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U. S. NAVAL TECHNICAL MISSION TO JAPAN
CARE OF FLEET POST OFFICE
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7 January 1946

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From: Chief, Naval Technical Mission to Japan.
To : Chief of Naval Operations.

Subject: Target Report - Japanese Meteorological Instruments.

Reference: (a) "Intelligence Targets Japan" (DNI) of 4 Sept. 1945.

1. Subject report, covering Target X-17 of Fascicle X-1 of reference (a), is submitted herewith.

2. The investigation of the target and the target report were accomplished by Capt. Jerry H. Service, USNR, assisted by Lieut. James R. Sanders, USNR, aerologist, and Lieut. John Catt, RNVR, interpreter.



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JAPANESE METEOROLOGICAL INSTRUMENTS

"INTELLIGENCE TARGETS JAPAN" (DNI) OF 4 SEPT. 1945

FASCICLE X-1, TARGET X-17

JANUARY 1946

U.S. NAVAL TECHNICAL MISSION TO JAPAN

SUMMARY

MISCELLANEOUS TARGETS

JAPANESE METEOROLOGICAL INSTRUMENTS

Most Japanese meteorological instruments are reproductions of German, English, and French models. Research and development work on meteorological instruments has been the most impressive and important of all Japanese meteorological activities. Nevertheless, inconsistencies and lack of proportion generally are present; that is to say, when the Japanese modified a foreign instrument, they very often developed one part to an extreme without raising correspondingly the quality of the other parts.

Japanese aerological offices and general physical facilities are far inferior to those in the United States. Poor lighting, little or no heating, inadequate furniture, and generally untidy conditions prevail. These conditions very probably are worse now than before the war because of shortages of material and general confusion.

Representative Japanese meteorological instruments and equipment have been shipped to the U.S. Naval Observatory, U.S. Naval Engineering Experiment Station, Naval Research Laboratory, Ordnance Investigation Laboratory, and the Bureau of Ships.

The only Japanese instruments for measuring high wind velocities which were found by the authors of this report were Pitot tube anemometers.

A mercury barograph was observed in operation at the District Observatory at HIROSHIMA.

Particular reference is made to a report on Japanese meteorology, prepared by the Air Weather Office of Far Eastern Air Forces which covers subjects within the scope of this investigation as originally planned. The work of the Air Weather Office was not duplicated.

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LIST OF ENCLOSURES

- (A) List of Japanese Meteorological Instruments and Equipment
Shipped to Navy Activities in the United States Page 8

REFERENCES

A. Location of Target:

1. General Central Meteorological Observatory, TOKYO.
2. District Observatory, HIROSHIMA.
3. Weather Stations at SASEBO, KUTSUKAKI, and KYOTO.
4. Japanese Naval vessels in Kure Harbor.

B. Japanese Personnel who Assisted in Gathering Materials:

1. Commander Hisaya IIDA, IJN, who was in charge of the Naval Meteorological Service during the latter part of the war.
2. Dr. Sakuhei FUJIWARA, Chief of Central Meteorological Observatory, TOKYO.
3. Lieutenant Colonel Hirokatsu MARAOKA, formerly of Army Meteorological Division.
4. Mr. KARAISHI, Chief of Instrument Laboratory, Central Meteorological Observatory.

