Section 3 Radio Astronomy

The 32+2-element compound interferometer at 3.75 GHz, which is quite similar to that at 4.9 GHz, was almost completed in July, 1967, except for the quick scanning system and a part of the automatic phase control system. It has a resolving power of 1.1 min. arc for the 32-element adding interferometer and 23 sec. arc for the compound configuration. The test observations of the distribution of brightness and polarized component across the sun have been carried out since August, 1967. The dishes are 3 meters in diameter and a unit spacing is 6.88 meters. The base line, about 437 meters in length, is placed at the northern part of the Toyokawa Observatory. The antenna system, the transmission line, the rotary phase shifters, the receiver and the examples of the record are shown in Figs. 1-8.

The main problem in operating the compound interferometer is to compensate the phase change due to the temperature variation. If the temperature difference between the transmission lines of 32-element adding interferometer and 2-element interferometer is 0.1°C, the phase difference is estimated to be about 3 degrees. Therefore we are now constructing a real time phase control system, a part of which is now in operation.

The quick scanning system for observing the source of the impulsive burst is also under construction and it is expected to be completed in spring 1968.

T. Yamashita will stay in Texas University for one year until the end of August, 1968, studying the radio astronomy in millimeter wavelength.

-Haruo TANAKA-

Publications (1966-1968)

Tanaka, H. and T. Kakinuma : Absolute Calibration on the Flux Density of Solar Radio Emission, Presented to URSI XVth General Assembly, Munich (1966) : Inf. Bull. Solar Radio Obs., Utrecht, 21 (1966)

Tanaka, H. and T. Kakinuma : Relation between 27-day Recurrence Tendency of $\sum K_p$ and Solar Radio Emisston Derived from Interferometric Observations, Rep. Ionos. Space Res. Japan, **20**, 1, 22 (1966)

Tanaka, H., T. Kakinuma and S. Enome : High Resolution Observations of the Sources of Solar Burst at 9.4 Gc/s, Proc. Inst. Atmospherics, Nagoya Univ., **14** (1967)

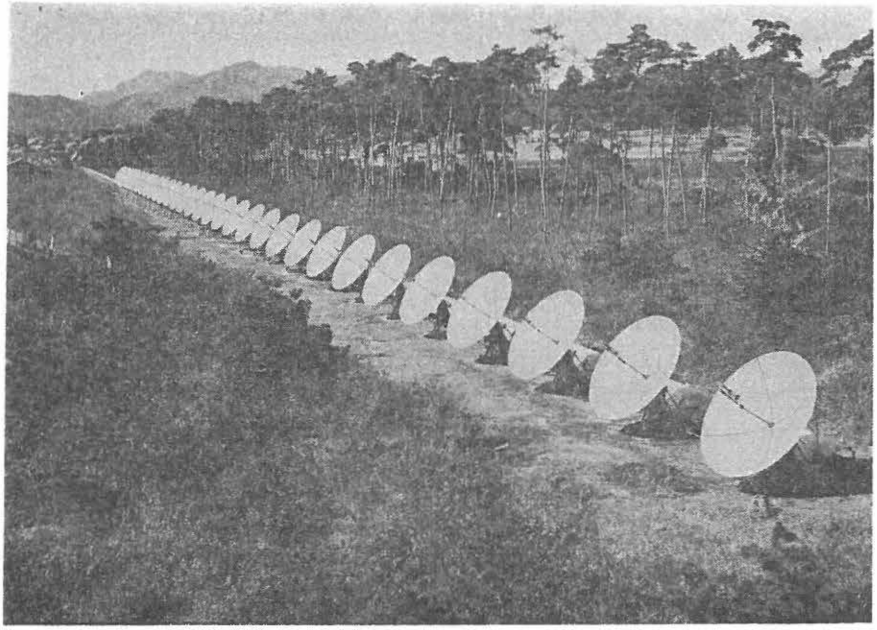

Fig. 1. General view of 3.75 GHz compound interferometer.

