

New Siemens 16mm Projector Amplifiers

By NORBERT ENGELS

THE PRINCIPAL construction characteristic of the Siemens Projector 2000 is a component block system, with components such as the sound-head assemblies, amplifiers and 16mm tape decks. These are manufactured separately from the basic projector and assembled to basic standard models depending on market requirements. It is feasible in most cases to expand a projector which is already in use by equipping it with additional components to work with new projection methods or requirements. The many uses of 16mm sound film require the availability of a variety of amplifiers with different characteristics and power outputs. Three transistorized amplifiers were recently designed and put into production (Fig. 1).

electrical matching, and consequently simplifying production.

The input sensitivity for the optical sound is 0.5 mV, on 1.8-k Ω impedance, whereas the input for the magnetic sound is 1.2 mV, on 3 k Ω . Due to high input sensitivities, some remarkable gain reserves are available to assure proper sound reproduction if a poorly recorded soundtrack is reproduced. A 3-W Exciterlamp, type BRK, is used in all optical soundhead assemblies, contrary to previous models. A dc bias supply powers the Exciterlamp which is voltage controlled over a transistor circuit. This system is used on all amplifiers (Fig. 3). A small photo transistor, operating without a dc bias supply, is installed in the input circuit of the optical

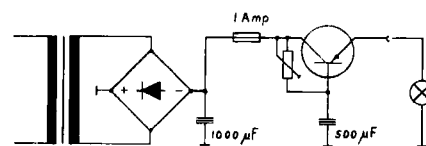


Fig. 3. The dc Exciterlamp circuit.

sufficient current so that bass tones by maximum gain can be reproduced in full fidelity thus minimizing the general overall distortion.

All amplifier inputs such as microphone, phono and tape have been dimensioned to have the same input impedance for each amplifier. The input sensitivity for a microphone is 0.8 mV and the impedance is 200 Ω .

The signal-to-noise ratio on all am-

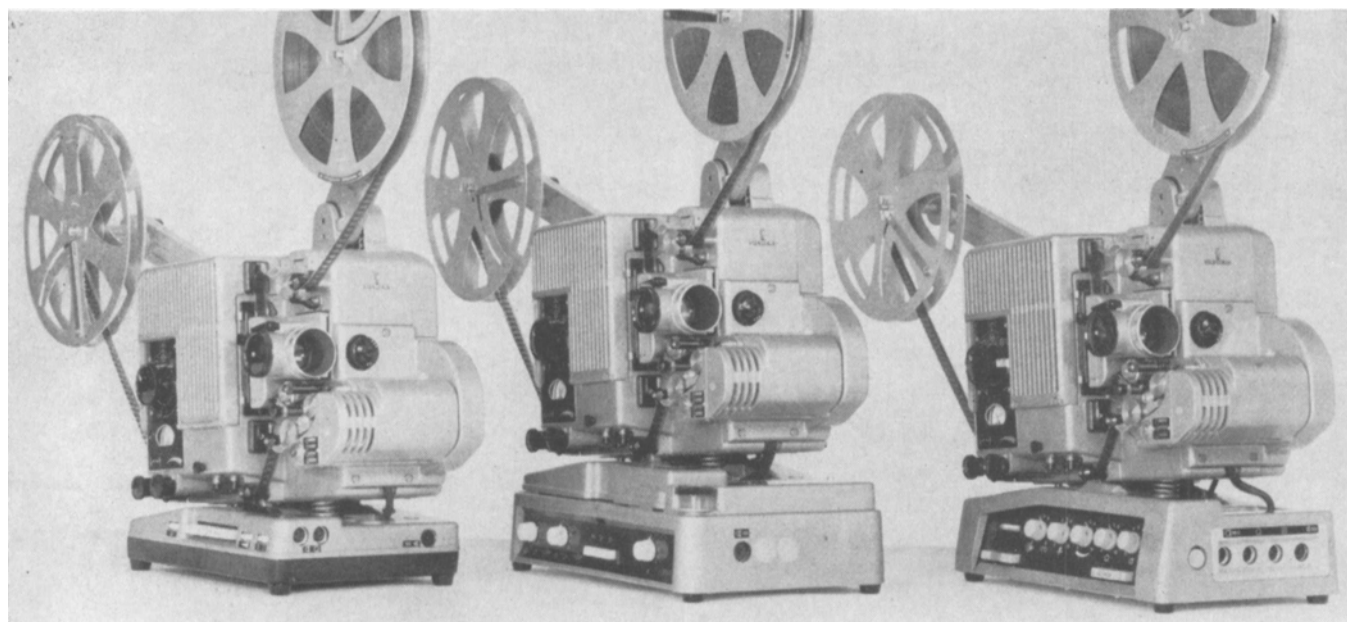


Fig. 1. Three new amplifiers mounted with the projectors.

