AGENDA

EQUIPMENT BOARD MEETING

MEETING NO. 1-67

DATE: 5 April 1967

TIME: 1400

PLACE: OC Conference Room - 2D03 Headquarters Building

OLD BUSINESS

None

NEW BUSINESS

25X1A

(a) Recommendation for the expansion of [redacted] Crystal Processing Facility

(b) Recommendation for the procurement of a small general purpose computer for use in OC-E.

25X1A

(c) The design and fabrication of a special purpose machine similar to the [redacted] 25X1A Proposal)

25X1A

(d) The design and fabrication of one applique unit. [redacted] 25X1A [redacted] Proposal)

(e) Standardization of Delta Model HFAS-9 High Frequency Antenna System

Recommendation for the Expansion of [redacted] Crystal Processing Facility. 25X1A

1. RECOMMENDATION:

It is recommended that [redacted] crystal processing capabilities 25X1A
be expanded. The information in the attached memorandum ref. TSB 66-208, dated 18 April 1966 remains valid and the total cost for expansion of the [redacted] crystal facility is approximately $100,000. It should be 25X1A
noted that this expansion will result in improved delivery time but no great financial savings, although some savings will be realized. Timing, installation and training can be treated as separate subjects once the determination has been made to initiate the project.

2. RISK:

The financial risk involved is slight. If for any reason it is determined at a later date to close the [redacted] facility, all equipments 25X1A
and crystal stock could be returned to Headquarters Crystal Laboratory. The following fiscal year forecast for [redacted] Technical Section could 25X1A
show a lessening of money requirements directly proportional to the monetary value of equipment and crystal stock returned for Headquarters use.

3. SCOPE OF OPERATION:

FY 66 indicates that [redacted] were less than 20 per cent of 25X1A
the total of the [redacted] Crystal lab's business. Through January of 25X1A
FY 67 these same areas have been approximately 50 per cent of the 25X1A
[redacted] Crystal Lab's business. Of this 50 per cent approximately 39 per cent of the crystals could have been made in the field under the recommended increased capabilities. It should be noted that these percentage figures reflect the increase in activity in Vietnam and are subject to sudden change both upward and downward. In addition, the FY 67 figures do not show our heaviest months for crystal orders which are usually in May and June.

The area of customer responsibility of the proposed facility could be increased or decreased dependent upon workload. Areas could be added to or taken away as needed, thus giving much more flexibility to the Agency crystal processing system as a whole. Also, as mentioned previously, the whole operation could be scrapped and not cause excessive financial loss or personnel problems.

SECRET

4. ADDITIONAL BENEFITS:

There would be a reduction of work load at [redacted] Crystal Lab 25X1A which would allow for the following:

a. Larger individual orders to be processed at [redacted] 25X1A and not procured from vendors, thus decreasing delivery time.

b. Faster order turnover.

c. Flexibility of one lab helping another on large orders with short delivery dates.

5. PERSONNEL:

In order to put this facility into operation one staff employee will be needed for a period of two years. He would be trained at [redacted] Crystal 25X1A Lab for a period of four months to become familiar with processing in general and the vacuum deposition system in particular. It is proposed 25X1A that an [redacted] contract employee take over the supervisors job after a year or two thus releasing the staff employee for other duty. The staff employee selected need not be a technician, a diligent CT/R could do the job. A six month training program for local personnel will be required prior to the crystal facility becoming operational .

6. COST SAVING PER CRYSTAL:

25X1A

Crystal type	[redacted]		Purchase
CR-18	1.18 (blank) .73 (labor) .20 (material) 2.11	1.18 (blank) .10 (labor) .20 (material) 1.48	2.70
CR-78	2.37	1.74	3.15
CR-81	2.41	1.78	3.75
CR-52	3.10	2.47	3.25

There would be an approximate $6,000 savings for every 10,000 crystals made 25X1A by the area. This saving will be continuous and recurring for as long as the [redacted] facility remains in business.

