HERITAGE COUNCIL OF WESTERN AUSTRALIA

REGISTER OF HERITAGE PLACES - ASSESSMENT DOCUMENTATION

11. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE

The criteria adopted by the Heritage Council in November 1996 have been used to determine the cultural heritage significance of the place.

11. 1 AESTHETIC VALUE*

OTC Satellite Earth Station (fmr) has landmark value as a distinctive part of the Brown's Range landscape and is a prominent focal point to the area east of the Carnarvon township. (Criterion 1.3)

The 1960s buildings and structures that comprise *OTC Satellite Earth Station (fmr)* form a precinct that is identifiable as a satellite earth station. (Criterion 1.4)

11. 2. HISTORIC VALUE

OTC Satellite Earth Station (fmr) is of exceptional historic significance as the first satellite earth station constructed in Australia. (Criterion 2.1)

OTC Satellite Earth Station (fmr) is significant for its association with the creation of INTELSAT in August 1964, reflecting Australia's involvement in the establishment of the global communications system (INTELSAT). (Criterion 2.2)

OTC Satellite Earth Station (fmr) is significant for its association with a number of NASA's space projects, including the Apollo project which successfully landed the first men on the moon in July 1969. (Criterion 2.2)

OTC Satellite Earth Station(fmr) is associated with the first live telecasts between Australian and an overseas country. (Criterion 2.2)

OTC Satellite Earth Station (fmr) is closely associated with the work of OTC, INTELSAT, NASA and ESA organisations. (Criterion 2.3)

OTC Satellite Earth Station (fmr) is associated with the technical innovation and achievement of creating a global communications system. (Criterion 2.4)

11. 3. SCIENTIFIC VALUE

OTC Satellite Earth Station (fmr) holds international significance as a research and teaching site for its ability to illustrate the principal characteristics of the earth stations erected to create a global communications system by 1968. Elements of particular importance include the Cassegrain fed folded horn antenna and the larger OTC parabolic dish. (Criterion 3.1 & 3.2)

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* For consistency, all references to architectural style are taken from Apperly, Richard; Irving, Robert; and Reynolds, Peter *A pictorial Guide to Identifying Australian Architecture: Styles and Terms from 1788 to the Present*, Angus & Robertson, North Ryde, 1989.

OTC Satellite Earth Station (fmr) is significant as an example of technical and innovative advancements in global communications in the 1960s. (Criterion 3.3)

11. 4. SOCIAL VALUE

OTC Satellite Earth Station (fmr) holds significant social value to the Carnarvon community as a site of international importance at which many people from the town were employed. (Criteria 4.1 & 4.2)

12. DEGREE OF SIGNIFICANCE

12. 1. RARITY

OTC Satellite Earth Station (fmr) contains a collection of structures that are rare and uncommon in Australia. The place was the first earth station built in Australia by the Overseas Telecommunications Commission and was one of only eight satellite earth stations in the world which carried out the function called Tracking, Telemetry, Command and Monitoring (TTC&M). (Criteria 5.1 & 5.2)

12. 2. REPRESENTATIVENESS

OTC Satellite Earth Station (fmr) is characteristic of satellite earth stations located around the world. (Criterion 6.1)

12. 3. CONDITION

The majority of the technical buildings associated with *OTC Satellite Earth Station (fmr)* are in poor condition. Reconstruction of the parabolic dish's concrete support structure has been undertaken in recent times, to eradicate concrete 'cancer'. In recent times, however, the steel structure above the support structure has been severely affected by fire. The cradle and dish appear to be in sound condition. The houses associated with the place are in good condition.

Maintenance needs are considerable due to the hostile environment and continued vandalism of the place. A maintenance management program needs to be developed. Improved security of the place may be required to prevent further damage to the structure resulting from vandalism.

12. 4. INTEGRITY

OTC Satellite Earth Station (fmr) has a moderate degree of integrity. With the removal of technical equipment, the place cannot reflect former methods of operation. The current use of the residential quarters as private residences is a compatible use. The structures and buildings associated with the place can be restored over a long period of time to sustain the values identified. Although the central tripod has been removed from the large parabolic dish (main antenna), the structure's integrity is maintained. The Quarters are still in use as residences. The Observatory is used by Birmingham University.

12. 5. AUTHENTICITY

Overall, *OTC Satellite Earth Station (fmr)* is largely intact and retains a moderate degree of authenticity. Changes that have occurred over time are relatively minor in consequence to the original site layout of the place, although it is obvious significant technical equipment has been removed from

the various structures. Changes to the residential quarters were typical of alterations to housing in the period and demonstrate evolution of use, and the authenticity of the residences has been only marginally diminished.