The experience gained from the introduction of the first 2-W transistor socket amplifier in 1963 led to the basic construction principle of making all amplifiers with complete printed circuit boards mounted in lightweight aluminium alloy housings (Fig. 2). This type of metal enclosure helps reduce the basic weight and is useful for additional cooling required to keep power transistors within maximum tolerable temperatures. All amplifier inputs for optical and magnetic sound are identical. This permits complete interchangeability of soundhead assemblies without needing

sound, doing away with a transformer matching to the first transistor preamplifier.

A similar voltage-stabilizing circuit powers the amplifier transistors. This circuit is extremely stable and produces

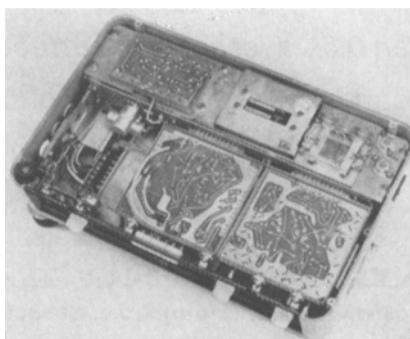


Fig. 2. Chassis and printed socket board layout of 12-W amplifier.

Presented on November 2, 1965, at the Society's Technical Conference in Montreal by Norbert Engels, Industrial Sales, R. & H. Products Ltd., 4930 Courval St., Montreal 9, Que., Canada. (This paper was first received on September 20, 1965.)

plifiers against full output, measured on the inputs of optical sound, microphone, and phono, is higher than 55 dB. On magnetic playback the signal-to-noise ratio is higher than 45 dB measured with standard German test film DIN 15638. Extensive mu-metal shieldings on the magnetic heads as well as a complete mu-metal enclosure of the motor help to eliminate outside interferences. A distortion of 5% is measured between the frequency range of 60 Hz and 10 kHz on full output, whereas the constant signal of 1 kHz produces less than 1% of distortion (Fig. 4). All amplifiers work without output transformer. The two power transistors are wired, to receive their dc supply, in series and to produce the audio signal in parallel phasing. The output impedance is 15 Ω for all amplifiers.

The amplifiers have been designed with pushbuttons for selection and with

Troubled by out-of-focus pictures?

Troubled by emulsion

pile-up in your camera gate?

Troubled by distracting camera

noise when shooting subjects who should not be distracted from what they are doing?

Troubled by cameras that are always in need of repair and adjustment?

If so, switch to Auricon, the only 16mm Camera that guarantees you protection against all these troubles, because it is so well designed! The Auricon is a superb picture-taking Camera, yet silent in operation, so that at small extra cost for the Sound Equipment, it can even record Optical or Filmagnetic sound in addition to shooting your professional pictures.



AURICON SUPER-1200, takes 1200 ft. Runs 33 min. \$5667.00 & up

AURICON "PRO-600 SPECIAL," takes 400 ft. Runs 11 min. \$1295.00 & up

AURICON PRO-600, takes 600 ft. Runs 16½ min. \$1871.00 & up

CINE-VOICE II, takes 100 ft. Runs 2¾ min. \$998.50 & up



GUARANTEE
All Auricon Equipment is sold with a 30-day money back Guarantee and a 1 year Service Warranty. You must be satisfied!

Write for your free copy of the 74-page Auricon Catalog

BACH AURICON, Inc.
6946 Romaine St., Hollywood 38, Calif.
HOLLYWOOD 2-0831

MANUFACTURERS OF PROFESSIONAL
16MM CAMERAS SINCE 1931

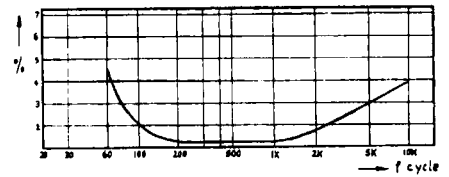
servicing expedited by accessible components. The printed circuit boards may be replaced individually. All amplifiers are equipped with a single tone control which in the case of the 12-W record and playback amplifier also effects the frequency response while in record position. The increase or decrease of frequency response may be seen from Fig. 5. A regulation of +5 dB and -12 dB is reached at 12 kHz.

The 7.5-W socket amplifier (at the left in Fig. 1) is designed for optical and magnetic playback and is simply built into the socket base of the projector. The projector and amplifier are mounted

as an integral unit and it weighs only 29 lb. The amplifier cannot be equipped with magnetic recording facilities.

