

CHAPTER FIFTEEN

The Second Time Around - New World Symphony

My second circuit of the globe was to be far more hectic than the first. In four months I was to visit as many TV stations as possible, and obtain qualitative and quantitative information about -

- Technical staffing, functions and relative salaries
- Studio sizes, acoustic treatment, sound isolation and floor composition
- Studio lighting facilities, lights, controls and rear projection
- Airconditioning of studio buildings
- Studio cameras, lenses, mountings and cables.
- Microphones and microphone booms
- Control room facilities and layout
- Intercom facilities for production crews
- Telecine film projectors, slide and opaque projectors and multiplexers
- 16mm perforated magnetic film sound recorders
- 16mm film cameras for news collection. Film editing and raw film stock.
- Film recording of programmes and film processing
- Coaxial feeders from transmitters to radiators
- Lightning protection for towers
- Outside broadcast operations
- Microwave relay links
- Rotatable mountings for microwave dishes
- Passive reflectors for microwave links
- Test equipment and provision of spare components
- Emergency power units and lighting

and, in particular, first-hand information on the operation and reliability of RCA and Marconi equipment. Information on these matters was to be collected and recorded in notes and, when necessary, transmitted to Ted Allen in correspondence.

I took off at 11am on Saturday October 22nd, 1955, by Qantas flight EM736. After touching down at Nadi and

crossing the international dateline, I reached Honolulu at 11.55 am - and it was still Saturday!

Honolulu

I stayed three nights at the Moana Hotel, where only a narrow strip of tropical garden separated the open dining room from the sandy beach and the ocean. They told me the winds were never strong enough to blow sand in - just a gentle balmy breeze with the rolling surf breaking on the beach. Food was in wonderful variety, magnificently served and relatively cheap by US standards. The Hawaiians are a happy people. They love singing, and in Honolulu you hear Hawaiian songs everywhere. I went to a 9pm cinema session and saw "The Seven Year Itch" starring Marilyn Monroe.

There were three TV stations in Honolulu - rather happy-go-lucky like the people, and designed for easy operation by small staffs. They had little live TV production. One station had no air-conditioning, and kept a large studio doorway open to the street during live shows - with people and dogs crowding round to see what happened inside. This was TV on a shoestring!

However I gained some useful information and ideas about studio lighting and rear projection and what could be regarded as the absolute minimum space for film handling operations. In rear projection a slide of a scene is projected on a large translucent screen from

behind, and the studio action in front of this has to be carefully lit to avoid shadows and loss of contrast on the projected background. It is cheap, but limited, production.

Because of our different TV standards, film transmission facilities in the USA and Canada differed operationally from what was required in Australia. As their 525 line 60 field system produces 30 complete pictures per second, this has to be reconciled to the standard 24 pictures per second film rate. They do this by projecting alternate film frames respectively twice and three times, by very brief pulses of light occurring 60 times per second. The projected images are viewed by a TV camera with an image-storing facility, and scanned 60 times per second in the usual way, but in darkness, between the light pulses. Film pull-down occurs 24 times a second at intervals between light pulses. Thus 5 pulses of light occur during 2 frames of film, or 60 during 24 film frames.

America had been using Iconoscope cameras, with a storage characteristic for film transmission, but in the early 1950s RCA had developed the photo-conductive Vidicon camera tube, and an improved type - suitable for film transmission - was released in 1954. They claimed this had better grey-scale reproduction, increased signal-to-noise ratio, better resolution, simpler control

requirements and lower operating costs than the Iconoscope.

In 1955 the Vidicon was rapidly gaining favour in America for film transmission, and we had ordered them through AWA. In our case, with the 625 line 50 field TV system, producing 25 complete pictures a second, we proposed to run film at 25 frames per second instead of the standard 24 - which simplified the projection problem. The resultant speeding up of motion and the rise in pitch of the accompanying sound (less than a semitone) was inappreciable.

RCA had also designed a "multiplexer" for telecine operations. This was essentially an optical bench - an assembly of half-silvered mirrors inside a long cover with openings at each end and at the sides. A slide projector could feed in at one end, two film projectors could feed in from either side and an opaque projector could feed in through another side opening. A Vidicon camera was placed at the other end of the assembly. The half-silvered mirrors inside allowed the light from any of these projectors to reach the Vidicon camera, depending on which projector was illuminated at the time.

This multiplexer allowed rapid changeover between film, slide and opaque images - which was necessary in commercial TV programming, especially in the transmission of commercials which could incorporate all three types of

picture sources. The slide projector supplied by RCA had two rotatable discs, each carrying a number of standard 2" x 2" slides, which could be projected alternately at the press of a button.

We had ordered two of these RCA multiplexers through AWA, with slide projectors and an opaque projector. I saw my first Vidicon camera and multiplexer at station KONA in Honolulu.

Station KGMB-TV ran a live "off-the-cuff" breakfast session from 6.15am. They called me in for an interview - my first appearance on TV. I was introduced as "the mystery man", and viewers were invited to phone-in their guess as to my occupation. The first guess was "a policeman"! Eventually someone guessed I was an engineer. The compere said I was from Melbourne, and gave our city a plug for the 1956 Olympic Games. This station had a simple but very effective studio lighting control system. Qantas delivered me to San Francisco at 6.30am on October 26th.

San Francisco

I had just unpacked in my room at the St Francis Hotel in Union Square when the phone rang, and I was surprised to hear Keith Cairns' voice. I thought he would have been in Cleveland by now, but he, Colin Fraser and Jack Waters had stayed in San Francisco to attend a Convention of the National Association of Radio and

Television Broadcasters (NARTB). I had lunch with them before they departed for Los Angeles that day.

San Francisco had three TV stations, all with OB units. They were of a size to which we could aspire in our early years - serving a community of comparable size to Melbourne.

KGO-TV had its transmitter at Twin Peaks, on top of Mount Sutro, and its studios in a converted San Francisco building. It specialised in rather more live production than the other two, with a staff of 42 technicians. KPIX shared the same transmitter building with KGO-TV. Its studio building was specially built for TV, with three studios, but most of its programming was on film.

KRON-TV had its transmitters on top of San Bruno Mountain, where its film transmission facilities were also located. Its studios were in the "San Francisco Chronicle" building in the city, producing a fair proportion of live shows.

KRON-TV had always made a study of staff economy, and had the smallest technical staff of the three stations - only 22!

These stations were all worth investigating in detail, and I stayed in San Francisco for six hectic days.

Harry Jacobs, Chief Engineer of KGO-TV, gave me valuable information on staffing, salaries, 16mm film use, control rooms, acoustic treatment, air conditioning, studio lighting and rear projection. Their 105x52ft studio had flying lighting battens, counterweighted for easy raising and lowering. Their smaller studio, 44x34ft had a fixed lighting grid. KGO were programming 92 hours a week.

They produced a one-hour variety show called "San Francisco Tonight" at 10.30pm from Monday to Friday in the larger studio, with two cameras, two microphone booms and live commercials. This show was probably the inspiration for the "Tonight" shows later produced for many years on Melbourne TV. It involved a band, songs, dancing and comedy routines, with a live studio audience - and was produced without rehearsal except for the band numbers, which were rehearsed without cameras. I watched, and thoroughly enjoyed, two productions of this show - one from the floor and one from the control room. Despite the late hour, they always obtained a full studio audience.