C. Related Reports of other Agencies:

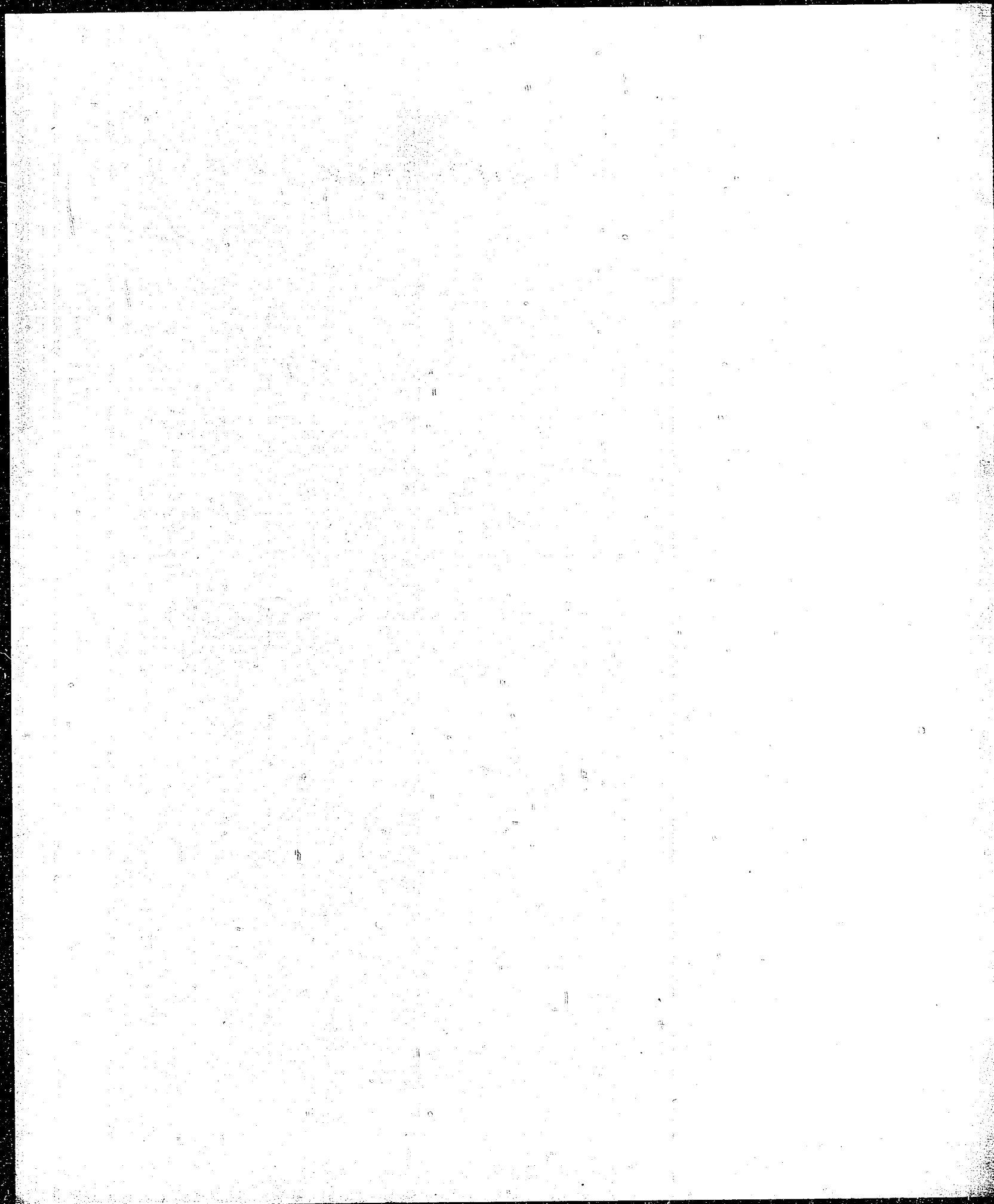
1. "Scientific Intelligence Survey in Japan - September, October 1945" (5 volumes).
2. Interrogation Reports, U.S. Strategic Bombing Survey.
3. G-2, SCAP Accession Lists.
4. Report of Air Weather Office of Far Eastern Air Forces to Army Air Force on Japanese Meteorology (in preparation).
5. Joint Report by (1) Technical Liaison and Investigation Division, Signal Office, GHQ, (2) Technical Intelligence Section, Engineer Office, GHQ, and (3) Major Jones, on the subject of the 9000 large paper balloons set free by the Japanese to be carried by air currents to the United States.

INTRODUCTION

The objective of this investigation was to obtain information on Japanese meteorological instruments of any type not common in the United States as, for instance, special instruments for the measurement of very high wind velocities, and data and theories on typhoons.

The first work of the investigating personnel was to determine to what extent this objective had been accomplished by other U.S. intelligence agencies. References (C-1), (C-2), and (C-3) were examined and interviews were had with personnel of the United States Strategic Bombing Survey, Air Technical Intelligence group, Army Signal Corps and the Air Weather Office of Far Eastern Air Forces.

It was found that FEAF had covered all phases of this investigation as originally planned and, consequently, personnel of this mission limited themselves to inspecting Japanese meteorological installations and forwarding to the United States representative Japanese meteorological instruments and equipment.



THE REPORT

1. Inspection of Meteorological Installations

Inspections were made of numerous Japanese weather stations on HONSHU and KYUSHU, including the Central Meteorological Observatory at TOKYO, the District Observatory at HIROSHIMA, and stations at SASEBO, KUTSUKAKI, and KYOTO, as well as Japanese naval vessels of various types anchored in Kure Harbor.

2. Collection of Instruments

Representative Japanese meteorological instruments and equipment collected by the Air Weather Office, FEAF, and NavTechJap and which have been shipped to Navy activities in the United States are listed in Enclosure (A).