7. CRYSTAL BANK COST ESTIMATE INITIAL INVENTORY:

CR-78	20,000	units	@ 1.44	$28,800.00
CR-18	30,000	units	@1.30	39,000.00
CR-81	6,200	units	@ 1.48	9,176.00
CR-52	6,200	units	@ 2.20	13,640.00
			TOTAL	$ 90,616.00

8. EQUIPMENT ESTIMATE:

*Vacuum Plater	$6,070.00
Counter and Plug-in	
Impedance Meter	
Vacuum Pump	
Cold Trap	
Shipping Cartons	1,200.00
Scales	150.00
*Soldering Block	50.00
Assorted Crystal Mounts	1,000.00
Wire, Paste, Flux, etc.	300.00
Cans for crystals	600.00
*Can-hole punch	100.00
Number Stamper	250.00
Cabinets for storage, 15 ea.	1,500.00
TOTAL	$11,220.00

25X1A

*To be fabricated by [redacted]

9. TOTAL COST:

Grand total (7) and (8) $101,836.00

The overall price ultimately would be dependent upon low bid for stock crystals. Estimates used in this report were from recent bid prices with the exception of the CR-52.

10. RECURRING CHARGES:

Crystal blank re-supply (Using 10,000 crystal per year @ nominalized price of $1.50 ea.)	$15,000

*Liquid Nitrogen, per year	1,800
Labor, 3 people per year	1,680
TOTAL	$18,480

25X1A

*Verify availability [redacted]

Additionally, the lab must have compressed air available. Plant overhead was not costed or included.

11. ADDITIONAL MANHOURS:

TSB is capable of ordering all equipment needed and initiating the order for crystal bids. The vacuum deposition system would have to be fabricated as would some minor items. Total expenditure of [redacted] manhours would be approximately 250. 25X1A

12. SUMMARY:

25X1A

It is recommended that the [redacted] crystal facility be expanded. The initial costing is approximately $100,000 but the financial risk is low due to full utilization of stock and equipments should the proposed lab be required to close down. The main advantage in having this facility is in the time saved from request to the receipt of order. 25X1A There is an additional advantage in that labor costs are less by making the crystals at [redacted] in lieu of Headquarters.

the same initial investment yields a system that can be re-configured in a few man hours without modification of hardware. If calculations are based on evaluating ten different devices, the expected savings using a computerized approach will exceed $20,000.

4. One obvious solution would be to gain access to an existing Agency computer having the characteristics required for our application. A quick check has disclosed that DDS&T/ORD has such a computer, a Linc 8, on the fifth floor of Ames Building.

5. If this line of action is followed, our time requirements in the next year would be estimated at 800 hours. Included in this estimate are several periods of 40 hours of continuous run time for reliability evaluations. The remaining time would be used in increments of one to eight hours between 8:30 to 5:00 during the work week.

6. To prevent interference with other customers using the Linc 8, a special rack would have to be configured to contain our special interfaces. This rack would be cabled and plugged and the Linc 8 I/O bus would be cabled and plugged so that the Linc 8 could be normalized at the end of each run. Cost of this configuration is estimated at $4,000. A minimum of forty square feet of floor space would be required within the computer room to contain the equipment under evaluation along with oscilloscopes and other metering devices.

7. To perform RFI evaluations on these equipments would require removal of the Linc 8 from its shielded enclosure for one or two days at a time. Signal line filters would be installed in the enclosure wall to pass signals in and out of the room. RFI test instrumentation would be moved from the eighth to the fifth floor to conduct these tests.

ATTACHMENT B

RECOMMENDATION FOR THE PROCUREMENT OF A GENERAL PURPOSE COMPUTER FOR USE IN OC-E

1. Within the past year a number of requirements have been levied on OC-E for new "state-of-the-art" communication devices. These requirements include high speed printers, tape readers, punches, and CRT displays. Until recently, engineering action was limited by the lack of availability of these devices. This situation has been corrected by recent DOD contracts and a general awakening to the problem by industry.

2. Therefore, it is now feasible to begin investigating these new devices. However, a secondary problem arises in that these equipments all differ in interface requirements. Among and within each category there are variations in codes, speeds, numbers and types of control lines, and timing and sequencing of signals across the interface.

3. To perform engineering, operational, and COMSEC evaluations of one such device would involve a minimum of $15,000 for test instrumentation and engineering time to set up the laboratory test hardware. To then reconfigure the interface for a new-device would require approximately $3,000 in time and hardware. A less expensive approach is the use of a small, general-purpose computer to simulate the interface via a small program using re-settable parameters to re-configure for each new device tested. Several manufacturers now market small GP computers for under $20,000 which are specifically designed to provide flexible and powerful input-output systems such as this application requires. With this approach,

8. It is apparent from the above that there are many drawbacks to sharing this computer. Delays would certainly occur since the computer would be in use on many occasions when we wanted to use it, and the set-up time for our use would be time consuming and tedious.