13. SUPPORTING EVIDENCE

The documentary evidence has been compiled by Kristy Bizzaca, HCWA staff. Some Documentary Evidence has also been compiled by Roger Hobbs of the Australian Heritage Commission. The physical evidence has been compiled by John Taylor Architect.

13. 1. DOCUMENTARY EVIDENCE

OTC Satellite Earth Station (fmr) is located on Brown's Range, a sandy ridge of 15-30m elevation close to and east of the Carnarvon township, and some 5km north from the former NASA Tracking Station (also referred to as Carnarvon Tracking Station). *OTC Satellite Earth Station (fmr)* was established on Brown's Range in 1966 to support the National Aeronautics and Space Administration (NASA) Tracking Station constructed at Carnarvon in 1964.

The NASA Tracking Station was built to support the Gemini space program and replaced the Muchea Tracking Station, which had been used during the Mercury missions..1. This was the second of five such tracking stations established in Australia for the manned space programs and for scientific satellites. The other stations were located at Island Lagoon (1960) in South Australia and at Tidbinbilla, Orroral and Honeysuckle Creek in the Australian Capital Territory.2 In January 1964, the station went into operation tracking and plotting the first few hours of Ranger VI's flight to the moon. The NASA Tracking Station was officially opened in June 1964.3

On 20 August 1964, fourteen countries, including Australia, signed two agreements to form an international telecommunications satellite consortium (INTELSAT). The objective of the first agreement was to establish a global communications system by 1968. Later, a second agreement was signed to outline the financial, technical, operating and contracting principles relating to the operation of the global system.4

The Interim Communications Satellite Committee (ICSC) was established as a result of the first agreement to form a global network. The ICSC administered the space segment of the global system and was represented by members of the participating nations. The Overseas Telecommunications Commission (OTC) was Australia's representative on the committee.5

OTC was constituted by the Overseas Telecommunications Act of 1946. At the time, it was responsible for 'the establishment, maintenance and operation of commercial telecommunication services between Australia and other countries, with ships at sea, and to and between Australia's external countries'.6

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1 'The Space Connection', Souvenir Brochure for 25th Anniversary, 1994, p. 2. Carnarvon was chosen as the site for the tracking station after an investigation into various places in Western Australian and the Northern Territory indicated that it would provide the most suitable location.

2 ibid., p. 2.

3 ibid., pp. 2-3.

4 OTC, 'Australia's first satellite communications earth station, Carnarvon, WA', OTC, 1967, p. 2.

5 ibid., p. 2.

6 ibid., p. 1.

In April 1965, INTELSAT 1, the world's first internationally owned commercial communications satellite, was launched from Cape Kennedy. As a part of the program it was decided that, in addition to the Atlantic satellite, a Pacific satellite would enable an earth station to communicate with North America, Japan and other East Asian countries.[7]

In that same year, NASA's Apollo moon landing project proposed a communications satellite network in which two satellites would be launched into orbit. One of these satellites would be above the Pacific Ocean, and the other above the Atlantic and Indian Oceans. A network of satellite earth stations was also needed to work in conjunction with these satellites. Earth stations, with their complex electronic equipment, transmitted and received communication to and from satellites simultaneously. The locations of the six earth stations were: Carnarvon; Paumalu, Hawaii; Brewster Flat, Washington State; Ascension Island, Britain; Grand Canary Island, Spain; and, Andover, Maine. Carnarvon, Paumalu and Brewster Flat were built to serve the Pacific region.[8].

The Carnarvon location was decided upon primarily because of the presence of the NASA Tracking Station. Subsequently, the earth station was designed to provide a direct communications link between Australia and the USA as part of the space projects administered by NASA.[9] Its capabilities included 'circuits for voice between ground controllers in Australia and the United States as well as teleprinter links and data circuits between these points.'[10]

In December 1965, OTC General Manager A. E. Shepherd announced that approximately £2 million would be spent on the construction of the Carnarvon facility.[11] *OTC Satellite Earth Station (fmr)* was opened in late 1966.[12] The site initially comprised of three air-conditioned vans (an operations van, a maintenance van and a power van), an administration building, a powerhouse, 12 staff houses, and a 12.8m Cassegrain fed folded horn antenna (Casshorn). Land cables connected the earth station to the NASA Tracking Station.[13]