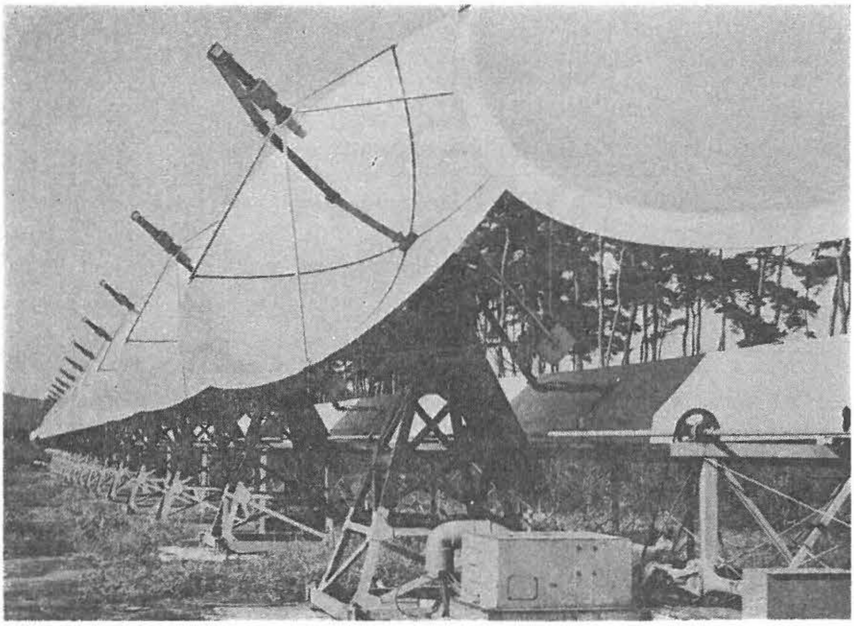

Fig. 2. Center part of 32 elements.

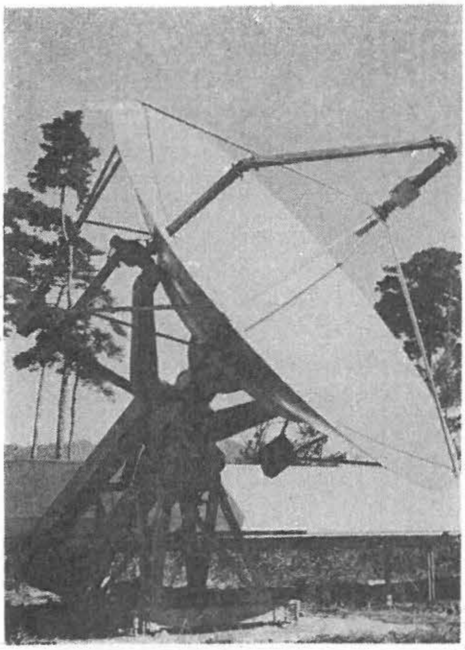

Fig. 3. Close-up of the antenna element.

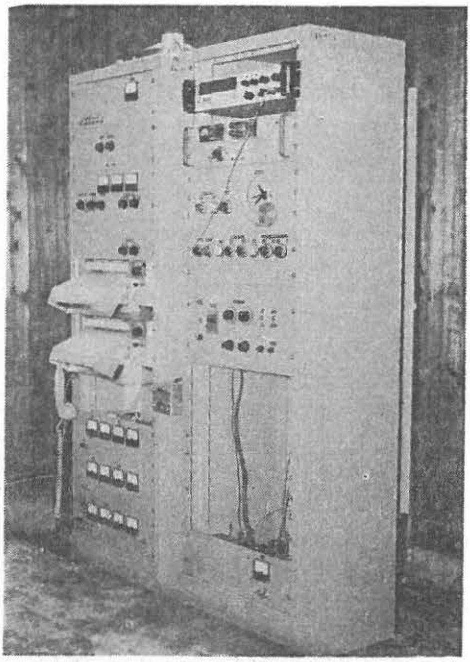

Fig. 4. Receiver.

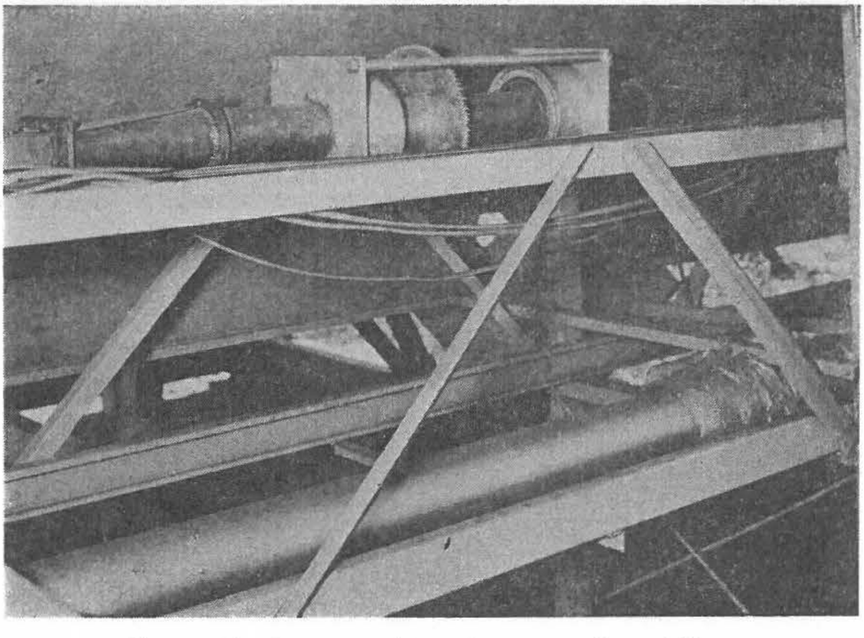

Fig. 5. Circular waveguide and a rotary phase shifter.

