

- Circuit description of NKE-2063

1. The compound modulation circuit, CME-386.

This circuit is consisted of three circuit blocks.

- i. Power supply circuit block

This circuit block provides voltages for circuit operation in the scanner unit.

The input voltage (12V or 24V -10, +30% ) from ships main power supply via a relay on the processor unit. This circuit block is provides five kinds of voltage.

- 5V: for receiver circuit
- +30V: for motor drive
- +15V: for transmit trigger circuit
- -8V: for receiver circuit
- +300V: for driving a magnetron

- ii. Modulation circuit block

This circuit block is for driving the magnetron.

The voltage (+300V) for driving the magnetron is provided from power supply circuit block. When the radar system state is in the transmission mode, the trigger signal is input from control circuit block to switching circuit part consisting of MOS-FET. The MOS-FET is switching +300V to the pulse transformer. The pulse transformer converts +300V into 3.7kV for oscillating the magnetron.

The magnetron is not controlled by an active frequency oscillator. The power limitation is determined by the magnetron specification and the current amplitude to the magnetron. The switching circuit (MOS-FET) and pulse transformer on the modulator circuit controls the current amplitude, but it is not active. The specification of the power range has a nominal value of  $\pm 50\%$ .

A spurious microwave filter, MPAB32161 is used to suppress the spurious radiation. This filter is listed in the mechanical parts list.

The radar transmitted pulse is not modulated by any information.

- iii. Control circuit block

This circuit block has two functions.

- the communication function between processor unit and scanner unit
- the scanner controlling function

This function is controlling the motor driver, transmission control, tune control and receiver band width selection.

2. The receiver circuit, CAE-548.

This circuit consists of two circuit blocks.

i. Intermediate frequency circuit block

The input IF signal, 60MHz, from frontend is separated to the high power signal and low power signal.

The low power signal is amplified via amplifier block, band pass filter and logarithmic amplifier. The high power signal is amplified by the same method as the low power signal but it is not same parts. After amplifying the two signals, they are combined by the combiner circuit part. The combined signal is output as the video signal from receiver circuit block.

ii. Tune indicator circuit block

The high power signal is also input to the tune indicator circuit block. After input the signal, it is detected as DC voltage by detection circuit part and peak hold circuit part. For stabilizing the tune indicate voltage, the main bang of the signal is only used and the other signal is suppressed.