The satellite equipment and facilities for *OTC Satellite Earth Station (fmr)* were supplied by Page Communications Engineers Inc., of the United States. Geraldton Building Co. Pty. Ltd. constructed the administration building, the powerhouse and the 12 staff houses for OTC.[14]

OTC Satellite Earth Station (fmr) was the first of four earth stations constructed in Australia by OTC. A second earth station was opened at Moree in NSW in 1967/1968. The earth stations were all owned and operated by the company.[15]

On 26 October 1966, the first INTELSAT II satellite was launched from Cape Kennedy, Florida. An agreement secured by Australia allowed our television stations to use the first two days of the satellite's life free of charge. The ABC made arrangements with the BBC to tape one of its programs at Carnarvon and then distribute it Australia wide. In return, the ABC agreed to tape

7 ibid., p. 3.
8 ibid., p. 4.
9 ibid., pp. 4-5.
10 *The West Australian*, 21 December 1965.
11 ibid.
12 OTC, op. cit., p. 9.
13 ibid.
14 ibid., p. 12.
15 ibid., p. 15.

interviews with British immigrants for the BBC.[16] Unfortunately the satellite failed to sustain its orbit and these plans never reached fruition.

On the afternoons of 24 and 25 November 1966, the satellite became 'covisible' to the earth station at Carnarvon and an earth station at Goohilly Downs, Cornwall, England. Test patterns were transmitted on 24 November 1966 and on 25 November 1966 the first live telecasts occurred between Australia and an overseas country.[17]

TVW7 Perth sent a prerecorded news program to English commercial station I.T.V. The highlight of the direct telecast was an ABC/BBC program which reunited British immigrants living in Carnarvon with their relatives who had been brought into the BBC studios. Commentators Kim Corcoran and Peter Pockley also interviewed other Carnarvon residents and talked about the history of the place.[18]

An operating and technical agreement granted OTC licence to process satellite transmissions in Australia. NASA's information was sent from the tracking station to *OTC Satellite Earth Station (fmr)* and from there through the dishes to NASA's base in Houston, Texas. *OTC Satellite Earth Station (fmr)* and the NASA Tracking Station were involved in the Apollo series which operated from October 1968 to December 1972. These missions resulted in the first manned lunar landing in July 1969, as well as the establishment of an Automated Lunar Scientific Experiment Package (ALSEP) in 1972.[19]

In May 1973, the two facilities were also involved in the launch of Skylab, the first US Earth-orbiting space laboratory. The Skylab project resulted in man's longest space flight to date. Other collaborative projects included the launch of Surveyor 3, an unmanned landing on the moon, and various interplanetary probes such as the Mariner series to Venus and Mars (1967-1973) and the Pioneer series to Jupiter (1972-1973).[20]

In December 1968, OTC announced that it would establish a second satellite station at Carnarvon (on the same site) at a cost of $3 million. The construction tender was let to Mitsubishi (Aust.) Pty. Ltd. to supply and install a new antenna worth $1,070,512. Sumitomo Sheji (Aust.) Pty. Ltd. was awarded the contract to supply and install the microwave and multiflex equipment worth $890,829.[21]

A further $600,000 was spent upgrading the earth station to fulfil a new function called Tracking, Telemetry, Command and Monitioring (TTC&M). This involved the collection of signals beamed to them by satellites in orbit over the Indian and Pacific Oceans. *OTC Satellite Earth Station (fmr)* tracked the satellites during the launch and while they were in service. [22]

OTC Satellite Earth Station (fmr) was one of eight such stations located around the world which could perform the TTC&M function.

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16 *The West Australian,* 25 October 1966.
17 OTC, op. cit., p. 13.
18 ibid., p. 13; *Australian Women's Weekly*, 14 December 1966, in 'The Space Connection', op. cit., pp. 12 & 13.
19 'The Space Connection', op. cit., p. 16.
20 ibid.
21 *The West Australian,* 3 December 1968.
22 ibid.; From 'Back Page Story', c.1980, information supplied to the National Trust by Cecily Miller.