I spent part of five days with Harry Jacobs and his assistant Hal Brown. Harry had seen Styroflex cable installed at the KPIX transmitter, and warned that it was difficult to prevent kinking of the cable as it was being withdrawn from its transport drum. He recommended the

use of a long spring-loaded wooden clamp to straighten the cable as it left the drum.

After watching an RSPCA "Pet Exchange" programme at KGO-TV on the Sunday afternoon, their technical director drove me to the Mark Hopkins Hotel on Nob Hill, where I once more took the elevator to the 18th floor, with its walls of plate glass windows. Over a leisurely drink, I watched the sun setting behind the Golden Gate Bridge - a magnificent "Turneresque" sunset. As the red and gold sky faded in the west, the multi-coloured lights came on in the cream and fawn buildings of the city spread out below - and on the other side of the harbour the Oakland Bay Bridge faded into a blue haze with a never-ending line of car lights moving slowly across its long flat curve.

Coming down to earth, I strolled through China Town on my way back to the St Francis. They said this was the largest Chinese settlement outside of China - full of colour, with brightly-lit shops selling a multitude of Eastern goods; lacquerware, brassware, kimonos, bambooware, ginger, ivory and thousands of trinkets as well as the usual European merchandise. Most spoke excellent English and all were very polite. I made some purchases.

I spent most of Thursday with Tom Ely, Chief Engineer of KPIX, and his assistant Bill Burgess. This

visit was very valuable, because they were in the process of installing an RCA Vidicon telecine camera with a 16mm film projector, slide projector and multiplexer. They stressed the importance of accurate optical alignment of these units, and recommended mounting them on a common channel-iron welded frame bolted to a concrete floor for stability, of such a height as to keep the units clear of floor polishers, etc. Critical alignment might require a week of adjustment. And they recommended remote control of telecine Vidicons from more than one point, for flexibility of operation during live or film-only programming. Live studio production at KPIX was at a low ebb. Most of their 130 hours a week programme was on film. KPIX had a General Electric transmitter giving 100 kW of effective radiated power for vision and 50 kW for sound from a radiator fed by two 3.125" Styroflex feeders to the top and bottom halves respectively. I obtained detail of the method of joining the Styroflex to the rigid copper coaxial conductors at the transmitter and at the radiator. The Styroflex cables were pressurized with dry air fed into the rigid copper section in the transmitter building.

Like all the USA engineers, the KPIX men were most helpful. We had a delicious crab lunch together at Fisherman's Wharf.

I took a night off on Friday to go on a "Gray Line" tourist bus tour of night spots with 20 or 30 others from

all over USA and Canada. I was the only Australian. Elmer, the guide, had been in Sydney for two years after World War II, and did announcing at radio 2UE. There were floor shows at three spots, with singing, tap and ballet dancing, conjuring and a barber shop quartet. All very colourful.

On my last day in San Francisco I discussed KRON-TV staffing with Chief Engineer Berryhill and his assistant Rodger Woodruff. All their 22 technicians were fully qualified and interchangeable. Shifts were rotated to give each one a turn on every job. Maintenance was done in two overnight "graveyard" shifts. They transmitted 120 hours of programme weekly, with two men always on duty at the transmitter.

They had five field TV cameras, three monochrome studio cameras and one colour camera. No film shooting was done. The minimum OB technical crew was five. They had two production studios, but all their telecine facilities were at the transmitter.

My stay in San Francisco was very profitable, and provided answers to many questions. I was gratified to find their engineers almost wholly in agreement with our studio building plans. They offered only a few suggestions for improvements, which we could incorporate.

Feeling very reassured and confident I flew to Los Angeles by United Airlines on Tuesday November 1st. So far the weather had been beautiful.

Los Angeles

My suite at the Hollywood Roosevelt Hotel overlooked a heated swimming pool - a rare feature in 1955. I spent the evening poring over a telephone directory and an indexed map of LA, printed in great detail with print so small that just reading it gave you a headache. Los Angeles, with its two million population, appeared to be a city rolled out to a thickness of two storeys and about 50 miles wide, criss-crossed by a tangle of freeways. There was no public transport except buses, and the likelihood of finding a bus to take you to a desired business address was remote. I made a list of the places I wished to visit and reconciled myself to the prospect of taking taxis to places not within walking distance of my hotel in Hollywood Boulevard. Smog was not evident, but you could smell it.

My first target was the Houston Fearless Corporation, makers of the studio camera pedestals and the rotatable mount for microwave terminals which we had ordered through AWA at the beginning of July. Their address was an incredible 11801 (!) Olympic Boulevard - a good taxi drive away. I met their design engineer, Bruce Dalton, and their sales engineer Art Kjontvedt, and I was

astounded to find they had received no order for our items - after four months! The camera pedestals were being manufactured continuously - but as the demand for rotatable mounts was small, these were made only in batches, and a batch was about to be commenced. If this batch did not include our order, we would face six months delay in delivery. I therefore sent a telegram to AWA, stating -

"No order rotatable mount received Houston Fearless.
Manufacturing batch soon please expedite"

I wrote to Ted Allen and asked him to follow this up - another example of procrastination somewhere in the organisation.

Bruce Dalton gave me the necessary information to enable us to fit a Raytheon microwave terminal to their rotatable mount, and to fit the pan-and-tilt friction heads of Marconi cameras to their pedestals.

Next, a taxi drive to the Bell and Howell Co in La Brea Avenue, to obtain information about their 16mm film cameras largely used by TV stations in the USA. However, I was very interested to learn that they were in the process of developing a 16mm film projector especially for use with telecine Vidicon cameras. This was a modified version of the JAN projector supplied to the US joint army and navy forces, and was to be known as the 614CBVM - built for both optical and magnetic sound replay and with a 3-prong claw pulldown to minimise wear

on-film sprockets. It was to be available for either 60 or 50c/s power supply, with a synchronous motor. In view of our dissatisfaction with the 16mm projectors offered by Marconis, this information was most interesting. I obtained directions to reach their Chicago factory, where the projectors were being manufactured.

I also had discussions with Berndt-Bach Inc., manufacturers of Auricon 16mm film cameras, and with the Bodde Screen Co., makers of rear projection equipment. The Auricon cameras had 600 and 1200 ft magazines, and were used extensively for TV news shooting, being very silent in operation.

The Bodde Screen Co. supplied rear-projectors and associated translucent screens, and offered a wide range of slides for use as background settings in TV studio production - such as I had seen in Honolulu. I obtained valuable information on the requirements for foreground studio lighting.

The two largest TV networks in the USA - the CBS (Columbia Broadcasting System) and the NBC (National Broadcasting Company) both operated large live production studios in LA and New York. Both were producing high budget shows, fed to affiliated TV stations across the country and also sold elsewhere in the form of "kinescope" recordings - that is recordings made on film from a kinescope or cathode ray tube screen.

- Because of the time difference of three hours between New York and LA, programmes originating in New York and relayed across the country were recorded at LA for replay later, and for distribution elsewhere.

This recording activity was very considerable.

