

## PUBLIC VISITS

Welcome address - Guides. NOTE: The following notes are for your information and should be put into your own words.

### BEFORE ENTERING BUILDING AND BEGINNING TOUR :

Good afternoon ladies and gentlemen, welcome to Honeysuckle Creek Tracking Station on behalf of the Station Director and staff. My name is ..... and I will be your guide for your tour today.

Your tour today will cover only the broadest outline of our work, but if any among you have a detailed technical interest in any of the things you see, we will make available technical staff to answer your questions. We would request however, that you endeavour to keep up with the party.

Please keep children under close observation as the areas we will be entering are cramped and the equipment you will see has high voltages of power running through them. Also this equipment is very delicate and can easily be damaged.

We regret that no photos may be taken in the building, however please feel free to take photos of the ground and buildings.

### RUN DOWN ON THE MSFN :

Honeysuckle is one of three stations in the ACT - all are owned and paid for in entirety by NASA (National Aeronautical & Space Administration) supervised by Dept. of Supply and run by Australian private enterprise. In this case STC.

The three stations are Orroval Valley (85ft site) an earth orbital site, doing up to 35 separate passes in one 24 hour period, it is manned 24 hours a day 7 days a week.

Tidbinbilla (85ft site) is a Deep space communications centre (DSCC) tracking deep space missions, Mariners to Mars and Venus. It has been specially modified to assist this site in its manned missions. Tidbinbilla act as a backup and also is of assistance when the CSM is separated from the LEM.

HONEYSUCKLE is a prime site in the MSFN. There is only three prime sites in the world, the other two sites are Goldstone in California USA and Madrid Spain. Goldstone and Madrid both have a backup site close by. During a manned space flight, one of the three prime sites (ie HSK, MAD or GDS) will have acquisition of the spacecraft - we carry out handover procedures from one to the other. Honeysuckle track only manned space flights or ALSEP (Apollo Lunar Surface Experimental Packages).

We have recently completed the much publicised Apollo 13 mission (Odyssey CSM, Aquarius LEM). The station is now in preparation for Apollo 14 which has a scheduled launch date in January 1971. The Commander on Apollo 14 will be Alan Shepard (First American into space) IMP is Edgar Mitchell and the CSMP is Stuart Roosa. Apollo 14 will be landing in the lunar ranges in an area known as FRA MAURO - the chosen landing site for Apollo 13.

If you have any questions, please do not hesitate to ask.

(The explosion onboard Apollo 13 is believed to have been caused a failure of stirring fan in number 2 Cryogenic Oxygen Tank).

MOVE INTO BUILDING :

1. Explain the functions of Lunar Excursion module (LEM) and the map of launch to splashdown.
2. Explain the photos along the walls.
3. Test Equipment :- explain its function.

Total value of 460 items is \$3,500,000

Value of one oscilloscope is \$2,000 - there are 22 on station

Value of synthesizer & driver = \$15,375 - there 4 on station

All items are calibrated at periods which vary for 3 to 18 months.

The equipment can be checked to any voltage from .000001 (microvolts) to 15,000 volts to four decimal places. It can also check frequency from 1 cycle to 3,000,000,000 cycles 3,000 mega cycles to  $\pm$  1 cycle.

All standards are checked by NASA calibration team against NASA standards every 6 months.

4. USE Explain the functions of the Simulation console. This is to help simulate any mission - they have Astronauts etc.

SDDS Data demodulators, all signals come through this. It brings in TV, Biomed etc.

TIMING There are three main timing systems. The prime is the Cesium clock, then the Rubidium clock and the last - a crystal clock. The clock is accurate to 1.5 secs in every 1,000 years. We keep a Frequency chart which shows comparison with USA standard at all times.

APP : Antenna Position Programmer - computer which commands the antenna on a paper tape of predicted position to an accuracy of approx 0.01 of a degree.

SERVO : The antenna can be driven three ways, APP, Real time by computer and manually by the ball and switches.

