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Japan Report

(FOUO 70/81)

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CONTENTS

MILITARY

MOVES TOWARD CREATING COMBAT-READY ORGANIZATION DISCUSSED

Tokyo EKONOMISUTO in Japanese 27 Oct 81 pp 26-31

[Article by Takashi Takano]

[Text] While unrealistic defense discussions dazzle the public, uniformed officers of the Defense Agency are steadily marching toward the "combat-ready military," that is, "Japanese Armed Forces." What makes this move possible?

"Combat-Ready" Organization

News that a consortium of three companies, Zenitaka-Gumi, Tokyu Construction and Oki Construction, was the successful bidder for the main construction work for the "Central Command and Control" of the Defense Agency held on 22 September was very casually reported. It may have been the "everyday sensitivity" of the press club at the Defense Agency that allowed this indifference in reporting the news--the view which regards as rather unnatural the lack of a joint command and control center uniting the three branches of the Self Defense Forces, when the Self Defense Forces are about to commit themselves to accept a military share in Asia in line with the "Japan-U.S. Alliance" formulated by Suzuki's visit to the United States. However, this issue is deeply related to the qualitative changes associated with the postwar history of the Security Treaty and the Self Defense Forces, which will probably confront a decisive turn in the mid-1980's.

The purpose of the Central Command and Control is none other than unilateral information gathering and servicing operations and transmission of orders by means of linking "Defense Microcircuits," that is, the communications network of the Ground Self Defense Force, the "Self Defense Fleet Command and Support (SF) System" with the Self Defense Fleet Command in Yokosuka as its center, and the "BADGE System" of the air Self Defense Force. The control room, equipped with a large screen that displays movements in the three forces, is of course connected by a hot line to the operations and command room of the Yokota Command of the U.S. Armed Forces Japan. If necessary, it will request the presence of American generals and function as the joint operations center in cooperation with the U.S. Armed Forces in the Far East.

In short, only after the completion of the construction of this small building of two floors aboveground and three floors below ground, to be built at a nominal

cost of 9 billion yen in the compound of (the Defense Agency) in Hinoki-machi, will "really combat ready" Self Defense Forces be born for the first time.

It is quite outside the common sense of military practice to enter into combat actions that influence the destiny of a nation without having any setup for the joint use of three military forces. In reality, the Self Defense Forces, which started as the National Peace Forces, or more frankly, forces to guard the bases after the U.S. Armed Forces Japan left for the Korean front, do not have a function or a system to join these three forces.

For example, taking a look at one of the exercises, the tank division of the Ground Self Defense Force, which courageously runs through the wasteland of Hokkaido, repeats exercises that only scratch the surface with the utmost effort, without being linked to the command of the air and ground cover by the Air Self Defense Force fighters. Or, similarly, air cover cannot be hoped for when the Marine Self Defense Force trains for antisubmarine attack.

The reason is simple. The training areas of the Ground, Marine and Air Defense Forces are too far apart to conduct a joint exercise. However, essentially it proves that the Self Defense Forces are "junior" military which lack a joint system for the three forces.

However, the Self Defense Forces greatly overcame that disadvantage in the exercises last July. That commendable event was the joint maneuver staged on northern Kyushu, which commanded a forced landing of a 10,000-man Ground Self Defense Force unit on Tsushima Island by sea and air to counter an air raid on Sasebo Port and on cargo ships by enemy aircraft, supposedly an "Emergency on Tsushima" --actually an emergency in Korea.

It is not only because this was the largest full-scale joint manuever to date that attracted our attention. We must acknowledge that it was the first maneuver in history "directly commanded by the chairman of the Joint Staff Council" and at the same time it was actually conducted in concert with the exercise held in the Sea of Japan by the American and Korean navies and the drill to seal Tsugaru and the Soya Straits held by the U.S. Armed Forces.

These deployments of units and cooperative operations with both American and Korean armed forces are precisely programs that can be facilitated on a full scale only after the inception of the Central Command and Control in 1983.

If that is how things are shaping up, a critical obstacle will emerge. Who is the commander to be charged with unilateral power to manipulate the joint Self Defense Forces in conformity with a real war? In other words, who sits in front of the operations board at Central Command and Control?

Man to Fill the "Vessel"

From the standpoint of common sense, none other than the chairman of the Joint Staff Council, standing above the chiefs of staffs of the Ground, Marine and Air Self Defense Forces, should be the appropriate candidate. In fact, Chairman

Yada of the Joint Staff Council took "command" in the Tsushima maneuver. However, a delicate nuance is woven into the wording "command." Actually, the chairman of the Joint Staff Council is not entrusted with authority to command and order.

In other countries, usually the chairman of the Joint Chiefs of Staff or the chief of the Joint General Staff is at the top of the uniformed officers and is authorized to take the great responsibility of leading the actual command of the three forces immediately under the commander in chief.

The Self Defense Force Law, however, provides: 1) the prime minister has the supreme command and control power of the Self Defense Forces (Article 7); 2) under that authority, the minister of state for defense has general control of the duties of the Self Defense Forces (Article 8); and 3) the three chiefs of staff of the Ground, Marine and Air Self Defense Forces execute orders given to the respective forces by the minister of state for defense (Article 9). It does not mention the chairman of the Joint Staff Council anywhere. It is only in Title 3, Paragraph 2, Section 1 of the Defense Agency Law that the chairman of the Joint Staff Council is for the first time provided for. The content of the provision, in one word, is no more than "coordination" for the three chiefs of staff.

That can be interpreted, although it is rash to go so far, that the chairman of the Joint Staff Council can only "coordinate" when, in a time of emergency, the three chiefs of staff authorized to execute the respective orders given to the Ground, Marine and Air Self Defense Forces are engaging in a fist fight over the deployment of operations and transfer of units in front of the helpless minister of state for defense, who does not have a military background. The authority to command all forces directly, jumping over the heads of the three chiefs of staff, is not necessarily clearly delegated to the chairman.

It is natural that the uniformed officers consider it impossible to engage in a war in this circumstance. After the "vessel" called Central Command and Control is created as an accomplished fact without any serious debate in the Diet, the inevitable problem will be: what shall be in that vessel? Chairman Yada himself said to the press at the time of the previous Tsushima manuever: "A question regarding the authority of the chairman of the Joint Staff Council will come up sooner or later."

In other words, this is a question of establishing a military command system. In the military of any country, usually the two systems, military administration and military command, are set up inparalle. However, in the case of the Self Defense Forces, a military administration headed by an administrative vice minister has been established, but the position of the chairman of the Joint Staff Council, the supreme post of the uniformed officers, is ambiguous as described above. The chairman lacks power and authority to the extent that there may be some cases where only the three chiefs, but not the chairman, are invited to parties given by foreign embassies and consulates, but not the reverse.

That suggests that the military command system is "incomplete." The complaint often voiced against "civilian control," i.e., against domination of the Self Defense Forces by the bureaucrats in mufti in the intra-ministerial bureaus of the Defense Agency, after all, comes down to a demand for designing the

establishment of a military command system headed by the chairman of the Joint Staff Council through upgrading the position of the chairman in parallel with the administrative vice minister.

That means that they demand a complete system which upgrades the Self Defense Forces so they may be suitably called "Japanese Armed Forces."

Reform of Two Defense Laws?

To this effect uniformed officers are reportedly anxiously devising the first major reform of the two fundamental defense laws, the Self Defense Force Law and the Defense Agency Law, since the laws became effective, with the reform to be completed before next fall so as to be in time for the initiation of the Central Command and Control scheduled for September 1983. Or, prior to that, there is a possibility that even the Second Special Investigation Committee may make a radical proposal for upgrading the Defense Agency to a Defense or a Ministry of National Defense.

At the meeting of the second subcommittee of the Special Investigation Committee held on 6 October, former director Osami Hayashi of the Bureau of Legislation, who is also one of the nine members of the Special Investigation Committee, attracted attention by stating: "The Defense Agency is heterogenous as an external bureau of the prime minister's office. It should be established as an independent ministry." Member Ryuzo Sejima and consultant Chu Ito, also of the Special Investigation Committee, stood out for a study on the creation of a ministry of national defense in their article supporting the proposition, "Ways to Defend Japan" by the "Japan Strategy Research Center," to which they serve as advisers.

Recalling that the director of the Administrative Management Agency is Yasuhiro Nakasone, who once defended the same issue in the Diet when he was serving as minister of state for defense, it is considered quite possible that the report of the Special Investigation Committee to be submitted in the middle of next year will dish it out once again.

There is no doubt that the "Ministry of National Defense" to be established in that case would not be the current Defense Agency with a new title, but that a new dimension would be added to its qualities, including the establishment of military command.

Look how the pursuit of military consolidation by the career military officers originated from a simple and naive apprehension--we cannot fight a war in this condition--often builds up to an endless ambition.

Indeed, there are some grounds behind the complaint from the uniformed officers that there is no such thing as "civilian control" in Japan, but only an infestation by politicians who are after the defense concessions and by ignorant bureaucrats inmufti sent to "serve for 2 years" against their will from other first-class government offices.

Then, the question to be raised is how to establish "civilian control," which serves as an institutional guarantee to subordinate military matters to politics and diplomacy. What is at issue is, of course, not to demolish "the civilian control" itself by the consolidation of the uniformed officers' power.

Uniformed officers of the Self Defense Forces now appear to be stealthily starting to challenge the "civilian control" itself by creating a small "vessel" called Central Command and Control with the admixture of a mild sense of antagonism likely to be seen in any government officials disguised as discontent with the internal high-handedness and ignorance, and an endless desire for "consolidation" as military technocrats.

This movement seems to be a more serious matter that affects the future course of our nation than the anxiety over a small increase or decrease in the defense budget, but the "civilians" themselves who will be directly affected are hardly award of the problems that are being posed. This "mild coup d'etat," contrary to expectations, may succeed smartly in the political climate of Japan, where nobody wants to take responsibility for the defense policy in its true sense.

This process which fits the description of a "mild coup d'etat" is going on parallel to the process of "mild reform of the Security Treaty" started by mutual consent in November 1978 with the "Japan-U.S. Defense Cooperation Guidelines" for discussion of details of the Japan-U.S. Joint Operational setup in case of an emergency in the Far East.

It is still fresh in our memory that Kurisu, then chairman of the Joint Staff Council, was in effect dismissed from duty because of his statement in July 1978 that "the Self Defense Forces will go beyond the rules and regulations in countering a surprise attack," when it had already been disclosed that these guidelines requested that the self defense forces play the role of a ready war potential force in case of an emergency in the Far East beyond the duties of the Self Defe Defense Forces prescribed in Article 3 of the Self Defense Law, "defend our country against direct or indirect invasion"; beyond the provision for Japan to share "exclusively defensive defense" in Articles 5 and 6 of the Security Treaty of 1960; and of course far beyond the concept of Article 9 of the constitution.

Kurisu's Fully Calculated Statement

That statement meant the start of psychological operations with the effect of shock treatment to appeal to public recognition that the conventional setup of the Self Defense Forces "is no longer workable," seeing that the direction shown by the guidelines is finally about to be realized. Simultaneously, on the other side of the coin, it was the igniter of open rebellion by the uniformed officers against the intra-ministerial bureaus. In the era of Director General Osamu Kaihara of the Secretariat of Minister of State for Defense, who was called Emperor Kaihara, (he later served as chairman of the National Defense Council), the intra-ministerial bureaus literally had absolute control (allow me to interject that this and civilian control are not the same). However, the uniformed officers' power, especially those of the Ground Self Defense Force, has been slowly but steadily creeping upward since then.

In any case, because the Ground Self Defense Force has lots of men, it can send its men to many posts. The Ground Self Defense Force holds responsibility for administering practically all of the Self Defense Forces' prefectural liaison offices, which carry out recruiting--which is the greatest headache of the Self Defense Forces. Therefore, it has even become the course to success in the Ground Self Defense Force to be appointed to the post of the director, particularly at the Fukuoka Prefectural Liaison Office, which achieves the top score every year. The big household of the Ground Self Defense Force always talks, for instance, when mobilizing for events and when shuffling the number of members due to a budget cut.

Moreover, the Ground Self Defense Force assigns old sergeants without a place to go to the "supportive part" of the Self Defense Forces, such as patrol units within the Self Defense Forces, investigation units and auxiliary organizations, by a method that "transcends rules and regulations" called "action" in their term.

It is said that the existence of the Special Section of the Second Division of the Ground Self Defense Force, which was sought by AKAHATA as a "shadow military," was not known until reported in AKAHATA to the intra-ministerial bureaus of the Defense Agency or even to the Marine and Air Self Defense Forces.

With the ballooning of such a "supportive role" controlled by the Ground Self Defense Force, it would be easy for an investigator to follow an elite bureaucrat and take a picture of him with his arm around the shoulders of women in a cabaret. I do not know whether there has ever been an incident where the Ground Self Defense Force threatened the bureaus of the Defense Agency actually using that kind of Photograph. However, such a capability of the Ground Self Defense Force already known to the Defense Agency and the Self Defense Forces is undoubtedly at work as a kind of intimidating pressure on the intra-ministerial bureaus

Of course, the inside of the big household of the Ground Self Defense Force is not at all consolidated into a single interest group, as seen in the speckled patterns of people from the former Ministry of Home Affairs, particularly those from the National Policy Agency, former Imperial Army officers, and former Imperial Navy officers in addition to an independent power from the Defense Academy, which produced major generals from its first graduates. On the contrary, they must pass through fierce competition just to be selected for the "Command Staff Course," equivalent to the "graduates of the Military Staff College" of the old days. In the present condition, they must be ready for more relentless string-pulling in order to finish the course and get a higher post. However, it is a fact that the weight of the Ground Self Defense Force as a whole is steadily consolidating its power of speech.

Chairman Kurisu, who appeared on the stage in front of such a backdrop, expressed unabashed hostility to (then) Vice Minister Maruyama from the National Police Academy who belonged to Kaihara's group, perhaps tinged with a superiority complex unique in the bureaucratic world because he himself was a graduate of the Law School of the University of Tokyo. While he was in that office, he often went "beyond the rules and regulations" by offering his opinions directly to the minister of state for defense, bypassing the vice minister. Well, that could

be interpreted that he carried out his belief in the balance between military administration and military command. Kurisu's "explosive" utterance was issued rather on the basis of a thorough calculation as the grand finale of these esoteric struggles.

The intra-ministerial bureaus successfully dismissed Kurisu, giving an inadequate reason of "challenge to civilian control," but they had to recognize the necessity of studying legislation regarding emergencies as advocated by Kurisu. The case was closed giving uniformed officers the substance while taking away the honor. It was 2 days after Kurisu was dismissed that then Prime Minister Fukuda instructed that a study on emergency legislation be conducted.

Infestation of Phantom Defense Argument

Since then, as everyone knows, campaigns for emergency legislation and a boom in arguing about threats from the Soviet Union crying, "the Soviets are coming to Hokkaido tomorrow," were produced with Kurisu himself, who was put to pasture, as convincing talent.

Although I do not have time and space to discuss the history point by point, the "Hoddaido Defense" theory advocated by the Ground Self Defense Force is, in a nutshell, nothing more than a strange mixture of the fantasy of science fiction and the "Go North" theory of the former Imperial Army--the Siberia Advance theory. The "Sea Lane Defense" theory loudly proclaimed by the Marine Self Defense Force in competition to the "Hokkaido Defense" theory is also only a deformed relic of the antiquated combined squadron concept of the former Imperial Navy. I wonder why such a "Defense Argument," which nobody seriously believes in when personally discussing it with executive officers of the Ground and Marine Defense Forces, is amplified by the irresponsible mass media and is prevalent with a haughty air.

