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ACTION	DIRECT REPLY	PREPARE REPLY
APPROVAL	DISPATCH	RECOMMENDATION
COMMENT	FILE	RETURN
CONCURRENCE	INFORMATION	SIGNATURE

Remarks:

Attached is an Administration proposal to release certain materials from the national stockpile. OMB has asked us for comments by March 12th. Would you please let me have any comments you may have by the end of February. Thank you.


Assistant Legislative Counsel

FOLD HERE TO RETURN TO SENDER

FROM: NAME, ADDRESS AND PHONE NO.		DATE
OLC	7D35 HQ	2/14/75
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FORM NO. 1-67

237

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CENTRAL INTELLIGENCE AGENCY

WASHINGTON, D.C. 20505

DD/S&T#553-75

14 FEB 1975

MEMORANDUM FOR: Mr. Robert B. Wright, Director
Office of East-West Trade
Department of State

SUBJECT : Production of Computer Disc Drives in
the USSR and Eastern Europe

REFERENCE : Department of State Memorandum,
dated 30 January 1975, Request for
Assessment of Eurasian Communist
Countries Computer Technical Capability

1. Attached is our response to your request for information on the capabilities of Communist countries to manufacture disc drives and packs. Although we have not been able to resolve the question fully, we hope that the limited information we can offer will be helpful.

2. Additional questions may be directed to [redacted] Office of Economic Research, [redacted] or [redacted] Office of Scientific Intelligence, [redacted], who prepared the attachment.

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[redacted]

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EDWARD W. PROCTOR
Deputy Director for Intelligence

[redacted]

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CARL E. DUCKETT
Deputy Director for Science and Technology

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Attachment:
As stated

[redacted]

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Attachment

Production of Disc Drives and Packs
in the USSR and Eastern Europe

1. According to our information, disc drives of the IBM-2311 type are under development in the USSR, Bulgaria, Czechoslovakia, East Germany, and Poland. Each of these countries has developed and exhibited a prototype disc drive system. Each claims to be "producing" disc drives. With the exception of Bulgaria, we believe that disc drives are still in a developmental stage -- that is, not in production -- in all of these countries. Bulgaria is the only CEMA country that claims to have disc packs in serial production.

2. The case of Bulgaria is complex. The evidence seems convincing that Bulgaria is producing disc drives (and compatible packs) of the IBM-2311 type. Bulgaria has built two modern plants, equipped mostly with Western machinery, at Stara Zagora and Pazardzhik -- specifically for the production of disc drives and disc packs, respectively. According to Bulgarian officials, production has been underway since October 1972 at Stara Zagora and since early 1973 at Pazardzhik. US visitors to these facilities in 1973 observed drives and packs in production. Only Bulgarian disc drives have been observed in use with operational RYAD comp

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3. The current rate of production of disc drives is not known. US visitors to Stara Zagora in 1973 estimated output capacity at about 80-100 drives per month. Actual output (in mid-1973) was estimated to be far below this level. Probably, no more than 500 systems were produced during 1973.

4. All of the disc drives that were produced in Bulgaria in 1973 almost certainly employed Western-made heads. Between June 1972 and December 1973, Bulgaria illegally acquired from a US supplier at least 15,000 completed head units, and additional quantities of other uncompleted disc drive subassemblies. Unspecified quantities of head units and other subassemblies allegedly have been illegally obtained in Western Europe as well. At the Stara Zagora plant, Bulgarian officials have attempted to disguise the foreign origin of the recording heads. US visitors to the plant in 1973 have reported that foreign markings had been filed off.

5. Bulgaria appears to have acquired at least enough heads to produce a minimum of 1500 disc drive systems. If the estimate of output of disc drives in 1973 is reasonably accurate (500 systems), Bulgaria would have had a quantity of heads sufficient to support capacity output of disc drives at Stara Zagora (80-100 per month) during most or all of 1974.

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6. We cannot determine, on the basis of information available to us, whether Bulgaria currently is serially producing disc drive systems using imported heads, heads assembled using imported parts, or purely Bulgarian-made heads. All requests by US visitors to observe disc head production have been denied. There is evidence that Bulgaria has made at least some heads on its own. A US firm acquired three heads in Bulgaria in late 1973 and was told that they were Bulgarian-made and were representative samples. Electrical tests concluded that the heads were suitable for 2311 type disc drives. Visual examination by US experts revealed that the heads could be purely Bulgarian-made but based on Western design features. The acquired heads could have been prototypes.

