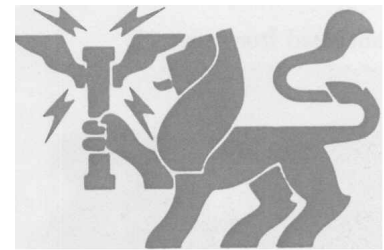
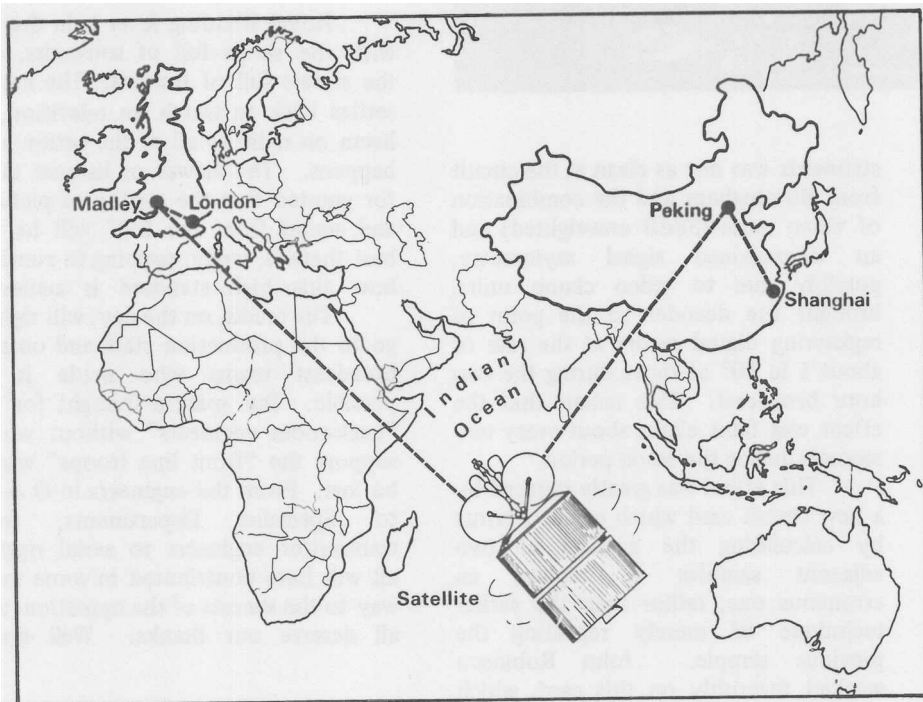


# ENG INF



The Quarter's For BBC Engineering StaH

## 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.

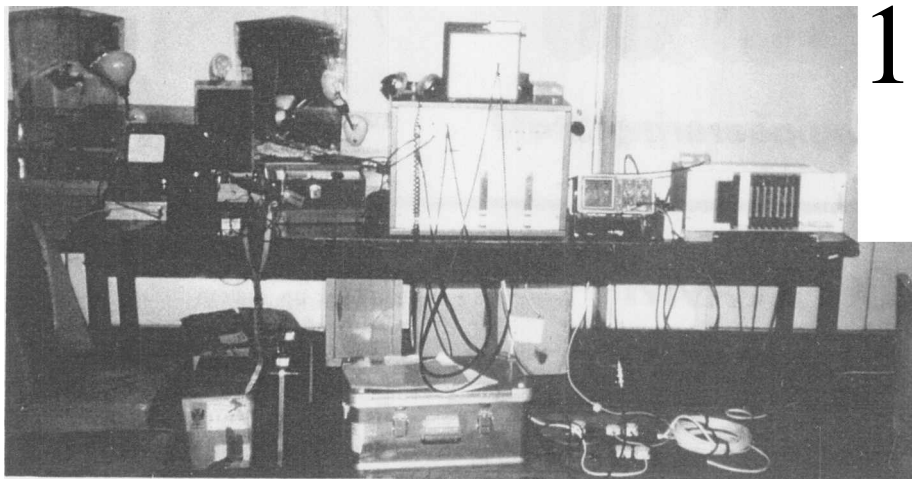
The equipment is mainly intended to encode six high quality (15 kHz) audio channels in a form suitable for the 2048 kbit/s Post Office digital telephony circuits. These digital systems are now taking over the wires which up till now have provided the BBC with permanent and temporary analogue circuits 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 'continued on page 2'