The 12-W plug-in amplifier (at center in Fig. 1) has been built into a detachable housing and functions basically as the 7.5-W amplifier described above.

The 12-W socket amplifier (at right in Fig. 1) may also be used for magnetic recordings. Three mixable inputs are installed on a separate board and has an adjustable bias system. This permits superimposing of magnetic sound tracks or a gradual fade-in or fade-out of the bias to avoid switching noise.



Harmonic distortion by 1 W

Fig. 4. Harmonic distortion by 1 W.

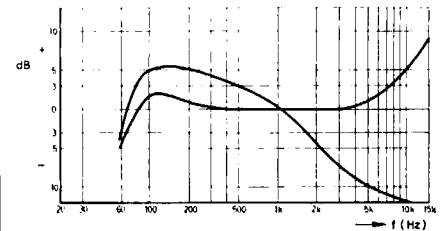


Fig. 5. Frequency curve of 12-W record and playback amplifier.

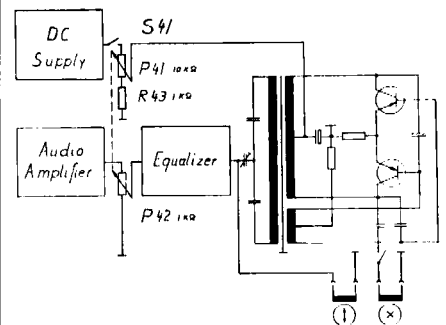


Fig. 6. Principal outlay of variable recording oscillator.

As shown in Fig. 6, this stage uses principally two power transistors wired in push-pull method by using a separate feedback winding. The amplitude, and, therefore, the high-frequency bias, for the erase and record and playback head may be altered by adjusting the dc supply of the two transistors which is fed over a variable voltage divider No. P-41 and R-43. The potentiometer P-41 is coupled mechanically to potentiometer P-42 which in turn regulates the audio level feeding the record and playback head. If P-41 is turned down to the minimum, enough dc supply remains to guarantee a positive start if the oscillator is switched on to record position with S-41. The coupling of the dc supply potentiometer P-41 with the audio potentiometer P-42 guarantees that the audio level decreases in the same ratio as the decrease of the oscillator bias. Thus, over-modulation is avoided. The recording level indicator is a magic-eyetube system that also shows the decrease of audio level to the magnetic recording head if P-42 is adjusted. The rugged construction, and mechanical and electronic reliability makes this equipment suitable in both the professional and amateur fields.

In conclusion, we thank H. Maschgan of Siemens & Halske, in Germany, for providing the technical information on which this paper is based.

A STAR IS BORN

FILMLINE'S MODEL FE-50

A Processor for Ektachrome Film

Processes 16mm Color Emulsions at 50 FPM.



Model FE-50
FROM
\$18,500
F.O.B.
Milford, Conn.

Who knows more about building film processors than Filmline? Nobody. And everything we've learned has gone into our newest Ektachrome processor, the FE-50. It is top quality equipment at a sensible price . . . the result of Filmline's productive know-how. Designed and engineered to fulfill the requirements of both large and small TV stations the FE-50 is the most versatile, fully automated Ektachrome processor ever built.

- **EXCLUSIVE OVERDRIVE SYSTEM** — guarantees against breaking or scratching film. The system is so sensitive that film can be held manu-

ually while machine is in operation, without breaking film or causing lower film assemblies to rise. Provisions for extended development to increase ASA indexes to 250 and higher are incorporated. Machine threadup allows use of standard ASA indexes or accelerated indexes because of Filmline's Film transport system features.

- **EASY-TO-OPERATE**—automated controls make this an ideal machine for unskilled personnel.
- **VARIABLE SPEED DRIVE**—speed range of 5 FPM to 60 FPM for Ektachrome emulsions.

Now available: Filmline FE-30 Ektachrome Processor. Speed — 30 FPM. Complete with Replenishment System . . . \$15,750. F.O.B. Milford, Conn.