There was a strong rivalry between the two cities. As Hollywood had a huge reserve of artists, musicians and dancers associated with the film production industry, it seemed likely that LA would become the chief centre for TV variety production, while New York - with the resources of Broadway - would become the chief centre for drama production for TV.

TV recording equipment had not been included in our initial order for equipment, largely because James Hanrahan held the strong opinion that we would not need it, and it was very expensive. However I considered it would be found essential for programme exchange between Melbourne and Sydney and for programme repeats, as well as sales to other future TV stations. Therefore I wanted to take the opportunity of gathering as much information as possible on kinescope recording equipment and procedures. American kinescope equipment would require modification for Australian use because of differences in TV standards and power mains voltage and frequency.

Recording at 25 film frames per second would require either a very rapid pull-down of the raw film stock

between successive TV picture scans (in about 1.2 milliseconds) OR recording only alternate TV field scans, and pulling down during the interlaced field period with the TV image blacked out. The second method would be kinder to the film stock but poorer in picture resolution, because the missing interlaced lines would have to be replaced by thickening the recorded lines to fill the intervening gaps.

In recording the American 525 line 60 field system, the film stock was run at 24 frames per second with successive frames exposed to one and a half TV scans and pull down occurring during two successive half-TV scans, so that two film frames occupied the same time as five TV field scans - or 24 film frames during 60 field scans. The pull down (with the TV image blacked out) during about 16 milliseconds was not injurious to the film, but the effective loss of two TV field scans in every five meant a loss in picture resolution - not quite as bad as the second method for Australian TV standards.

I knew that Marconis were developing a rapid pull down 16mm film recording equipment for 625 line 50 field TV systems, but it had not yet been used in established stations and its performance was open to question. Fernseh in West Germany were producing recording equipment based on quite different mechanical principles.

However, many operational and sensitometric film procedures used in making American TV recordings would be

relevant to analogous recording in Australia, so I spent three days investigating the facilities at CBS and NBC and the processing laboratories used by them.

CBS at 6107 Sunset Boulevard had three recorders for 35mm film and three for 16mm, made by General Precision Laboratories (GPL) and RCA, with Acme and Eastman cameras. Sound was magnetically recorded separately. Their film processing was by Consolidated Film Industries, two miles away.

NBC, at the corner of "Sunset and Vine", also recorded on 35 and 16mm film using RCA equipment - but they did their own 16mm processing.

Mr Anderson of CBS and Mr Lovell of NBC were most helpful in giving me details of their operational procedures and sensitometric controls, requiring the most stringent supervision of recording and processing to maintain technical quality of their output.

I visited the laboratories of Consolidated Film Industries at 959 Seward Street. I was impressed by the scrupulous cleanliness of their plant and received good advice from Ted Fogelman. In Burbank, Jack Kiel discussed film recording cameras made by Producers Service Co for both CBS and NBC, and warned me against rapid pull down film mechanisms because of their inherent wear and the damage they can cause to film. I discussed

16mm perforated magnetic film sound recorders with Kinevox Inc. of Burbank.

I paid two visits to "Television City", the CBS production studios at 7800 Beverley and Fairfax. The building was enormous, and the first impression was that the inside looked more like a factory than a TV studio building, with small motors drawing trains of scenery trucks along cavernous corridors. In the gigantic studios, artists used quite large mobile dressing rooms parked in corners. A rehearsal was in progress, using five TV colour cameras and two large studios - one of which had permanent seating for an audience. It was interesting to see that the control room was functioning with holland blinds drawn over the studio windows. The director was interested only in what viewers could see - the picture on the tube! I felt the scale of these operations was not relevant to Melbourne TV.

On Saturday November 5th, John Knight, Engineer-in-Charge of KRCA, the local Hollywood NBC station, drove me to Mount Wilson to see their TV transmitter, 17 miles from their LA studios. They had a 25 kW RCA vision transmitter feeding a three stack super-turnstile antenna on top of a 450 ft mast. The top and bottom halves were fed with equal power, but phased to give a downward beam tilt of 2.5 degrees, Mount Wilson being 6700 ft above sea level. There were seven TV radiators on the mount, but KRCA had the tallest and so attracted most of the

lightning. John gave me details of their earthing system. Winds up to 100 mph were often experienced. They had microwave relay receivers mounted inside plastic "radomes" on the flat roof of the transmitter building.

Night had fallen when we completed our inspection. Emerging from the transmitter building I was surprised to see no lights in the direction of LA. John Knight explained that this was due to a blanket of smog. We were above this, in clear air at the mountain top. Then I was mystified to see a large disc of light, skidding about rapidly in various directions in the darkness below us. It looked suspiciously like a flying saucer! John said it was the top of a searchlight beam, piercing the blanket of smog below. The searchlight was promoting the release of a new model car in Downtown LA.

Next morning I brought my notes up to date - 84 pages since leaving Melbourne - had a swim in the hotel pool and went to a 5pm session of "This is Cinerama" at the Warner Theatre in Hollywood Boulevard. This was the latest attempt of the film production industry to fight the challenge of television. Three synchronized projectors shooting at three adjacent parts of an enormously wide screen certainly gave the feeling of "being there", but the effect was marred by differential jitter between the projectors from time to time.

In five days at Los Angeles and Hollywood I had visited 13 organisations and travelled many miles in taxis - but I hadn't seen one film star! I had no pleasant recollections of LA as a city, but its engineers were most helpful. Since leaving home I had gained a great deal of useful information in a very short time.

At 11pm I took the United Airlines flight to Cleveland - my longest flight in the northern hemisphere during this world trip, over 2000 miles. All other flights made in the USA and Canada were under 500 miles. I had 4lbs of excess luggage.

Cleveland

Lyle Lloyd and the WEWS Station Manager, Frank Hartley, met me at Cleveland airport on the morning of Monday November 7th. It was good to be among friends and colleagues again. Keith Cairns, Colin Fraser and Jack Waters were also in Cleveland. I was to attend a midday dinner party to be followed by a discussion with the "crowned heads" of WEWS and a Mr L.M. Druckenbrod Jr., project engineer of the Austin Co. who had designed the air conditioning system for WCAU Philadelphia, and many other TV stations.

Before leaving Melbourne I had posted copies of our studio building plans to Lyle at Cleveland. After enjoying my first Cleveland dinner I was surprised to find that they had made slides of these plans, and that I

was expected to hold forth on them and explain the logic of our planning. With the aid of the slides and a pointer, I spoke for four to five hours, with much discussion as I went along. They listened very attentively, but with many interjections. The general conclusion was that they were happy with our technical layout, but strongly recommended an increase in the size of the smaller studio and more windows in the control room area.

However, they were not so happy about some features of the office layouts, film editing accommodation and projection arrangements for the film preview theatrette. Lyle and I undertook to discuss their suggestions with Keith Cairns, who was also present, before he left for New York with Jack Waters in three days time.

Lyle and I wanted somewhere to discuss the suggestions made, where we could be free from interruption. My large room in the Statler Hotel seemed the best solution. I secured the several large sheets of plan and elevation drawings of our proposed studio building to the walls of my hotel room with adhesive tape - and covered them with sheets of tracing paper.