## Stereo from China

'continued from page 1'

I



Digital Equipment at Shanghai City Hall

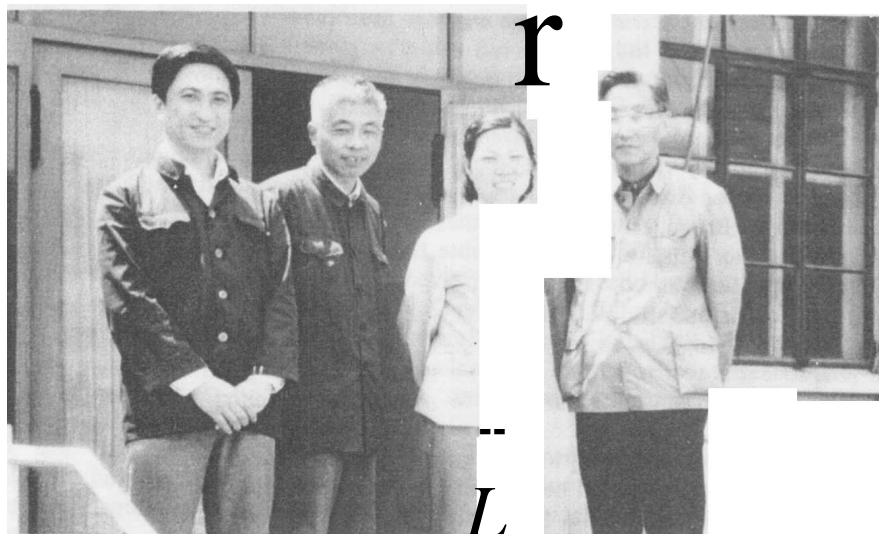
provide the required number of channels. Other equipment will also be provided which can add or insert channels to a six channel bitstream without decoding the PCM, or conversely extract two channels from a bitstream to send to some special destination.

Two coder-pairs have been installed in Pebble Mill to provide four mono or two st-ereo channels to London, where two decoder pairs have been installed in Broadcasting House control room, as described in Ariel, (April 15th 1981). These contribution circuits use a video bearer, since no digital bearer is available, and provide high-quality circuits, for stereo concerts, for example, which are of a quality comparable with the main distribution network. Later this year a similar facility will exist in Manchester.

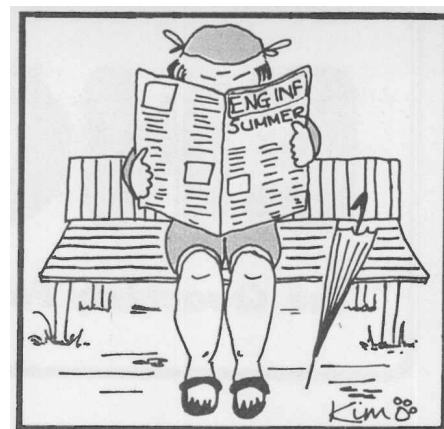
The long circuit from Shanghai although good by international TV

standards was not as clean as the circuit from Birmingham and the combination of video noise (38dB unweighted) and an unexplained signal asymmetry, possibly due to video clamp units, brought the decoder to the point of registering digital errors at the rate of about 1 in 106 at times during the two hour broadcast. This meant that the effect was faint clicks about every two seconds during the worst period.

This effect was greatly reduced by a new circuit card which corrects errors by calculating the average of two adjacent samples to replace an erroneous one, rather than the earlier technique of merely repeating the previous sample. John Robinson worked feverishly on this card, which uses a microprocessor to calculate the replacement sample, up until two days before the link was tried out on the Friday before the transmission.



Mr. Chew, the Senior Engineer at Shanghai with Assistants Mr. Chang (left) and Mr. Ting and Mrs. Zho (interpreter)



## Editorial

Royal Wedding fever is in the air, with the shops full of souvenirs, and the streets full of tourists. The nation settles back to watch on television, or listen on radio to all of the action as it happens. The viewer or listener takes for granted that the quality of pictures and sound from the BBC will be the best there is, rarely stopping to consider how this high standard is achieved.

