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TELEVISION SINGAPURA

TELEVISION FOR A MULTI-LINGUAL COMMUNITY

THIS ARTICLE deals with the problems of planning a television service for a developing society of heterogeneous peoples in Singapore and the setting up of an efficient and comprehensive television broadcast organization in an independent Republic with the minimum expenditure possible for the realization of the project.

The scope and purpose of a television service and its operation vary according to the needs of each community. There can be no 'master plan' applicable to all. In the design and creation of each plan, however, there arise many similar basic problems and considerations. Television in Singapore has to serve a population of nearly 2 million, covering four major languages and cultures, crowded into an area of 256 sq. miles which is already served by considerable m.f, h.f and v.h.f installations.

The problems can be broadly classified under two heads, i.e. restricted finance and lack of expertise and technical know-how. Taken singly, each problem within these two groups is not uncommon in fully developed countries in the European or the American continents. When they exist together however, they appear formidable, especially so in a developing society where there is a greater need to provide an adequate service to improve literacy, to educate and inform its peoples and more important still, to promote a national consciousness amongst a thoroughly heterogeneous population in respect of race, culture, language and religion.

The project was started in 1960 when two officials from the Nippon Hoso Kyokai (Japanese Broadcasting Corporation) presented a report which included recommendations for a rather modest television service in Singapore. Following this, an official of the

Ministry of Culture visited Australia and obtained the services of three technical and programming officers from the Australian Broadcasting Commission to help the Government in the planning and implementation of its proposed two-channel television service.

The television installation was planned in two stages, an interim 'phase 1' with limited facilities to gain operational experience, followed by a fully equipped 'phase 2', designed in the light of 'phase 1' experience.

EXPERIMENT → EXPERIENCE

The first-phase equipment, housed in a temporary building in the grounds of the existing Sound Broadcasting station, was planned to transmit on one channel, included a main announcer studio, control room, master control room, telecine, and videotape machines plus two O.B. units, and was 'on air' daily for 4-5 hours.

Extensive use was made of graphics and sub-titles to combat the language problem—the experiments conducted at this stage forming the basis for the eventual success of the service. The experiments however, quickly highlighted limitations, even for an interim service. Sub-titling, no matter how complex, could not reach more than two of the four major language groups (English, Malay, Chinese and Tamil) and considerably restricted the service.

To accommodate the four basic groups, therefore, the 'phase 1' facilities were increased to provide two television plus one m.f sound channels, the sound transmitter operating in 'programme parallel' with one of the television transmitters. The



Fig. 1. The headquarters building of Radio Singapura.

second-channel facility obviously required further studio support, and a second announcer studio and master control room were added.

Although Marconi engineers were in attendance in a training role during the first few months of transmission, the responsibility for servicing and maintenance lay with the Broadcasting Authority, whose capabilities were adequately proved when a studio resumed operation 24 hours after a fire had put two cameras and other equipment out of action. 'Phase 1' from the start of the installation work to transmission took 2 months, becoming operational in February 1963. The second channel went 'on air' in August 1963.

EXPERIENCE → EXPERTISE

During the operation of 'phase 1', several small factors were highlighted to modify the 'phase 2' plans. It was decided to increase studio 4 to a four-camera unit with a mobile camera crane plus a special effects mixer in the control room, and to increase the telecine, sub-title and videotape facilities.

The site chosen for the permanent television centre was 12 acres of scrubland on Caldicote Hill about 3 miles from the centre of Singapore. Clearing the site as a preliminary to building was started in June 1963.

