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TO GCHQ

INFO AUSLO

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~~CONFIDENTIAL COMINT CHANNELS~~ SECTION 1 OF 2

CITE: SM-012-84

REFERENCES: A. GCHQ MSG DTG 191534Z APR 84
B. GCHQ MSG DTG 231328Z APR 84

1. PLEASE PASS FOLLOWING TO / CRAY RESEARCH LTD.
A. REMOTE ACCESS

2. INTEND PROCEEDING WITH REMOTE ACCESS PLAN AND WILL
FROM LOCAL TECHWAY
OFFICE.

3. RELEVANT MANUALS, COMPUTER SERVICES NEWSLETTER ETC ARRIVAL
1 JUNE 84.

4. PRESUME REQUIREMENT FROM OUR PTT (LOCALLY KNOWN AS TELECOM)
IS FOR A 300 OR 1200 BAUD ASYNCHRONOUS HALF DUPLEX DATEL
CONNECTION AND MODEM WITH DATELPHONE FOR CONTROL PURPOSES.
HOWEVER, REF 8 PARA 3 INDICATES YOU HAVE ALSO MADE ENQUIRIES
WITH TELECOM. PLEASE FORWARD ANY ADDITIONAL INFORMATION YOU MAY
HAVE.

B. SITE PLANNING

5. SINCE YOUR LAST VISIT, HAVE GAINED PARTICIPATION OF A
DSO ENGINEER ON THE POWER/FILTERING/TEMPEST
RELATED ISSUES. INVESTIGATIONS HAVE SHOWN THAT WE HAVE BEEN
UNIFORMLY SUCCESSFUL WITH ISOLATION AND FILTERING OF POWER
AND CONTROL WIRING TO ALL OTHER COMPUTERS CURRENTLY INSTALLED
IN THE SHIELDED COMPUTER AREA, WHICH INCREASES OUR DESIRE
TO MAINTAIN THE SAME LEVEL OF PROTECTION IF A CRAY WAS INSTALLED.
THE POSSIBLY UNIQUE FEATURE OF THE CRAY REQUIREMENT APPEARS TO
BE THE METHOD OF VOLTAGE REGULATION.

EXAMINED

6. THE FOLLOWING PARAS 7 TO 16 ARE PROVIDED BY NOEL MURPHY FOR YOUR CONSIDERATION:

Declassified by ASD - 04/02/2022
Information removed for national security and/or personal sensitivities

TEMPEST FILTERING OF 400HZ POWER/CONTROL LINES.
FOR Q9 - PLEASE PASS TO OF CRAY RESEARCH UK.

7. FURTHER CONSIDERATION OF THE FILTER PROBLEM SINCE THE VISIT HERE OF YOURSELF AND MESSRS LEADS US TO CONCLUDE THAT OUR UNDERSTANDING TO DATE HAS BEEN INCORRECT.

8. REFERENCES IN MESSAGES BY TO (QUOTE) VOLTAGE REGULATION LINES (UNQUOTE) WE HAVE TAKEN TO MEAN THE FEEDBACK OF A 400HZ VOLTAGE SAMPLE FOR PURPOSES OF AUTOMATIC VOLTAGE REGULATION. THIS APPEARED LOGICAL SINCE THE FUNCTION INVOLVES A FEEDBACK LOOP AND LOOP STABILITY COULD BE IMPAIRED BY INTERFERENCE WITH ITS PHASE AND/OR GAIN MARGINS BY THE ADDITION OF FILTERS.

9. DISCUSSIONS SINCE YOUR VISIT AND THOROUGH REVIEW OF ALL TRAFFIC NOW SUGGESTS THAT HIS INTENDED MEANING OF THIS TERM IS THE CIRCUIT LINKING THE MANUAL VOLTAGE ADJUSTMENT RHEOSTAT TO THE MG SET WHICH IS STATED TO CARRY 8-12 VOLTS DC. THE CIRCUIT CARRYING 400HZ AC HAS BEEN SEPARATELY IDENTIFIED BY THE TERM (QUOTE) REMOTE SENSE LINES (UNQUOTE).

10. IF PARA 9 IS CORRECT, IT MEANS THAT THE MANUAL VOLTAGE ADJUSTMENT RHEOSTAT LINES CONSTITUTE THE CIRCUIT CONSIDERED TO HAVE A PROBLEM IF FILTERED. REQUEST YOUR CONFIRMATION.

IF THIS IS SO, WE NOW SEE TWO AREAS WHERE ADDITIONAL INFORMATION IS NECESSARY IF WE ARE TO ACHIEVE OUR GOAL OF A PROFESSIONALLY EXECUTED TEMPEST INSTALLATION.

11. THE FIRST IS THE MANUAL VOLTAGE ADJUSTMENT RHEOSTAT LINES. DESCRIBED AS CARRYING DC ONLY, AND BEING AN OPEN LOOP CONTROL FUNCTION IT IS NOT CLEAR TO US WHY THE REACTIVE IMPEDANCES OF A FILTER WOULD CAUSE A PROBLEM, AND THE FILTER'S DC RESISTANCE IS LIKELY TO BE A MINOR FRACTION ONLY OF THE RHEOSTAT RESISTANCE. WE HAVE HAD A CONTROL CIRCUIT OF THIS TYPE IN SERVICE IN OUR CYBER SYSTEM FOR 5 YEARS WITH NO PROBLEM ARISING FROM THE FILTERS IN THE LINES.

12. THE SECOND AREA IS THAT OF 400HZ VOLTAGE FEEDBACK. ACCORDING TO OUR NEW UNDERSTANDING YOU DO NOT CONSIDER THIS LINE TO OFFER A FILTERING PROBLEM YET IT IS PART OF A CLOSED LOOP SYSTEM INTO WHICH WE PROPOSE TO INTRODUCE NOT ONE BUT TWO FILTERS (THE FILTERS IN THE SUPPLY LINES ARE ALSO IN SERIES WITHIN THE FEEDBACK LOOP). OUR CHECKS ON A SAMPLE FILTER HERE WITH RESISTIVE LOADING DISCLOSE FILTER PHASE SHIFT BUT THE DEGREE OF SHIFT IN THE REAL INSTALLATION WILL CLEARLY BE MUCH AFFECTED BY THE SIZE AND PHASE ANGLE OF THE LOAD CONNECTED TO THE FILTER OUTPUT TERMINALS. WE BELIEVE IT WOULD BE FOOLHARDY TO PROCEED UNTIL A DETAILED ANALYSIS OF THE LOOP'S GAIN AND PHASE MARGINS IN THE PRESENCE OF BOTH SETS OF FILTERS IS DONE.