We had daytime discussions with Joe Epperson, the WEWS Chief Engineer, on staffing arrangements, but on two evenings Lyle and I went into a huddle in my room and thrashed out modifications to incorporate the WEWS

suggestions for the non-technical areas of our building, and also worthwhile suggestions I had received in San Francisco and Los Angeles. We worked till 4am, and obtained Keith Cairns' agreement to our modifications on the day of his departure.

My first letters from Melbourne had been awaiting me at Cleveland - four from Ted Allen, with many queries. I wrote to him, giving details of the constructive suggestions made. WEWS made dyeline prints of the tracings I had made with Lyle, and I posted these to Ted with a seven page summary of the proposed alterations in office layout, film and slide storage and handling, newsreel accommodation, art department, scenery and property construction and storage, goods delivery, air conditioning and machine shop. The only changes to the technical areas were the addition of some inter-area soundproof windows and a larger small studio. I lettered all areas in red, to facilitate reference in further correspondence. We had suffered baptism by fire, but our technical planning was sound. I gave Ted details of lightning protection of the transmitter radiators at LA and Cleveland.

I was asked to give a brief description of the Australian TV system at a meeting of the Institute of Radio Engineers. In 1955 the concept of a 625 line 50 field system was a novelty in the USA.

Lyle and I visited the Austin Co. at 16112 (!) Euclid Avenue, where Mr Druckenbrod Jr. gave us valuable information on studio air conditioning, and sound treatment of studio walls, and control room windows, and studio floor construction. Ted had reported on discussions with W. E. Bassett and Associates and their air conditioning proposals, the progress of excavations for the tower footings and his initial interviews with prospective staff members.

WEWS transmitter had a 831ft guyed mast, with an RCA 25 kW vision transmitter. They employed coaxial switches in the feeder lines between main and standby transmitters and at other points to provide emergency switching facilities. They transmitted 80 hours of programme each week with a technical staff of 32, but their programme operations bore little resemblance to what we could expect in Melbourne - because WEWS was a "network affiliate". This meant that from time to time during the day they took network programme (relayed from either the east or west coast) and during these periods many of the studio staff had nothing to do and retired to a coffee shop across the road. There was no facility for interstate TV relays in Australia in 1955 - or for some time to come.

We also visited two other TV stations in Cleveland, WNEK and WXEL. These provided some useful comparisons, but it was becoming increasingly evident that there were

wide variations between American TV stations in the method of staffing and in the individual responsibilities of technical staff members.

In his four months operational experience at WEWS, Lyle had become thoroughly familiar with TV equipment and especially with the efficient production of pictures with TV cameras using 3" Image Orthicon Camera tubes. Lyle persuaded Joe Epperson to present HSV-7 with a dozen used RCA type 5820 Image Orthicons which, although rejected for further production use after 500 hours service, were quite OK for use in training technicians in the months before we commenced a regular service, after the delivery of our OB van. We obtained quantitative information on studio lighting requirements for monochrome Image Orthicon cameras from a visit to the General Electric Laboratories at Nela Park.

Lyle and I snatched a respite from our TV investigations to see Danny Kaye in his "All Star International Show" at the RKO Palace Theatre. In the first half of the show there were acts by the almost human chimpanzee "Marquis", and the Spanish ventriloquist "Senor Wences" - both of whom we have seen subsequently on international TV shows. The second half was devoted entirely to the unforgettable Danny Kaye - then in his prime - performing solo for about two hours, with the assistance of an orchestra. He was absolutely wonderful, and had the audience eating out of his hand with songs

like "The Peony Bush" and "Antoine of Paris". His patter was incomparable and his expressions indescribable. I hadn't laughed so much in years. It was a welcome release from the tensions of our technical work - of eleven nights in Cleveland we worked on all but three until 2.30am or later.

On one free night we dined at Joe Epperson's home and watched a colour TV programme with Joe and his wife - variety relayed from Los Angeles and drama from New York, with Greer Garson, Janet Leigh and Janet Blair. Some of the colour was lovely - it highlighted the red of Greer Garson's hair - but some very garish. Colour was restricted to certain high-budget programmes in 1955, and of course could only be seen with a colour receiver.

On our third free night we went to a party of WEWS staff members and their wives at the home of Jim Breshin, one of the programme directors. Divided into two teams we played the old parlour game of charades. Individuals, alternating between the teams, had to illustrate the name of a book, saying or song, drawn from a hat - and members of the other team had to guess the name from mimed actions, in response to questions such as "Sounds like?" and "Looks like?" It gave opportunities for animated puns and was great fun. I had to illustrate "There's one born every minute" - not the easiest to convey in mime. No doubt this was the inspiration for the live TV show

"Fun with Charades", which found a place in the first week of HSV-7 programming.

Joe Epperson and his staff had been extraordinarily kind and helpful. Lyle, Colin Fraser and I took some of the senior staff to dinner to return their kindness on the day before Lyle and I moved onto Chicago. Colin was to remain in Cleveland for some months, working with their programme staff.

I spent the last days in Cleveland bringing my notes up to date - another 14 pages - and sending more details to Ted. I had told Lyle about the Bell and Howell 16mm film projector being produced in Chicago, and he was anxious to see it. We flew to Chicago on the morning of Friday November 18th.

Chicago

Having booked in at the Conrad Hilton Hotel (previously called the Stevens in 1951) we asked a taxi to take us to the Bell and Howell factory. The directions I had been given in LA proved somewhat misleading and the driver had great difficulty in finding it. It was 12 miles from the city and outside the limits of our map.

Seven of the new 614 CBVM projectors were undergoing final assembly and testing. We were told that several prototypes, produced by direct modification of the JAN

projectors supplied for some years under contract to the US Armed Forces, were already in use with RCA Vidicon cameras at some American TV stations. We discussed the design with John P. Weber Jr. their Director of Technical Services. We were most impressed with their facilities and quality of workmanship. It appeared that this projector satisfied all the requirements of Vidicon telecine operation for commercial TV use. In particular it had -

- Unitized construction, with optical and mechanical systems interchangeable between projectors
- Synchronous drive motor, available for 50 c/s, magnetically shielded
- Film pull-down available at 25 frames per second
- Backward, as well as forward running - for cueing purposes.
- Push-button control of film-loop reset, during running
- Projector lamp intensity remotely controlled
- Remote control of start, stop, "show" and reverse
- Single button control of changeover between projectors
- Optical and magnetic sound replay
- Three-prong claw film pull-down
- Mounting pedestal and lens suitable for use with RCA Vidicon Multiplexer

and it was suitable for continuous operation

They quoted a delivery of 30 days, and the projectors would require no modification for our requirements. We were delighted. The projectors offered by Marconis in June lacked many of these features and would require considerable modification for use with the Vidicon cameras and Multiplexer.

The export manager, Fred Gonzalez, drove us back to Chicago. It had started to snow in earnest, and footpaths and the tops of cars had inch-thick coatings of

lovely pure white snow. We three had dinner at the Won Kow Chinese Restaurant. I had heard of one horse towns, but never Won Kow Restaurants. We each ordered different dishes, and shared all three - from plates heaped 2.5" high - delicious! Fred drove us back to our hotel, but Lyle and I had a cheerful walk up and down Michigan Avenue before retiring because the snow looked so enticing and it was fun leaving a trail of footprints 2" deep.