For future expansion the building may be developed either in the vertical direction or in the horizontal. The present Television Centre adopts the horizontal plan development in which the studios are on the same level on ground floor. Of the four studios, two are for

large productions and two small interview studios. The sizes and production facilities are:

| | <i>Length (ft)</i> | <i>Width (ft)</i> | <i>Height (ft)</i> | <i>Production facilities</i> |
|----------|------------------------|-----------------------|------------------------|---|
| Studio 1 | 80 | 60 | 34 | 3 4½-in I.O camera channels |
| Studio 2 | 40 | 30 | 34 | 2 4½-in I.O camera channels |
| Studio 3 | 40 | 30 | 34 | 2 4½-in I.O camera channels |
| Studio 4 | 80 | 60 | 34 | 4 4½-in I.O camera channels and special effects |

A passage way leads to the prop and scenery storage area, parting the four studios into two groups: Studio 1 and Studio 2 on one side of the passage and Studio 3 and Studio 4 on the opposite side. The scenery storage area is located at the rear of the building and is directly accessible from all studios. Movement of scenery and props into production areas of the four studios can be achieved easily and quietly. Loading and unloading of equipment, scenery, props and materials into the storage area can be carried out with minimum noise. The scenery workshop is located in a separate building away from the studios.

The studio control rooms provide space for equipment and operating and production personnel. For the large production studios the control rooms are elevated and on the second floor, occupying the full width of the studios. Each control room is fitted with observation windows for an unimpeded view of the studio floor. The control rooms for the small studios

are raised slightly over the first-floor level and occupy the full length of the studios.

Each control room for the large studios is further partitioned into four sections to provide sound, production, vision and lighting control rooms and a viewing room for visitors.

The sound room is adjacent to the production room and provides an operational control position for the sound supervisor. The sound control console is placed near the studio observation window so that the sound supervisor can see the movement and positions of microphones. A picture monitor, two disc reproducers and a magnetic tape recorder are generally provided alongside the sound console, with a high-quality wall loudspeaker fitted over the observation window for sound monitoring.

The production room contains a production desk providing operational positions for the producer, the producer's assistant, the vision switcher operator and the technical producer. In front of the desk, and over the observation window, there is a row of picture monitors, one for each camera channel, two for preview and one for the transmission output from the studio. Two wall loudspeakers are used, one for monitoring and the other for studio talkback to production room personnel. Communication panels and push-button switches for vision switcher and faders are incorporated in the production desk.

The vision control and lighting room is on the opposite side of the production room. The camera

control and power supply equipment, vision relay frame for vision-mixing equipment, vision mixer and video patch panel are bay-mounted in racks. Each camera channel picture and waveform monitor and the camera control unit are housed in a console and placed in front of a glass window in the partition between the production room and the vision control room. Also in this room is placed the lighting control console and lighting patch panel. The lighting control console is placed near the studio observation window to permit a good view into the studio so that the lighting state can be seen easily.

An important feature in the design is the location of a Plenum immediately below the Central Technical area, but excluding the Production Suites. In this Plenum are laid the air-conditioning ducts, the chilled water pipes and mains power cables. The Plenum has an average height of 6 ft, which therefore allows easy access to the various installations in this space.

Vision and audio cables which have to pass through the Plenum enter the technical areas via openings in the floor, care being taken to keep their cable-trays away from the trunkings which carry the power cables. On the second floor itself, vision and audio cables are laid in ducts across the floor to the appropriate racks and consoles. Supports for delay-cable drums are provided along the main beams immediately below the Central Apparatus Room. The newsroom and teleprinter facility are also located on the second floor.



Fig. 2. Studio control at Radio Singapura.
(Straits Times picture.)



Fig. 3. Camera control panel.
(Straits Times picture.)

The O.B unit accommodation and air-conditioning plant are in the east wing of the building with gardens, which are pleasantly landscaped with palm trees encircling a pond with a fountain actually functioning as part of the air-conditioning cycle.

The television centre was completed in June 1966 and was officially opened by the Prime Minister, Mr. Lee Kuan Yew, in August 1966.

