DEPARTMENT OF DEFENCE

MINUTE PAPER

f1.

REFERENCE:

SUBJECT: PLANS FOR FUTURE COMPUTER INSTALLATIONS IN SM SPACES, FIRST FLOOR, UTILITIES BLOCK

SE
ADA
AG
AF

Through: SM
ADS

For Info: SMO
ADD

This minute lists the computer equipment scheduled for acquisition in the period covered by the current FYDP. Rough estimates are given of power, air-cooling and chilled water requirements, and of the space needed for computer equipment and power-generation machinery. Please draw this information to the attention of all staff involved in funding, planning and maintaining the building and its services.

1983/84: STOCKPOT

2. This is the data staging computer proposed as a replacement for MUNGI, with enhanced capabilities to allow termination of all data links for the next decade. Investigations to date have indicated the need for very fast communication to allow timely transmission of data to processes on LIBRETTO. The necessary speed is unlikely to be achieved by anything other than a direct channel connection, or by sharing disks. STOCKPOT will therefore need to be located in room 1-67, within the length limitations of this type of connection.

3. The equipment is likely to be a mini-computer with some degree of duplication to maintain availability. Power and cooling requirements will probably be about double those of the PRIME recently installed in Q space, ie:

Power: 18 KVA 240V 50 Hz single phase
Heat to air: 40,000 BTU/hour

4. Prior to installation of STOCKPOT re-arrangement of some partitioning in SMO area will be needed. Further changes will be needed for a LIBRETTO upgrade in 1984/85, and to rationalise SMO office areas in the smaller space remaining. The total requirement will be to dismantle and in some cases re-erect up to 100 ft of partitioning (25 modules). To avoid later disruption this work should be scheduled during 1982/83.

1984/85: LIBRETTO Upgrade

5. An upgrade is planned to accommodate an anticipated increase in processing load and to maintain and improve availability. This will probably take the form of a second IBM processor and some extra peripheral equipment, to be installed in part of what is now the distribution area in 1-67. This configuration requires a separate source of 400 hz power,

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installed within a limited distance from the processor controller. It is suggested that a silenced unit of the Piller type be installed in part of what is now the Punch Room. Alterations to the Punch Room should take into account requirements for project LOBSTER (see below). Site requirements are likely to be:

In 1-67

Power:	20 KVA 400Hz (ex separate unit) 16 KVA 50/60Hz
Heat to air:	44,000 BTU/hour
Air flow:	104 m^3/min
Heat to water:	48,500 BTU/hour
Chilled water: (within the (to range of (	30 litres (6.6 gals)/min at 15°C 15 " (3.3 gals)/min at 4°C

In Punch Room (figures based on IBM 3089)

Heat to air:	17,500 BTU/hour
Air flow:	11.5 m^3/min

6. In order to allow access for large equipment an additional double door will be required from the corridor alongside the pigeonholes.

1984/85 Removal of 3400

7. The removal of all 3400 and 160A equipments will reduce the site requirements in 1-67 as follows:

Power:	10.375 KVA 400Hz 64 KVA 50Hz
Heat to air:	226,300 BTU/hour

8. Following removal of 3400 etc the printer enclosure in room 1-67 should be removed to allow better use of available space.

1985/1986: Project LOBSTER

9. Although this computer will eventually take all CH processing load from the CYBER 175 both machines will have to be accommodated for several years. There are two likely contenders, a large CYBER or a small CRAY. Since CH chief requirement is the ability to run FOLKLORE and support IMP programs, the choice will depend upon an assessment of future trends in collaborating agencies. This assessment is unlikely to be completed before end 1982. In order that it can be considered in this assessment, ADA advice of the cost of each alternative is sought by 1 September 1982.

CRAY

10. A likely configuration of the models currently available would fit (just) into the space vacated by the 3400 etc, with some minor movement of IBM peripherals. However, its specialised refrigerant piping requires a raised floor clearance of at least 12 inches (the present raised floor has a clearance of less than 9 inches). An area of 48 ft x 26 ft would need to be raised, with ramps for access capable of withstanding loads from heavy equipment. Some equipment requires reinforcing of the flooring due to concentrated floor loading. During installation access routes must support rolling casters with 1700 pound (771 kg) loads and a total weight for the largest unit of 4,350 pounds (1,977 kg).

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11. The refrigeration condensing units required are noisy and should not be installed in the computer room. A solid partition would be required to block off an area 25 feet long in the far corner of 1-67 (cols 44-47, rows 0-12 of drawing SK 448//0). This space could be subject to heat loading of up to 17,500 BTU/Hz. 4r ?

12. Two 150 KVA, 400Hz Motor Generator Sets would be needed, each with a control cabinet. The CRAY-supplied units are suitable only for a plant room environment. If for space reasons these have to be installed in the ex Punch Room extensive sound proofing would be required or quieter units substituted. Space should be reserved for a third unit to allow for a future upgrade. The heat loading of two units at maximum output is 200,000 BTU/Hz. Hr. ?

13. The chilled water requirement of a CRAY varies with temperature as follows:

°C	gpm	
27	89	
21	56	
16	42	16°C is recommended
10	33	
4	28	

14. CRAY maintenance staff require approximately 150 sq ft of office space and 150 sq ft of workshop space. This could be supplied by removing partitions in 1-83, and moving the IBM office/documentation store to what is now the duty punch lobby (1-66). The workshop must accommodate a Module Test Station with a heat load of 4,400 BTU/hour.

15. The heat loading of CRAY equipment within 1-67 could be up to 120,000 BTU/hour.

CYBER 875 (or later model)

16. Preliminary information on the latest CYBER (875) indicates that its power requirements are comparatively modest, and could probably be satisfied by an 80 KVA 400Hz generator of the silent Piller type installed in the Punch Room (without extensive sound proofing).

17. A chilled water unit is required in addition to a 10-ton and a 5-ton condenser. It appears that separate chilled water supplies are required, as the inlet temperature ranges do not overlap. They are:

10-ton Condenser	°C	US gpm	
	26.7	12	
	21.1	9.3	
	15.6	7.6	

5-10 Condenser	°C	US gpm	
	27	7	
	21	4.8	
	16	3.8	

Chilled water unit	°C	US gpm	
	4.4	8	
	7.2	14	7.2°C recommended
	10.0	18	

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18. Room heat loading of the CYBER equipment installed in room 1-67 would be up to 169,000 BTU/hour.

Summary

19. Heat load variations (BTU/hour) in 1-67

1983/84	+ 40,000	STOCKPOT
1984/85	+ 44,000	LIBRETTO upgrade
1984/85	-226,300	3400 removed
1985/86	+169,000	CYBER
or	+137,500	CRAY

20. Chilled water variations

1983/84	nil	
1984/85	6.6 gpm at 15°C	LIBRETTO upgrade
1985/86	11.4 gpm at 16°C)	CYBER
and	14 gpm at 7.2°C }	
or	42 gpm at 16°C	CRAY

SMT

12 July 1982