3. Anemometers for High Wind Velocities

The only Japanese instruments for measurement of high wind velocities of which the authors learned were Pitot tube anemometers. These anemometers would operate satisfactorily up to 50 meters per second but at higher velocities were likely to be carried away.

4. Mercury Barograph

The only mercury barograph ever seen by the authors of this report was examined (while in operation) in the District Observatory at HIROSHIMA. The barometer tube was U-shaped, with the open-end leg more than one centimeter in inside diameter. A float of plastic material on the mercury surface in the open end operated a recording pen by means of a simple lever system. The instrument appeared to be operating satisfactorily. The record had a pressure scale perhaps twice that of most aneroid barographs.

ENCLOSURE (A)

LIST OF JAPANESE METEOROLOGICAL INSTRUMENTS AND EQUIPMENT
SHIPPED TO NAVY ACTIVITIES IN THE UNITED STATESUltimate Destination

- A - US Naval Observatory, for BuAer
 E - US Naval Engineering Experiment Station
 N - Naval Research Laboratory
 O - Ordnance Investigation Laboratory
 S - Bureau of Ships

(Two letter symbols indicate that at least
 one specimen was sent to each activity)

<u>NavTechJap No.</u>	<u>Quantity</u>	<u>Description</u>	<u>Destination</u>
JE50-5701	1	Altimeters, Precision Pressure Aneroid	A,N
JE50-5933	2	Altimeters, Recording	A,N
JE50-5930	6	Anemo-Cinematographs	A,N
JE50-5998	6	Anemographs, Dine's	A,N
JE50-5986	3	Anemographs, Dine's, Recorder Head	A,N
JE50-5921	3	Anemographs, Robinson	A,N
JE10-3107	2	Anemometers	O
JE10-5101	1	Anemometer, Hand	E
JE50-5957	2	Anemometers, Hand, Type A Navy	A,N
JE50-5950	1	Anemometer Portable, Army	A
JE50-5949	1	Anemometer, Recording, Army, Unclassified	A
JE50-5984	2	Anemometer Recorders, Robinson, Unclassified	A,N
JE50-5927	3	Anemoscopes, Fixed Record, Mechanical Linkage	A,N
JE50-5738(21)	1	Atmospheric (?) Type 3	A
JE50-5999	1	Atmospheric Recorder, Sferics, Type 3 Navy (Incomplete)	A
JE50-5977	1	Barograph, Army	N
JE50-5938	2	Barographs, Type A, Navy	A,N
JE50-5946	2	Barographs, Type 2-A, Navy	A,N
JE50-5967	2	Barometers, Aneroid, Box	A,N
JE50-5990	3	Barometers, Fortin, Portable, Army	A,N

ENCLOSURE (A), continued

<u>NavTechJap No.</u>	<u>Quantity</u>	<u>Description</u>	<u>Destination</u>
JE50-5978	2	Barometers, Mercury, Station Type, Navy	A,N
JE50-5980	2	Baro-Thermo-Hydrographs	A,N
JE50-5710	4	Cloudsonds, Type A, Army	A,N
JE50-5714	3	Cloudsonds, Type A, Navy	A,N
JE50-5715	4	Cloudsonds, New Type, Navy	A,N
JE50-5704	1	Drift Indicator, Type 94	A
JE50-5969	2	Evaporagraphs	A,N
JE50-5705	1	Evaporagraph, Navy	N
JE50-5959	2	Evaporimeters	A,N
JE50-5722	1	Hydrogen Generator, Army	A
JE50-5976	2	Hydrographs, Army, Unclassified	N
JE50-5937	2	Hydrographs, Navy	A,N
JE50-5948	1	Hydrograph, Navy, Unclassified	A
JE50-5987	2	Meterographs, Airplane	A,N
JE50-5968	2	Nephoscopes	A,N
JE50-5963	3	Pibal Balances, 2 Types	A,N
JE50-5993	5	Pibal Balances, Navy	A,N
JE50-5972	2	Pibal Balances, Spring	A,N
JE50-5926	2 Bx	Pilot Balloons (20,60,100,200, and 400gm) White and Pink	A,N
JE50-5966	1	Psychrometer, Assman's	N
JE50-5943	3	Psychrometers, Army, Unclassified	A,N
JE50-5944	1	Psychrometer, Navy, Unclassified	A
JE50-5988	2	Pulviometers, Army	A,N
JE50-5730	4	Radio Direction Tracking Receivers, Type 2	A
JE50-5738(19)	1	Radiosonde, Old Type, Army	A
JE50-5997	3	Radio Tracking Devices, Type 4	A,N
JE50-5730	1	Radio Tracking Device, Type 4	N
JE50-5922	2	Rain Gages, 20cm Diam, Non-Recording	A,N
JE50-5965	2	Rain Gages, Non-Recording, Portable, Army	N