THE CHANGEOVER

The transfer from 'phase 1' transmission to 'phase 2' transmission had to be accomplished without any breaks or restrictions in programme time. The O.B units were withdrawn from broadcast service to provide a temporary link between the 'phase 1' studios and the transmitter site while the normal link equipment was being transferred to the television centre. The changeover was executed smoothly. Channel 5, for example, closed down at the 'phase 1' site at 23.00 hours on 27th June and restarted transmitting from the new site at the normal time, 18.00 hours, the following day. Many unorthodox equipment arrangements were employed during the changeover, all of which were removed to leave a properly engineered system for the operational staff to use.

LANGUAGE PROBLEMS

The programme difficulties and solutions with a four-language service have already been described, but the

advertising problems, however, require a slightly different technique.

Although programmes have advertising spots in a manner similar to that used by the commercial programme companies in the U.K, advertising revenue is insufficient to cover the greater cost of broadcasting to the different language groups so a licence fee is levied to make up the difference. The advertisements seen come from several European, various American, Canadian and Japanese manufacturing companies and when these are slide advertisements, they are usually backed up by offscreen announcers giving details of the product in one or other of the languages or dialects. A development of this is that now the announcements are recorded on audio tape. The tape is the combined recorded announcement and switcher control for the consecutive slides. After each recorded announcement, a small piece of metal tape previously fixed to the audio tape activates a switching circuit to bring the next slide up. The next announcement begins when this slide is switched to transmission and the system continues until all the required slides have been shown.

Similarly with sub-titles, the engineers devised their own equipment. The sub-titles for a programme are typed on a 5-in. wide roll of paper and are spaced about $\frac{1}{2}$ in apart. The sub-titles on the roll are positioned for exposure in front of the camera by a drive motor and a brake motor. A small hole, punched after each item, allows light to activate a