The credit, on the day, will rightly go to the production staff and outside broadcast teams who made it all possible. But spare a thought for the "back-room engineers" without whose support the "front line troops" would be lost. From the engineers in O & M, to Specialist Departments, from transmitter engineers to aerial riggers, all will have contributed in some small way to the success of the operation, and all deserve our thanks. Well done.

### BBC MICRO-COMPUTER

In EID we are often asked about the much publicised BBC micro-computer. To set the record straight, these devices are being manufactured and marketed by Acorn Ltd., to a BBC specification. They will be available for purchase direct from Acorn in the Autumn, and there are no plans for a BBC staff discount. Engineers requiring further information or order forms can obtain them direct from Acorn Ltd., at 27 Bridge Street, Cambridge.

### ENGINEF

Delays in the preparation and printing past editions of "Eng Inr" have resulted in the seasons changing before the magazine had reached all of our readers. We have therefore prepared an eight-page copy this time, with a shorter interval between editions. We hope that it reaches you in Summer, and not early Autumn!

Alan Lafferty

# STUDIO 'B'-MANCH~~STER

## Studio 'B'; Manchester

The new television studio will bring all Manchester's broadcasting activities under one roof for the first time. The 2,500 sq. ft. studio - known as Studio 'B' - will be used mainly by Regional Television for the production of the nightly news magazine 'Look North West' and other regional programmes, but it is also expected that Network programmes will be produced from the studio from time to time. The new studio concludes a £12 million radio and television development which started in 1975 with the opening of Studio 'A' and a suite of radio studios.

The studio has been equipped as a joint project by external contractors and S.C.P.D. The vision system has been supplied by Pye TVT Ltd., the sound system by Calrec Audio Ltd., the lighting system by Berkey Colortran (UK) Ltd. and Thorn Theatre Lighting Ltd., and the communications and telephone system by S.C.P.D.

A combined production and vision control room houses a Central Dynamics 480 vision mixing desk, incorporating a Quantel DPS 3000 special effects unit. Cox 2 and 3 level synthesizers can be used in conjunction with a three part monochrome caption scanner and Ryley Caption Generator. Also in this area is a Thornlite 120 lighting console, which can handle up to one hundred and twenty channels connected to it; the console can store information about a hundred different lighting plots. The studio has four Philips LDK25 cameras. The sound control room houses a 28 channel Calrec mixing desk, Studer B62 tape recorders, and EMT950 record desks.

A Philips LDK 25 camera ready for "Look Northwest"

The studio area itself is divided into three - the main studio, an adjacent annexe (which can be used in conjunction with the main studio or separately as required), and a small presentation area. The 600 sq. ft. annexe has its own small production control room located close to the News Room, and it enables items such as national news contributions and 'Nationwide' inserts to be transmitted from the annexe without disturbing programme activity in the main studio.

The project, under A.C.E.D. and S.C.P.D. management with the close liaison of Manchester engineer Andy Shepherd, was completed on schedule, allowing the first programme - 'Look North West' - to be transmitted live on 18th May.

## Transmitters

### Opened

The following uhf tv transmitters have opened since April:

Westward Ho!, Devon	1.5.81
Uandysul, Dyfed	8.5.81
Abergwynfi, W. Glam.	8.5.81
Salcombe, Devon	15.5.81
Dolybont, Dyfed	15.5.81
Delph, G. Manchester	5.6.81
Kirkoswald, Strath.	5.6.81
Union Mills, Isle of Man	19.6.81
Broad Haven, Dyfed	19.6.81
Backwell; Avon	26.6.81
Sunderland, Tyne & Wear	3.7.81
Crucorney, Gwent	3.7.81
Cartmel, Cumbria	10.7.81
Urswick, Cumbria	10.7.81
Hawkshead, Cumbria	17.7.81
Lauder, Borders	17.7.81
Stow, Borders	17.7.81
Kettlewell, N. Yorks	17.7.81
Fetlar, Shet. Isles	24.7.81
Monmouth, Gwent	24.7.81
Cerrigydrudion, Clwyd	31.7.81
Dolwyddelan, Gwynedd	31.7.81