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Letters to the Editor

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A SOLID STATE AMPLIFIER FOR RECORDING APT CLOUD PICTURES

The India Meteorological Department is using modified Mufax recorder (Datar and Joseph 1971) for reception of APT cloud pictures from the polar orbiting satellites. Subsequent to the fabrication of the APT recorders using electro-sensitive paper by the department, developement of a suitable amplifier was undertaken and is reported in the present note.

The FM signal transmitted by the satellite is received by a VHF APT receiver. The video output of the receiver is a 2.4 kHz signal whose output varies from 2.5 to 0 volts as the FM deviation of the received signal changes. In the satellite cloud pictures the variation of brightness from dark to white is directly related to the FM deviation. The amplifier should respond linearly to the changes in the output voltage of the receiver. The circuit diagram of the system is at Fig. 1.

The first stage is a frequency selective amplifier using integrated circuit SSD 741. A twin T-network tuned for 2·4 kHz is used in the feed back path of the operational amplifier to obtain the frequency selective properties. The amplified signal is fed to the driver stage of the power amplifier through an emitter follower. The power amplifier consists of a driver stage BC178 and two transistors AC187 and AC188, connected in a complementary symmetrical output state, give an output of 250 mW. The output is taken through a step up transformer for driving the next stage, the reversal unit. In this circuit, following Datar and Joseph (1971), the rectified power output, using a selinium bridge rectifier, is used to drive a power transistor ECP 055 and the recorder (helix and blade) is connected across the collector and emitter of the power transistor. With maximum input signal to the transistor, it offers low resistance compared with that of facsimile paper between the helix and blade and there-

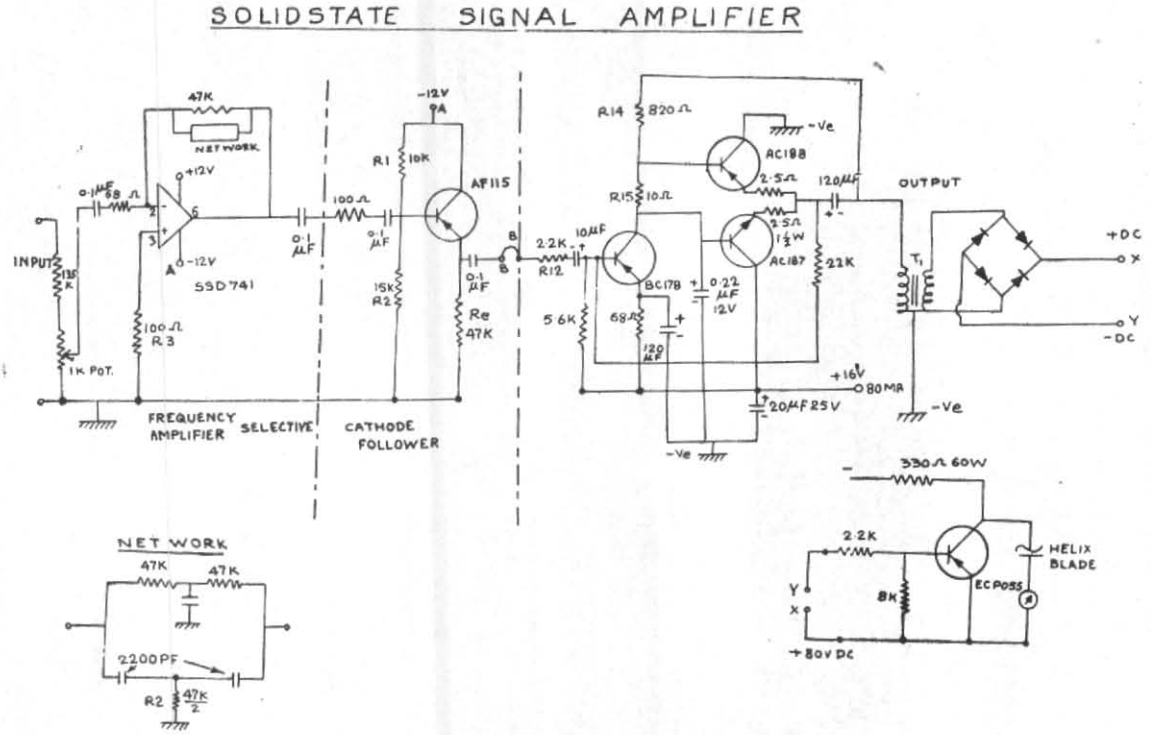

Fig. 1. Schematic circuit diagram

fore no current flows through paper. With minimum input voltage, reverse happens. When clouds are present, the d.c. output from the rectifier is maximum which is sufficient to cut-off the transistor and therefore no current flows through the paper which appears white. In cloud-free areas, signal strengh being less, d.c. output of rectifier is also minimum. Transistor is not cut-off and maximum current flows through the paper which appears black.

The amplifier described above requires three power supplies, *viz.*, 15 V, $\pm$12 V &—80 V.

The amplifier, designed for use with the APT receivers is simple in construction and for adjustments use is made of indigenously available components. It has dynamic range which is better than the amplifier in use. As a result of this there is an improvement in the picture quality. It gives four out of possible shades of grey transmitted as calibration steps with the NOAA APT pictures. As the amplifier uses solid state components, the stability is improved.

Reference

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