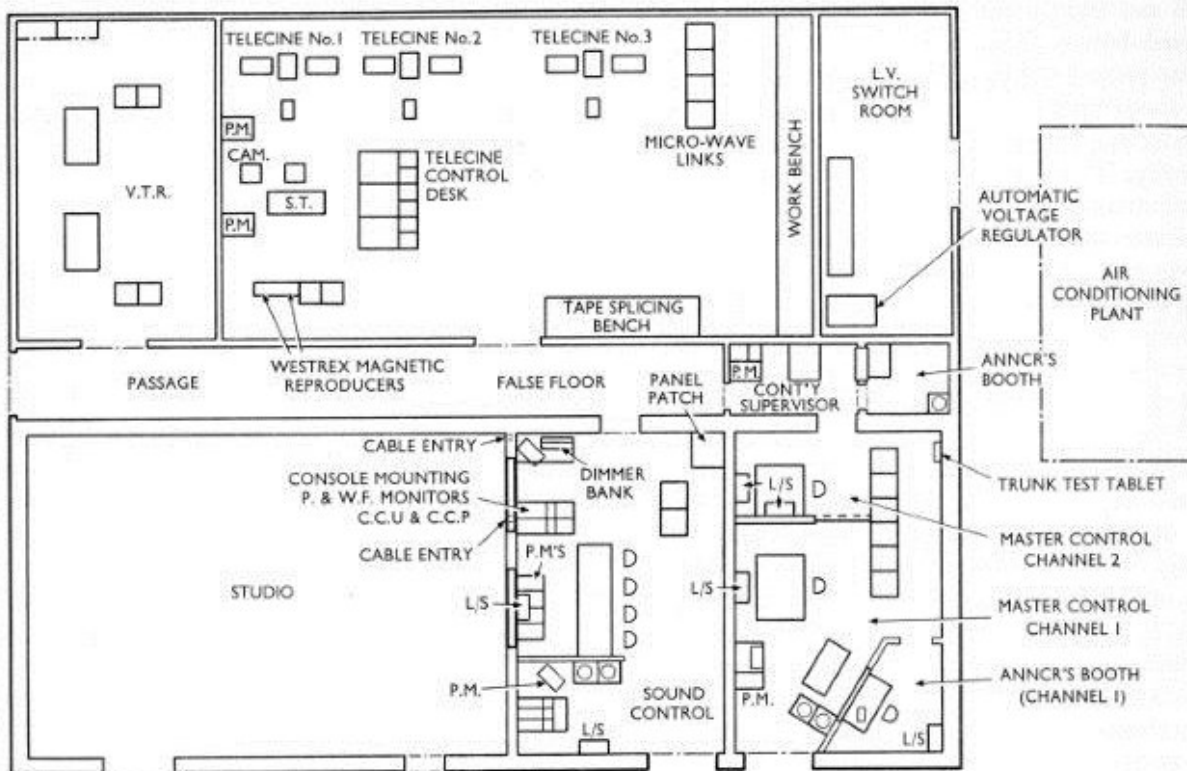


Fig. 4. Television centre, phase 1.

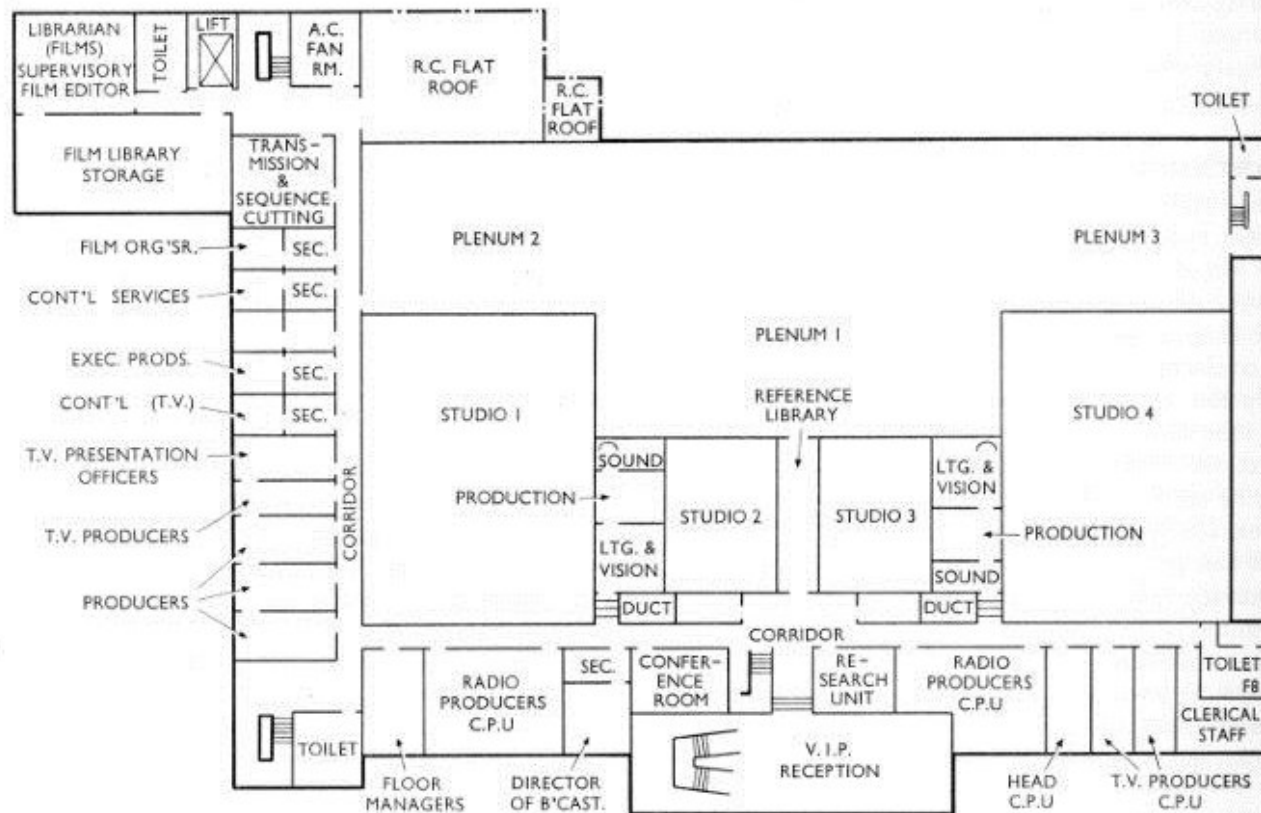


Fig. 5. Television centre, phase 2.

photo-cell and trigger the brake motor to stop the roll. A push-button allows the next sub-title to be moved into picture and then exposed. Where a tape-recorded sound track is used, the metal tape switching system described above is used to change sub-titles automatically. This removes a tiresome but necessarily accurate task.