On Saturday morning we awoke to a city transformed by a mantle of snow. All the shops had Christmas window displays. One had a different tableau in each showcase - colourful little figures depicting the Nativity scene, Santa Claus and his sleigh, families gathered round the fireplace with stockings hung from the mantelpiece, and so on - all in period costume. Every lamppost in this street had a large silver christmas tree above it.

That afternoon we watched a play produced in a live theatre converted into a remote TV studio by WBBM-TV. Large scale shows were produced on the stage, with live commercials in a concealed area at the rear. A control room had been constructed in the stalls, which were also used for audience seating. OB type cameras and mountings were used. We returned that night to watch a variety show. This was the forerunner of a later teletheatre in Melbourne.

In the early evening we inspected the TV news operations of WGN-TV, in a new studio building adjacent to the "Chicago Tribune" building - the controlling newspaper organisation. This had some relevance to the TV news planned by HWT for HSV-7. Lyle took copious notes. Their TV and radio news office operated 24 hours a day, producing a half hour international and local news service at 6pm and a quarter hour service at 11pm, with two 5 minute daytime sessions on weekdays.

The TV and radio news staff numbered 23, and cameramen kept their cameras in their cars, ready for instant use. They had two 16mm film processors and 10 teleprinters plus a facsimile machine. A small studio was used for pre-filming interviews. It was a very comprehensive set-up for 1955. They had found that men with newspaper photographic experience were well suited to TV news-camera work, because they had the necessary news-sense and an appreciation of the urgency of news gathering.

We rose at 5.30am to catch a Trans Canada plane to Toronto on Sunday. The temperature was 12 degrees F below zero, but it was sunny. Our visit to Chicago had been brief, but rewarding.

I wrote to Marconis, enclosing a specification for the 614CBVM projector, with a summary of its advantages, and requested that they make arrangements for four to be

supplied to HSV-7 (two for telecine and two for film review) via the Gaumont British Bell and Howell organisation or by whatever other route might be appropriate. I stressed the importance of our obtaining a firm schedule of deliveries for all our equipment, and reported on the current state of progress on our towers and buildings as advised by Ted Allen. I gave our estimated dates of arrival in Britain and asked for discussions before and after Christmas. I sent a copy of this letter to Ted, and requested him to send a copy to AWA.

Toronto

Into the cold air I descended from the plane at Toronto airport, when

Wham!

My foot touched the tarmac and flew from under me, landing me on my elbow and backside on the innocent-looking but frozen surface of Canadian terrain. An undignified and uncomfortable arrival. Lyle helped me up, and in the airport I examined the damage - a bruise on my rear and abrasion on my right elbow, but nothing serious.

Toronto looked as cold and inhospitable as when I arrived in 1951, but our room at the King Edward Hotel was large and beautifully furnished, with a TV receiver provided - an unusual extra in those days.

We slept in the afternoon - having had only four hours sleep the night before. In the evening we went to the CBC studios in Jarvis Street, to see the production of a one-hour play on the life of Leonardo da Vinci - beautifully costumed and presented with excellent lighting and scenery. The production crew seemed nearly as big as those I had seen at the BBC in 1951.

Next morning we received a welcome cable from Melbourne -

"All dollars Raytheon approved"

Lyle was so delighted he jumped up and down on his bed like a circus act. I forthwith wrote to Ted, thanking him for the news, and suggesting some details in our order regarding mountings, dishes and cables. I said I would visit the Raytheon factory in Boston.

We called on Mr H.R. Hilliard, the CBC Regional Engineer and discussed their experience with Marconi equipment. They had found the Marconi Mk III monochrome cameras were very good, but they were using General Electric synchronizing generators.

We spent two days inspecting the CBC kinescope recording installations - all using 16mm film stock, because of cost. They had four GPL recorders and cameras - two arranged for immediate processing, with the exposed film feeding through a light-tight tube into GPL "hot" film processors. The dried negative film could be

projected immediately for review purposes. They had been found extremely reliable. They made their own contact prints for distribution, and recorded sound on 16mm perforated magnetic tape with Reeves synchronized recorders.

We discussed their recording, processing and printing operations with Roger Ross, and made copious notes about their sensitometric control and film stock used. They had found that recordings of consistently good quality could be made, provided the studio production lighting and camera control operation was rigorously supervised.

The CBC kinescope equipment had been in use for two years, and they produced about 5 million feet of 16mm film recordings per year. They said GPL had sent kinescope recorders to Britain to record TV coverage of the Coronation, with excellent results.

The CBC News service headquarters were in Toronto. Newsreels shot on single system reversal stock were received from all Canadian Provinces, and the daily news service compiled from these was distributed on 16mm film. They used Auricon, Arriflex, and Bell and Howell cameras.

In the evenings we saw two live variety shows produced at the Yonge Street Studios - "Pick the Stars" and "Your Hit Parade". The first was a 30 minute new

talent show, with a compere and a panel of judges. It ran a series of heats, leading up to a final, with cash prizes - no doubt the prototype of our Australian TV "New Faces" in later years. In "Your Hit Parade" a series of popular "hit" recordings were played, while artists in the studio mimed the songs or danced to the music. This was certainly the prototype for the "Hit Parade" which became a favourite in Melbourne in the early years of HSV-7.

Lyle and I walked back to our hotel after the show along Yonge Street with its very attractive shops. When I visited Toronto in 1951 this street was a chasm, excavated for a subway and boarded over. It was good to see the better side of Toronto this time - cold as it was.

The CBC engineers were very helpful and friendly, but rather more formal than their American counterparts. Their approach to TV was very professional, and we regarded their comments about Marconi equipment as a guide to our negotiations with the manufacturers.

We had to rise at 4.30am on Thursday to catch a Trans Canada plane to Ottawa, for a brief stop to inspect a Marconi TV transmitter. We continued on to Montreal that afternoon. The last 17 days of our travels had been spent on the banks of the Great Lakes - Cleveland on Lake Erie, Chicago on Lake Michigan and Toronto on Lake

Ontario, no more than two or three hundred miles apart - but because of our obsession with TV and everything connected with it we had hardly been aware of the proximity of this largest group of inland waters in the world. Well, the Great Lakes flow to the Atlantic via the St. Lawrence River. Montreal was at least going to give us a glimpse of this.

Montreal

The CBC engineers at Montreal, with their command of both French and English, proved to be the most courteous we had met on our travels. We stayed at the delightful Laurentian Hotel in Dominion Square and spent Friday and Monday talking to the CBC about Marconi equipment and studio air conditioning.

On Saturday, after exploring the city, with its charming architecture showing a strong French influence, we went to the Stadium to watch an OB coverage of an ice hockey match between the Canadians and the Boston Bruins.

I spent Sunday writing Christmas cards to my family and friends back home, and walked through falling snow to post them. In the afternoon Lyle and I watched a Christmas parade through the city streets - beautifully decorated floats with Father Christmas and his reindeer sleigh, Jack and the Beanstalk, and many other fairy tale characters - forming a colourful contrast to the snow-clad roofs and leafless trees in the background. Then we

climbed Mount Royal to inspect the TV transmitter now installed there.