7. The Performance Subgroup of the CSTAC has estimated that Bulgaria has produced 20,000 of its own heads. Apparently the estimate is based on the observation of serial numbers on acquired Bulgarian heads. The Performance Subgroup has not explained how output was estimated from the serial numbers. In any event, we think it likely that the estimate, if it is accurate, includes a very large number of Western-made heads (see paragraph 4 above).

8. Several Bulgarian disc packs that have been tested have been found to contain defects and to be below acceptable

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Western standards. Further, Bulgarian officials have admitted that pack yields are not satisfactory. Poor quality disc packs would result in unreliable disc systems even if the disc drive itself was of good quality.

9. There is no evidence that disc units equivalent to the more advanced IBM-2314 currently are being produced in the USSR or Eastern Europe. All 2314 type drives that Western observers have seen operating with Communist computers have been of Western origin. Bulgaria and the USSR are known to have 2314 type drives under development, and the Soviets have exhibited a non-working model of a disc drive with claimed 2314 characteristics.

10. Bulgaria and the USSR still have a long way to go before they can hope to produce, serially, double density 2314 or 3330 type disc drives. Bulgarian 2311 type heads will have to be further refined and developed; voice coil actuators will have to be designed and developed (Bulgaria has illegally acquired a small number of Western-made voice coil actuators, probably to aid native development); neither Bulgarian drives nor the prototype Soviet drives that have been observed employ the kind of stabilized base plate design needed for reliable high performance. It is not now evident that either the Bulgarians or the Soviets fully appreciate the base plate requirements. Also, grease seals and other electromechanical

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parts in Soviet drives are of poor quality. Finally, substantial improvement in disc packs, over those that have been examined, would be needed for the development of 2314 and 3330 type disc drives systems.

11. Summarizing, the information available to us supports the view that 2311 type disc drives are in production in Bulgaria. However, we cannot establish that the technology is exclusively Bulgarian, or that Bulgaria does not depend on Western suppliers for components. The continued interest in the purchase of large numbers of Western heads (and other subassemblies), raises strong suspicions that Bulgaria either does not produce its own heads, or does not yet have the capability to manufacture sufficient quantities of critical recording heads of the 2311 type without help.

12. We believe that the USSR, Bulgaria, and other Eastern countries will not have the capability to produce substantial numbers of more advanced type systems -- 2314 and 3330 types -- without Western help, for a few years. These countries can be expected to press for the acquisition of

- a) finished disc units; b) production technology; and
- c) complete computer systems incorporating 2314 and 3330 type disc units. Some design technology and maintenance experience

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could be derived from acquisition of finished disc units; probably, it would not be sufficient to enable these countries to produce disc systems. On the other hand, if finished disc units were acquired in quantity so that priority uses could be satisfied, there would be little need, in the short run at least, for a native production capability. In past approaches to Western firms for the purchase of large quantities of disc units, Communist countries have insisted upon follow-on transfer of disc production technology. The acquisition of a limited number of complete computer systems, with 2314 or 3330 type disc systems tailored for these systems, would minimize the technological gain to East European countries and the possibilities of division of disc systems to unauthorized uses.

CIA/OER/OSI
12 Feb 75

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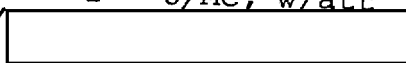
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Distribution: (S-6776)

Orig. & 1 - Mr. Robert B. Wright
Director, EB/ITP/EWT
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(12 February 1975)

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Ref

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Date: 13 Feb 75

TO: Mr. Proctor

FROM: Jack *Jack*

SUBJECT: CIA Response to State Department
Request

STAT I called [] who was able to
answer your questions pertaining to the attached
memo.

- The response to Wright's
request can be passed to
the TACs without any
changes.
- The covering memo can also
go to the TACs who are
cleared for information
classified up to and in-
cluding CONFIDENTIAL.

STAT P.S. Both [] mentioned in the
covering memo, were unavailable for com-
ments. They were at meetings for most
of today.