Well, speaking from the side of the uniformed officers, they must be letting it go, considering it a plus for getting a better defense budget, to see the campaign drumming or the boom rampaging, whatever it may be, as long as it helps the Self Defense Forces themselves to be widely recognized.

However, when one asks the opinion of the executive officers who graduated from the Defense Academy, they all criticize the Kurisu style, idea and method as "romanticism of the old generation from the former Imperial Military." That does not mean that they have the capacity and spirit to turn the defense policy discussion into something more substantial and practical. All the "real" soldiers who have actual combat experience are already gone, even among those from the former Imperial Military in the Self Defense Forces. In 5 years, none of the remaining nominal soldiers from the former Imperial Military will remain. Some may think optimistically that the manner of discussion will be more practical after that, but I am afraid that is too optimistic.

The recent phantom "Defense Argument" is destined to be gone before long. However, the program for making the "Japanese Armed Forces" out of the Self Defense Forces--the main track installed by the generations of the former Imperial Military exerting the last drop of their energy--will surely be continued in the

hands of the postwar uniformed executives led by those who graduated from the Defense Academy, because this program has its own flavor of "military consolidation."

The problem is the "civilian" side which should control it. Even now there are a group of anachronistic people who would shed tears in front of others saying, "the constitution was imposed upon us by America," who holds the central power among the group for national defense and the group for reform of the constitution.

Also, there are a group of people called the "Security Treaty Mafia" among groups of people traditionally friendly to the United States in the Foreign Ministry. Immediately after the mutual agreement was reached on the guidelines in 1978, they organized a "Security Treaty Policy Planning Committee," placing current Ambassador to the Soviet Union Takashima, then defense counsellor, at its axis, which continues to study the security treaty policy of the eighties in communication with the executives at the Defense Agency.

Furthermore, the Japan Socialist Party, which is allegedly even more to the "right" than the Liberal Democratic Party, including the executives of United Labor which cry for "realization of weapons exports for higher wages," forms a hawkish bloc of "civilians." The conservative mainstream of today stems from the Suzuki and Miyazawa line, and the majority of the business and financial world still do not choose the road to a military superpower through reckless expansion of the military. Rather they are fully aware that the greatest factor contributing to Japan's growth and remaining power for innovation in a time when the world is in recession, is the very fact that after the war Japan was lucky enouth to have been able to adhere consistently to a relatively conservative military expense burden, even though America calls us a "free rider" or whatever it wants to call us, for that matter. For example, Director General Kiichi Miyazawa of the Secretariat of Minister of State for Defense, who is considered to have best inherited the Yoshida-Ikeda lineage, asserted the following in a lecture he gave this past January.

"There is a background of its own in the creation of a constitution such as this. Furthermore, the number of people who have been raised under the constitution has already reached more than half of the population of our country. In view of this, there are matters that cannot be reversed. In the history of mankind, there is no country which has survived upholding such a constitution. This is the first such great experiment, so to speak, of human history." (Yomiuri International Economic Roundtable Conference]

In addition, Miyazawa clearly acknowledged the presence of a split over this point in the Liberal Democratic Party, and affirmed that Prime Minister Suzuki definitely stands for the protection of the constitution. Nonetheless, when Prime Minister Suzuki, who maintains this stand, visited the United States, he was easily taken on a ride. He agreed to the "Japan-U.S. Alliance" proclamation prepared by the "Security Treaty Mafia" of the Foreign Ministry conspiring with the Defense Agency and promised to share a military role in the Far East based upon the proclamation.

Problematic Civilian Side

In summation, the "civilian" side which should control the trend of defense policy and the uniformed officers is divided into a hawkish bloc which is distantly dissociated from reality, a moderate but vulnerable conservative mainstream, and, in addition, absolutely powerless opposition parties. A discussion, no matter where it might take place, relating to the strategic choice about to be pressed upon Japan in the eighties whether it likes it or not, will never be honestly pursued.

In this sense, it is indeed none other than "civilians" who demolish "civilian control." Since it is as it is, we can easily envisage the civilians getting on their knees in front of the mighty "military consolidation" sought by the uniformed officers, who are closing in on them with piles of established facts.

Director Nakasone of the Administrative Management Agency once described his resolution for an administrative reform as follows:

"According to the encouragement by the leading national policy planner (Kazuo) Yatsugi, we must consider the Meiji Restoration as the first renovation and the loss of the war as the second renovation, and we must succeed in forging the present administrative reform into the third renovation. Former Prime Minister Shinsuke Kishi also inspired me the other day, when he said: 'Administrative reforms are almost impossible. They are achieved, it is said, only by a coup d'etat or an internal uprising. Please brace yourself in doing so.' Administrative reform aims at attaining a structural reform and a functional improvement in all areas of national defense, education, welfare and finances" (lecture presented at the meeting of the Society for the Study of National Policies held on 27 July).

The administrative reform extending over the political and financial worlds can be considered to have veered from its original purpose, but it has begun to take on the color of a plan to remodel our nation from above in the direction of a "combat-ready national structure" entailing the creation of a Ministry of National Defense.

If this national remodeling plan handed down from above succeeds in docking with the making of "Japanese Armed Forces"--a program pursued by the mild coup d'etat--the combined force will surely insure "the third renovation." It is because of this possibility that we should not overlook the quiet article concerning the bidding for the construction of the Central Command and Control.

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ECONOMIC

U.S. SEEKS END TO TARIFFS ON 29 COMMODITIES

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 pp 1, 19

[Text]

The U.S. Government last week submitted a request to Japan asking that it swiftly do away with tariffs on 29 products and rectify non-tariff barriers, such as by simplifying import procedures. The representation, in writing, was conveyed to the Japanese Foreign Ministry by William Barraclough, minister at the American Embassy in Tokyo.

In its latest request, the U.S. is said to have urged Japan to r duce its tariffs for computer mainframes, peripheral equipment, auto parts, plywood, lumber and grapefruit to nil, and to have proposed incorporating this in the external economic measures which the Japanese Government intends to announce shortly.

At the same time, the U.S. proposed having its request taken up for discussion at the two-day meeting of the Japan-U.S. Trade Group to be held in Tokyo on December 9-10.

The U.S. Government was known to be strongly pressing Japan to make concessions on the points that it has enumerated on the grounds that the one-sided imbalance in bilateral trade in favor of Japan was sorely straining Japanese-American relations in general.

While Washington already has suggested an agenda of 21 points to be taken up at the trade group meeting concerned with liberalization of Japan's market, such as with regard to high technology, lowering of tariffs and abolishment of import quotas for farm products, the latest request particularly concentrates on tariffs and non-tariff barriers.

Its key feature is that it refers to specific commodities, and takes up computer-related tariffs from the very outset.

As for this phase, Japan now imposes a tariff of 10.5 per cent on the mainframe of computers and a 17.5 per cent tariff on peripheral equipment. The corresponding U.S. rates are only 5.5 per cent for both classifications. The U.S. wants Japan to abolish its tariff directed at it.

Japanese computer quarters, however, are already deeply alarmed by the U.S. request, stating, "If this is done, Japanese makers are going to be dealt a devastating blow."

These quarters cite, that International Business Machines Corp., America's top computer maker, now has the second largest share of the domestic computer market after Fujitsu Ltd., and its subsidiary in Japan, IBM Japan Ltd., imports a considerable amount of finished products and parts from the U.S.

Actually, Japan has been running a deficit in computer trade with the U.S. According to the Finance Ministry, Japan's imports of computer mainframes and peripherals from the U.S. last year totaled ¥152,889 million. The import value was about five times larger than Japan's such exports to the U.S. (See related story on Page 9.)

If tariffs in this area are greatly lowered or reduced to zero, IBM's competitiveness within Japan further is going to increase, and this also is going greatly to favor other large American makers, such as Sperry-Univac, they hold.

In the Tokyo Round of multilateral trade negotiations, Japan pledged to reduce tariff on computer mainframes to 4.9 per cent and that for peripheral equipment to 6 per cent by 1987.

It is believed that the U.S. now aims at getting Japan to reduce the tariffs to zero at once or, if it cannot, to have it advance the date of its tariff reduction.

Up to this time, the U.S. frequently has asked Japan to open its market to products of high technology. As a result, the two governments only recently reached agreement on advancing the tariff reduction goal for integrated circuits set in the Tokyo Round, that is, to 4.2 per cent by 1987, to April, next year. The government quarters here thus feel that the U.S. this time has turned the focus of its attention to winning a fresh concession in the computer field.

In the latest U.S. move, Washington also wants Japan to reduce to nil tariffs for farm products coming under quotas, such as grapefruit. Last month, U.S. Agriculture Secretary John Block sought a review of such quotas when he visited Japan. It now appears that the U.S. will take up this issue and also press for an abolishment of tariffs at the December trade group meeting.

The U.S. also has come out strongly this time to seek a drastic review of non-tariff barriers, such as: 1) speeding of customs procedures in general; 2) simplification of inspection and standards relative to plywood, autos, processed foods and cosmetics; 3) revision of quarantine regulations as to animals and plants; 4) recognition of American baseball bats, tennis balls and other sporting goods by private Japanese sports organizations.

In addition to this, the U.S. already has been pressing for realization of eight "demands," such as a review of the agreement on procurements by the Nippon Telegraph & Telephone Public Corp., other agreements on tobacco and leather goods, and matters pertaining to decontrol of the service and financing fields, and investment.

Correction: In November 17 issue, quotations for steel sheets and plates were reversed.

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ECONOMIC

DISCUSSION ON CUTTING DISCOUNT RATES

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 pp 1, 2

[Article by Masahiko Ishizuka: "Discount Rate Cut Looms as Near-Term Possibility"]

[Text]

Argument for a discount rate cut in the immediate future somewhat suddenly gathered momentum last week as the yen's value soared against the U.S. dollar, while domestic business recovery continued lagging and trade surplus kept swelling placing Japan under increasingly vociferous attacks from Europe and the U.S. Toward the end of the week it appeared that officials of the Bank of Japan and the Ministry of Finance had started weighing the timing of a discount rate cut, which could come in December or January. (See Analysis on Page 10.)

There had been an undercurrent of demand for lowering the Bank of Japan's discount rate, at 6.25 per cent since last March, but it had been held back due to the persistence of high interest rates in the U.S. that kept the Japanese yen weak for months. With the price front continuing markedly calm at a time when domestic demand recovery is excruciatingly slow, those who favor an early discount rate cut cited the level of U.S. interest rates and the resultant weak yen as the only stumbling block.

But as the U.S. interest rates started falling recently, the yen rose sharply on the Tokyo foreign exchange market, to 219 to the dollar on Friday, the highest since late May, and was viewed likely to continue to strengthen.

A leading advocate of a discount rate cut, Economic Planning Agency Director General Toshio Komoto last week reiterated the urgency of an early action, saying, "It is desirable to stimulate the economy through lower interest rates."

Stimulation of domestic demand is being urged as a means of spurring slow imports caused by weak demand for materials and other goods. Lagging imports are held responsible for the swelling trade surplus as much as strong exports are. The current account surplus in fiscal 1981 is now estimated to reach $10 billion or more, compared with the $7 billion in the Government's two-month old revised outlook and a deficit of $6 billion in the original projection.

According to government economists, the real economic growth in the third quarter most likely ended up at an annual 2-3 per cent rate and up 1 per cent from the preceding quarter. The lagging growth rate is attributed to weakness of domestic demand, particularly personal consumption and housing, while it is being made up for by strength in overseas sales.

Recently, there are signs that the pace of expansion of exports and private capital investment, the two major forces that have led the growth of the Japanese economy in the past year, may be losing momentum. Some government officials and businessmen are even beginning to be concerned that the business recovery underway may falter.

People who are cautious about a discount rate cut warn that a lower interest rate would work to weaken the yen and as a result boost exports, adding to the current account surplus. But whether this turns out true depends on the extent of the fall of U.S. interest rates and, more

essentially, strengthening of the Japanese currency.

While officials of the Bank of Japan and the Ministry of Finance last week generally voiced prudence, citing necessity to watch the trend of U.S. interest rates for some time, Finance Minister Michio Watanabe drew attention by saying Thursday that he would like to see tax revenues grow "through stimulation of the economy." His remark was interpreted as implying that he was leaning toward a discount rate cut. Bank of Japan Governor Haruo Mayekawa, meanwhile, merely said that he would closely watch various economic indicators for the time being.

International Trade & Industry Minister Rokusuke Tanaka and Japan Chamber of Commerce & Industry President Shigeo Nagano came up with an outright endorsement of an early discount rate cut. Nagano made special reference to the stagnant state of smaller enterprises, whose interest his organization represents. With business failures topping 1,500 in October, the situation required an immediate relief, he asserted.

CSO: 4120/73

SCIENCE AND TECHNOLOGY

FUJITSU'S STRATEGY TO SURPASS IBM DISCUSSED

Tokyo SHUKAN ORU TOSHI in Japanese No 451, 16 Jul 81 pp 54-59

[Text] We cannot discuss Fujitsu, the standard bearer of "Rising Sun" [i.e., Japanese] computer, without mentioning IBM.

The super giant IBM, holding 60 percent share of the world's computer market, is called the sun of the computer world. Repeatedly in the past, a number of planets which surround it has challenged its authority only to retreat in defeat. But at the head of the planets which continue to mature despite the glare of the sun and whose existence can no longer be ridiculed, is the steadily rising Fujitsu.

In support of this is the symbolic "incident" when Fujitsu, confronting IBM directly, won the bid to [install computers] for Australia's Bureau of Statistics. At one point the bidding developed into a political issue, and despite the strenuous effort by chairman Cary of IBM, Fujitsu finally won the battle in November 1979.

At about the same time, Fujitsu succeeded in "replacing" IBM machines in Brazil. Fujitsu's M-200 Series was installed for the savings and loan systems of the largest bank in South America, the Bank of Bradesco. In 1980, both the National Bank of Brazil and Bank Auxiliar introduced Fujitsu's machines, thus creating a kind of avalanche effect. These successes are proof that Fujitsu's technology has caught up with IBM's, that time has come when it can compete on equal terms with IBM, on overall capability from "cost performance" to maintenance service.

New Super Large Computer, Faster Than IBM's

One condition which enabled Fujitsu to confront IBM directly is that its OS (operation system) is coterminous or interchangeable with IBM machines.

OS refers to the most basic software that drives the hardware. All the computer manufacturers are developing their own OS. Based on OS, users are developing softwares (application soft) that operate machines appropriate for their actual business needs. When an old machine must be replaced, a different company's machine can be introduced as long as the OS can utilize the new machine existing "application." This is called "compatible machine."

Fujitsu chose to develop IBM compatibles. This choice was based on the view that, "When one tries to enter the world market, one must concentrate on IBM users. This is the ticket that allows him to enter into business negotiations overseas. Let the

machines be compatible with IBM's. This will create choice and eliminate the unhealthy effect of IMB's monopoly. All of this is good for the user." (Yukimaro Kawatani, director of Sales Promotion Headquarters)

The turning point at which Fujitsu decided to move into [IBM compatible] development came at the time of 1971 industry reorganization. In 1970, IBM introduced the large-scale 370 Series and began the offensive. At the time the import of computers was partially liberated (complete liberation came in 1975) and this put the future of Japanese computers in doubt. It was then that MITI stepped in to reorganize the computer industry, subsidizing half the capital needed to develop a counterpart to IBM's 370.