Once again I was charmed by the grey squirrels frisking among the leafless birches and elms, with the city spread out below us on the banks of the mighty St Laurence River. As we walked down to the city the multi-coloured lights were coming on in the dusk below.

After tea we saw a French play produced in a 68x63ft CBC studio. They were using three Marconi MkIII cameras, one on a crane dolly and two on Houston Fearless pedestals of the type we had ordered through AWA. These were extremely manoeuvrable, and the cameras could be raised or lowered by one finger.

I posted Ted a summary of the detailed advice we had been given on air conditioning by Mr G.B. Elliot, the CBC mechanical engineer, who had worked with the Carrier Air Conditioning organisation and had many years experience. We caught the night plane to New York, only 340 miles distant, on Monday November 28th.

New York

Lyle's wife Valerie had an aunt who was a permanent guest at an hotel in East 51st Street. Lyle had stayed there for a week in October when he flew to New York from Cleveland to do a special TV course. He had found the

hotel convenient, and so had written to Valerie's aunt and asked her to book a room for us.

We took a taxi from the airport to the city, and I paid the driver whilst Lyle checked our booking at the reception desk. I had no sooner entered the hotel lobby, when the taxi driver burst through the revolving door and strode towards me with an outstretched hand, shouting - "What's dis, boss? What's dis!"

I was somewhat taken aback, and after an attempt to pacify him, I realised that his concern arose from the fact that I had paid him in Canadian money.

Apparently, despite the equality of exchange at that time, Canadian currency was not regarded as legal tender by the taxi drivers of New York. I cashed a travellers cheque at the hotel desk and paid the mollified driver in US dollars.

I was horrified to see the tiny room that Lyle and I were to occupy. The two beds were barely separated, and when you opened the wardrobe door it just cleared the side of the nearest bed. The rate was only \$5 a night for the two of us - absurdly cheap for the USA, even in 1955 - but it certainly looked like it. They had no other room available.

It was too late in the day to do anything about it, but I refused to contemplate two or three weeks intensive

work in such cramped conditions. I persuaded Lyle to look for other accommodation on the morrow.

Next morning we repacked and set off in search of a better and more convenient hotel. Our main centre of activity was to be the RCA Building in the Rockefeller Centre - also in 51st Street but on the West side near the centre of Manhattan.

We enquired at eight hotels in that general vicinity. All were full. Our hopes sank as we met failure after failure. We had to check out of our hotel by 3pm, and at 1pm we found ourselves outside the famous Waldorf Astoria in Park Avenue and 50th. Well, we thought - there's no harm in trying!

Yes, they had a double room vacant, and the cheapest was \$18 a night - a heavy burden on our resources. In desperation we took it, and rushed back to collect our luggage from East 51st. We found that the taxi had to disgorge our bags at a side door, from where it was spirited up to our room. We were going to spend the night in luxury!

We collected some letters from home at the RCA building and that evening Cliff Slaybaugh - then Director of RCA Engineering Products Marketing Department - took us to dinner in the basement restaurant of the Rockefeller Centre, with its plate glass windows looking

into the sunken garden and the ice rink full of skaters in colourful winter garb - a fascinating background to a meal. We returned to his office to talk business.

When we told him where we were staying, he raised his eyebrows and said "Isn't that rather expensive?" We said yes it was, and explained our predicament. Cliff said he would see what he could do about it.

Next morning he rang and told us he had obtained a double room for us at the Abbey Hotel, 151 West 51st Street, only a block away from the Rockefeller Centre. The rate was \$10 a night for the two of us - an excellent compromise. We lost no time in moving our luggage. Maurice Chevalier was performing nightly in the Empire Room at the Waldorf, but we had to cut our cloth to suit our means. We spent the afternoon in discussions with Cliff and dined with him on the 67th floor of the RCA building.

The Abbey was comfortable, convenient and not costly. Lyle's only complaint was that screaming women in the street below kept him awake on the first night. Strange things happen in New York!

We were staggered to learn from RCA that AWA had not yet obtained dollars to import to Australia the rotatable mounting, the camera pedestals, the lighting pantographs and a sideband analyser which were approved by HWT on

June 28th and ordered from AWA on July 7th. AWA had not written to RCA ordering these items until November 7th - a delay of four months! The AWA letter to RCA ordered also a second rotatable mounting and a second sideband analyser, no doubt for delivery to ATN-7 in Sydney.

RCA also advised us that they had supplied some Vidicon camera chains and special effects mixers to Marconis, but no multiplexers, slide projectors or Telops which we required to use with the Vidicons - nor had these items been ordered from them by Marconis, despite the fact that they were included in our original order through AWA.

Accordingly I sent a radiogram to Ted Allen on November 30th, advising of these deficiencies and asking him to "please pursue AWA vigorously". I sent another radiogram to Marconis querying the position regarding the multiplexers, etc. They wired back on December 5th stating -

"Orders placed with RCA Photophone London. Unfortunately import licence not yet to hand and therefore no order placed in USA"

In the light of our insistence on adherence to delivery targets in placing our order with AWA, these delays were unpardonable. It seemed obvious that Marconis were reluctant to order equipment from RCA - their American rivals. They probably hoped to be able to develop as much as possible themselves, if this could be done within the time available. Maybe that was why AWA

decided to order the rotatable mounting and camera pedestals, etc. direct from RCA in November, instead of through Marconis. The situation was most unsatisfactory. We could have done better by applying for dollars and ordering directly ourselves, as we had with the Raytheon equipment. RCA were very critical of the delays.

On the evening of Thursday December 1st I booked a phone call to Ted Allen. I first dictated to Lyle what I wanted to say in answer to two letters from Ted collected from RCA, so that I had it in note form. We spread our drawings of the studio buildings out on our hotel beds for easy reference. Ted had a tape recorder to record my incoming comments, and fortunately reception was good. Ted had arranged for Phyll to be in his office and speak to me at the end of our technical conversation. This was marvellous, especially as (due to the 15 hours time difference) it was 11am in Melbourne on Friday December 2nd - Phyll's birthday! Norm Stuckey took a photo of her as she talked to me.

Ted said the phone call "was indeed worthwhile" - it enabled him to attend to quite a number of outstanding questions. It cost me \$52.80 including tax - very expensive for 1955 and more than the cost of five nights accommodation for us. I wrote a confirmatory letter to Ted before retiring.

Next day we visited Century Lighting, manufacturers of studio lighting equipment, WRCA television studios, and the NBC kinescope installation in the RCA Building. They had RCA and GPL kinescope recording equipment, and considered the GPL system to be "amazingly reliable". We obtained details of their sensitometric controls and the film stock used. They provided recording services for other TV studios in New York, including WOR-TV and WPIX.

That evening Lyle and I took a break and went to see the musical "The Pajama Game" at St James Theatre in West 48th Street - a welcome change from TV work. We enjoyed it thoroughly, especially the eccentric dance routine, "Steam Heat".

Saturday was Lyle's final working day in New York. We took a 90 minute train journey to the Telechrome factory and spent the day inspecting test equipment. Back in the city, I helped Lyle finish some last minute shopping, then we worked in our room till 3am.

