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2 October 1975

MEMORANDUM FOR: Chief, Trade Branch, D/U

ATTENTION : Mr. George Schember

SUBJECT : Quartz Crystal Technology in the USSR and Eastern Europe

1. Attached is a brief discussion of Soviet and East European capabilities to produce quartz crystals (Attachment A).

2. Questions concerning the attachments should be addressed to

Office of Economic Research

Attachments:
as stated

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ATTACHMENT A

USSR and Eastern Europe: Production of Quartz Crystals

General

Information on output of quartz crystals or on quartz crystal technology in Communist countries is extremely sparse. That which is known is presented below, by country, and summarized in the attached table. The information suggests that quartz crystal technology in the USSR and Eastern Europe is a neglected area, that it lags, everywhere, behind that of the West, and that the Communist countries do not have the capability to produce crystals and devices in the quality, assortment, and quantity needed to meet all of their requirements.

Output by Country

USSR

As far as we can determine, until very recently, the USSR has produced quartz crystals on a relatively small scale in laboratories and research institutes. Apparently, the first Soviet plant for the production of crystalline quartz has just been completed or is in the process of being completed, at Nadym. Production was scheduled to begin in 1975. No further details are available.

Bulgaria

A plant to produce oscillator-grade quartz crystals using Soviet equipment reportedly was under construction in Sofia in 1970. The subsequent purchase of technology from the UK suggests that plans to produce crystals using Soviet technology may have been scrapped.

East Germany

East Germany appears to be the most experienced, among East European countries, in the field of quartz crystal technology. Two plants -- VEB Zeiss/Jena and VEB WF in Berlin -- reportedly were producing quartz crystals in the early 1960s. Recently it has been reported that the VEB Ceramics Works in Hermsdorf has produced quartz filters for frequencies of 3.0, 3.2, and 10.7 MHz.

Hungary

reported that Hungarian filter designs were good but that Hungary could not produce high quality filters in quantity, and that high quality quartz was in short supply.

Poland

As far as can be determined, Poland had no capability to produce quartz crystals prior to 1969. Poland first produced,

in the laboratory, synthetic quartz in a size that possibly would justify industrial exploitation, in 1968; however, there is no evidence that industrial-scale production followed. Indeed, since that development, Poland has attempted to purchase quartz crystal production technology from a number of Western countries, notably the UK, France, and the US. In 1972, Poland claimed to be producing quartz filters (465 KHz) under Soviet license, and claimed to have signed a contract with a foreign firm [ ] for technology to produce filters for frequencies of 4.5 MHz and 10.7 MHz. Whatever the claims, it seems apparent from recent negotiations with a US firm that Poland's current production capability is inadequate: Poland already has purchased two autoclaves (large, high pressure containers for growing synthetic quartz) and is negotiating for a turnkey plant to produce 10 metric tons of oscillator-quartz annually.

Romania and Czechoslovakia

As of late 1974, [ ] Romania had no production capacity for quartz crystals or filters. No information is available on quartz production or technology in Czechoslovakia.

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Table

Quartz Crystal Production Facilities

Country	Plant	Status	Products	Comments
Bulgaria	Sofia	Under construction in 1970	Filters and oscillators	Equipment scheduled to be supplied by the USSR. Current status is not known.
	Not Available	Not Available	Filters at 10.7 MHz	Technology supplied by UK, approved by COCOM March 1970.
Czechoslovakia	--	--	--	No known production facilities.
East Germany	VEB WF Berlin	Operational	Quartz crystals	Annual output estimated at 15 to 20,000 units in 1960 for both plants.
	VEB Zeiss Jena	Operational	Quartz crystals	
	VEB Ceramics Works Hermsdorf	Operational	Filters at 3.0, 3.2 and 10.7 MHz	No information on production rate.
Hungary	--	--	--	No known production facilities.
Poland	Not Available	Operational as of 1972	Filters at 465 KHz	Equipment reportedly supplied by the USSR.
	Not Available	Planned as of 1972	Filters at 4.5 and 10.7 MHz	Poles claimed to have signed a foreign contract for this technology.
Romania	--	--	--	No production facilities as of 1974
USSR	Nadym	Under construction as of 1974	Quartz crystals	First such plant in USSR according to Soviets. Experimental plant to begin operations in 1975

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