In 1969, OTC was awarded a contract to perform the TTC&M function. OTC estimated that the contract would net Australia $500,000 to $600,000 annually. It was believed that the upgraded facility would 'provide the basic capacity to handle the demand for telecommunication probably into the 21st century.'[23]

At this stage, *OTC Satellite Earth Station (fmr)* comprised two antennae, each performing a different function. While the Casshorn antenna monitored the performance of satellites, the larger 29.6 metre parabolic dish constructed in 1969 handled internal communication via the INTELSAT Pacific Ocean Satellite. The smaller dish was used to control the functions of satellites including drift, spin rate, battery voltage and a host of other technical measurements. The larger dish concentrated on transmitting and receiving commercial telecommunications such as telex and television.[24]

It was most likely during the 1969 upgrade of the earth station that semi-transportable structures were replaced with more permanent structures. The twelve staff houses were increased to twenty five and single mens quarters were erected adjacent to the administration building. The complex also featured its own water supply reservoir and a tennis court.

In 1979/1980, several contracts were awarded to OTC for *OTC Satellite Earth Station (fmr).* One of these was a $4 million contract awarded by INTELSAT ending in 1984.[25] The second was a five year contract awarded by the European Space Agency (ESA) for the installation, maintenance and operation of VHF launch support facilities. This involved the construction of an ESA dish antenna, 15 metres in diameter, and the erection of two smaller antennae. The ESA antenna played an instrumental role in the 1985/1986 space mission to intercept Halley's Comet. The role of *OTC Satellite Earth Station (fmr)* was to track the Giotto satellite from its launch on 2 July 1985 up to its interception of Halley's Comet.[26]

Although OTC's contracts at Carnarvon were still in process, by the early 1980s the company had already begun to discuss the closure of *OTC Satellite Earth Station (fmr)* in favour of its new earth station at Ceduna. The Ceduna site had been chosen to be 'Australia's western gateway to the Indian Ocean region satellite system for international public telecommunications traffic'.[27] The advantages of this site over Carnarvon meant that the operations of *OTC Satellite Earth Station (fmr)* would be scaled down, no longer warranting the 42 staff that had been employed at the station.[28]

In 1983, it was reported that *OTC Satellite Earth Station (fmr)* would lose its contract for TTC&M by the end of 1984. Besides this, the contract with the European Space Agency concluded at the end of 1985 and the ABC were transferring its services to another station in 1985. As a result, it was decided that all services provided at *OTC Satellite Earth Station (fmr)* would be phased out and transferred to the Ceduna earth station.[29]

OTC Satellite Earth Station (fmr) closed in 1987. During its last year of operation the station's responsibilities included: prime responsibility for controlling the Giotto Probe; launch support for the fourth ESA mission; the German Television and communications satellites; launch support for the

23 *The West Australian*, 3 December 1968.
24 'The Space Connection', op. cit., p. 10.
25 From 'Back Page Story', c.1980, information supplied to the National Trust by Cecily Miller.
26 'The Space Connection', op. cit., pp. 14 & 15.
27 *North Western Times*, 5 July 1980.
28 ibid.
29 *The West Australian*, 23 February 1983.

Indian Space Agency's first space shuttle; assistance with the launch and orbital parking of Meteorsat from Africa; guiding the Marecs spacecraft; and, assistance for marine observation aircraft from Japan and mapping the world's tides and the perimeter of the land masses.[30]

In 1987, the 36 hectares of Gascoyne Location 272 owned by OTC was transferred to joint owners David Lisman, James Booker, Henry 'Roy' Young and Rodney Young.[31]

By 1989, an astronomical observatory had been constructed at the northern end of the site. It is thought that this has been erected on the base of what was the Telemetry Antenna Support (1969). The observatory is leased by Birmingham University, UK[32].

In 1994, ownership of the portion of Gascoyne Location 272 was transferred to Roy Young and Rodney Young.[33] In the mid 1990s, plans were made to develop the major part of the site as a residential area. The staff houses and single men's quarters became privately owned residential properties. That land which was not purchased as private residences was transferred to Boddee Pty. Ltd., of which Roy Young is a Director.[34]

In 1996, Boddee Pty. Ltd. donated Lot 40 of Gascoyne Location 272 to the Shire of Carnarvon as part of Amendment 23 to Town Planning Scheme No.10. This lot is the location of much of the functional part of *OTC Satellite Earth Station (fmr)* with its operational and technical structures. Boddee Pty. Ltd. retained the remainder of the land.[35]

In 1996, the Department of Commerce and Trade provided $25,000 through the Regional Initiatives Fund for the upgrade of *OTC Satellite Earth Station (fmr)* as a tourist site. The project was completed in conjunction with the Shire of Carnarvon and, as a part of the project, several interpretive displays were installed.[36]

Although the astronomical observatory is located on the land held by the Shire it may be moved to another site. The former administration building is potentially separated from the interpretive areas. The boundary between the land owned by the Shire and privately held land actually passes through the north-eastern corner of the building.[37].