OK

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Date: 4 February 75

TO: EWP (info D/W/ML/JP)

FROM: Ben

SUBJECT: Request for Review of Study

State is asking Carl Duckett and you to assess ASAP the attached Commerce report on Recommended Export Licensing of Direct Access Storage Devices in Computer Systems Under U.S./COCOM Regulations.

Suggest giving to Ernst for making a direct response.

ask OER to prepare + coordinate response with OSI as usual - then will decide who will sign

(Quickly)

*Ed Done - 2/9/75
Peter Projects
sent*

ACTION

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Next 1 Page(s) In Document Exempt

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REPORT ON
RECOMMENDED EXPORT LICENSING OF DIRECT ACCESS STORAGE DEVICES
IN COMPUTER SYSTEMS UNDER U. S. /COCOM REGULATIONS

23 January 1975

Performance Characteristics and Performance Measurements Subgroup
Computer Systems Technical Advisory Committee
U. S. Department of Commerce
Washington, D. C.

FOREWORD

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At a Computer Systems Technical Advisory Committee meeting of 10 December 1974 held at the U.S. Department of Commerce, Washington, D. C., Henry S. Forrest, outgoing Chairman, Performance Characteristics and Performance Measurements Subgroup, indicated the completion of efforts to assess and recommend methods to measure better central processor performance of computer systems and for export licensing use.

Richard E. Toepfer, incoming Subgroup Chairman, indicated that the next priority work program lay in the measurement and performance areas of peripherals exported as an integral part of computer systems. Of highest priority was immediate consideration of direct access storage devices (DASD).

A DASD work program outline prepared by the Subgroup Chairman dated 27 December 1974 was distributed to Subgroup members by the Department of Commerce. This was followed by Subgroup comment interchange, and an informal meeting of Subgroup members John L. Collins, Dr. S. Fernbach, H. S. Forrest, G. E. Lindamood, R. E. Toepfer, and G. R. Younts was held in San Jose, CA., on 21 January 1975.

The report herein tendered represents the findings, conclusions, and recommendations of that 21 January discussion. For reader convenience, a single manufacturer (IBM) DASD model terminology is utilized; the Subgroup has available and can supply model terminologies of other U.S. computer system manufacturers having DASD units whose export treatment falls under the considerations and recommendations of this report.

H. S. Forrest

R. E. Toepfer
Subgroup Chairman

RECOMMENDED EXPORT LICENSING OF DIRECT ACCESS STORAGE DEVICES
IN COMPUTER SYSTEMS UNDER U. S. /COCOM REGULATIONS

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A typical computer system configuration represents a careful balance of performance between the following functional modules:

1. The central processing unit (CPU) with its memory bus and input/output (I/O) channel rates
2. Main storage (size and speed)
3. Peripheral or "virtual storage" elements; disc; tape or solid state (capacity and speed)
4. Various input/output devices (speed)
5. Data communication channels

Software operating systems coupled with the various utility and application programs also influence the system performance for a given application.

The Performance Subgroup of the Computer System Technical Advisory Committee (CSTAC) has studied the CPU and has arrived at a set of measures comparable to the existing PDR* and BR** which quantify the maximum theoretical performance of a system using a given CPU.

Having arrived at these CPU measures (VAR,VMR) and considering the need for system balance in order to achieve adequate performance, it follows, once a range of central processing units has been approved for export, there is a set of peripherals of matching performance which should be cleared with the given CPU. For the larger high performance processors, the system elements most often in question are disc memories, tape memories and high-speed data communications and graphics terminals. In small or minicomputer based systems, the performance of A/D converters, communication interfaces, graphics terminals and writeable control store elements are of concern.

There is one class of peripherals used with systems for which no export licenses have been issued. These represented by 3333-1 / 3330-1, and 3340 / 3348-type*** direct access storage devices require immediate attention. Yet, these devices are applicable to CPU's which have already been licensed and which span a wide range of performance.

-
- * PDR - Processing Data Rate; Proposed comparable measure - Vector Add Rate (VAR)
** BR - Bus Rate; Proposed comparable measure - Vector Move Rate (VMR)
*** This excludes 3330-Mod 11, 3333 Mod 11, and 3348 F.

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The CSTAC Performance Subgroup has assessed these type devices with respect to:

1. performance, and
2. foreign availability.

