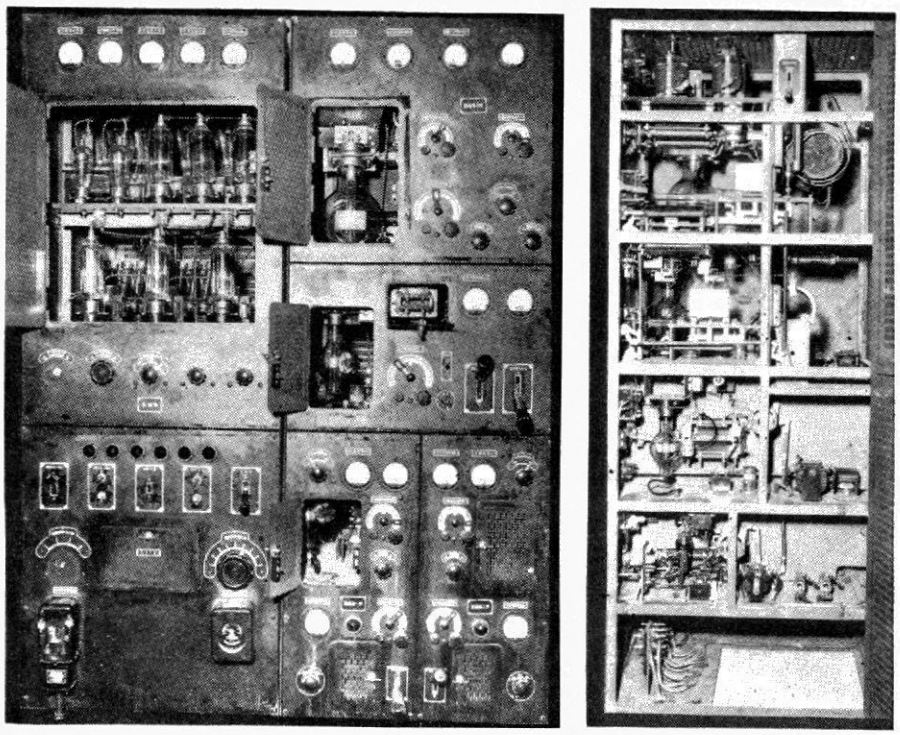
CAPTURED 1000 Watt JAP TRANSMITTER

This transmitter, like all radio equipment produced by the Japs, has the appearance of being copied direct from American models.



Front panel view of Jap 1 kw. transmitter shows power supply racks toward the left and r.f. section on the right. Side view shows r.f. section of transmitter. From top to bottom, antenna tuning, power amplifier, driver, buffer doubler, and oscillator.

SHERMAN to the contrary, war sometimes has advantages, at least for former civilian radiomen in the signal corps. T/5 John M. Young, of Springfield, Missouri, for example, found that it gave him the opportunity every ham dreams about, to have a one-kilowatt transmitter put in his lap with the privilege of playing around with it all he pleases, finding out what makes it tick, and making it tick some more.

The set was a Japanese 1000-watt CW transmitter captured on Luzon by the U. S. Army Signal Corps. It was, by far, not the best or largest we had captured, but it was the only one of its kind we had found.

From the front panel, it looked like a transmitter that might have been designed in America about ten or twelve years ago. It came in two separate cabinets about six feet high and four feet wide, the r.f. section and the power supply. It was a conventional exciter, buffer-doubler, driver and power amplifier, all single-ended and capacitively coupled with a link coupling from the final stage to a pi-network antenna matching arrangement.

The interior revealed coils, resistors, condensers, and potentiometers of a design also about ten years old. The use of heavy aluminum castings, glass stand-offs, and connecting shafts from the front panel, was evident throughout. Each of the multitude of doors on the front and side was protected by an efficient interlock of a wedge-contact type. It had no forced air or water cooling arrangement. Flat discs mounted on wooden coil forms and heavy variable condensers served their purpose. The heavy construction of the condensers, especially in the driver and power amplifier stages, could take a fair amount of arcing.

All tube filaments had voltage regulators on the primary side of the transformers. They were variable resistors, a sliding arm over resistance wire wound on a wooden form, somewhat similar to the laboratory type variable resistor.

Of its six meters, five were Japanese

and one, the driver and power amplifier filament voltages, was a *Weston*, model 476, 0 to 15 a.c. voltmeter, manufactured in America.

The exciter provided for either crystal control or master oscillator operation. It was divided into two electrically separate sections, low and high frequency. Choice was made with a heavy-handled knife switch that resembled a high power switch. It incorporated four crystal sockets for each section, but there appeared a peculiarity. Two of the sockets were of the double pronged, plug-in variety while the other two had circular bases. Evidently the lack of standardization in Japanese crystal manufacture necessitated designing the transmitter to utilize existing crystals. It had no insulation or temperature control in the crystal compartment. Only a temperature compensating resistor circuit gave it any semblance of stability. The tube was the equivalent of a 47, but its workmanship and results were below American standards.

The buffer-doubler employed an American type 860 tube. Its circuit design was conventional and matched the rest of the rig in being out-moded. The only peculiarity of this stage was two knife switches on the front panel that shorted out fixed coils and condensers. The handles were large and again similar to a power switch.

The driver also used an American type 860 with the same features found in such a single-ended stage a decade ago. Keying of the screen grid of this circuit left the oscillator and buffer-doubler constantly excited. The keying relay was sluggish but ruggedly built. It could key up to about 150 words a minute.

The power amplifier, with its American-type 861 tube, was elementary with a crude feedback circuit for neutralization.

The power supply was a three-phase, 220-volt bridge rectifier using six 820 type, mercury vapor rectifiers for the plate power and bias supply from two 866's in full wave, single-phase rectification. Wire wound bleeder resistors, in banks, looked serviceable, but showed sign of sweating. Transformers and filter condensers appeared adequate. The transformers had a lot of iron in them, and the workmanship of the winding was passable.

An overload relay of the magnetic coil variety was reset by a toggle switch. The time delay was a clock arrangement, which could be set for any desired time. Fuses were cartridge type.

The potentiometers and switches were heavy and sluggish.

The Japanese had made this transmitter work for them, so why not make it work for us? That, again, was the job of signal corps technician, John Young. With typical ingenuity, he cannibalized a power transformer from another captured set, and wound some copper tubing to replace the driver and power amplifier coils that were missing. Tubes, found separately, were put to use. Young tried hit-and-miss methods with the foreign dials and the meters began to respond. Reflected impedance kept knocking the exciter off frequency. It was a touchy job, since no provisions had been made to lower the plate power during tuning. 861's were hard to get, at that stage of the operation, and the current carrying capacity of the Jap counter-part was uncertain. The danger of drawing too much current and burning out the tube was considerable.

Finally, after tuning each stage and constantly retuning the preceding stages, the transmitter was ready to go on the air. The link coupling to the antenna proved inadequate, so Young tapped into the power amplifier tank directly. It worked.

Our own superior equipment was being installed by then, and though the Jap transmitter's frequency was unstable and its design outmoded, it was employed as a stand-by.

This set does not typify Japanese signal equipment. Although the Japs haven't surpassed us, the U. S. Army Signal Corps today is using a good deal of captured equipment to supplement its own supply. A high degree of skill and constant training on the part of signal corps personnel has made this equipment serve the vast Southwest Pacific communications system.

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