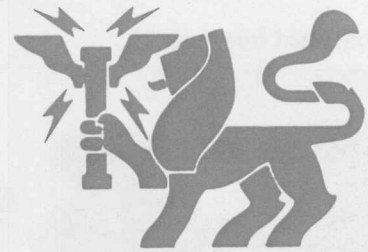


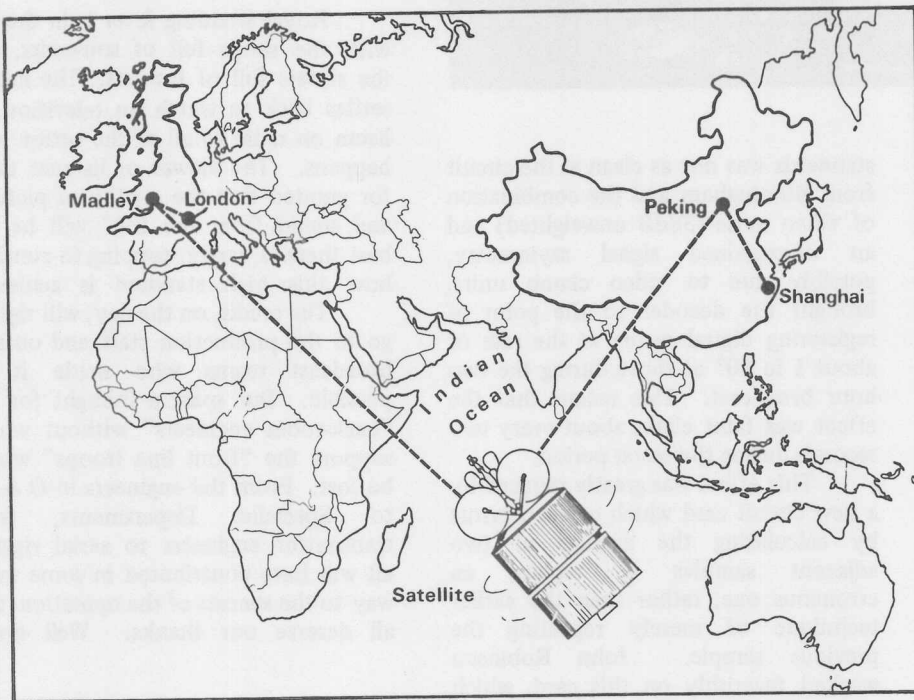
PDP / GBR

# ENG INF

The Quarterly For BBC Engineering Staff



## LIVE STEREO FROM CHINA~ANOTHER FIRST



A concert given by the BBC Symphony Orchestra in Shanghai was broadcast live on Radio 3 on Sunday 17th May this year. The stereo programme was digitally coded in the City Hall in Shanghai and was relayed to Broadcasting House, London using a television channel on an Intelsat satellite as bearer.

The communication planning for this major stereo OB initially concentrated on using the conventional system for most international relays. A 48 kHz group from Shanghai to London would have been obtained and then two 15 kHz stereo-capable channels derived by means of FDM (Frequency Division Multiplex) equipment. The decision to use the satellite link was finally taken because the small number of telephone channels between London and China made it virtually impossible to arrange the release of a whole group. Establishing direct communications between the appropriate authorities in

both countries was an added difficulty.

The only problem that remained was to find and rent a television channel from Shanghai City Hall to the Peking Earth Station where the programme was to be sent over the Indian Ocean route – the local Shanghai Earth Station only works the Pacific Ocean satellite which would have meant an expensive double satellite hop to relay the signal to London. After direct discussions with the Shanghai Broadcasters and numerous telexes to the Chinese PTT, a route to Peking was established. This involved an SHF television OB link from the City Hall to the Shanghai Television Station, a coaxial cable to the PTT terminal and a long terrestrial television link to Peking.

Having had confirmation that an overall television link could be provided, it was decided to encode the signals digitally using the BBC's latest NICAM 3 2048 kbit/s equipment borrowed from the Birmingham terminal of the

recently installed BM – LO PCM link. A back-up system, using the older 704 kbit/s 2 channel NICAM equipment, was provided by Neil Gilchrist and Reg Dean of Research Department. Decoders for both systems were installed in London Control Room.

Mike Rushmere took both sets of encoding equipment to Shanghai, installed them in the City Hall and established the communications facilities in China. He was joined there by Frank Howard, Geoffrey Purrier and Colin Hayles, who were accompanying the BBC Symphony Orchestra on its tour of the Far East, and who were responsible for setting up the rest of the BBC equipment, from microphones to mixer desks, used in the broadcast.

An overall test was performed on Friday 15th May and, apart from some asymmetry of the signal which was greatly improved by reducing the sending level in Shanghai, produced very satisfactory results on both the 704 kbit/s and the 2048 kbit/s systems. The live broadcast was a great success and the technical quality was excellent.

This occasion was the first "On Air" use of the NICAM 3 equipment designed by Robin Caine, Alan English and John Robinson of Designs Department. NICAM stands for "Near-Instantaneously Companded Audio Multiplex" and is designed for permanent contribution and distribution circuits for Radio Broadcasting, as well as providing stereo links for outside broadcasts.

The equipment is mainly intended to encode six high quality (15 kHz) audio channels in a form suitable for the 2048 kbit/s Post Office digital telephony circuits. These digital systems are now taking over the wires which up till now have provided the BBC with permanent and temporary analogue circuits of the "carrier-phantom" type. The equipment is equally suitable for use on video circuits, radio links and other bearers.

For convenience in stereo use, channel coders and decoders are assembled in two-channel pairs to  
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