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In the area of performance it can be demonstrated that there are drives presently licensable and which will allow comparable performance to a system utilizing these types of drives (See Figure I).

The peripheral devices, licensed since 1971, are no longer manufactured by major U.S. mainframe companies. Therefore, they are not available as part of their system offerings to CEMA markets. In fact, many of the more recent CPU's; i.e., 370/115 and /125, are not designed to allow connection of the older 2314-type peripherals.

The main reason for the evolution to the current state-of-the-art product offerings is the user requirement for greater data storage capacity at lower cost/megabyte (See Figure II).

With respect to foreign availability, CEMA countries are known to have an indigenous capability to manufacture a disc drive comparable to a 2314. Using this drive a RYAD 1050 system can achieve throughput comparable to a 370/145 system using 3330's (See Figure III).

Hence, we conclude that the export of 3330-type disc files on a system should be of no more concern than the export of previously licensed drives of the same net capacity. It should be recognized that this conclusion should not be considered and is not in conflict with findings of the Peripheral TAC.

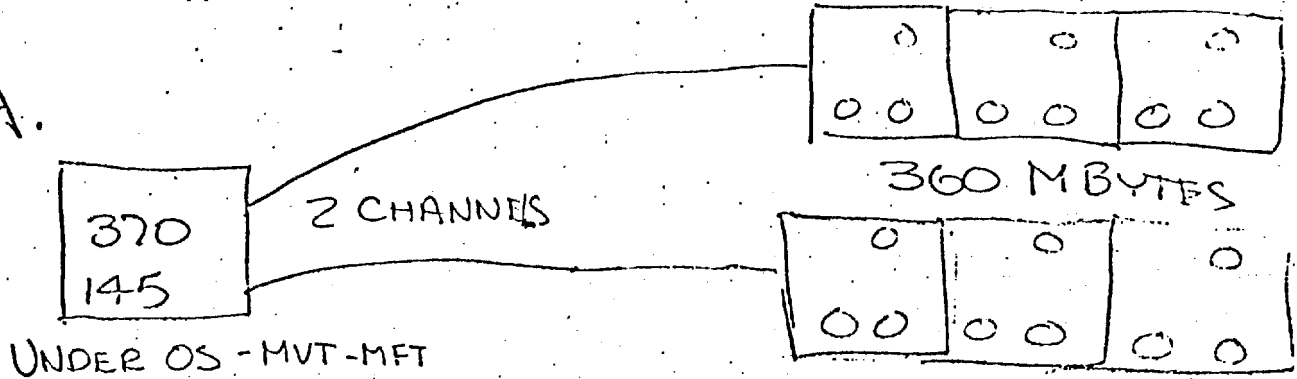
To further amplify this point, observed COMECON disc file technology, now 19 months old, has resulted in a 2311-equivalency manufacturing capability. It is a 6-high pack and has a hydraulic actuator. The heads are manufactured in Bulgaria, Lithuania, and USSR, and they use a 3330-type arm assembly (ramp loader). The read head is narrow gap compared to the (U.S.) 2311-type. It has a stainless steel and ceramic shoe, and the unit is capable of using a density of 4,000 pulses per inch.

Reliability and performance of current production units is of low quality, principally because of the very mixed quality of the employed media. Through better quality control of the media and other manufacturing quality control/quality assurance procedures, an improvement can be expected in unit reliability performance in calendar 1975.

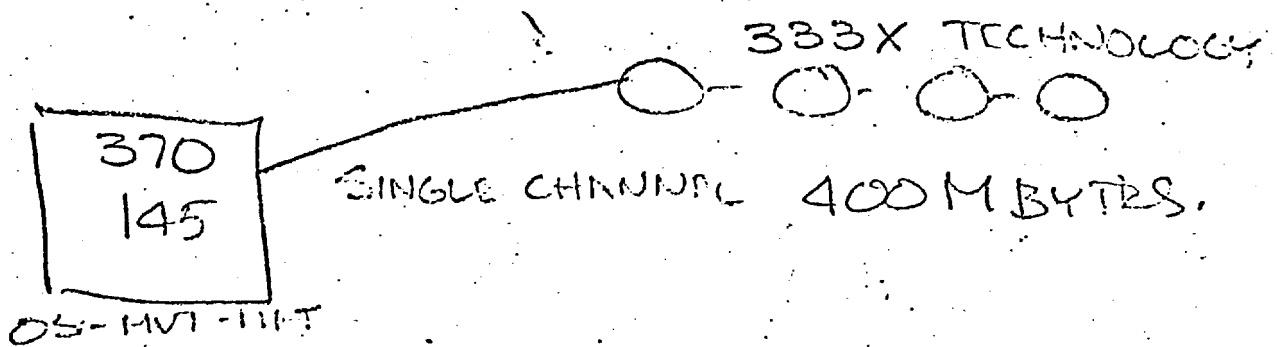
Based on this 19 months' effort, the production of 20,000 heads -- production figure based on head serial number observation -- the technical capability is now present for producing 2314-equivalent units using ceramic heads and with the unit operating using a density of 4,400 pulses per inch.