Nippon Electric - Toshiba and Mitsubishi-Oki groups chose not to develop IBM compatibles. Fujitsu, in tie-up with Hitachi, did. The project, requiring a total investment of 160 billion yen, was indeed a gamble with Fujitsu's future at stake. The person responsible for the entire project was Takuma Yamamoto who became president this July.

In 1974, Fujitsu finally came out with the M Series, compatible with IBM's OS, but superior to it. Thus began Fujitsu's offensive as Japan's all-purpose computer specialist.

In the meantime, there was an encounter between Dr Amdahl and Toshio Ikeda, the late computer specialist of Japan. Because of this meeting, Fujitsu participated in the capital formation of the newly established Amdahl Corp. This cooperation led to a joint development and manufacture of "plucon machines" (Operating by simple replacement of plugs). This technology proved beneficial for Fujitsu in various ways.

With the introduction of M Series, Fujitsu's replacements of IBM machines followed in succession. The M-200's cost performance is said to be 2-3 times higher than IBM 370's.

Including this M Series, the share of compatible machines in the world's large scale machine market has grown to 10 percent.

The super giant IBM's evaluation of Japanese computer manufacturers is high; in its shareholders meetings it has made statements indicating its awareness of the rise of Fujitsu.

In fact, it is said that with the appearance of compatible machines, IBM's service has improved. It is also said that with the two bender system which can be used alongside the IBM machines, competition is born and this has mitigated the ill-effects of IBM monopoly.

On the other hand, IBM failed to develop follow-up machines to its 370 Series which it had planned to introduce in 1976-77. In order to stop the flow of users to plucon machines, it introduced 303X Series. But this had nothing technologically new, and only served to fill the gap prior to its H Series. Moreover, the performance of H Series has not caught up with that of M-200 of 3 1/2 years ago.

Having shown the world its excellent hardware technology through the development of IBM compatibles, this May, Fujitsu introduced the world's fastest all-purpose large-scale computers M-380 and M-382.

The processing speed of M-380 is 24 MIPS (Million Instruction Per Second), a threefold increase from the M-200. It, moreover, surpasses 15 MIPS of Nippon Ekectric's ACOS 1000 and 10 MIPS of IMB's 3081 (per 1 processor).

Challenges World Market with Technological Strength

It is Fujitsu's semiconductor technology which makes this world's fastest computer possible. According to Kawatani, "The greatest weapon for computer manufacturer is logic semiconductor. In this area Fujitsu's technology is second to none." As these words indicate, the speed of logic LSI for M-380 is 350 pico second (1 pico = $1/10^{12}$). In comparison, the speed of Hitachi's M-280 is 450 pico second; that of IBM 3081, 1,000 pico second.

Furthermore, in the area of memory, Fujitsu led the world in developing 64K RAM (64,000 pieces of data can be written in and read out). In comparison to IMB's model, Fujitsu's is 20-30 percent smaller in size, and power consumption, 30 percent lower; it is a high performance semiconductor.

The advanced technology developed in the area of LSI has blossomed in other areas as well. For example, there is the new transistor HEMT (Super High Speed Semiconductor Element).

According to Kawatani, "It was the spirit of challenge which enabled Fujitsu to develop the LSI first. No one thought it possible. We are now reaping the benefits of that spirit."

In comparison to ordinary silicon transistors, [the HEMT] enables electrons to move 10 times faster in normal temperatures, 50 times in terms of theoretical value when cooled. The principle behind [the HEMT] was originally discovered by the Bell Laboratory of the United States. What Fujitsu did was to develop its application which was believed impossible. Additionally, the technology for magnetic bubble memory system was also one of the pioneering efforts of Fujitsu. There will be others--the application of Josephson element circuit and fifth generation computers. With government subsidies and through joint development of technologies, Fujitsu will continue to be a pioneer in computer technology.

As expected, Fujitsu's investment in R & D is extensive. In fiscal 1980, it invested about 35 billion yen in hardware, equivalent of 6-7 percent of its sales. The percentage rises to 12 percent if software is included.

In terms of equipment investment, Fujitsu allocated 49 billion yen in 1980, of this, 29 billion yen was spent on semiconductor related equipment. High investment continues; this year, 53 billion yen (27 billion for semiconductor equipment) will be invested.

For the computer industry which is at the head of all other industries in the so-called age of computer and where technological renovations are radical and intense, investments in R & D are the key to the survival of the enterprises. Because of this, profits are enevitably reduced and more so because of intense price competition among domestic and foreign manufacturers. Fujitsu's 1980 sales net profit rate was 3.2 percent; that of Japan IBM, one of the superior companies in Japan, was 10.7 percent, even higher than Fujitsu's 7.8 percent sales profit rate. The differences will not be bridged for some time. But in fiscal 1979, Fujitsu's computer department sales surpassed that of Japan IMB. In 1980, it grew by 17 percent, compared to

4 percent growth rate for the latter. The difference in scale, in other words, is growing in favor of Fujitsu, and there is no indication that a reversal of this trend will occur in the future

Having surpassed Japan IBM in terms of sales, Fujitsu's next target is the overseas market. The basic strategy for this is to engulf IBM by "starting from markets other than the United States and then besieging it." The battlefronts will include Australia and Brazil.

Fujitsu's base of operation in the United States, the largest market, is Amdahl Corporation. Fujitsu has invested 24 percent of the capital of this company which, with further help from the same, has survived and shown signs of recovery since last year while other plucon manufacturers have succumbed. Fujitsu is responsible for joint development and manufacture of large-scale computers, Amdahl for final assembly and sale. Already the company has received orders for 300 units.

For manufacture of medium and smaller units and terminals, there is the TFC, a joint company formed with TRW. The latter has 200 maintenance offices nationally; it is a large conglomerate. Since last year, TFC has been marketing POS terminals, finance terminals, small V Series; it plans to introduce units smaller than the medium M-160.

America is too large to set up independent sales and maintenance networks. Fujitsu's strategy is to take advantage of the networks of TRW and penetrate the market bit by bit. The joint venture with TRW signifies the beginning of Fujitsu's serious attempt to enter the American market.

As for Europe, Fujitsu has exported a large-scale M-200 to Siemens and is selling OEM in all of the EC countries except Spain. In certain cases, it has beat IBM in obtaining orders.

Fuji Electric, Fujitsu's parent compnay, was born of a joint venture between Siemens and The Furukawa Electric Co Ltd. Fujitsu was also established when Siemens offered assistance in communication technology. Since then, the roles have been reversed. Siemens, however, has been long involved with computers and has a good track record in manufacture of IMB compatibles. Its joint venture with Fujitsu is aiming at expansion of its product line.

Excluding Great Britain, Europe is also IBM's fiefdom. Although the governments of European countries are trying to develop their own manufacturers, IBM's presence has brought their efforts to minimum. As such, it could be said that the Siemens-Fujitsu venture represents a combined attack on IBM by Japanese and European forces.

Recently, reports of a move toward joint venture between Fujitus and ICL were publicized. ICL is a powerful European computer manufacturer established with government subsidy during the period when the Labor Party was in power in England; it has a rather extensive track record. It succeeded, for the first time in the world, in reducing IBM's share in England to below 50 percent. Recently, however, it is slumping and is on the verge of laying off its employees.

It seemed that during the Minister of MITI Rikusuke Tanaka's visit to England there was a talk of joint rescue of ICL, but Fujitsu, it is said, was never informed of it.

ICL does not deal in IBM compatibles and therefore Fujitsu cannot offer any technological assistance; moreover, Fujitsu's EC sales are handled through its agent, Siemens. The talk, therefore, lacked any possibility of realization. One theory has it that ICL, as an effective means of obtaining assistance from the British government, fabricated the "G.B.-Japan Federation" and cited, the fastest-rising Fujitsu among all other companies as its partner.

This theory cannot be substantiated; it is an incident which illustrates the worldwide recognition of the name "Fujitsu," so much so that it was used without the knowledge of Fujitsu.

Ceaseless Pursuit of IBM

Recently, simultaneously with the promotion of president Yamamoto, an extensive company restructuring was conducted. Both the communications and electronics industry divisions were abolished, and combining their sales departments, a new sales promotion division was established. The purpose of this reorganization is to stress the development of communication equipment and systematization of computers, and, at the same time, increase their sales. The intensity behind this move may be expressed as follows: "Nippon Electric's 'C & C' is outdated; Fujitsu's is 'C to the second power'."

Further changes include the establishment of a separate company, Fujitsu Office Equipment, from the old OA Equipment Sales Promotion Division. This initiates a more mobile sales of OA equipment. The OA (office automation) is the most promising item in the eighties. Yamamoto has pledged "to strengthen the development of OA," and cited it as one of the areas which Fujitsu must emphasize in the future.

"The key (according to Kasaburo Nakanishi, former director of OA Sales Division) to the future of OA is how WP (word processor) is handled." Fujitsu's contribution is the OASYS 100, based on the kana [Japanese script]-Chinese character conversion method. A full-scale shipment of this processor began last October; its demand is excellent, averaging about 200 units a month.

The demand for Personal Computer FM-8, introduced in May, is also good, based on the fact that it sells for 30-40 percent less than the previous model and is equipped with the most advanced technologies such as the 64 K memory. Monthly production is expected to be 2,000-3,000 units. Fujitsu's OA equipment line is comprehensive; there are, in addition, office computers and facsimiles.

Fujitsu started with communications equipment. Its advances in OA equipment and optical communication systems, fully incorporating the most advanced electronics technology and its experience in communications, are highly evaluated. Its merchandise is not limited to computers.

If former president Kanjiro Okada, who pushed for domestic production of computers twenty years ago, can be called the second founder of Fujitsu, then the July reorganization instituted by Yamamoto can be seen as the beginning of a new era in which Fujitsu of the eighties will confront the world's super-giant IBM.

The road that Fujitsu had followed as a specialist in computer manufacture was indeed like the expressway where there is no turning back. Its vitality as an

enterprise was supported by a sense of urgency as a specialist in computer manufacture and its fate as the protector of the "Rising Sun" computers.

Kawatani's confidence is growing: "IBM is making a series of mistakes and inconveniencing the users. Our job is to crumble the IBM myth. We already have enough strength to endure the race."

Fujitsu will probably maintain this strength in the future. It is also aware that without this persistent strength it cannot confront IBM. Yamamoto speaks of [sales] "of one trillion yen in several years, two trillion in less than ten." Even if it gets to this scale, Fujitsu's technological development strength, with its flexibility will not deteriorate.

Fujitsu's computer sales is seventh in the world. It is certain that it will jump to the second place as early as 5 years from now. IBM is unstable; there are even talks of division. Only Fujitsu is steadfast in its attack on the world monopolized market. Its continuous challenge [of Fujitsu] is nothing other than a manifestation of its sense of vitality.

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SCIENCE AND TECHNOLOGY

DISCUSSION HELD ON IC CONFLICT WITH UNITED STATES

Tokyo SHUKAN TOYO KEIZAI in Japanese 19 Sep 81 pp 32-37

[Article: "Discussion on the U.S.-Japan Conflict, the Approaching VLSI Age"]

[Roundtable discussion by Atsuyashi Ouchi, vice president, NEC; Tadashi Sasak; Executive Director Sharp; Yuko Shimura, director, Society for Industrial Investigation]

[Text] Japan Leads in Memory

Moderator: It is said that Japan has surpassed the United States in one segment of the semiconductor industry, but there is a strong impression that the United States is far ahead in the matter of overall developmental strength. I would like to analyze the U.S.-Japan confrontation situation in the area of semiconductors focused on VLSI, and I would like to discuss, first of all, just where the Japanese semiconductor industry stands today.

Shimura: If we compare the market scale of semiconductors and production strength, the United States accounts for 50 percent of the world's market while the remainder is divided between Japan and Europe. There is an even greater difference in production strength, where the United States has about a 65-percent share of the world's capacity, Japan about 25 percent, and Europe slightly less than 10 percent. Assuming that the United States is the grand champion, Japan has the role of a lesser group member at best, and Europe stands in the midst of the leading apprentices.

Japan is also putting its strength into leading technology areas. For example, up to about last year the 16 K (16,000 bit) random access memory (RAM, reading and writing memory) was the big market target that all the makers were aiming at, and Japan was able to garner a 40-percent share of the market from the United States, thereby invoking claims from the American side that large volume exports were disrupting the market.

There is a possibility that the performance with the 16 K will continue with the 64 K element, which is the entry product to the VLSI market, and this could well become a seed for friction between these countries.

Moderator: The basic technological development is supposed to have been completed in the case of the 64 K, and there is some feeling that Japan may be ahead of some of the remaining areas such as mass production or in minor improvement type technological area problems.

Ouchi: This is not something that can be dealt with in a simple manner. IC is influenced by scale merit and learning curve (mastery curve). It is expected from here on that the various Japanese and American companies will start in on 64 K production, and this learning curve will come into play, and now is a time when all of these companies are putting forth all efforts to start.

Certainly, Japan was stronger in the area of 16 K memory. This is because Japan had the superior technology to produce a high-quality product cheaply and in great volume. The Americans are superior where basic development is concerned, and they produce far more papers and patents. Since superiority is determined on the basis of a mixture of this basic development strength and mass production technology, it is not a simple thing to say: "we will also win out on the 64 K."

In addition, Japan has become considerably stronger in the area of IC production facilities due to the research efforts of the LSI Technology Research Association, but the United States still has greater strength in areas such as diffusion process facilities, and we cannot rest easy.

Sasaki: Putting everything together, the question of whether Japan can really put forth its real strength will be determined by the 64 K situation. From the viewpoint of the Japanese user, even though a similar product is involved, the service strengths are completely different. They choose the Japanese product of better quality and service strength. The appearance of 64 K will bring with it application in many items, and we need to make preparations for that time.

Moderator: The production systems of the Japanese makers for the 64 K are in the process of some astonishing expansions....

Ouchi: Some very large figures are being tossed about, and if we add them up, the supply will be several times the world's demand. (laughter) I think all we can say here is that every company has a strong desire to increase its production. When Japan managed to capture 40 percent of the 16 K memory market, one factor was that American production had not come into full-scale operation, and it is risky to say unconditionally that Japan has the strength to take over half of the world's market.

Shimura: Aren't you, Mr Ouchi, being modest in your statements because you are under full American pressure? (laughter) Japan accounts for 40 percent of the world's share of 64 K as of this year, and even the various surveys made in the United States show that Japan will account for 40 to 50 percent in the future, and there are many who make this prediction.

Ouchi: I was not trying to be particularly modest.... Certainly, I think that Japan is fairly strong where 64 K alone is concerned. The technology for 64 K is established, and Japan is in a somewhat better position in a race where better yield and quality are concerned.

On the other hand, there are more microprocessors developed in the United States. If we look at VLSI in a much wider sense, the Americans are stronger. They have twice the number of research and academic personnel, and they keep getting funds from NASA and the Pentagon.

Inferior in Logic Circuit Development

Moderator: The pattern for RAM is set, and it will decide the fate of the production technology. Is this not where Japan is strong?

Ouchi: If the race is to be decided on the premise that pin connections can be made at a maximum rate of 15 nanosecond speed, then Japan is stronger. This is because the situation is the same as with the automobile industry and the TV industry where quality of labor and automation are concerned. On the other hand, IC is not limited to 64 K, and various types of memory may appear. When logic (logic circuits) is included in an all-round race, the problems become multiplied.

Moderator: The United States also seems to be moving in a direction to improve production technology.