Lyle packed on Sunday morning and I moved to a single room at \$6.30.

We had proposed to view Manhattan from the top of the Empire State Building, but it was too foggy, so we discussed tactics for our further investigations in Britain. Lyle was to look at prices and specifications

for English film projectors for comparison, and Mole Richardson lighting equipment, pending my arrival later.

Lyle had purchased a pigskin bag, shaped like a gothic window end-on when closed, which held considerably more than an attache case. He had this filled with accumulated technical papers, catalogues, etc. I accompanied him to the Idlewild Airport to catch his 5pm plane to London. The fog was still heavy and departures were delayed. At 6pm we began to understand how the airport got its name. The passengers were idle and becoming increasingly wild. We had plenty of time to look around. One picture was firmly engraved on my mind. Three little piccaninny tots, about five years old and obviously triplets, sitting side by side on a seat with big white bows on top of their jet black curls. They looked like a Norman Rockwell painting on the cover of a Saturday Evening Post. I wished I had a colour film in my camera.

Drinks were served, and 30 minutes later all passengers were driven to Forest Hills Inn for dinner as guests of BOAC. I joined the party, without any questions being asked. It was near the Forest Hill Tennis Courts, where Australia had recently won the Davis Cup. When Lyle checked out at the airport they accepted his pigskin bag as allowable hand baggage. I decided to follow his example. His plane eventually took off at 9.30pm and I returned to Manhattan by the airways bus.

Next day I took a train to Pleasantville, 28 miles north, to see the General Precision Laboratories. I spent the day discussing their kinescope recording equipment with Joseph W. Belcher. This was the beginning of two very hectic weeks on my own. Lyle and I had worked as a team - I generally asked the questions, and Lyle wrote down the answers in rough note form; so I could concentrate on the discussion. Then we worked together afterwards, to draft the notes in detail. It was far more difficult to keep my notes up to date, working solo.

In that week I visited Kliegl (manufacturers of TV lighting equipment), Reevesound (manufacturers of magnetic sound recorders), the CBS design section in Madison Avenue, the CBS kinerecording section in Vanderbilt Avenue, the WPIX News division, and topped the week watching a TV drama produced at NBC studios.

At CBS I met Howard Chinn, Chief Engineer and author of the famous "Television Engineering" text book. We lunched together after a very informative discussion on Vidicons in telecine operations. He gave me concise and practical advice on studio lighting for Image Orthicon cameras, and the basic requirements for studio crew intercommunication. I obtained further information on film recording procedure and sensitometric control from Mr Mac Ilvain at the CBS kinerecording section.

The WPIX News division, run by "The Daily News", was very impressive. They produced a daily 30 minute news service at 7pm and latenight news after a sports telecast, and claimed the largest TV news audience in New York. Their news studio used two cameras fitted with teleprompters.

New York had a fall of snow on the Tuesday - not enough to coat the pavement, but the flakes drifting down looked delightful. In Fifth Avenue the famous Saks department store had a neon sign on their facade depicting little angels playing harps, and in the garden court below - which led to the Rockefeller Plaza - there were blue angels blowing long trumpets, all fashioned from cane and plastic net. In the Plaza, beside the sunken skating rink, they had erected a real Christmas tree about three stories high. For days this had been surrounded by scaffolding for the workmen decorating it, but now it was finished and on the Friday - with the scaffolding removed - all the lights were turned on by a popular TV personality. Thousands of lights, and multi-coloured plastic balloons with lights inside. Every evening hundreds of people gathered to look at it, and watch the ice-skating below.

RCA were very cooperative. They helped me make contacts and appointments and installed a 24" monochrome TV receiver in my hotel room. They also gave me the services of a stenographer to help catch up on my

correspondence. This gave problems with pronunciation, especially with the Australian "a's" and "i's", and a letter I dictated to the BBC came back addressed to "Mr M.J. Pulling Esq". Our accent seems to present more of a problem to women than it does to men in the northern hemisphere. I explained, before we started, that I was liable to say tomahtos and banahnas.

Reception on the TV receiver, less than a mile from the Empire State Building, with its multiplicity of TV transmitting antennae, was marred by reflections from all the tall buildings in Manhattan. By moving the "rabbits ears" receiving antenna around my room I found I could get any number of "ghosts" spread pretty well across the screen. Even with it in the optimum position I still had to watch four images of the "\$64,000 Question" programme, and saw four negros receive \$2000 each for finishing the first stanza of John Masefield's "Sea Fever". Channels 9 and 13 suffered least, but the pictures on channels 2 and 4 looked like a Melbourne bar at 6pm.

I was interested to hear of other Australians visiting New York. I ran into Talbot Duckmanton of the ABC and learned that Lloyd Hadfield was to visit GPL at Pleasantville the day after my visit there.

Technical correspondence between Ted Allen and myself had reached mammoth proportions - our letters were running to 10 to 12 pages, and full of important

information. I spent the best part of three days during that second week in New York writing up notes and answering Ted's letters in my room at the Abbey. The Abbey had a restaurant with an excellent Swedish Smorgasbord - a tempting array of all kinds of wonderful dishes, beautifully arranged - \$3.10 for as much as you liked to eat, which was pretty reasonable for a good meal in New York in 1955. On the Saturday I had lunch with Bill Slocombe of the Australian Trade Commissioner's Office.

On the Sunday I wrote to Ken Owens of Marconi giving him details of our proposed method of synchronizing 16mm magnetic sprocketed tape sound recorders with Bell and Howell 614CBVM film projectors - using synchronous motors and interlocking selsyns. I advised him of my movements and apologised for my pending arrival in London during Christmas week. I sent a copy of this letter to Lyle, giving him my latest news of developments in Melbourne - the transmitter building was commenced on December 5th and studio tower foundations were completed on December 1st. The smaller studio dimensions had been increased to 40x38ft, which was more satisfactory.

My last week in New York was even more hectic. On the Monday I had discussions with Bell and Howell representatives, and met a projector technician who had been responsible for maintaining JAN projectors for several years in the US Navy. He said they gave

excellent service and their only defect had been a tendency for the shuttle to run dry - it required oiling every three days with more or less continuous running. As the 614CBVM projectors were almost identical to the JAN projectors, this augured well for their reliability.

That night I watched a 90 minute TV production of the Tchaikovsky "Sleeping Beauty" Ballet performed by the Sadlers Wells Ballet in the NBC studios at Radio City. Margot Fonteyn danced the Princess, and Beryl Grey was the Lilac Fairy. I was not admitted to the studio, where all the crowned heads of the ballet world were guests, but I watched it on a 25" colour monitor in a viewing room. The colour was delightful, and I thought it was almost as good as seeing it in a theatre.

Philadelphia

Next morning I left by bus for Camden and Philadelphia, 75 miles to the south west in Pennsylvania. I spent a day and a half with Mr L.E. Anderson and other RCA engineers at their factory and development centre, Camden, discussing equipment and performance matters, and stayed overnight at the Walt Whitman Hotel. In the hotel lobby RCA were demonstrating an electronic golf-drive analyser. When you drove your club at a teed-up golf ball before a painted backdrop of a fairway with a green in the distance, spots of light lit up in the painted fairway - showing the trajectory which your ball would have followed if it had been allowed to take-off. It was

attracting a great deal of interest from golfing enthusiasts.