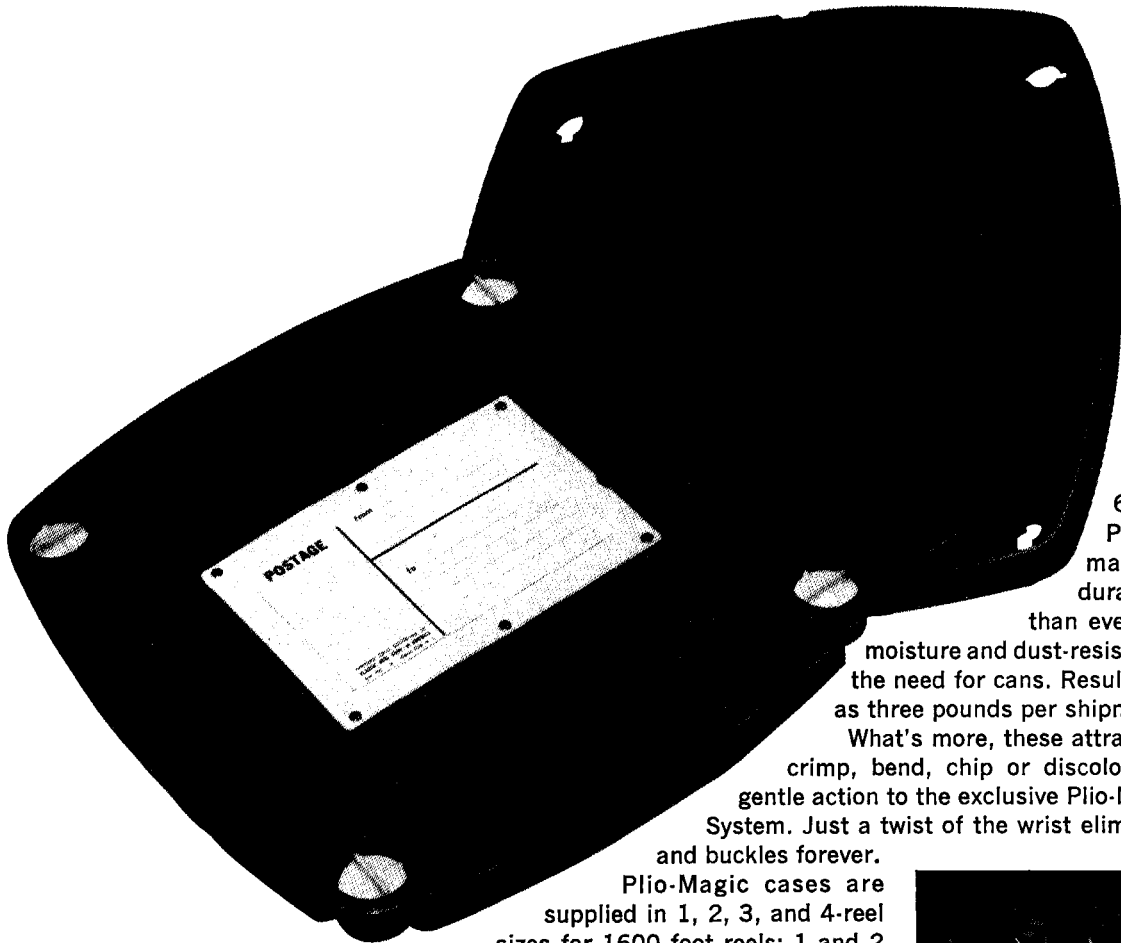
For more details write: SN-66



FILMLINE
CORPORATION
MILFORD, CONNECTICUT

Recent FE-50 Installations: WEAT-TV, WCKT-TV, WMAL-TV, NBC, CBS, WTOP-TV, A-1 Labs, Precision Labs, Film Service Lab.

the case against high shipping costs.



Plio-Magic film cases cut your shipping costs by as much as 65%. New, improved Plio-Magic material makes them even more durable, lighter in weight than ever before. And you get moisture and dust-resistant protection without the need for cans. Result: a saving of as much as three pounds per shipment.

What's more, these attractive cases can't rust, crimp, bend, chip or discolor. And there's a new gentle action to the exclusive Plio-Magic Positive Locking System. Just a twist of the wrist eliminates unwieldy belts

and buckles forever.

Plio-Magic cases are supplied in 1, 2, 3, and 4-reel sizes for 1600 foot reels; 1 and 2 reel sizes for 1200 foot and 2000 foot reels; and in 1-reel size for 400, 600 and 800 foot reels.

Available in a wide range of colors, with custom imprinting, if desired.

Write today to Dept. SM11, 612 Boulevard East, Weehawken, N. J., for money-saving PRC data kit.



PLIO-MAGIC®

A Product of PLASTIC REEL CORPORATION OF AMERICA

Manufacturers of Plio-Magic Film Reels, Cans, Shipping Cases, Reel Paks, Tape Reels, Processing Rollers, Cores and Bushings.

612 BOULEVARD EAST, WEEHAWKEN, N.J., (201) 867-4020 Direct N.Y.C. Phone No.: (212) YUKON 6-4841
West Coast: 1133 COLE AVENUE, HOLLYWOOD, CALIF. 90038, 213-462-8005