Ouchi: Where the Pentagon and NASA are concerned, no matter what poor performances such as yield are involved, all costs are borne by the country. That is different from an environment such as ours where we are in free competition and have to devise means from the outset to avoid wasteful use of materials and so forth. But it is extremely dangerous to say that this is the reason the Americans have no capability of producing IC of good quality.

Shimura: Where memory is concerned, Japan has come so far with the 64 K, and Nippon Electric, Toshiba Information System, and the Communications Laboratory of Nippon Tel and Tel are pushing research on the 256 K. Now, the United States is not up to Japan. That is to say, once Japan has a clearly defined target, it is very good at arriving at its goal.

In another direction, unlike memory, random logic or microprocessors require system development capability and creativity. This is an area where the United States already has appeared with minibit microprocessors at the ISSCC in February, where both Hewlett Packard and Intel displayed their products, and there was none from Japan. Japan is still way behind in the matter of searching the virgin wilderness for ideas.

Development Somewhat Different From Military-Oriented United States

Moderator: American IC makers are fighting the quality control problem by building their own plants in Japan. It is said that the TI plant in Japan is running very smoothly at the present time, and they seem to be aiming at VSLI mass production.

Shimura: Japan TI has three plants, while Japan IBM has built a plant at Yashu (Shiga Prefecture) where it is targeting IC production in 1983. There is also talk that Fairchild, Motorola, and Analog Devices are considering locating in Japan. Behind this is the high quality of Japanese labor, in addition to which they seem to think that Japanese technology can be utilized. The world is paying close attention to the results put out by the FLSI Research Association.

What bothers me is the time to make this move, and when one considers mass production of 16 K or 64 K class memory, 1983 or later may be somewhat late.

Moderator: On the other hand, the Japanese makers are pushing production sites in the United States and Europe. Won't there be problems such as maintaining product quality and yield?

User Service Will Be Deciding Issue

Ouchi: Where our company is concerned, we purchased one of the Silicon Valley companies, and we also hope to build a plant in Sacramento. We have a plant in Ireland and are now constructing one in Scotland. Since automation has progressed so well, we have no worry about quality. The yield is still somewhat lower than in Japan, but improvement is possible. Both plants are showing profits.

One of the major points in locating plants in the Western world is to get away from trade friction, but there is an even greater objective. Just as with custom IC, service is an important adjunct of IC, and if we have the plant within the customer's country, the technologists can hear the requests of the customers or be able to go instantly on the day they are notified by telephone that trouble has occurred, and such capabilities are a must. If we are to compete in the world market, there is no escaping the fact that we must put up plants in the Western world.

Moderator: Mr Sasaki said before that Japan provides better service, but where the American users are concerned, service for Japanese IC is not necessarily the best.

Ouchi: The problem of distance is a little steep.

Sasaki: The problem of service, which means a quick response on the part of the maker, is even more important in the case of gate array (half-finished IC which is completed according to the wishes of the user).

Ouchi: The installment of distribution lines in accordance with the customer's orders is what gate array involves, but the present one-touch micron is also one in which we listen to the customer's wishes for the ROM section (read out memory).

Moderator: Such being the case, mutual entry on the part of the Japanese and American makers will become vital.

Sasaki: It is management which has to turn the key for mutual entry. No matter what kinds of agreements are bandied about, there is the Japanese type management, which believes that the customer must not be put to any inconvenience, and a management which follows the terms of an agreement strictly to the letter, and there is a wide gulf in between.

Moderator: IC at its foremost technology is deeply involved with military use. Because there are so few military projects in Japan, does this not constitute an obstacle?

Ouchi: This is certainly a major handicap, but there is a tendency for some advantage taking in the United States. We work to the utmost to keep going.

This situation may be tough from the monetary standpoint, but it is a plus spiritual factor. To be sure, the Nippon Tel and Tel Public Corporation takes over the role of the military in Japan.

Shimura: The United States at present is working on the VHSIC (very high speed IC) on orders from the Pentagon, and this is a major project which is expected to cost 300 million dollars between 1980 and 1986. This project involves the development of a super high speed signal processor to be loaded on a radar guided type missile. This will require a pattern on the order of 0.5 micron and the introduction of 250,000 gates per chip to enable speed of severan tens of millions to several hundreds of millions of computations per second. There is no such need in Japan. This is a turn in the direction of reinforcing the American semiconductor industry.

Survive Because of Being "Poor"

Sasaki: Now, on the basis of our contacts on desk calcuator-use IC with the American makers, the line of thinking of a designer with respect to a desk calculator is completely different from that of a maker who has been nurtured by the military. This is something heroic. Because they had been nurtured so far, they finally began to understand what was needed in the line of military calculators, and they were able to come out with such units. this is why I consider that it was the military calculator which developed LSI.

If one had the time, ample funds, and good material to work with, a number of ideas would come forth, but when one attempts to manufacture practical goods out of it, he cannot because he has been too pampered. This is why I believe that we poor people have been able to achieve what we have through our hard efforts. The Americans come out with some very fine ideas on microprocessors, but if the Japanese can come up with good software, the poor man Japan will be even stronger on hardware.

Moderator: The Japanese IC industry up to now has been led by desk calculators, but what will lead the high density memory and logic of the future? What are the prospects for its use in the private market?

Sasaki: Whether it is a wealthy man or a maker of large computers, he values reliability so greatly that cost cannot help but be high. When we perform the functions, we probably will discard anything which involves considerable risk. Although there can be some failures, we will try to the utmost. As long as there is the feeling that any item for private use has to be low in cost, there will be differences between the Americans and Japanese regarding LSI.

Moderator: Ordinary commercial use does not require too great speed. On the other hand, the most recent Kanji treatment seems to require a large capacity and extremely fast CPU (central computing and treating facility) and a memory device.

Ouchi: High-speed elements are becoming necessary even in word processors for private use, and it has become difficult to differentiate from industrial-use computers in the matter of machine performance of the private-use units.

Shimura: Research and development of VSLI in Japan include Nippon Tel and Tel's project in the communications area and the Ministry of International Trade and Industry's next-generation computer project, and household electrical makers are not participating in either program. This does not mean that there is no tie-in with VSLI.

One point I want to make is that VLSI looks toward not only high capacity and high speed but high density as well. That is to say, a single wafer can provide the equivalent of three or four times the number of chips, and this makes possible improvement in the economics. One other item is the trend to digitalization even in the private-use area, and as the frequency of use of digital circuits increases, the significance of VLSI is becoming increasingly more important.

Sasaki: The VLSI we handle is considerably different from that used by the computer makers. We consider cost, first of all, as we try to reduce the size of the chip while we strive for a higher degree of integration. It has been adequate thus far, but treatment of Kanji characters is slow, and the belief arises that there will be some congestion emerging within a few years.

The price of the American VHSIC is too high. What to do? Eventually a non-Newman approach using parallel treatment and development of suitable software should provide a pathway to the solution of this problem. It is with this intent that we are trying to develop a Japanese VLSI for which we are presently drawing up the design, and we expect that some extremely interesting software will become available to the consumers.

Ouchi: When we talk about VLSI, the first things that come to mind are that this is an item of super high degree of integration and that a single chip incorporates 100,000 to 1 billion bits, and this definition seems to stand foremost in our minds. On the other hand, I emphasize to my staff that "VLSI represents a super precise and fine pattern technology, the first objective of this technology is to reduce cost, and other considerations include very high reliability and faster speed."

High-Speed and High-Capacity IC for Kanji Treatment

Moderator: It seems that other than silicon, attention is being directed to gallium arsenide as possible material for study.

Ouchi: It is a fact that gallium arsenide and the Josephson element will become important items in the next generation. On the other hand, these units place great emphasis on speed, so they probably will make up one sector of a wide array of IC. It would be a big mistake to assume the end of the age of silicon is in sight.

Shimura: Although silicon may be somewhat limited in its market potential with the appearance of the gallium arsenide type compound semiconductor, gallium arsenide is a semiconductor after all, and the semiconductor age will continue.

Ouchi: No matter what is said, there is no need to use gallium arsenide in large volume items such as desk calculators and watches.

Sasaki: Several years ago, about the time IC was announced, the parts makers said, "our business will disappear" thereby voicing their concern, but the parts industry still remains. The same situation also applies here.

Moderator: I see where the VLSI for private use not only will have the capability of handling Japanese characters but graphics as well.

Sasaki: Graphic capability will be incorporated as well as voice and sound synthesis capability; this unit will be very versatile.

Shimura: I apologize for saying this in front of Mr Sasaki, but the language and number of phrases entered into an electronic translation machine are very limited. Even including voice and sound synthesis, the use of several ROM of several mega (million) bit capacity will be able to provide the capability. This is why VLSI memory has such important significance.

Ouchi: Kanji treatment is an important area for exploiting the speed and large capacity memory of VLSI. The IC presently in use is adequate for use in watches, but should the cost of VLSI come way down, there are sufficient grounds to use it in watches. In this manner, VLSI probably will infiltrate all semiconductor areas.

Sasaki: Not only semiconductors but VLSI technology must be applied, because the potential is unlimited. There are any number of applications, including printed circuits, distribution line technology, or finishing technology.

What Will Be the Direction of Japanese-American Semiconductor Friction

Sasaki: Among the problems facing the industry is the gradually increasing cost of investment in facilities. The ratio of investment in facilities with respect to sales total is increasing. This is a truly vexing problem.

Ouchi: A few years ago it was necessary to invest 100 million yen in facilities in order to increase annual sales by 200 million yen, while today 140 million yen investment is required to achieve the same sales volume, and it is said that it won't be long until 200 million yen investment will be required to realize the same return.

Moderator: In other words, you are saying that there is no way but an oligopolistic approach.

Ouchi: This is why it is difficult to invest in business ventures on the West Coast of the United States. There are also the cries that "Japanese IC makers have added to the situation" with regard to the irritation to construction depression.

Shimura: While this is the situation with the medium and small makers in Silicon Valley, large makers such as IBM and TI are making investments such that certainly we in Japan cannot ignore such moves.

Moderator: Finally, let us discuss the direction Japanese-American relations will take. Just what will be the future problems of the research and development system of Japanese private industry or what directions will the SIA (American Semiconductor Industry Association) take in the future, and will the trade friction be rekindled....

Sasaki: Is it not the case that there is no longer friction? Why, even the import duties have been lowered.

Ouchi: The Americans have from the start kept proposing their own selfish views. Although Japan lowered duties on IC to bring them to the same level as the Americans, duties are higher on all other areas where export to the United States is concerned.

While the VLSI Technology Research Association calls it impertinent, it itself is receiving funds from the Department of Defense (Boeisho). In the final analysis, it is saying to Washington, "lend us money just as Japan does."

Sasaki: It will become more and more difficult to voice complaints against Japan, and they will gradually direct their complaints to their own government.

Ouchi: If on top of all this there is an advance in mutual extension, the significance of export figures will be lost.

Shimura: On the other hand, it cannot be said that the customs problem may not reappear. Looking at the Jones report of last fall or the statement of Brock representing USTR to Congress or still further to the statement of the assistant secretary of commerce, they all indicate that after the automobile the subject will be the semiconductor and computer, and information equipment is expected to be the focal point of Japanese-American trade problems in the eighties. In any event, the sparks are there as before, and any opening wedge such as mass export of 64 K has great potential of rekindling the problem.

Ouchi: This is what the Combined Defense Authority (Kokubo Sosho) is saying. IC is important from a military standpoint, and it is only because the United States has technology which is absolutely superior that the present ordered situation is maintained where the West is concerned, and should Japan or Europe approach this level, military problems will arise. If these words were actually said, surely a conflict is in the offing.

Shimura: Just as the free ride on defense thesis, there are a number of technology free ride theses in the history of semiconductors. To be sure, Japan has promptly paid for the technology it introduced, but that is ignored in their statements. As Japan becomes stronger, this technology free ride thesis will appear more and more.

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CSO: 4106/3

SCIENCE AND TECHNOLOGY

U.S DEMAND ON REMOVING TARIFFS CONSIDERED UNREASONABLE

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 9

[Text]

The computer industry strongly criticized last week the latest U.S. demand that Japan eliminate tariffs on 29 items, including computer mainframes and peripheral equipment, for correcting the swelling trade imbalance in favor of Japan. (See related story on Page 1.)

Takuma Yamamoto, president of Fujitsu Ltd., said that the demand on the grounds of trade imbalance was totally unreasonable as the bilateral computer trade has been against Japan.

According to the customs clearance statistics of the Finance Ministry, Japan's exports of computer mainframes and peripherals to the U.S. last year reached a value of ¥34,927 million, merely one-fifth of such imports from the U.S.

Industrymen believe that the U.S. now is trying to redress its massive trade imbalance by promoting exports of competitive products, such as computers and related goods.

However, the Japanese computer industry is sorely perplexed with the American "political pressure" following on the heels of Fujitsu's failure to win an AT&T contract for a fiber-optics communications system.

Executives of leading Japanese computer builders hope that the Japanese Government will stick to the 1979 agreement of the Tokyo Round of multilateral trade negotiations which calls for a gradual reduction of tariffs on maniframes and peripherals down to 4.9 per cent and 6 per cent, respectively, by 1987.

In contrast, importers of computers welcomed the U.S. move. But a trader said that it was 10 years too late as Japanese makers already have become strong enough to compete against their American rivals particularly in the fields of minicomputers and desktop computers.

Japan-U.S. Computer Trade

(In millions of yen)

	Exports to U.S.	Imports from U.S.	Import excess
1976	17,089	80,563	63,474
1977	12,801 (—25.1)	92,459 (+14.8)	79,658
1978	24,659 (+92.6)	76,615 (—17.1)	51,956
1979	27,084 (+ 9.8)	110,842 (+44.7)	83,758
1980	34,927 (+29.0)	152,889 (+37.9)	117,962

Note: Total of computer mainframe and peripheral equipment. Yearly percentage change in parentheses.
Source: Finance Ministry.

Import Tariffs on Computers

(Per cent)

	1977	Apr. 1979	Jan. 1980	Apr. 1981	1986 (planned)
Mainframe	13.5	10.5	9.8	9.1	4.9
Peripherals	22.5	17.5	16.1	14.6	6.0
Parts and accessories	15.0	15.0	12.5	12.5	4.9

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SCIENCE AND TECHNOLOGY

STEEL INDUSTRY SEES FINANCIAL CRISIS DANGER IN 1990

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 6

[Text]

A pessimistic view has arisen in steel industry circles here that their industry, now boasting of the world's strongest competitiveness, will face a financial crisis around 1990 as it will need a tremendous amount of money to replace the increasing number of superannuated production facilities.

Steel industry analysts estimate that the ratio of relatively new production facilities (in operations for less than 10 years) will decline to 35.6 per cent in 1990 from the present 60 per cent.

This means that Japan's steel industry will have to make a large-scale replacement investment in the latter part of the 1980s in order to maintain its present international competitiveness. It is generally known that a steelmaking facility must be 60 per cent replaced after it has operated for more than 25 years.

The industry's average annual plant and equipment investment is estimated to swell to about ¥1,340 billion in the latter part of the 1980s and further to ¥1,680 billion in the 1990s, with inflation taken into account, compared to ¥860 billion at present.

Such big investment burdens are expected to drive Japanese steelmakers into financial straits and weaken their international competitiveness.

Japanese steelmakers thus have come to feel the need to map out long-term equipment investment plans with their equipment situation 10 years hence taken into account while their investment burdens are still relatively light.