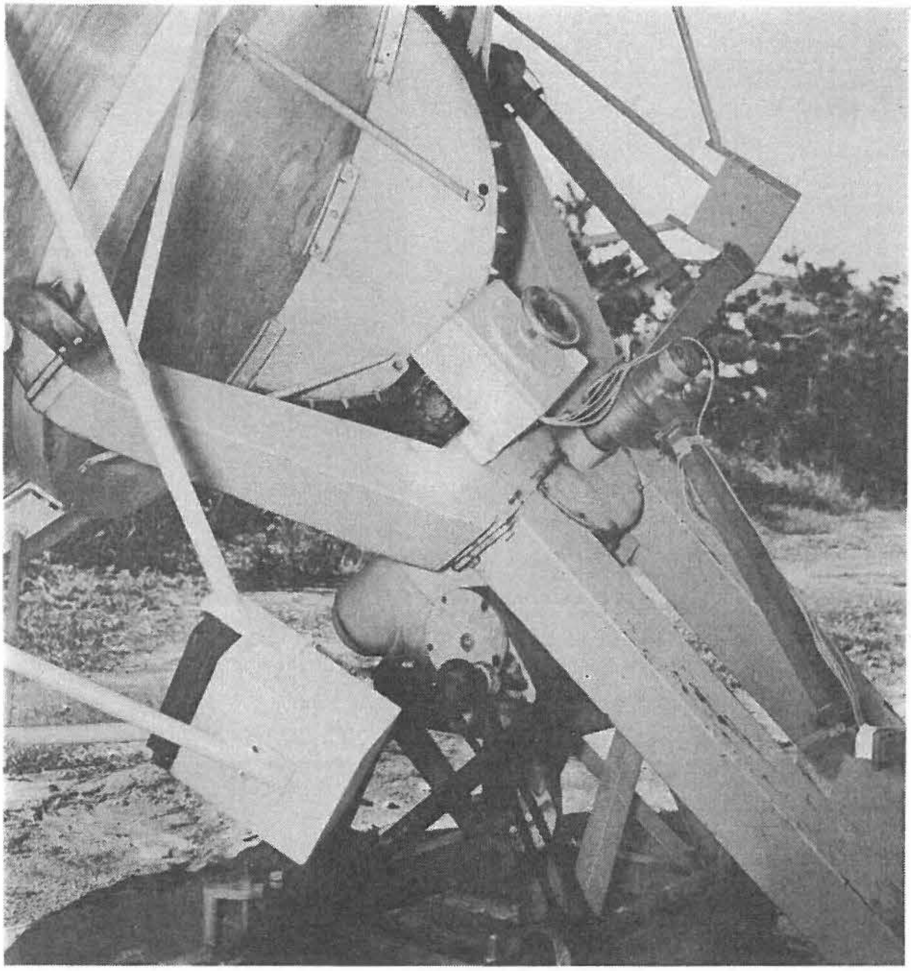

Fig. 6. Rear view of the antenna element. Declination axis is normally driven by pulse and clutch mechanism.