Programmes which are originated locally, although often produced to suit the language and tastes of one particular section of the community, may be of interest to other language groups, and skilful sub-titling helps greatly in adapting them to these groups.

Singapore's Educational Television service began early in 1967. The ETV telecast consists of six 20-minute lessons broadcast on one of the two television channels between 08.30 and 12.45 hours (for morning schools) with a repeat, from 14.00 to 18.30 hours, for afternoon schools. At present the programmes are directed to secondary school students with subjects including general science, mathematics, English and literature for the English stream of education. The other subjects are Malay, for national language classes, and geography and physics for Chinese medium schools. ETV programme production is the sole responsibility of a unit of the Ministry of Education, whilst Television Singapura merely telecasts the fully packaged programme productions recorded on video tape. Programmes for primary schools and other levels of general education have been planned to follow at a later stage.

EARTHING

The earthing system comprises four separate sets of copper rods beneath the ground floor radiating from the feet of the four columns designed to support the tower. At intervals along each radial, copper rods 4 ft long are driven into the ground. Measurement of conduction through the building to ground was very low (20–30 Ω) and as this introduced a hum problem and a lightning hazard, it was decided to erect the tower away from the building, with a similar earth mat laid beneath the new tower foundations. The tower has two earthing systems, the tower mat and general mains supply earth. The technical automatic voltage-regulated mains supply is isolated from the tower and is earthed on the main building. Due to an electrolytic action of the soil a steady 0.5V d.c. can be measured between any of the earths. The general mains earth is taken down the hill to a small stream and this earth will pass 10 mA of d.c. at 0.5V.

To avoid large circulating currents being set up within the building, every piece of equipment has been insulated from the structure, even sections of the ventilation duct are insulated from each other, providing another useful function in acoustic inhibition.

ACOUSTICS

Although the acoustics problem is present in any building concerned with broadcasting, the conditions at the Singapore centre are particularly acute. Noise from air-conditioning equipment, from large jet aircraft, from tropical rain beating on the roof, and even from high-heeled shoes tapping along the corridors (which act as air-return ducts) must be attenuated to bearable proportions. The studio walls were already soundproofed on three sides, up to a height of 12 ft, by scenery backcloths and props, so the major portion, from 12 ft to 34 ft, and the ceiling were clad with a 2-in thick blanket of mineral wool, with a 2-in airspace between wool and wall. The fourth wall, with the production gallery observation windows, was covered with perforated hardboard, and the bitumen-bonded gallery windows raked to cut out acoustic standing waves and reflections. The studio roof consists of multi-layer bitumen felt weatherproofing over wood-wool slabs. Soft vinyl tiles on the corridors reduced the heel tapping to an acceptable level.

To reduce the noise from the air conditioning equipment, the cooling plant is housed as far as possible from the main building, with the O.B garage between, and is structurally isolated from the rest of the building. Structure-borne noise is further attenuated at the expansion joints in the building. The general noise level from an unoccupied studio, including microphone and line noise, is about -55 dB.

VENTILATION

Because of the relatively high humidity, temperature control must be a compromise between the needs of active and non-active staff in the studios. With studio lighting on, temperatures are kept at 75°F, and, although this is comparatively cool, artists still become uncomfortably hot, while camera operators, floor managers, etc feel the chill. The air conditioning is kept on from 08.00 hours to midnight.

From the opening of the centre to the present day, the station has had negligible 'off air' time. The system has proved to be reliable and highly satisfactory.