American and European steelmakers are said to have lost their international competitiveness from delay in replacing their production facilities. The number of operating years for Japanese steelmaking facilities averaged 9.5 years at the end of fiscal 1980, compared to America's 17.5 per cent early in 1979.

Some observers here, however, suspect that in the back of the steel industry's latest "crisis outlook" actually is the industry's wishes to persuade steel users to accept its planned product price hikes next year by emphasizing the need for huge equipment investment in the future.

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SCIENCE AND TECHNOLOGY

SEAMLESS STEEL PIPES EXPORT PRICES RISE

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 6

[Text]

Export prices for seamless steel pipe and tubes are going up sharply, reflecting the continued oil exploration spree, particularly in the U.S.

The average price in the first half (April-September) of fiscal 1981 rose 23.3 per cent over the second half (October, 1980-March, 1981) of fiscal 1980 to $1,113 ton.

As U.S. Steel Corp., the price leader, elevated its seamless pipe prices by an average of more than 10 per cent last month, the average price will likely be hiked to around $1,300 per ton for even popular types of such pipe.

In order to meet the swelling demand, four major Japanese steelmakers — Nippon Steel Corp., Nippon Kokan K.K., Sumitomo Metal industries, Ltd. and Kawasaki Steel Corp. — are now operating their seamless pipe mills at capacity.

Their combined seamless pipe exports in the first half of the current fiscal year amounted to 1,549,112 tons. Exports in the second half are likely to gain slightly over the first half, although Kawasaki Steel has increased its seamless production capacity.

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SCIENCE AND TECHNOLOGY

GENERAL ELECTRIC MACHINERY MAKERS BOOST EXPENDITURE

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 9

[Text] Four general electric machinery manufacturers — Hitachi, Ltd., Toshiba Corp., Mitsubishi Electric Corp. and Fuji Electric Co. — have been aggressively expanding their production capacities and streamlining production lines by revising upward their original fiscal 1981 plant and equipment investment plans.

Their combined capital spending in fiscal 1981 is now estimated to rise 18.1 per cent from the preceding term to ¥208 billion. Computers, semiconductors and video tape recorders are major targets for their capital spending.

Among the four, Toshiba seems to be the most aggressive. It has revised its initial fiscal 1981 capital spending program by ¥10 billion to ¥67 billion (JEJ-Nov. 3 issue). Mitsubishi has earmarked ¥4 billion more funds than the originally planed ¥41 billion for such investments in the current term. The revised amount is ¥10 billion larger than the preceding year's performance.

Hitachi revised the original figure of ¥80 billion to ¥82 billion. The increased portion is relatively small because it put the original program at a high level.

Most of the earmarked funds are for facilities to produce electronics products, such as semiconductors, computers and VTRs. In the case of Mitsubishi, ¥23 billion of the ¥45 billion are for the semiconductor/computer division. If investments in VTRs and color picture tubes are included, investments for the electronics field account for 80 per cent of Mitsubishi's total capital spending for this year.

The character of their investments this year is that they hardly are concerned with building an entirely new plant. Instead, they are for setting up factories in their existing plants or for installing more sophisticated lines.

Their aggressive investments owe much to their current favorable business performances and bright prospects in the latter half of fiscal 1981. Intensified price competition in electronics products also is forcing them to continue spending a huge amount of capital. Otherwise, they will be eliminated from the competition.

Besides the four general electric machinery makers, Nippon Electric Co. (NEC) is actively boosting production capacities. NEC competes with the four firms in the field of semiconductors and computers. Plant and equipment investments planned by NEC and its affiliated companies have been revised upward by ¥6 billion to ¥85 billion. The revised figure is ¥20 billion larger than in the preceding year.

Sharp also has raised its fiscal 1981 capital spending plan to ¥50 billion from ¥44 billion. Originally, the Osaka consumer electronics maker had earmarked ¥40 billion for this year.

Fujitsu Ltd. has boosted its fiscal 1981 capital outlay program by ¥10 billion to ¥59 billion from the original ¥49 billion. The revised figure represents a 31 per cent gain from the fiscal 1980 performance. Of the amount, ¥33.5 billion will be for facilities to produce semiconductors and other electronic components. On the strength of the increased funds, Fujitsu will be able to boost its monthly production capacity of 64-kilobit random access memory devices to 700,000 chips by the end of next March.

Four General Electric Machinery Manufacturers' Revised Capital Spending Programs for Fiscal 1981

(In billions of yen)

	FY1980 (actual)	FY1981 Initially planned	FY1981 Revised	% chg. from FY1980
Hitachi	77.5	80	82	+ 5.8
Toshiba	53.6	57	67	+25.0
Mitsubishi	35.0	41	45	+28.6
Fuji	10.0	13	14	+40.0
Total of the four	176.1	191	208	+18.1
NEC*	65.0	79	85	+30.8

*—Including those of affiliated companies.

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SCIENCE AND TECHNOLOGY

NEW MINUTE METAL PARTICLES PRODUCTION DISCOVERED

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 16

[Text]

A method to produce exceptionally fine particles of metals, ranging in diameter from 1/10,000th to 3/100,000th of a millimeter, at an extremely low cost, has been developed by the National Research Institute for Metals of the Science and Technology Agency.

According to the institute, the method, featuring utilization of electric arc discharges, though still experimental, is without precedent anywhere for its efficacy in creating such ultra-fine particles of various metals. Moreover, it is fit for mass-production of such particles for its surprisingly low cost, possibly only about 1 per cent of the best conventional method of making such metal particles.

The institute said the method was accidentally discovered as a by-product of its research on reactions between molten metal and gas. It thus still has to explain clearly the principle of how such extremely fine metal particles are created by the method. But it has presumed that its use of a hydrogen gas with an electric arc discharge results in inducing the gas into metal specimens and forcing very tiny metal particles out when the gas emerges.

The method consists in placing a metal sample in a mixture of argon and hydrogen in an electric arc discharge chamber any collecting very fine particles of the metal coming out of the specimen, when the specimen is hit by the arc discharge. The mixed gas was not pressurized.

Used for the experiment with success were specimens of iron, cobalt, titanium, tantalum, and alloys of iron, including nickel, and cobalt. The resultant particles were not uniform in size and connected like strings of beads because it was still an experimental trial. But they were obtained at the rate of 1 gram to 0.2 grams per minute at an electric power consumption of only 6 kilowatts.

Production of such ultra-fine metal particles is still at the threshold of the development of the technology concerned anywhere in the world. In Japan, the Science and Technology Agency had started developing such technology only last April.

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SCIENCE AND TECHNOLOGY

SHARP TO PRODUCE VISIBLE LIGHT SEMICONDUCTOR LASER

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 16

[Text]

Sharp Corp. has announced developing a high-output visible light-generating semiconductor laser hitherto considered difficult to produce in an applicable form.

The Osaka electric-electronic equipment producer plans to start mass production of the new laser in February, next year. It stands greatly to speed up recording and reproduction of the opto-magnetic audio discs and the laser printers now under development in Japan.

Sharp's new product is a gallium-aluminum-arsenide semiconductor laser having an optical output of 10 milliwatts and emitting a visible red light of 0.78 microns in wavelength.

It features an improved version of the company's own semiconductor laser structure known as the VSIS (V-Channelled Substrate Inner Stripe) type. The special structure is characterized by a grooved layer of V-shape in cross-section beneath the laser beam shooting active layer first to pen up the oscillated beam in the groove so that a light nearly circular in cross-section will be emitted.

The corporation had earlier developed a similar semiconductor laser of 5 milliwatts or half in output for application to making a digital audio recording-reproducing disc.

The corporation has followed it up with the development of a better version by such new method as to thin out the active layer without the danger of destruction of its crystallization even by doubling the output, to reform the structure of the grooved layer to stabilize the beam oscillations, and to minimize the occurrence of the watt-less (reactive) current.

The new semiconductor, measuring 0.25 millimeters high, 0.3 wide and 0.12 deep, starts high temperature oscillations when an electric current of 40 milliamperes or up, that is, the threshold (stimulus-giving) value or higher is applied, and then put into constant activity by sending an operating current of 70 milliamperes into it.

To go along with the new laser, the corporation also developed a new optomagnetic audio disc-making film of terbium-diprosium-iron-family amorphous substance type.

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SCIENCE AND TECHNOLOGY

REAGENT MADE FOR MEASURING MOLECULAR WEIGHTS

Tokyo JAPAN ECONOMIC JOURNAL in English Vol 19 No 982, 24 Nov 81 p 16

[Text]

A reagent to precisely measure the molecular weights of all sorts of substances between 5,000 and 800,000 has been commercially developed by Hayashibara Biochemical Laboratories, Inc. (Hayashibara Co.) of Okayama, and will soon be exclusively marketed by Showa Denko K.K. of Tokyo.

According to sources close to the Okayama manufacturer, the new product is a redeveloped version of its "edible" plastic, a sort of polysaccharoid, named "Pullulan", developed back in 1973.

Hitherto used as molecular weight-measuring reagents are various brands, including "Dextlan," a Swedish-produced polysaccharoid. But they have invariably been imprecise or limited in applicability. Because of its great range of applicability, it is expected to be usable even in high-speed industrial or other sophisticated chromatographs and high-precision biochemical and biotechnical research. A biochemical expert of the University of Tokyo Faculty of Science expected the new product to be an innovational reagent in biochemical or biotechnical studies because there has so far been no good reagent capable of accurately measuring proteins or nucleic acids of 500,000 or larger in molecular weight.

Hayashibara will shortly start mass-producing the new reagent at its Okayama factory and supplying the entire output to Showa Denko. Showa Denko was chosen out of numerous sales applicants, both domestic and foreign, because, besides being Japan's top-level chemical and fertilizer maker, it has a long record of research, development, information gathering and sales. To be marketed under Showa Denko's own tradename of "Shodex STANDARD P-82," the new reagent will be an expensive commodity priced at more than ¥200,000 a gram. Still Showa Denko expects to sell several kilograms annually to research institutions throughout the world.

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SCIENCE AND TECHNOLOGY

POTENTIAL OF DEFENSE INDUSTRY EXAMINED

Tokyo NIKKEI SANGYO SHIMBUN in English 25-30 Sep, 2-3 Oct 81

[25 Sep 81 pp 10-12]

[Text]

Potentiality of Japan's Defense Industry (Part 1) -- Time for Its Becoming Independent Not Too Far in the Future

Our country's defense industry is on the verge of becoming a full-fledged independent industry. Occasioned by the US request for the strengthening of defense power, voices are also mounting within our country, centering on the LDP, for the "accelerating of the consolidation of defense power," and the defense budget is starting to increase steadily. Expectations for its quantitative expansion are mounting, on the one hand, while on the other, the development of our country's own independent defense equipment, through the application of our country's advanced electronic and communications technology, is also becoming conspicuous. The US is asking to be supplied with military technology and for joint development, and there are even appearing arguments for the re-studying of the Defense Plan General Outline. There is no possibility that our country's defense industry, which is limited to the fields of conventional weapons and which abides by the principle of not exporting weapons, based on the basic defense policy of adhering strictly to defense, will suddenly grow into a mammoth industry at one stroke, as seen in the US. However, the time for its becoming independent, as a defense industry suited to the actual situation in our country, is not too far away. In this series, the possibility for its growth, its technological potentialities, its enterprise management, and its effects on our country's industries, as a whole, will be explored.

-- One-Trillion-Yen Market Very Near at Hand; Autonomous Development, after Quantitative Expansion; Aiming at Extrication from Licensed Domestic Production --

Orders, Based on Medium-Term Operations Estimate, Being Placed at Fast Pace

"There is the standard that defense expenditures will be within one percent of the GNP. Therefore, there is no possibility of the defense industry becoming big, all of a sudden. It may be a different story if

it is said that it is alright to exceed the one-percent level ..." The statements by Keidanren's (Federation of Economic Organizations) Defense Production Committee Chairman Gakuji MORIYA (Advisor to Mitsubishi Heavy Industries) are always cautious, unaffected by the generally prevailing mood for the strengthening of defense power. There is no sense of urgency in the defense industry circles, desiring even a small increase in the amount of work. This is because the situation is now appearing that, even without their saying anything, orders from the JDA will steadily increase.

Orders for main equipment under the Medium-Term Operations Estimate (the 1978 Medium-Term Operations Estimate for the period from fiscal 1980 to fiscal 1984), which is the JDA's plan for equipment and organization, and the early attainment of which was requested by former US President CARTER, are now being placed, at a fast pace. If the budget request for fiscal 1982 for the F-15's (licensed domestic production by Mitsubishi Heavy Industries) (43 planes) is approved, the target of 77 planes set under the Medium-Term Operations Estimate will be achieved. The rate of attainment of the Medium-Term Operations Estimate for all main equipment, such as the P3C anti-submarine patrol planes (licensed domestic production by Kawasaki Heavy Industries) and the 74-model tanks, will also exceed 70 percent.

The Keidanren's Defense Production Committee, which is the general controller of our country's defense industry has been requesting that "capital expenditures," which include the expenses for the purchase of equipment, such as planes, research and development expenses and facilities consolidation expenses, will be increased to account for at least 30 percent of the defense budget as a whole.

However, if the placing of orders for a large number of F-15's and P3C's under the fiscal 1982 budget is approved, the expenditures even just to pay for the equipment for which orders have been placed before and in fiscal 1982, will exceed one trillion yen in the fiscal 1983 budget, and there is even the possibility that the amount will account for nearly 40 percent of the defense budget. The defense industry circles view that "our requests in the past will come to be realized, even if we do nothing about them" (Chief of the Defense Production Committee Secretariat Hiroshi MORIKAWA), and they are now on the point of starting moves to formulate new requests more in keeping with the rapid development of equipment. This shows how great the changes in the environment surrounding the defense industry are. The JDA is aiming at the attainment of the equipment level prescribed in the Defense Plan General Outline, even during the period of the next-term Medium-Term Operations Estimate (from fiscal 1983 to fiscal 1987), which is slated to be formulated, even as early as next spring, with the early attainment of the 1978 Medium-Term Operations Estimate as a foothold.

Even Possibility of Re-Studying General Outline, in Compliance with US Request

However, the requests for the strengthening of defense power, presented by the US side at the Japan-US administrative-level consultations on security in June and elsewhere, largely exceed the level given in the General Outline.

For this reason, there are even starting to appear arguments for the re-studying of the General Outline (revising it in an upward direction), in compliance with the wishes of the US, in the LDP Security Research Council, etc. This stems from the awareness that the General Outline, which was decided in October, 1976, no longer provides a guideline for the equipment program.

The defense industry circles are already waiting eagerly, observing that "if the General Outline is revised, the facilities which we now have will certainly not be sufficient" (Kawasaki Heavy Industries Vice President Renzo NIHEI). After all, if the interceptor-fighter groups, consisting of such planes as the F-15, were to be increased by four groups (one flight group is organized with 18 planes), as requested by the US, it will mean that nearly 100 F-15's, including the reserve planes, which will cost about 11 billion yen per plane, will come to be needed. The expenses for the purchase of this number of planes alone will exceed one trillion yen.

The monetary amount of the JDA's contracts in fiscal 1980 is 953.1 billion yen (of which 12 percent is for imports, etc.) This amount includes the expenses for the purchase of fuel, textile products, etc., and it is not all for frontline equipment. Even so, the scale of the defense industry exceeding the big line of one trillion yen is now a matter of time.