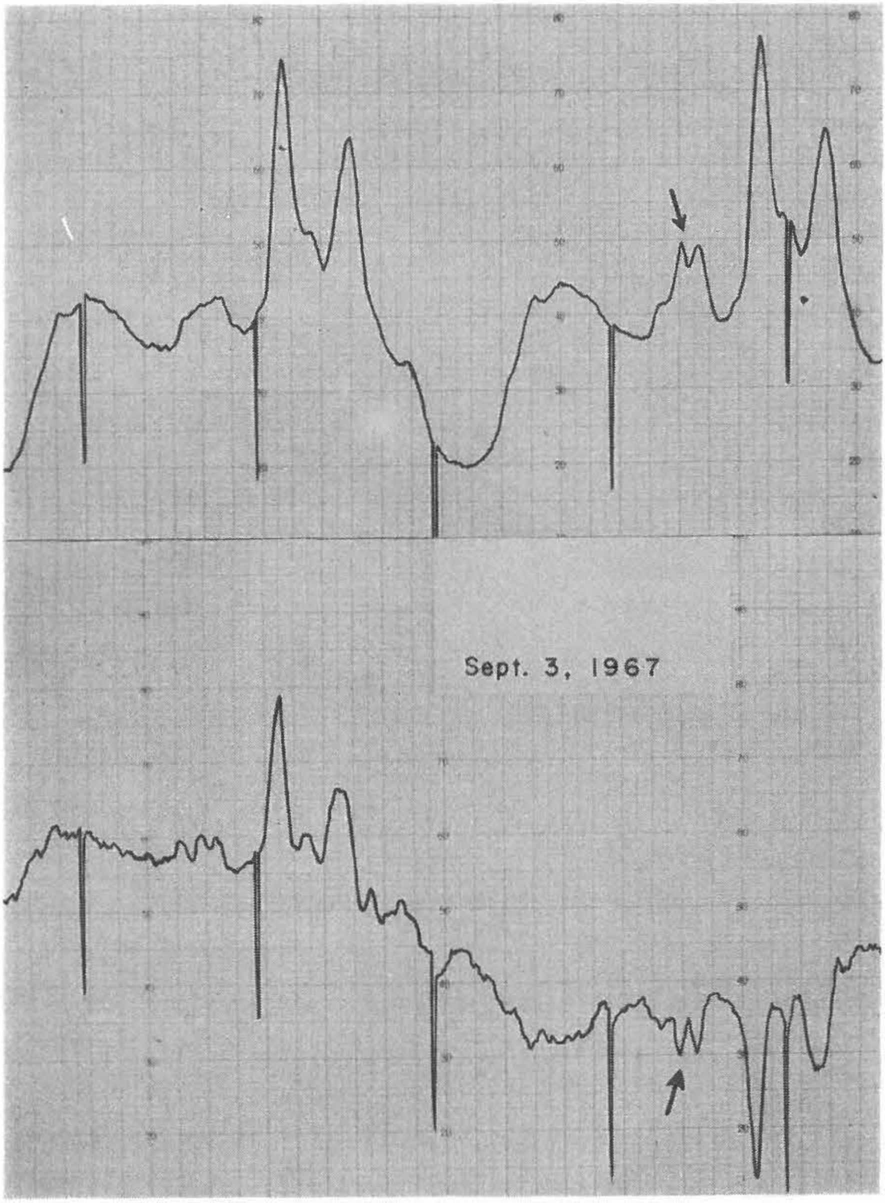

Fig. 7. Upper : drift curve taken by 32 elements
Lower : the same scan by the compound interferometer.

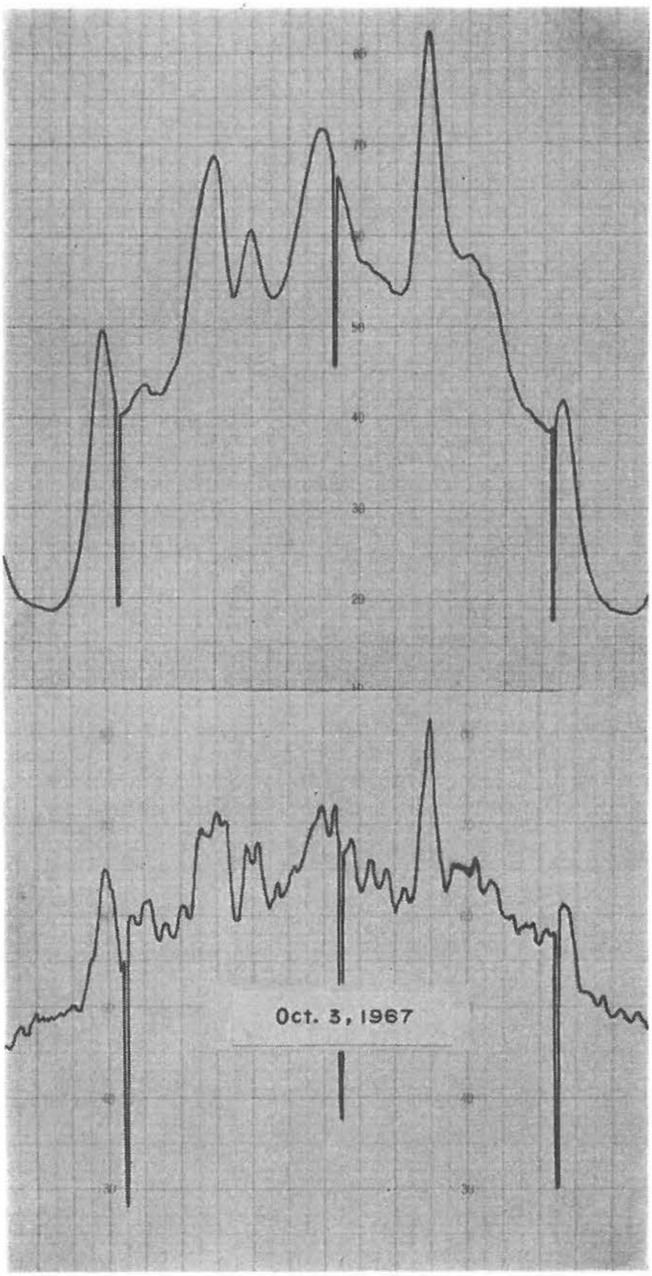

Fig. 8. Upper: drift curve taken by 32 elements
Lower: the same scan by the compound interferometer.