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MODIFICATION OF INOVONICS 380
RECORD AMPLIFIER FOR 125 kHz BIAS
10 August, 1981

1. Lift the end of 10k resistor R74 nearest IC5. Connect a short piece of insulated wire to the lifted end and connect to the end of R51 nearest C21. This provides 125kHz drive to both the erase and the bias amplifiers.
2. Change C36 from 910pF to 3600pF. This retunes the bias amplifier tank circuit to 125kHz without changing inductors.
3. Change the parallel-tuned bias trap components L4 / C38 from 560uH and 680 pF to 1mH (shielded) and 1800pF.
4. Change series-tuned bias trap components L5 / C39 from 1mH and 470pF to 2mH (two 1mH's in series) and 750pF.
5. Increase the size of the bias coupling capacitor C37 from 100pF to 1000pF.

(ADDITIONAL COMPONENTS REQUIRED):

P/N 0822 - Capacitor, dipped mica, 1000pF
P/N 0825 - " " " 1800pF
P/N 0828 - " " " 750pF
P/N 0837 - " " " 3300pF
P/N 1403 - Inductor, fixed, 1mH
P/N 1404 - " " 1mH shielded; with additional shielding provided.

APPLICATION NOTE

USE OF THE INOVONICS 380 IN MAGNETIC FILM RECORDING

The Inovonics 380 is a sophisticated Magnetic Recording Electronics package intended primarily for use with studio tape recorders. Because of its advanced features, however, it also finds application in magnetic film "insert" recording. The few operational distinctions between the two services may require accommodation to insure best performance.

A. Logic Interface

The 380 normally receives Record function "interlock" logic from the studio tape transport, and only when the transport is in the forward (PLAY) mode. This prevents inadvertent erase in the Rewind and Fast Forward modes, and demands an intentional command each time the Record mode is entered.

Film transports do not generally incorporate this interlock function, though it would seem a good idea from the same standpoint. The 380, nevertheless, does require application of an external DC voltage before it can enter the Record mode.

If this external voltage is applied only when the film transport is running in the forward direction, a Record Interlock function similar to that of a studio tape machine will be provided.

If, on the other hand, the voltage is applied continuously, the Record function will be enabled and disabled only with the front panel or remotely-located SAFE/READY and RECORD buttons.

The 380 requires an external voltage between 24VDC and 160VDC. It is applied to the rear-panel, 10-pin "Jones" POWER INTERCONNECT connector, the same connector which supplies AC mains power to the unit.

Apply the voltage between pins 3(+) and 7(-) for full-function, interlocking operation of the SAFE/READY and RECORD buttons.

Apply the voltage between pins 3 and 4(+) and 7(-) if only the SAFE/READY switch is to be used to enter the Record mode.

See Pages 10 and 11 of the Manual for information on Remote Control of all 380 switching logic.

B. SMPTE Equalization

The wide range of the 380 Record and Reproduce equalizers accommodates both the 16 and 35mm SMPTE curves without modification.

The major difference between present SMPTE and some other curves involves low frequency equalization. The Reproduce Equalizers are variable over a wide range, sufficient to accommodate any curve. The 380 Record low frequency characteristic is, however, fixed. LF Record boost may be disabled completely per the strapping instructions on Page 9 of the Manual. To change the boost characteristic, however, R16 on the Record Board must be changed. Increasing the value reduces the amount of LF boost; decreasing the resistor value increases low frequency Record pre-emphasis.

C. Bias Limitation Notes

The Inovonics 380 has 125kHz erase and 250kHz bias frequencies. The bias frequency is more than twice that used in most of the existing film recording equipment.

Record heads not specifically designed for 250kHz operation will not operate properly. Head impedance and lamination thickness limit efficiency at high bias frequencies.

When the Record Head is replaced with one in the preferred 4 - 6mH inductance range, operation will be upgraded.

Modern studio tape recorders which employ the higher bias frequencies utilize record head cabling with very low capacitance to minimize losses. Head cables in film equipment may have to be replaced.

Unless the cable capacitance is negligible (50pF or less), the actual cable capacitance should be measured and the measured value subtracted from the bias trap tuning capacitor, C38 on the 380 Record Board. Thus if the cable

measures 300pF, replace the 680pF, C38 with a 390pF capacitor. This retunes the bias output circuitry for optimum efficiency. Cables which measure more than 500pF should be replaced.

D. Insert Timing

The "pickup" timing is symmetrical in/ and /out and adjusted by R53 on the Record Board. The millisecond markings around the control refer to 7.5 and 15ips tape operation. Proper adjustment of R53 for film work must be derived either experimentally or by following the instructions on Page 17 of the Manual.

MANUAL ADDENDUM
MODEL 380 TAPE ELECTRONICS
-01 OPTION: SCULLY BACK PANEL ASSEMBLY

OCTOBER, 1982

Description

The -01 option for the INOVONICS 380 is a back panel assembly which provides direct, pin-compatible interconnection between the Electronics and SCULLY 280-series tape transports. No modification of the transport, head assembly or control logic is necessary. With the -01 option installed, the INOVONICS 380 directly replaces the original SCULLY record / reproduce electronics with the single exception that the 380 does not derive power from the transport and must maintain its own, separate AC line connection.