However, the main-stream of our country's defense production is licensed domestic production, as in the case of the F-15's and the P3C's. Even if the sales amount increases, there will remain the dissatisfaction as expressed by President Taiji UBUKATA of Ishikawajima-Harima Heavy Industries, which manufactures the engines for these two types of planes by licensed production, that "licensed domestic production alone, is a problem." Their aim is autonomous development, after quantitative expansion. Defense Production Committee Chairman MORIYA and others are already launching PR campaigns, saying that "if a preparation period is given us, it will be possible to develop frontline fighters, which can succeed to the F-15's."

Different from the case of the aircraft sector, in which the main-stream is licensed production, domestic production is the core for ground equipment. There is, for example, the 74-model tank, which the GSDF says with conviction that "it is one of the highest quality products, even in the world, as a tank of the 1970's." Even in the midst of the mood for laying emphasis on air and sea equipment, orders for these tanks have been steadily increasing, from 60 tanks in fiscal 1980, to 72 tanks in fiscal 1981 and to 80 tanks in the request for fiscal 1982. It has reached the point where Special Vehicles Department Director Iwao HAYASHI, who has been in charge of the designing of tanks since the first half of the 1950's, in Mitsubishi Heavy Industries, can now make a declaration of independence, saying that "in the past, we were a 'family member, supported by other sectors' of the firm, but we have now reached the stage where we can manage on our own, somehow or other."

The next-term Base Air Defense Ground Environment (BADGE-X), which will become the keystone for our country's air-defense, will also be manufactured domestically. Influential American firms approached the JDA, but computers

and communications technology, which are needed for BADGE-X, can be fully taken care of domestically. In regard to the software for the air-defense system alone, Japan Electric, Fujitsu and Hitachi Works are aiming at receiving orders, using Hughes Aircraft, General Dynamics and SDC, respectively, as their "sub-contractors."

Some Missiles Are First-Grade Products

Essentially, the strength of the defense industry reflects the level of the industrial ability of that country. Some missiles, such as the air-to-ship ASM-1 missiles, developed by Mitsubishi Heavy Industries, and Tokyo Shibaura Electric's short SAM's are rated very highly as top-quality products. This is because our country's electronics technology can be utilized fully in the guidance system, etc., of these products. Our country has now reached the level where the US is asking for the supply of military technology, such as our country's high-precision electronic parts, saying that "it is a problem, for the offering of technology to be one-way traffic."

The defense industry is now starting to show signs of quantitative expansion. Even so, however, the ratio of the defense industry to the industrial circles as a whole is so small as to be almost negligible. The production of defense equipment (including foodstuffs, textiles, etc.), accounts for only 0.38 percent (in fiscal 1978) of all the industrial production amount.

The US Defense Department placed orders to the munitions industry, amounting to 76.8 billion dollars in fiscal 1980. The amount is roughly 16 times that of the orders placed by our country's JDA. As the defense expenditures of Japan and the US in the same fiscal year was also about the ratio of 1 to 16, this difference is quite natural. Furthermore, in the case of our country, it does not have strategic weapons, such as the ICBM, and exports of weapons are also virtually banned, under the three principles concerning weapons exports. Furthermore, a ceiling of less than one percent of the GNP is placed on defense expenditures, at the present time. Therefore, there is no likelihood of mammoth military enterprises, as seen in the US, being created. However, it is certain that a defense industry, which is suited to the actual situation in our country, is coming to take root steadily.

Changes in Ratios of Personnel and Food Expenditures, and Capital Expenditures to Defense Budget, as a Whole

	FY1978	FY1979	FY1980	FY1981	FY1982 (request)
Ratio of personnel and food expenses	54.4%	51.4%	49.3%	47.7%	44.8%
Capital expenditures (total of expenses for buying equipment, research and development, and consolidation of facilities)	20.5	22.6	24.4	25.7	26.7

[26 Sep 81 pp 11-13]

[Text]

Potentiality of Japan's Defense Industry (Part 2) -- Becoming Arena for Competition in Technology

-- Electronic Firms Fired with Enthusiasm; Japan Steel Tube in Hot Pursuit in Construction of Escort Ships; Escort Ships for Which There Will be Demand for Repair Are Attractive --

The Japan Shipbuilding Industry Association's Naval Ships Committee is a gathering of eight companies which receive orders from the JDA for the building and repair of naval ships, including escort ships, mine-sweepers and submarines. Of these eight firms, five firms, namely Mitsubishi Heavy Industries, Ishikawajima-Harima Heavy Industries, Sumitomo Heavy Machine Industry, Mitsui Shipbuilding and Hitachi Shipbuilding are in charge of building escort ships, while Mitsubishi Heavy Industries and Kawasaki Heavy Industries build submarines. Japan Steel Tube, which has so far been excluded from taking part in the production of the two major equipment items for sea defense, among the influential companies, has recently started to show moves for securing orders for the construction of escort ships and is causing a flutter among other companies. The five firms are trying to check the entry of a new competitor, saying that "even if the orders were to become twice that at present, we can fully meet the demand with the facilities which we now have."

Japan Steel Tube Managing Director and concurrently head of the Ship Division Tsuneo SEKIKAWA is showing a low posture, saying that "access (by a new entrant) is difficult, under the present shipbuilding pace; the first thing for us is to accumulate the know-how for building naval ships, and we are not thinking of joining them immediately." However, he does not hide the fact that preparations are already being made for that purpose.

The reason why Japan Steel Tube has decided to enter the field of defense production, even knowing fully well that it will be met with strong resistance from other shipbuilding companies, lies in the fact that "the management of the various companies building escort ships is in a stable state" (SEKIKAWA). Different from ships for exports and merchant ships, which will directly be affected by business fluctuations, escort ships are very attractive, as the placing of orders for them goes according to the planned schedule, as the monetary amount per ship is also big, and also as it is possible to expect demand for repairs. The ratio of defense orders for Japan Steel Tube's Shipbuilding Division is only 2.5 percent, while in the case of Mitsubishi Heavy Industries, which it regards as the target to emulate, the ratio has already exceeded the 10-percent mark (as of fiscal 1980, for both cases).

Another factor which has led Japan Steel Tube to seek access into this sector is that the spread merit of the know-how for the building of escort ships to the building of merchant ships is not small. Mitsubishi Heavy Industries' Naval Ship Division Director Kiyotaka MATSUNO testifies that "the reducing of vibration and noise is becoming a technological task in regard to merchant ships, and the parts which are common to both naval ship and merchant ship technology are big."

Electronic-ization of Equipment Is Being Further Accelerated

Electronic equipment is showing a remarkable increase, recently, in defense demand. According to an estimate made by a certain influential electronic instruments manufacturer, electronic equipment, including missiles, is considered to have accounted for about 200 billion yen, of the total amount of orders placed by the JDA in the last fiscal year (about 950 billion yen) (five years ago, the amount was 70 billion yen, in the total amount of orders of 450 billion yen). Electronics technology has made inroads into all fields of defense, ranging from missiles, aircraft, naval ships, to various types of ground air-defense systems. The next-term P3C anti-submarine patrol planes will cost about 10 billion yen per plane, but of this amount, more than 40 percent will be accounted for by electronic equipment and instruments to be placed on board the plane.

It is certain that "this kind of 'electronic-ization of equipment' will be further accelerated in the future" (JDA Technological Research and Development Institute Director Yukie OMORI). The Nomura Overall Research Institute has formulated an outlook for defense-related expenditures, up to fiscal 1984. It estimates the annual increase rate of expenditures for equipment at 19 percent, but it expects that the increase rate, if limited to electronics equipment alone, will far exceed 20 percent.

All the more for this reason, the posture of electronic equipment manufacturers toward defense production has become very positive, beyond comparison with their attitudes in the past. Hitachi Works, which had so far been lagging behind Mitsubishi Electric Machinery, Tokyo Shibaura Electric and Japan Electric, established a defense technology promotion headquarters in August of last year. Fujitsu is also shifting to a roll-back, newly

establishing the Fujitsu System Overall Research Institute in January of this year.

This is because they view that "the increased degree of the combination of defense technology, centering on electronics, will enable the full utilization of technology developed for civilian use" (Hitachi). Fujitsu Vice President Taichiro ATARASHI says bluntly and boldly, "It would be absurd if we were to overlook the defense market, which is about to attain rapid growth. In two or three years, we will increase the amount of orders we receive to twice the present amount, or to 10 billion yen." Hitachi assigns 60 staff members to the Defense Technology Promotion Headquarters on a standing basis, while Fujitsu has 130 staff members in its Research Institute, and they are both showing very strong enthusiasm.

Partly a Place for Studying and Acquiring Know-How

It is not only because they took note of the growth potential that these two companies consolidated their structure for defense production and for the acceptance of such orders, roughly around the same time. It is not unconnected with the fact that such large-scale systems as the BADGE system and Hawk and Nike surface-to-air missiles, which cost from 200 to 300 billion yen and even as much as one trillion yen, are approaching the time for renewal. "If we miss this chance, a decisive difference will appear with the manufacturers who entered this field earlier" (Hitachi). It will not only mean the missing of a business opportunity, but it will also lead to the losing of a place for "studies," for the acquiring of know-how for systems designing, which is incomparably bigger in scale and which requires far greater degress of precision, than on-line systems, adopted by banks, etc. The defense market from now on is becoming an arena where comprehensive electronic manufacturers will compete with one another in their systems construction ability and in the performance of their products.

This is most symbolically shown in the BADGE-X sales competition. Such early-comer manufacturers as Mitsubishi Electric Machinery, Toshiba and Oki Electric are planning to present a proposal jointly, forming a team. However, Hitachi and Fujitsu will put their real strength to test, independently, apart from what the outcome will be.

At the same time, manufacturers other than major companies are also making frantic efforts to strengthen their defense sectors. Hokushin Electric Machine Manufacturing Works, which is a manufacturer of aviation instruments and systems, will carry out a large-scale facilities investment, in preparation for the production of auxiliary instruments for the F-15's and the P3C's. It is already making preparations for an age of intensified competition, saying that when the weight of electronic equipment increases, "competition in performance, costs and quality will become severer, and this will affect the share of orders received" (Managing Director Sumio UEHATA). This kind of response is seen commonly among all electronic equipment manufacturers, irrespective of their size.

It is said that defense production, though having a high growth potentiality, "does not bring such big profits as is generally thought." However, it has the merit of "broadening the scope of application of technology which has been refined through the production of goods for civilian use, and of enabling the acquisition of know-how and techniques, which cannot be learned in civilian demand sectors" (Toshiba President Shoichi SABA and Japan Electric President Tadahiro SEKIMOTO). All the more for this reason, various related enterprises are aiming at strengthening their defense sectors, even if it means "the paying of tuition, for the time being" (Fujitsu Vice President ATARASHI). Research and development investments, in a different form -- this is one aspect of defense production in enterprises.

20 Top-Ranking Companies, Based on Amount of Defense Contracts

(For fiscal 1980)

Order	Enterprise Name	Monetary Amount
1.	Mitsubishi Heavy Industries	¥234,540 million
2.	Ishikawajima-Harima Heavy Industries	108,470 million
3.	Kawasaki Heavy Industries	81,190 million
4.	Mitsubishi Electric Machinery	72,380 million
5.	Tokyo Shibaura Electric	32,900 million
6.	Japan Electric	22,310 million
7.	Ito-Chu Aviation	14,040 million
8.	Japan Petroleum	12,900 million
9.	Japan Steel Works	12,270 million
10.	Sumitomo Heavy Machine Industry	12,040 million
11.	Komatsu Works	12,020 million
12.	Hitachi Shipbuilding	11,410 million
13.	Tokyo Instruments	9,390 million
14.	Hitachi Works	8,920 million
15.	Maruzen Petroleum	7,930 million
16.	Oki Electric Industry	7,750 million
17.	Shinmeiwa Industry	7,290 million
18.	Mitsubishi Shoji Trading Company	6,940 million
19.	Daikin Industry	6,760 million
20.	Shimazu Works	6,710 million

(For fiscal 1979)

1.	Mitsubishi Heavy Industries	¥96,930 million
2.	Mitsubishi Electric Machinery	53,960 million
3.	Kawasaki Heavy Industries	49,550 million
4.	Ishikawajima-Harima Heavy Industries	39,900 million
5.	Tokyo Shibaura Electric	18,190 million
6.	Japan Electric	16,640 million
7.	Japan Steel Tube	16,580 million
8.	Mitsui Shipbuilding	13,670 million
9.	Komatsu Works	10,290 million
10.	Japan Petroleum	8,860 million
11.	Oki Electric Industry	8,560 million

12.	Japan Steel Works	8,150 million
13.	Fujitsu	7,660 million
14.	Ito-Chu Aviation	7,300 million
15.	Sumitomo Heavy Machine Industry	7,150 million
16.	Fuji Heavy Industry	6,710 million
17.	Shinmeiwa Industry	6,701 million
18.	Hitachi Shipbuilding	6,700 million
19.	Fuji Electric Machinery	5,850 million
20.	Nissan Motors	5,790 million

[28 Sep 81 pp 7-9]

[Text]

Potentiality of Japan's Defense Industry (Part 3) -- Potential Ability for Development of Conventional Weapons

-- Production of Missiles at Low Cost; Heading in Direction of Breaking Through the "Wall of Quantity" with Autonomous Equipment --

"If we are permitted to use 100 billion yen as development funds, we will autonomously develop the next-term surface-to-air missiles (SAM-X) to follow Nikes and Hawks." -- This is what a JDA official in charge of development says, with confidence.

Research Budget Request of Less than 20 Million Yen

The most likely candidate for SAM-X, the purchasing funds for which will exceed one trillion yen, is the Patriot, manufactured by the Raytheon Corporation of the US. This is a missile on which research and development have been continuing for more than ten years. According to our country's industry circles concerned, which are aiming at its licensed domestic production, the development expenditures to be disbursed by the US Government up to the time of the full-scale production of Patriots, slated for the autumn of 1982, will amount to about 400 billion yen, calculated in terms of the Japanese yen.

As an alternative plan for this Patriot, Mitsubishi Heavy Industries and others have presented an autonomous development plan for Nike-Phoenix, to the Technology Research and Development Institute, which is the main JDA body for defense equipment development. However, the JDA, in its rough-estimate budget requests for fiscal 1982, is asking for only a little less than 20 million yen as the research expenses for the Nike-Phoenix, when it is requesting 500 million yen as survey costs for the introduction of the Patriot.

There has been no change in the JDA's basic policy for "deciding on the succeeding model, after checking into the performances of both models." However, it does not seem likely that it will decide on the autonomous

development of the Nike-Phoenix. After all, the budget for the Technology Research and Development Institute in fiscal 1981 was only 31.7 billion yen. Even if the development of SAM-X were to be possible, with research funds of 100 billion yen, it means that it will need development funds, which are more than three times the total annual budget of the Institute itself. The shortage of a large amount of development funds is posing an obstacle to autonomous development. However, autonomous development is achieving results steadily in the sector of short-range small-size missiles.

For example, the short SAM, which Tokyo Shibaura Electric jointly developed with the Technology Research and Development Institute. It had a difficult start, such as the arising of arguments concerning its performance, in the Diet, in the autumn of last year, just before the starting of the compilation of the fiscal 1981 budget, which included its full-scale introduction, on the grounds that it was inferior in performance, compared with Roland (jointly developed by France and West Germany), which was the rival model. However, the evaluation now commonly shared both within and outside the country is that "there are good points and bad points, depending on the guidance formula, and this is only natural. It is may not be given the perfect grade of 100, but it is a fully satisfactory missile."