In September 1998, a planning amendment to the boundary line that runs through the administration building was proposed to exclude the building from the council owned part of the overall OTC site. In June 1999, the issue is still in the process of being resolved.[38]

On 13 September 1998, the 29.6 metre parabolic dish was damaged by fire resulting in substantial damage to the workroom located below the dish.[39]

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30 'The Space Connection', op. cit., p. 16.
31 Certificate of Title, Vol. 1337, Fol. 824; Certificate of Title, Vol. 1765, Fol. 007.
32 'Satellite Earth Station Carnarvon, Landscape Concept Plan', prepared by Blackwell and Associates for the Shire of Carnarvon.
33 Certificate of Title, Vol. 1918, Fol. 258.
34 ibid.
35 Certificate of Title, Vol. 2073, Fol. 882; Certificate of Title, Vol. 2073, Fol. 883.
36 *The West Australian*, 9 July 1996; 'Satellite Earth Station Carnarvon, Landscape Concept Plan', prepared by Blackwell and Associates for the Shire of Carnarvon.
37 Personal communication with Cecily Miller, 25 September 1998.
38 P0472; Conversation with Peter Brooks, Shire of Carnarvon, 20 July 1999.
39 *The West Australian*, 16 September 1998.

In 1998/1999, the Shire of Carnarvon called for Expressions of Interest for the purchase/leasing of the 'OTC Dish Site – Tourist Precinct'. In July 1999, Gascoyne Historical Society is the custodian of the place.[40]

13. 2 PHYSICAL EVIDENCE

Carnarvon is a coastal town located at the mouth of the Gascoyne River in the Gascoyne Region of Western Australia. *OTC Satellite Earth Station (fmr)* is located on Brown's Range, a sandy ridge of 15-30m elevation close to and east of the Carnarvon township, and some 5km north from the former NASA space tracking station. The facility is now the subject of two land tenure titles which separate the key features of *OTC Satellite Earth Station (fmr)* from those areas of the former site which may be developed for housing. The site is accessed from the North West Coastal Highway via Mahoney Avenue.

Elements and features of the former overall site include the staff quarters, single men's quarters, recreation building and facilities, administration control building, workshop, powerhouse and fuel shed, antennae and reflectors, and the observatory. The site owned by the Shire of Carnarvon includes the 12.8m Casse horn antenna, 29.6m parabolic dish antenna, workshop, powerhouse and fuel shed, and a portion of the administration control building.

(B) Single men's quarters (1 building off Mahoney Avenue)

The single mens quarters are located to the west of the parabolic dish antenna. Access to the building is off Mahoney Avenue. The building is rectilinear in plan-form and is covered by a low pitched roof. A carport is situated on the south side of the building, the roof of the carport is perpendicular to the building.

(C) Recreation building including swimming pool, tennis court and playground

The recreation building and facilities are located to the south-west of the parabolic dish antenna. Access to the building and facilities is off Mahoney Avenue. The recreation building is rectilinear in plan-form and is covered by a low pitched roof. The facilities include a swimming pool, tennis courts and playground. These facilities are currently in a state of disrepair. A verandah is situated on the northern side of the building looking across to the swimming pool. Water reservoir tanks are located to the south-west of the recreation building. These tanks supply water to the former staff quarters located on Craggs Court.

(D) Administration control building

The administration control building is located to the north-west of the parabolic dish antenna and west of the powerhouse and workshop. Access to the building is off Mahoney Avenue. The current boundary line of the Shire of Carnarvon owned OTC site runs through the northern portion of the building. The building is clad in square profiled asbestos sheets. The L-shape plan-form of the building is covered by two low pitched roofs. A skillion roof covers the main entry on the west side of the building. The administration control building is privately occupied and internal access was not permitted at the time of inspection.

40 Correspondence on HCWA file P0472.

(E) Workshop

The workshop is located to the north-west of the parabolic dish antenna and south of the powerhouse. Access to the building is off Mahoney Avenue. The rectilinear building is covered by a 'flat' roof. Like the administration building the workshop is clad in square profiled asbestos sheet.

(F) Powerhouse and fuel shed

The powerhouse and fuel shed are located to the north-west of the parabolic dish antenna and north of the workshop. Access to the buildings is off Mahoney Avenue. The powerhouse is of a similar construction to the administration control building and workshop. The powerhouse is covered by a low pitched roof. A large opening in the east elevation of the powerhouse provides access to a short length of rail/track.