9. The alternative solution would be procurement of a small computer for installation in the eighth floor laboratory area. Cost of this procurement would be approximately $20,000 including the special interface. This approach would, however, save considerable time in RFI testing since the computer would be adjacent to a shielded enclosure containing the required RFI instrumentation.

10. After a thorough search of available computers it has been found that the PDP-8, manufactured by the [redacted] is the lowest priced unit which meets the technical requirements of a laboratory test unit for design and checkout of data communications systems. The cost of this computer is about $18,000.

25X1A

11. It is recommended that a PDP-8 computer be procured for OC-E use.

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OC STANDARD EQUIPMENT LIST

EQUIPMENT: Delta Electronics Model HFAS-9, High Frequency Antenna System

PERTINENT INFORMATION:

a. Description:

FREQUENCY RANGE: 3-30 mHz

POWER RATING: 1 KW Average, 2.5 KW Peak

ANTENNA: 35 ft. vertical whip with 8 ea. ground radials and mounting hardware.

INPUT VSWR: 1.5 : 1 or better

INPUT IMPEDANCE: 50 ohms

COUPLING NETWORK EFFICIENCY: 90% or better, 4-30 mHz; 80% or better, 3-4 mHz.

PRE-SET TUNING: Plug in printed circuit card.

DUMMY LOAD: Provisions for connection of external dummy load (dummy load not supplied) which can be switched in and out of transmitter to tuner circuitry. Controlled with switch on front panel of control unit.

CONTROL UNIT: Mounted in 3-1/2" standard [illegible]" rack panel.

COUPLING UNIT: Housed in weather protected aluminum case 23-1/2" X 10-1/2" X 18".

POWER REQUIREMENTS: 105/125 volts, 50-60 Hertz AC, 100 watts.

PRICE: Basic price: $1,297.23 Total price: $1,569.09 includes accessories, excepting antenna and base.

ATTACHMENT E

ACCESSORIES: 3 ea. pre-set cards, 200 ft. of control cable, 2 connectors (one installed), 3 coax cable fittings (RG-8/U), coax switch for dummy load, 35 ft. stainless steel whip (5985-H00-8225) and base (5985-636-8689), Mfg. Premax. 8 ea. ground radials and installation hardware, 10 ft. test cable (control to coupling units).

b. Purpose of Item: To furnish base and field stations with a vertical omnidirectional, transmitting antenna.

c. Replacement: To replace the Technical Materiel Corporation Model ATS-50-2 Antenna Tuning System, FSN 5985-H00-2616.

d. Requirement: To fulfill the need for an omnidirectional transmitting antenna requiring minimum space and a constant input impedance over the entire High Frequency (3-30 mHz) Band.

e. Selection of Suppliers: The Delta Electronics HFAS-9 is more useful than the TMC ATS-50-2. It handles more transmitter power, is affected less by humidity, simpler to tune, has pre-set tuning, includes provision for connecting and controlling external dummy load and maintains a better transmitter to antenna match. Physically, the Delta unit is more ruggedly built than any other tuner heretofore used.

Equipment specifications for the TMC Model ATS-50-2 are listed for comparison with the Delta HFAS-9.

	DELTA HFAS-9	TMC ATS-50-2
FREQUENCY RANGE	3-30 mHz	2-30 mHz
POWER RATING	1 KW Average 2.5 KW Peak	1 KW Average
INPUT VSWR	1.5 : 1 or better	2.5 : 1 or better
INPUT IMPEDANCE	50 ohms	50 ohms
COUPLING NETWORK EFFICIENCY	90% or better at 4-30 mHz 80% or better at 3-4 mHz	80% or better
PRE-SET TUNING	Plug in printed circuit cards.	None available

CONTROL UNIT DIMENSIONS	3-1/2" standard 19" rack panel	7" standard 19" rack panel
COUPLING UNIT DIMENSIONS	23-1/2" X 10-1/2" X 18"	18" X 14-1/4" X 9-3/4"
TOTAL WEIGHT	53 lbs. less cable	63 lbs. less cable
PRICE	Basic price: $1,297.23 (accessories extra)	$1,335.00

f. Cost: The Delta HFAS-9, High Frequency Antenna System is priced at $1,569.09 including optional accessories.

g. Commercial Data: Delivery can be made at the rate of ten units per month with the first units delivered 120 days after receipt of a contract.

APPROVED: 25X1A [redacted]
(Chief, OC-E)