Surpasses American Products in the Cost Field, Too

The air-to-ship ASM1 missile, which was developed by Mitsubishi Heavy Industries and others, is another missile, which the JDA is proud of. It says that it is better than America's "Harpoon" missile, which is the same type of missile, not only in performance alone, but also in the cost field. This is "the producing of results through thoroughgoing cost control, from the stage of designing, in order to produce them at low cost" (Technology Research and Development Institute Director Yukie OMORI).

When autonomous development of several missiles is placed on the right track, the moves of private enterprises also become active. It has been decided that Toshiba, which developed the short SAM's, will next take charge of the development of "portable SAM's," which will be surface-to-air missiles, which can be carried by SDF personnel. This missile adopts the homing formula, which will catch the invading airplanes as an image, through the adaptation of the charge-coupled device (CCD) technology, used for image-sensers in the cameras for household-use video-tape recorders (VTR).

JDA started to import portable SAM's, called Stingers, from the US, from fiscal 1981. However, even the US has not yet developed missiles which use the new guidance formula, using CCD. Toshiba says, with deep confidence, that "in the next portable SAM's, the US will also probably use CCD, but our country is ahead of the US in this field" (Specific Development Division Advisor Hirohide NAKAO of the Electric Wave Instruments Project Department).

The view that "in the missile field, technology developed for civilian-use goods, such as electronics, can be adopted, in order to make the size smaller and to raise the precision degree, and Japan is more advanced in this kind of improved technology" (Japan Weapons Industry Association Chairman

Mankichi TATENO), is becoming the generally accepted view. Still further, the obtaining of prospects for becoming able to develop products at a low cost, even when the production amount is small, as in the case of ASM1, even in the midst of the restrictions on weapons exports, has a big significance.

According to the JDA Technology Research and Development Institute, the technological level of products in the electronics field, such as missiles, radar, and firearms control systems (FCS), is high, but there is a tendency to lag behind in the fields of under-water weapons, firearms and ammunition. In other words, the pattern is that in fields where technology developed to meet civilian demand can be adapted, Japan is strong, but in fields where demand, other than that of the JDA, cannot be expected, weaknesses remain, reflecting the smallness of the market for such equipment.

In the aircraft field, where there is an overwhelming quantitative difference with the US, it is the earnest desire of Mitsubishi Heavy Industries, which developed the F-1 support fighters, and which is now engaging in the development of a CCV (control configurated vehicle), which will become the basis for future fighter-plane development, to link this with the development of the most modern and high-performance mainstay fighters. However, in the case of the F-4 fighter of the US MacDonnell Douglas Corporation, the production amount is about 5,000 planes, including those being produced domestically by the West European countries, on a license-production basis. That is why it is said that it is completely paying, even if it uses 2.1 billion dollars as funds for the development of the F-15. In the case of the production of 100 planes or 200 planes, as in our country, it can be said that it will be extremely difficult to break through the wall of amount, no matter how thoroughgoingly cost control is carried out.

"Three-Legged Race" by the JDA and Private Enterprises

The development of new defense equipment is determined by strategic concepts for coping with the threat of aggression. There are cases where it is more necessary to strengthen surface-to-air missiles, than to increase fighter planes, or where it is necessary to improve and increase anti-tank missiles, than to increase the number of tanks themselves. However, our country's ground, sea and air equipment tends to be scattered around widely, covering various fields. Some military experts point out that "even while saying that Japan will abide strictly by defense, the strategic principle is not quite clear."

The surface-to-ship missile, which the JDA will start developing on a full-scale, with Mitsubishi Heavy Industries, etc., from fiscal 1982, is one of the weapons which are suited to the actual situation in Japan. This is a missile, designed to have a range of 100 to 200 kilometers, and it will be for the purpose of attacking enemy ships, which aim at carrying out landings, from the central part of Hokkaido. If this type of equipment, which is suited for Japan, is created, one after another, the Japanese-type defense industry will come to take root firmly, overcoming the wall of quantity. The actual situation

of the defense industry of our country, where peace has been maintained continuously for over 30 years, since the end of the War, and which does not permit weapons exports, is that "it has never tested the performance of the weapons on the battlefield in actual reality" (Mitsubishi Heavy Industries Managing Director Yoshio SASAKI). Even in the future, the structure of a "three-legged race," under which the JDA chooses the subject matters for development and private enterprises supply the technology, will continue to be indispensable.

[29 Sep 81 pp 10-12]

[Text]

The Viability of Japan's Defense Industry (Part 4) -- Potential Capability of Manufacturing Strategic Weapons

-- Several Companies Have Capability for Manufacturing Atomic Bombs; Still Far Distant from Manufacturing Guided Missiles --

Supposing that our country were to possess "strategic weapons," represented by atomic and hydrogen bombs and ICBM's as the means of delivery, what will be total cost?

200 to 300 Million Yen Per Atomic Bomb, Ten Years Ago

It is said that, ten years ago, a ten-member team of the JDA's National Defense College, drew up a report, titled "Japan's Capability for Developing Nuclear Weapons and Strategic Weapons." The cover of the report was pure white, and only the mark "secret" stood out conspicuously. A certain politician, who says that he read that report, at the time, recalls that "the cost of manufacturing atomic bombs was 200 to 300 million yen, per bomb."

It is said that this was a report, formulated on the basis of the premise of "what Japan can do, in the case of Japan and the United States helping India's nuclear armament," based on instructions given by an influential LDP politician, who had served as JDA Director General.

There is another book which gives one answer to the difficult problem of "what the costs will be, in the case of actually possessing strategic weapons." That is the book, written by US Air Force General ENDICOTT, in 1975, and titled "Japan's Nuclear Option -- The Political, Technological and Strategic Factors."

This book, even though saying that "in conclusion, Japan will not choose the road to possessing nuclear weapons," reaches the conclusion that in the case of Japan's acquiring the minimum, but effective nuclear weapons, "it will be sufficient if it were to have ten submarines which can carry ten one-megaton-class SLBM's (submarine-launched ballistic missiles), which have a range of 2,500 nautical miles."

In this case, the number of missiles needed would be 192 missiles, including those for reserve, and the costs for them will be 1,556 million dollars. The ten submarines will cost 4,750 million dollars. In short, the costs for the acquisition of ten submarines, equipped with SLBM's, will total 6,610 million dollars, or about 1,520 billion yen. ENDICOTT writes that these equipment costs can be disbursed over a period of ten years, with the largest amount disbursed in the sixth year.

The consumer price index, with 1975 as 100, is 144, as of July of this year. In other words, if Japan were to acquire what ENDICOTT says is the "optimum nuclear war potential" at the present time, the costs will be about 2.2 trillion yen.

UN Secretary General U THANT (at the time) said that "Japan can acquire nuclear armaments at about the same defense expenditures as for conventional weapons." Defense-related expenditures for the current fiscal year, including personnel costs, are 2.4 trillion yen. The view expressed by Secretary General U THANT and the calculations made by a US Air Force General show the same results, coincidentally.

Apart from whether it is actually possible to manufacture an "atomic bomb at the cost of 200 to 300 million yen," there is no doubt at all that there exist enterprises in Japan, which have the capability of manufacturing atomic bombs.

Even Mass-Production of Plutonium Bombs

It is said that "Mitsubishi Heavy Industries, Hitachi Works, Tokyo Shibaura Electric and Mitsubishi Electric Machinery, which engage in the work of constructing nuclear reactors for power generation use, have potential capability for manufacturing atomic bombs" (National Defense Council Counselor).

Atomic bombs are classified into uranium bombs and plutonium bombs, according to the nuclear fission material which is used. It is said that the manufacturing of plutonium bombs is easier. It is said that various electric power companies, such as Tokyo Electric Power Company, which have nuclear power generation facilities, can produce high-quality plutonium for making plutonium bombs, even today, if they operate the nuclear reactors for power generation in a special way. There is even the view, overseas, that Japan is even capable of a mass-production of plutonium bombs, if the engineering technology, which is at the highest level, even in the world, of Japan's representative shipbuilding and heavy electric machinery manufacturing companies, such as Mitsubishi Heavy Industries and Hitachi Works, is used, with the plutonium thus produced as the "raw material."

The names of Mitsubishi Heavy Industries, Hitachi and Toshiba rise to the surface not only because they have full knowledge of the structure of nuclear reactors for power generation purposes, but probably also because they are outstanding in the fields of production technology and quality

control, as the top-ranking shipbuilding companies and manufacturers of heavy electric machinery.

Meanwhile, what is its latent capability for the manufacturing of ICBM's? Nippon Electric, Mitsubishi Electric Machinery and Toshiba have actual experience in technology for communications satellites for peaceful use. As for rocket technology, using solid fuel, it is said that Nissan Motors has a complete monopoly. In the case of rockets, using liquid fuel, the technological ability of Mitsubishi Heavy Industries and Ishikawajima-Harima Heavy Industries is highly viewed.

It is said that the three-stage "H-1" rocket, which the National Space Development Agency (NASDA) is planning to put to practical use in the second half of the 1980's, will be a "new-generation rocket, even capable of launching planet exploration ships and manned space-ships" (Counselor Yukihiko TAKENAKA), which adopts liquid-oxygen and liquid-hydrogen engines and inertial guidance systems.

The first stage (propulsion rocket) of this "H-1" is the United States' Thor-Delta rocket, which was developed for the launching of IRBM's. It is the commonly accepted view among military technology experts of the world that "if a country has the technology to launch stationary satellites, it can deliver missiles to any place in the world."

Severer than Competition for Development of Products for Civilian Use

Even so, it is also a fact that for the converting of "rockets for peaceful use" to those for ICBM's and IRBM's, "there still remain big problems in the technological field, such as the developing of control techniques at the time of re-entry, and the developing of high-temperature resistant materials" (Space Division Director Masaaki IWATA of the Japan Aeronautics and Space Industry Association's Technology Department).

The general current of military missiles has already entered the age of precision guided missiles (PGM), which use the most advanced electronics technology. The nuclear missiles of the US and the Soviet Union have reached the third-generation stage, where "there is no need to aim at the enemy." They are now hastening the development of IGM (intelligence guided missiles) which, if launched in the general direction of where the enemy is expected to be, will differentiate between the enemy and the ally, and then distinguish whether it is the target for attack or not. As against this, our country is still at the stage of domestically manufacturing the second-generation missiles, in which the finding of the target and the pushing of the button must still be handled by human beings, and only the part of pursuing the target and hitting it is taken over by the missile itself.

Apart from whether our country's influential enterprises will "take part in a war," under the present Constitution, in the competition of developing strategic weapons, which competition is said "to be even severer than the competition for the development of technology for civilian-use products" (Japan Electric President Tadahiro SEKIMOTO), or not, there also

remains some doubt as to whether the technology (and technicians) of our country will be able to bear the tension of developing strategic weapons, which shoulders the fate of "always having to be half a step ahead of the enemy, without fail."

Our Country's Missiles and Manufacturers

Mitsubishi Heavy Industries:	Nike-J (surface-to-air), licensed domestic production
	ASM-1 (air-to-ship), slated for equipment in fiscal 1982; domestic product
Mitsubishi Electric Machinery:	Hawk (surface-to-air), licensed domestic production
	Sea-sparrow (ship-to-air), licensed domestic production
	Sparrow (air-to-air), licensed domestic production
Toshiba:	Hawk (surface-to-air), licensed domestic production
	Short SAM (short-range surface-to-air), decided for equipment from 1981, domestic product
Kawasaki Heavy Industries:	Heavy MAT (anti-ship and anti-tank), domestic product

Besides the above missiles, there are the following imported missiles:

Tartar (ship-to-air)
Sidewinder (air-to-air)
Falcon (air-to-air)
Portable SAM Stinger (portable surface-to-air), decided for equipment from 1981.

[30 Sep 81 pp 5-7]

[Text]

Potentiality of Japan's Defense Industry (Part 5) -- Chorus of "Increase Development Expenses"

-- Spread of Technology to Private Sector Is Proceeding; Key Lies in Improving Payability and Productivity --

This year, in the US, a development project for very high speed integrated circuits, called "VHSIC," was started on a full-scale, centering on the Defense Department. VHSIC is a high-density IC, which will carry out calculations at 100 to 1,000 times the speed of the present IC's. Furthermore, it is said to be strong toward the changes in temperature and changes in the environment, such as radioactivity, and that it can be applied in a broad range of fields, including super-sonic detectors, radar, artificial satellites, communications, electronic and optical data processing, etc.

The development funds are 225 million dollars for a six-year period. Six groups, centering on IBM, Texas Instruments (TI) and Hughes Aircraft, have succeeded in concluding contracts with the Defense Department, and have already started research and development. The immediate purpose of this development project is to develop high-efficiency IC's for military use. However, our country's industrial circles concerned observe that it will become linked with the improvement of the "capability" of the US IC industry, which is tending to be hard-pressed by Japan, saying that "through the development of VHSIC, American IC manufacturers, which had tended to specialize exclusively in IC's, will come to acquire systems-development ability" (Mitsubishi Electric Machinery Electronics 1st Business Department Chief Takeshi ABE).

Military Technology Leading Industrial Circles in US

In the US, military industries developed new, revolutionary technology, and this helped to upgrade the technological level of private industries. Atomic bombs became the basis for nuclear power generation, and the vacuum tubes and computers, which were developed for calculating ballistic courses, became the foundation of today's computer industry. Aeronautics and the space industry and the computer industry, which are said to be the "strong industries" of the US today, are also supported on a large scale by the technological development capability of the military sector.

It is estimated that US military research and development expenses account for about 10 percent of its national defense budget, which is 142.7 billion dollars (35.5 trillion yen; 1980). As compared with this, the JDA's research and development expenses are 31.7 billion yen (fiscal 1981). It is on a scale which "is even less than our company's research and development expenses" (Japan Electric President Tadahiro SEKIMOTO). The ratio of research and development expenses to the military budget, as a whole, is also extremely low for our country, which is 1.3 percent, in comparison to other nations, such as about 30 percent in the case of the Soviet Union, about 10 percent in the US, Britain and France, and about 5 percent in West Germany.

Effective for Development of Aircraft Industry

Recently, internal and external "pressure" for the increasing of the defense budget is increasing. However, in the industrial circles, voices desiring an increase in research and development expenditures, in the defense budget, are strong. Keidanren's (Federation of Economic Organizations) Defense Production Committee, which is formed by the top leaders of about 20 representative enterprises in our country's defense industry circles, is now formulating the industrial circles' requests toward the 1981 Medium-Term Operations Estimate (for the period from fiscal 1983 to fiscal 1987). The situation in the said Committee is that "every member says that research and development expenditures should be increased" (Secretariat Chief Hiroshi MORIKAWA).

As regards the aircraft industry, it is said that there is a technological gap of about ten years between our country and the US. Mitsubishi Heavy Industries has actual sales records of nearly 100 billion yen (estimate for fiscal 1980) toward the JDA, through the development and production of the T-2 advanced trainers and the licensed production of the mainstay F-15 fighters. The research and development expenses for the development of these aircraft which Mitsubishi Heavy Industries itself shoulders a year are about several hundred million yen, and it relies on the JDA's development budget for a large part of the remainder. It desires an increase in the defense research and development expenditures in the future, saying that "as a tremendous number of technical engineers and funds and time are needed for the development of aircraft, the work is not possible without State help" (Managing Director Yoshio SASAKI, who heads a sub-group under the aircraft and special vehicles department).