The fuel shed is located to the north-east of the powerhouse. It is small rectilinear building covered by a low pitched roof.

(G) Cassegrain fed folded horn antenna (Casshorn), 12.8m across and 16.5m high (1966)

The Casshorn antenna is located to the north-west of the parabolic dish antenna and north of the administration control building. The structure is accessed via a bitumen road off Mahoney Avenue. The reflector dish is a characteristic concave circular dish, and smaller than the main antenna. The steel support structure of the reflector is built upon a hexagonal concrete plinth/base. Cable-ties fixed to the top of the reflector are tied back to concrete block anchors in the ground to prevent movement or damage to the structure under wind loads. A concrete stair on the south side of the reflector provides access to the top of the concrete plinth and to the motor/machine room in the base of the support structure. A steel stair on the east side of the support structure provides access to a platform and the control room/box. The fabric of the support structure appears to be in sound condition. Corrosion is evident in some portions of the structure, although aluminium panels on the reflector are in good condition.

(H) Parabolic dish antenna, 29.6m (1969)

The large parabolic dish antenna is located off Mahoney Avenue. The antenna is supported by a large conical reinforced concrete base. A room with some (former NASA) equipment stored within is situated within the concrete support base. Entry to this space is through timber double doors located on the north side. The opening is protected by steel mesh security doors.

Signage above the doors reads:

> SATELLITE EARTH STATION CARNARVON
> THE OVERSEAS TELECOMUNICATIONS COMMISSION (AUSTRALIA)

A concrete stair on the outside of the antenna support structure provides access to an intermediate platform. A steel-framed lift shaft on the east side of the structure is hung from the steel framework above. The intermediate concrete platform continues around the perimeter of the support base, a steel-framed stair on the east side provides access to the steel support structure of the parabolic dish.

Access to the upper support structure, machine rooms, workroom, platforms and cradle is restricted and temporary security measures have been incorporated in an attempt to prevent further vandalism of the place. Motor / machine rooms are located within the cradle, these spaces are in poor condition. One of the spaces contains a small motor which is used to rotate the parabolic dish to its upright position, the motor itself is in good condition and is operable. During the cyclone season the dish is fixed in an upturned / horizontal position.

Extensive fire damage is evident to the upper support structure. Much of the steel framework around the upper platforms and the workroom has buckled under the intense heat and other surfaces have blistered and pealed. Generally the structure of the cradle, titling mechanism and the dish itself appear to be in good condition. Corrosion of the steel balustrade around the upper platforms is advanced and evident in most of the rails and posts.

(I) ESA dish antenna base, 15m (1980)

The base of the former ESA antenna is located to the north-east of the parabolic dish antenna. The 15m dish and equipment have been removed from the structure. The square plan form of the base is of concrete construction, a small room is located within the base.

(J) Telemetry Antenna Support and equipment shelter

The small observatory located to north-west of the parabolic dish antenna is leased by Birmingham University. The observatory is accessed via a bitumen road off Mahoney Avenue. The structure appears to be located on the former telemetry antenna support site. The walls of the observatory are clad in corrugated iron sheet and the domed roof is clad in segmented metal sheet.

(K) Telecommand equipment shelter

The equipment shelter situated in the northern most portion of the former OTC site is located to the north-west of the parabolic dish antenna. Access to the shelter is via a bitumen road off Mahoney Avenue. The structure is of concrete construction, equipment has been removed and the shelter is in a state of disrepair.

Overall the buildings, structures and site of *OTC Satellite Earth Station (fmr)* are in poor condition. Although, most of the former staff quarters located on Craggs Court appear to have been well maintained, the condition of the remaining buildings at *OTC Satellite Earth Station (fmr)* have deteriorated, due primarily to neglect and / or vandalism.

(A) Staff quarters (25 houses on Craggs Court)

The associated 25 single-storey houses, comprising the former Staff Quarters, have not been included in the curtilage for the place, as they are in individual, private ownership. They are not included in the proposed Tourist Precinct.

13. 3 COMPARATIVE INFORMATION

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13. 4 REFERENCES

Australian Heritage Commission Data Sheet (Database No: 101390).

National Trust Built Environment Form (Fiona Bush), in progress.

'The Space Connection', Souvenir Brochure for 25th Anniversary, 1994.

OTC, 'Australia's first satellite communications earth station, Carnarvon, WA', OTC, 1967.

13. 5 FURTHER RESEARCH
