conjunction with a

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OB vehicles on the promenade at Brighton

UHF Multi-Tone Generator

The GE4P/17 UHF Multi-Tone generator is a UHF signal generator capable of providing up to four unmodulated carriers, as required for measuring the intermodulation performance of Band IV and V television transposer equipment. These four carriers correspond to the vision, sound and stereo sound carriers, and the colour subcarrier. As the equipment is intended for use by transmitter mobile maintenance teams, particular emphasis was placed during the design on portability and convenience of operation. To ensure the latter, the frequencies and relative amplitudes of the carriers are accurately defined and clearly indicated.

Any combination of carriers may be selected, but for convenience, a preset combination or vision carrier alone at 0 dB, may be selected by single switch operation. The colour subcarrier frequency may be altered, if desired.

The absolute level of the test signal is continuously variable from -60 dBm to 0 dBm, and a useful additional facility is the "response tilt" control. This enables correct relative levels of carriers to be obtained at the output of the equipment under test, should it not have a flat frequency response.

Each of the four carriers is generated by a UHF voltage-controlled oscillator (vco), the frequency of which is stabilised using phase-locked loop techniques. The frequency reference used is an 8 MHz temperature-compensated crystal oscillator providing a stability of ~ 5 parts in 10^7 .

The VCOs are followed by an accurate levelling circuit which ensures that the

relative levels of the carriers remains correct over Bands IV and V. These outputs are then passively combined to provide the required test signal at a level of -20dBm. The cross-loss between the carrier generators is sufficient to ensure that negligible intermodulation is introduced in the combining process. An amplifier is included to increase the output level to a maximum of 0dBm when required.

Static logic and linear power supply regulators have been used throughout this equipment, thus reducing the risk of spurious outputs to a minimum. The frequency and amplitude stabilising circuits are continuously monitored, and a warning given should a fault develop.

Transmitters Opened J

The following transmitters have opened or changed since June

UHF Television

Avoch	Highland
Burgar Hill	Orkney
Edginswell	Devon
Greystoke	Cumbria
Haughton Green	Greater Manchester
Hele	Devon
Kirkby Stephen	Cumbria
Lochinver	Highland
Moffat	Dumfries &
Galloway	
Norden	Greater Manchester
peterlee (Horden)	Co. Durham
Pool ewe	Highland
Sorn	Strathclyde
Tomich	Highland
Torquay Town	Devon

VHF Radio

Caterham	Surrey
Dartford Tunnel	Kent
Kenley	Surrey
Sandale	Cumbria
Tacolneston	Norfolk
Winter Hill	Lancs

Local Radio

R. Bristol	Bath
R. Cumbria	Kendal
R. Lancashire	Winter Hill
Radio Nottingham	Colwick Park

R poole (Tx D) checks the 4-tone generator