ENCLOSURE (A), continued

<u>NavTechJap No.</u>	<u>Quantity</u>	<u>Description</u>	<u>Destination</u>
JE50-5954	2	Rain Gages, Non-Recording, Navy, Unclassified	N
JE50-5961	4	Rain Gage Measuring Glasses, Two Types	A,N
JE50-5991	3	Raysonde Electrical Testers	A,N
JE50-5790	1	Raysonde Pressure Interrupter, Type 3 Army	N
JE50-5992	5	Raysonde Pressure Interrupter Testers	A,N
JE50-5738 (14,15,17,18)	4	Raysonde Receivers, Old Type, Army	A
JE50-5713	3	Raysonde Transmitters, Old Type 97, Navy (PPP-TT-RH)	A,N
JE50-5707	2	Raysonde Transmitters, New Type 97 (40- PPP-TT-RH)	A
JE50-5711	4	Raysonde Transmitters, New Type 97 (PPP-TT)	A,N
JE50-5707	1	Raysonde Transmitter, New Type 97 (PPP-TT-RH)	N
JE50-5708	2	Raysonde Transmitters, Type 3, Army	A,N
JE50-5971	3	Sea Water Hydrometers	A,N
JE50-5970	1	Sea Water Thermometer, Navy	A
JE50-5962	2	Snow Gages	A,N
JE50-5970	4	Solar Radiation Thermometers and Tripods, Army	A,N
JE50-5960	4	Sunshine Recorders, Jordan's	A,N
JE50-5929	2	Theodolites, Old Type, Army	A,N
JE50-5973	2	Theodolites, Unclassified, Army	A,N
JE50-5974	2	Theodolites, Type 92, Navy	A,N
JE50-5702	2	Theodolites, Type 92-A, Navy	A,N
JE50-5958	2	Theodolites, Type 92-A, Navy	N
JE50-5975	2	Theodolites, Type 3, Army	A,N
JE50-5935	2	Thermo-Barographs, Type A, Navy	A,N
JE50-5936	2	Thermo-Barographs, Type 1-B, Navy	A,N
JE50-5934	1	Thermographs, Army, Unclassified	A
JE50-5989	2	Thermographs, Earth, Remote Reading, Capillary Tube	A,N
JE50-5939	2	Thermographs, Type 1-A, Navy	A,N

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ENCLOSURE (A), continued

<u>NavTechJap No.</u>	<u>Quantity</u>	<u>Description</u>	<u>Destination</u>
JE50-5940	2	Thermographs, Type 1-B, Navy	A,N
JE50-5941	2	Thermographs, Type 2-A, Navy	A,N
JE50-5947	1	Thermograph, Type 2-A, Navy	A
JE50-5964	2	Thermometers, Earth, "L" Tube, Army	A,N
JE50-5703	2	Thermometers, Earth, "L" Tube, Navy	A,N
JE50-5981	2	Thermometers, Maximum and Minimum, Army	A,N
JE50-5942	1	Thermometer, Mercury, Short, Navy	A
JE50-5706	2	Thermometers, Mercury Standard	A,N
JE50-5979	2	Thermometers, Recording Army	A,N
JE50-5945	1	Thermometer, Underground, CWG, Army-Navy	A
JE50-5931	2	Tripod Theodolites, Type 92 and 92-A, Navy	A,N
JE50-5932	1	Tripod Theodolites, Type 3, Army	N
JE50-5716	1	Water Current Meter	A
JE10-3111SD-1	1	Weather Instrument	O
JE50-5985	2	Wind Direction Recorders, Army	A,N
JE50-5995	4	Wind Instruments, Type 91-A, Navy	A,N
JE50-5996	4	Wind Instruments, Type 97-A, Navy	A,N
JE50-5928	2	Wind Recorders, Robinson Old Type, Army	A,N
JE50-5982	4	Wind Vane Masts, Recording	A,N
JE50-5700	2	Wind Velocity Counters, Army	A,N
JE50-5953	2	Wind Velocity and Direction Calculating Instruments	A,N
JE22-2052(A-E)	5	Wind Velocity and Direction Indicators	S
JE21-3404	1	Wind Velocity Indicator	O
JE50-5955 JE50-5738 (1-13, 16,20,22-26)	-	Miscellaneous Aerological Equipment	A,N
JE50-5702	1	Stand for Navy Type 73 Theodolite	A
JE50-5983	2	Valves for Hydrogen Cylinder	A,N