Then on to Philadelphia, just across the Delaware River, to see the WCAU studios, which had been very fully described in "Broadcast News". WCAU I was anxious to see, because its design was the result of an analysis of the best features of all American TV stations in operation prior to 1951, and of sound engineering planning in conjunction with the Austin Company of Cleveland - who were responsible for the design and construction of the building. Built on a 10 acre site, it had three 4800 sq.ft. TV studios, all at ground level and served directly with scenery storage at one end and technical operational areas at the other. John Leitch, Director of Engineering, and George Lewis, Chief Engineer, spent the afternoon and evening with me discussing staffing, salaries, studio lighting, acoustic treatment, control room layout, video switching, Vidicon operation and rack room layout. It was a fitting climax to my US investigations.

Their technician staff numbered 85, and all were given a 60 day trial period on engagement. I was very impressed by the WCAU building and facilities, but not impressed with what little I saw of Philadelphia. It looked sooty and uninteresting. The bus returned me to New York at 12.30am on Thursday.

Thursday was full of frantic last minute contacts. I confirmed that Houston Fearless would supply us, through RCA, with a rotatable mount suitable for a Raytheon 6ft dish microwave receiver - with 60 days delivery ex works if the order was placed within 3 to 4 weeks. RCA would arrange this as soon as they received our order from AWA. It was now five months late. I finished at the NAB studios late that night and rose at 5.30am on Friday to catch the American Airlines plane to Boston, 190 miles to the north east in Massachusetts.

Boston

My destination was the Raytheon factory at Waltham, nine miles west of the city of Boston. Boston looked bright and clean, with a beautiful boulevard along the banks of the winding Charles River - which reminded me of our River Yarra boulevard. Boston is the city of Harvard University and the famous Massachusetts Institute of Technology. They row their inter-university races on the River Charles.

I spent all day with Edward Alpert, the Raytheon Applications Engineer, and Thomas J. Kelly, Director of Licensing. Ted Allen had sent me details of the cable lengths required between microwave terminals and the dishes on the studio dish room, the studio tower, and the transmitter dish room and other necessary information for our Raytheon order. Our dishes were to be 4ft in diameter except for the 6ft one on the rotatable mount

atop the studio tower - to give best reception from remote OB's. Ted had applied to the ABCB for frequency allocations. The studio tower steelwork was due to commence on December 12th.

We discussed propagation, RF Channel widths, intermediate frequencies, recommended test equipment and desirable spares. Raytheon gave me copies of their microwave link instruction book and relevant drawings of mountings. They strongly advised provision of spare klystron tubes and desired early notification of allocated frequencies to permit correct klystron manufacture.

When I told Mr Kelly I would leave New York for London on Sunday, he asked if I had obtained a taxation clearance. I said, "No, I didn't think I needed one - I hadn't earned any money during my stay in the USA." He said a clearance would still be required, and this could be obtained from the appropriate US department in Boston, but I would have to quote my passport number - and being Friday, the department would be closed the following day.

I had left my passport in the top drawer of my dressing table at the Abbey Hotel. We rang the Hotel and asked them to find it and give me the number. Mr Kelly rang the departmental office in Boston and told them I would be coming to obtain a taxation clearance forthwith. He drove me to the city through peak-hour traffic and

many traffic jams. We arrived 10 minutes after closing time, but the taxation officer had waited for us. I quoted my passport number, signed the necessary declaration and received the taxation clearance with a sigh of relief.

I bade farewell to Mr Kelly, thanking him for his courtesy and cooperation. I felt that without his help I would have had to postpone my departure for London.

Before leaving Boston I had dinner with a Mr J.B. Walsh, who had come down from Montreal to meet me. In the previous May he had written to the HWT applying for a position with us, and Keith Cairns had advised him that either Lyle or I would contact him in Montreal - but he had been away when we visited there. Jack Walsh was an Australian engineer who had been in England and Canada for six years, and was about to return to Melbourne. We did not engage him, but he joined AWA and for a time assisted in the installation of our TV transmitter at Mount Dandenong.

The 11pm plane back to New York was full of Harvard students going on Christmas vacation - a happy load. We flew to La Guardia Airport.

I found a cable from Keith Cairns waiting for me at the Abbey. The revised plans and estimates for our studio building had been submitted to the HWT Board on

Wednesday, based on our discussions with the WEWS personnel at Cleveland - and economies in cost and construction time were being demanded. The cable suggested deletion of a new floor proposed for scenery construction, above the scenery storage area, deletion of a proposed OB garage at the rear of the cottage in Wells Street, deletion of a proposed new floor above telecine and a new toilet block at the north end of the first floor, but worst of all - limitation of the smaller studio dimensions to a size originally envisaged.

I cabled a reply next day, stating -

"Imperative observe principle build to permit expansion without interruption service. Subsequent building operations directly above operating areas intolerable -- original width studio two universally considered impractical useful operation."

I said I would ring Ted Allen when I arrived in Chelmsford, England, and asked for the call to be taped. Overseas phone calls were far less common in 1955 than they are today, and far less satisfactory. Intelligibility was often a matter of chance, and a tape recording permitted subsequent analysis. This was my first setback in planning the HSV studios. The most important item involved was the retention of the larger size for studio 2. The other deletions did not seriously affect technical operations. They could come later with some inconvenience. I resolved to discuss them with Lyle before ringing from Chelmsford.

Ted managed to get agreement for the retention of the larger size for studio 2, but the other deletions were directed by Mr Williams.

Saturday was a day of relative relaxation. I sent parcels of papers back to Melbourne, but those I would need in Britain were still voluminous, so I purchased a pigskin bag like the one Lyle took with him, and filled it. I did some shopping for my family.

In the evening I went to a 10pm session at Radio City Music Hall - their Christmas show. The first half was live entertainment, telling the Christmas story in tableaux - the shepherds and their flocks, the procession to Bethlehem, and the Nativity scene. Then a chorus of angels, followed by Santa Claus and a variety programme - all very well produced. After the interval they showed the film "Kismet", with Ann Blyth and music from Borodin's themes.

I packed on Sunday December 18th and left for the airport at 3pm. The BOAC clerk insisted on weighing my carefully packed pigskin bag, much to my disgust. It amounted to 8kg of excess baggage, for which the charge was \$32. I had only \$10 in US notes and \$10 in US travellers cheques, plus some Canadian travellers cheques, which they didn't choose to accept. There was no love lost between American and Canadian personnel. So

they told me I could pay in sterling when I arrived in London - and marked the baggage labels COD.

Then, when I passed through the immigration check-out, they didn't even look at the taxation clearance which had given me so much worry at Boston!

In the USA and Canada I had accumulated over 160 pages of manuscript notes and diagrams, and filled my brain with images of what a commercial TV station should be, how it should work and how it should be staffed. But although I had visited more cities, I had seen less of this wonderful New World than I had in 1951. The people were warm and friendly, and generous with their advice. I hoped that the other half of my second time around would offer a little more opportunity to enjoy the Old World, before returning home.