2314 TYPE TECHNOLOGY

A.



B.



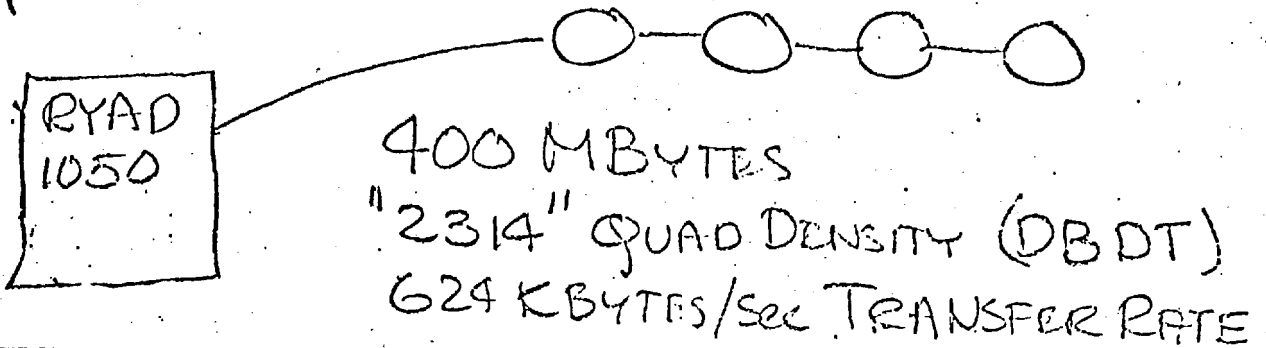
Given:

1. Same data base organization.
2. Same application
3. Same activity rate
4. Absence of disc pack interchange

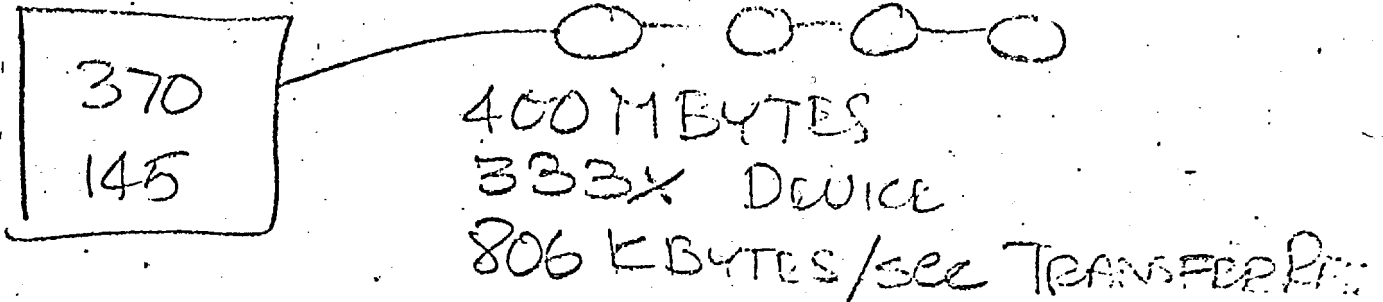
System A above is approximately 10% slower in throughput than System B.

Considering the need to keep track of recoverable errors via a software technique in System A, it is approximately 20% slower than System B whose drives have hardware error check capability.

A.



B.)



Using same conditions as in Figure I plus the fact that the RYAD has parallel hardware consisting of adder plus decision elements, System A is equivalent to System B.

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