Receiver/Exciter : 2 Exciters control 2 P.A. (Power Amplifiers) which transmit to the spacecraft (LM and CSM), 20 Kilowatts of power can be fed into the antenna by each P.A. if required.

Ranging : Measures distance to  $\pm$  1 foot within the unit and  $\pm$  15 yards with whole system in a distance of 430,000 miles, or Twice the distance to the moon.

5. TIM :

Recorders : Uses magnetic tape, this stores spacecraft information temporarily before it is transmitted to the states. Each tape is capable of storing 800 bit words in 1 inch of tape. (Tape is 1" wide and there are 14 tracks on the tape.

SCAN Converter : For on site Television which we send back to USA. VR 660 records TV and monitor colour TV and commercial quick scan TV. There are only 3 in the world, it also converts slow scan TV to commercial TV standards. It can be used for internal testing - has TV generator on site, station voice, astronauts voice, and Houston voice.

PLSS Portable Life Support System - monitors medical data when the Astronauts wear the back packs to walk on the moon. (Oxygen, heat, pressure etc).

DECOMS TIM signal go through the decoms where they convert serial pulse code modulation data to a parallel computer word format this is done by an internal computer program in each decom. Some of the parameters received on decom are stripped out for on site monitoring on brush recorders and sent on separate line to Houston.

## 6. COMPUTERS

UDB - Up Data Buffers - sends signal to spacecraft and checks it is correct and gets a signal from spacecraft to say it has entered their computer correctly before sending next signal.

PCC : Periferal Communications Computer - gives external equipment a means of entering the computers.

642B Computer : - COMMAND - gives commands to the spacecraft.

EMU COMPUTER : Expanded Memory Unit - for the 2 computers.

642B Computer : TIM - both 642B's are interchangeable.

1218 Computer : Get 29 pointer messages from America and processes it to point the antenna - APP commands.

I/O Console Input/Output where they get information in and out of the computer.

## 7. OPS CONSOLE

Section which controls station configuration and internal station count down to spacecraft contact. Controls flow of voice and data between S/C, the station and Houston.

Indicators giving equipment organisation and operation state and meters giving receive signal strength both on ground and in S/C.

Controls for station count down clocks and to control Telemetry leaving station and commands going to S/C.

Controls for S/C voice remoting to Houston and routing of Houston voice to either S/C.

In emergency commands can be sent from console to S/C and also voice contact to C/C can be made.

During Apollo flights we normally have 3 voice conference loops on which all stations around the world are on these loops and normally contact between these stations is done by the console.

8. COMMS CENTER : Teletype facility, operating 24 hours a day 7 days a week. Teletype traffic is computer switched at Canberra (Deakin) switching center. Computers are programmed to recognise addresses and automatically routes the traffic to its destination.

#### VOICE FACILITIES

There are 6 voice data circuits to Canberra (Deakin) which has access to all other stations in the Network. The main switching center for voice is located at Goddard, Washington DC.

The most modern method of communication used on this station is known as high speed data. Information is passed at 2.4 kilobits per second between USA and this site. It is mainly used for computer commanding and telemetry.

9. WIRE ROOM

Contains all the equipment necessary to interphase the station with the outside world. It contains thousands of relays and cables. During the missions Houston Control speaks directly to the S/C by way of these relays and other air to ground equipment.

- 10 POWER HOUSE

Power house generates all the power for the station. It has 7 diesel generators, with a total output of 2,700 kilowatts. Enough power to supply a town of 2,000 people. The power house consumes on an average of 300 gallons of fuel a day.

All machines run during missions but for normal station use only 2 machines are used.

- 11 WATER TOWER

30,000 gallons supply - pumped from a bore 200 feet down in the bed of Honeysuckle Creek, capacity of bore, 2,000 gallons per hour.

- 12 COLLIMATION TOWER

4,463 feet above mean sea level and it acts as a check point for our antenna, and it is used to simulate spacecraft signals.

- 13 MICROWAVE TOWERS

In front of building, transmits and up on Dead Mans Hill. The microwave link enables us to interface directly to Tidbinbilla.