Technology acquired in this way is also spreading to various fields for civilian use. The quality control technique used for the production of aircraft is also utilized effectively in the automobile and nuclear energy industries. The air dynamics technology is applied for the designing of bridges and high-rise buildings. The brakes used on the new super-express trains and turbo-engines for automobiles were also born from aircraft technology. However, even more than that, the merit of "what we can learn from the way of thinking and the way of approach" (Managing Director SASAKI) is emphasized.

Ishikawajima-Harima Heavy Industries, which started with the development of jet-engines in 1953 and grew up to become the biggest engine manufacturer in our country, also says that "the JDA's research and development expenditures were indispensable for improving technology to the present level" (Vice Chief of the Aeronautics and Space Project Headquarters Masami HAMANAKA). The most advanced processing technology is needed for the development of jet-engines, and HAMANAKA emphasizes the big spread effects to goods for civilian use, saying that "this processing technology can also be used effectively in shipbuilding, plants and nuclear energy."

Foundation of "Electronics" Is Technology of Private Sector

However, the aircraft industry is the representative industry which "benefitted" from the JDA's research and development expenditures. As for electric machinery and electronics industry, there are far more cases where technology developed by the private sector, centering on the development of semi-conductors and manufacturing technology, is adapted for defense equipment, even though there are expectations on the transfer of technology from the military to private sector in some parts of large-scale software, represented by BADGE-X. The fact that "Japan's defense technology is propped up by the electronics technology of the private sector" is an awareness held not only by the JDA alone, but shared commonly by all persons connected with the defense industry.

The JDA has made hardly any investments in electronics research and development. This technology was developed and improved by the private enterprises' own independent efforts and by projects for the development of technology for civilian use, centering on MITI. In this respect, too, it shows a sharp contrast to the aircraft industry, which is largely dependent on the JDA's research and development budget. In the industry circles concerned, it is often pointed out that "Japan's electronics technology has come to rank first in the world because it made good use of the vitality of the private sector, without relying on defense" (MITI Industrial Science and Technology Institute Technology Research Division Director Norikazu MATSUDA). There are also some persons who say that "military technology only gives thought to performance and does not give thought to cost and productivity, and for this reason, the minus factor is bigger, when viewed economically" (EPA Advisor Isamu MIYAZAKI).

In connection with the US VHSIC project, Tokyo Shibaura Electrics President Shoichi SABA says as follows: "In the case of developing semiconductors in our country, such a form as the VLSI development project, which was pushed at the initiative of MITI, is far more effective." This is because, "in the case of military technology, it is important to develop technology secretly and ahead of other countries, and it takes time for the technology to spread to civilian use" (SEKIMOTO).

However, it goes without saying that the industrial circles are interested in research and development expenditures, which can be obtained, free of charge, even though the technology spread effects are small. One also hears their real view, at times, that "it is better to have (the JDA's aid in development expenses) than not have it" (a top leader of a big electric machinery manufacturer). The industry circles are raising their voice in a chorus, calling for "an increase in the JDA's research and development budget." However, reflecting the situation in the industry circles concerned, what they aim at is not the same.

[2 Oct 81 pp 3, 4]

[Text]

Potentiality of Japan's Defense Industry (Part 6) -- Will Become Influential Country, If Ban on Exports Is Lifted

-- Tanks and Ships Are of Highest Quality; US Is Also Highly Evaluating Electronics-Related Technology --

"If the ban on weapons exports is lifted, we think that we will not be beaten by the US and European nations in regard to ground equipment and naval ships and other vessels, apart from aircraft. Of course, it will give rise to tremendous friction over the markets of the developing nations." -- Chairman Mankichi TATENO (Japan Steel Works President) of the Japan Weapons Industry Association views that if our country's defense industry were to launch into exports in full earnest, it will be able to compete fully well, even in the world's weapons market.

Our country's enterprises have shown to the world the excellence of their mass-production technology, through the exports of automobiles and electronic products. Today, their potentiality even in the field of defense equipment is coming to be recognized. A person in charge of defense production of a certain electric machine manufacturing firm confidentially disclosed as follows: "We are now coming to receive offers of concrete business negotiations in regard to defense equipment from high-ranking officials of several nations in Japan. Furthermore, these offers are made after they conduct detailed checks into the contents in advance."

US Requests for Technology and Joint Development

Recently, US military-connected persons are calling on our country's industrial circles, especially on electronic and electric machine manufacturers, one after another. A JDA official in charge of technology revealed that "perhaps, it may be that the US Forces know the real ability of our country's defense-related enterprises more than we do." A JDA official concerned, who accompanied former US Under Secretary of Defense PERRY, as guide, when he visited our country's enterprises, including Fujitsu, last year, also admits that he was surprised at the high level of production technology.

The US House Armed Services Committee drew up a report concerning the foundation of defense industries, toward the end of last year. It brings to the surface the state of the "ailing US defense industry," such as that (1) it lacks the capability for mass production, in times of emergency, (2) the delay in the time of delivery is conspicuous, (3) the shortage of skilled workers will continue for another ten years, (4) the degree of dependence on other countries for some components of equipment and for raw materials is rising, and (5) the rise in productivity is slow. Voices expressing anxiety as to "whether it is possible to maintain our position as a first-rate military power, standing on the basis of a second-rate industry or not" (statement by a military leader at the said Committee meeting) are spreading.

This US made requests to our country, seeking our country's offering of military technology to the US and joint development, at the Japan-US administrative-level consultations on security in June and on other occasions. JDA Equipment Bureau Director General Yutaka WADA, who visited the US around the middle of September and held talks with US Under Secretary of Defense DELAUER on Japan-US co-operation on military technology, says that "the US highly evaluates our country's electronics and photo-fiber technology."

Can Even Make Inroads into the World Market, in Two or Three Years

Even though called co-operation in military technology, it seems that it will center on the offering of general-use technology, such as IC's, which are used in missile guidance equipment and robots which are used in the sectors manufacturing various types of weapons, for the time being. Equipment Bureau Director General WADA transmitted to the US side, in regard to this kind of technology possessed by private enterprises, that "general-use technology, which can be used for both civilian goods and for military goods, can be supplied to the US, without being restricted by the Three Principles Concerning Weapons Exports." If views are finally co-ordinated

within Government circles, it seems that expansion of the exports of "weapons which are not weapons," such as radar and communications systems, will be realized in the future, without being limited to technology alone.

Since our country's production of defense equipment is supported by its high industrial level, which is even envied by the US, including electronics, it is only natural that defense equipment in fields where this high industrial level can be fully utilized will approach the foremost level. The air-to-ship ASM-1 missile is one such example. Not a few persons connected with the defense industry hold the view that, if the ban on weapons exports were to be lifted, "it will become possible to secure full-scale access into the world market, if there is a two or three-year preparation period."

For example, there is the case of tanks. "There are only about six countries, including the US, the Soviet Union and West Germany, which can domestically manufacture full-fledged tanks" (GSDF). However, our country has constantly developed first-rate tanks, such as the 74-Model tank. From fiscal 1982, it will start full-scale development of the Model-88 tank, aiming at their completion six years in the future. This Model-88 tank will be equipped with a 120-mm gun, and a 1,500 HP engine, which is twice as powerful as that used in the Model-74 tank. It will aim at the development of a tank which is of the highest level in the world in the 1980's. Even the Model-74 tank combines together electronics technology for such equipment as the computer for the calculation of the trajectory. At the time of its completion, it attracted the attention of US military personnel concerned. What will happen if Japan's defense industry were to take the same export strategy as it takes for general products for civilian use, such as to conduct thoroughgoing market research in various nations and were to carry out improvements?

Even in the aircraft field, too, it is steadily acquiring real strength in the small-size passenger plane field, as can be seen by the fact that orders for the MU-300 business-jet, which was developed by Mitsubishi Heavy Industries, exceeded 120 planes, even before it obtained a type certificate (TC). Mitsubishi Heavy Industries also calculates, in regard to its T2 advanced trainers, that "if we could produce 1,000 planes, we could lower the production cost by about 40 percent, compared with the time of producing only 100 planes." If that is true, it will acquire export competitive power, too. In regard to MTX (next-term medium-level trainer), which is being developed, with Kawasaki Heavy Industries as the main contractor, too, there is appearing the self-confidence that "the performance demanded by the JDA is high, to begin with, and if we succeed in the development of its engine, it will become an outstanding product, even in the world" (Standing Director of Kawasaki Heavy Industries Teruaki YAMADA).

Cautious Arguments about Exports Prevail, at Present Time

However, the actual situation, at the present time, is that, even if they were training planes, "the Government will say 'no,' if we were to propose exports of those which we deliver to the JDA" (Kawasaki Heavy Industries

Board Chairman Zenji UMEDA). The Weapons Industry Association deleted the item "weapons exports" from its by-laws, aiming at the promotion of the defense industry, at its general meeting toward the end of May. This was for the purpose of showing, both within and outside the country, that "we are not thinking of weapons exports, in any way at all" (Chairman TATENO).

"In regard to shipbuilding, for example, there is already the problem of trade friction, and there is no need to venture even into the exports of escort ships" (Ishikawajima-Harima Heavy Industries President Taiji UBUKATA), and this kind of cautious view is the prevailing trend.

At the same time, Keidanren's Defense Production Committee confirmed that "we will give due co-operation toward the US request for co-operation in military technology," at a meeting on the Standing Directors' level, held in early September. Depending on the talks at the Government level between Japan and the US, there is a possibility of its "developing" into joint research and joint development of defense equipment, in the future, going beyond the simple offering of technology. Occasioned by co-operation with the US, the time may come, unexpectedly quickly, for our country's defense industry to join the world's weapons market in an indirect form.

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[Text]

Potentiality of Japan's Defense Industry (Part 7 - Conclusion) -- Problems for Stable Growth

-- Growth of 10 Percent Is Certain, But Equipment Plan, Which Has the People's Consensus, Is Needed --

"Until about ten years ago, the top-grade technical engineers of our company openly showed distaste, if we were to propose to them that they join the defense sector. Today, however, there are not a few persons who volunteer from their side, in a positive way." -- So saying, the chief of the defense production department of a certain all-round electric machine manufacturer emphasized the big change in the awareness of the technical engineers of his company.

Hitachi Works set up its Defense Technology Promotion Headquarters, and electronics and electric machine manufacturers openly put up "defense" signboards. In the past, there was even an all-round electric machine manufacturer who was nervous about its becoming known that it was involved in defense equipment, saying that "it may even affect the sales of household appliances." Today, however, these manufacturers advertize the defense production technology which their companies have, in a positive way.

One Percent of the GNP Is a Matter of Time

One reason for this change in awareness lies in the point that the merits in the technology field, such as that "research and development can be carried out in the field of advance technology, disregarding costs, to some extent" (leader of an electric machine manufacturing company) have come to be recognized. However, the main reason, after all, lies in the point that the expansion of the market for the defense industry can now be expected.

In the defense budget for fiscal 1981, which amounts to 2.4 trillion yen, capital expenditures, including equipment expenses and research and development expenses, which directly affect the "market" for the defense industry, amounted to 670.5 billion yen. Defense expenditures in fiscal 1981 accounted for 0.91 poercent of the GNP. However, if a budget amounting to "exactly one percent of the GNP" were to be realized, there will be an increase of 248 billion yen. Personnel costs will not increase so greatly, and therefore, if this increased amount were to be added to the capital expenditures, capital expenditures would exceed 860 billion yen.

These are calculations, based on a hypothesis, to the last. However, if thought is given to the fact that payments to be made in later years, from fiscal 1983 and after, will amount to as much as 2,260 billion yen, as a result of placing orders for a large number of next-term mainstay F-15 fighters, with the defense budget for fiscal 1982, it is only a matter of time for the defense budget to reach the maximum level of one percent of the GNP. Under the 1981 Medium-Term Operations Estimate (from fiscal 1983 to fiscal 1987), which the JDA is slated to formulate next spring, there is even the possibility of the defense budget exceeding this framework.

Among the basic frameworks for our country's defense policy, such as exclusive adherence to defense, the Three Non-Nuclear Principles, etc., this argument for one percent of the GNP has the biggest possibility of being "revised," to begin with. There are even examples of Government leaders saying in the Diet to the effect that this is not necessarily on the same level as other basic policies.

Even if the principle of one percent is not changed, the defense budget can expect a rate of growth which would generally be about the same as the growth rate of the nominal GNP, which is viewed to be around 10 percent. The JDA's policy is to promote the autonomous development of equipment, and to raise the percentage of domestic production, even in the case of licensed production. Therefore, the "market" for our country's defense industry is certain to grow at a rate which will far exceed 10 percent.

Speed of Becoming Out-Dated Is Fast, and Outcome Will Be Determined by Comprehensive Capability

Our country's defense industry "has reached the technological level which can compete with the US, in fields which are needed to meet the country's requirements for exclusive adherence to defense" (Nippon Electric President Tadahiro SEKIMOTO). However, if autonomously developed equipment

is pushed, competition within the defense industry itself over the development and production of equipment will become fiercer. To begin with, this is an industry which has the special nature where "the pace of technological renovation is fast, and by the time an introduction plan is completed, that equipment itself may even become out-dated" (Kawasaki Heavy Industries Board Chairman Zenji UMEDA). For this very reason, the outcome will be determined by the comprehensive capability, including technical engineers, facilities, funds, etc.

Furthermore, it takes a long time to develop defense equipment. Tokyo Shibaura Electric's short SAM's have entered the stage of mass-production from this year. However, it took as long as 12 years, from the time it first started its development officially. Of course, a large part of the development expenses was shouldered by the JDA, but it is said that the expenses shouldered by Toshiba itself were far from small.

Even though defense demand will increase steadily, when viewed from a medium- or long-range standpoint, it is unavoidable that, when limited to the next several years, the burden of these development investments will increase at a rate exceeding that for the increase in orders. Furthermore, the actual fact is also that, different from investments in civilian demand sectors, it takes time to recover the investments. Except in the case of some specific enterprises, the ratio accounted for by defense orders in the total sales amount was extremely small, up until now, and it was possible to take the position that the diverting of able personnel and funds to the defense sector was the paying of tuition.

Even if an enterprise were to succeed in development, there is no guarantee that it will be able to obtain as many orders for it, as had been expected by the enterprise. If there were to develop such a situation as a large-scale slashing of defense expenditures, due to changes in the international situation, the management of an enterprise, as a whole, may even come to be affected, in the case of its relying heavily on defense. In the past, there was the case of equipment expenditures being slashed, toward the end of the 4th Defense Power Consolidation Plan (from fiscal 1972 to fiscal 1976), and there was seen a slight decrease. At that time, Mitsubishi Heavy Industries, for example, "managed to tide over the situation by re-assigning surplus personnel to other sectors" (Advisor Gakuji MORIYA). However, will this kind of measure be applicable, in the future, too?

No Assurance of Stable Demand

It is said that, as a part of President REAGAN's plan for the slashing of the national defense budget, the cancellation of orders for eight KC-10's, which are mid-air refueling plane, which can also serve as cargo transport planes, produced by the McDonnell Douglas Corporation, is being planned. As a side-effect of this, there is appearing the anxiety as to whether the production of DC-10's, which are planes for civilian use and which are of the same type as the KC-10's, can be continued or not. This fact can be said to be showing that the stable nature of demand, which is said to be the merit of defense production, is not necessarily absolute.

When the scale of an industry becomes big, it is the logic of industry to seek demand, which will be sufficient to fill its "stomach." When the weight of "defense" within an industry or in an enterprise rises, the defense industry itself, instead of the US, may come to press for the "strengthening of defense power," or show moves for seeking a way out through exports.

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