Field Installation

1. Disconnect POWER and all other back panel connectors from the Electronics. Remove the three plug-in circuit assemblies and the top cover from the chassis.
2. Unplug the Power Supply ribbon cable from J4 of the mother board. Similarly, unplug the power transformer from J3, the output transformer from J9, and the front panel meter assembly from J5.
3. Remove the six sheetmetal screws which fasten the back panel to the chassis; four on the rear and two underneath. Exchange the AMPEX-compatible back panel with the SCULLY-compatible assembly and replace the six screws.
4. Replug the Power Supply ribbon cable into J4 of the new mother board. The power transformer plugs into J2, the output transformer into J7, and the meter assembly into J3. Although the "J" numbers on the SCULLY-compatible mother board are different from those on the original AMPEX-compatible assembly, the relative positions of the connectors are the same.
5. Re-install the plug-in circuit assemblies and chassis top cover.

6. Refer to Section III of the 380 Manual for general installation considerations.

NOTE: The Erase Head Tuning procedure on page 8 of the Manual does not apply to the SCULLY-compatible back panel assembly. Refer to the following.

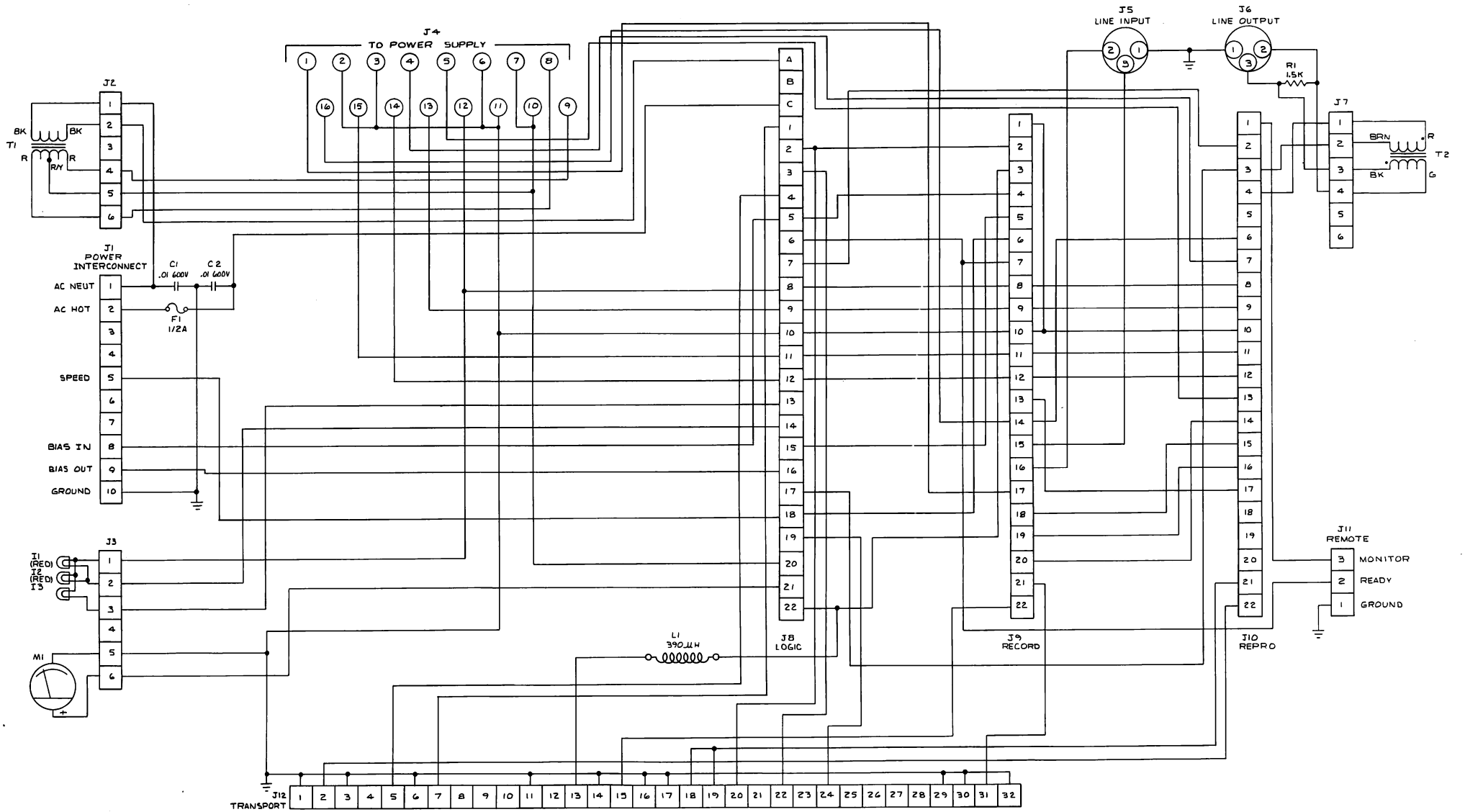
Erase Head Considerations

The SCULLY 280-series machines utilized a very low impedance erase head with an inductance between 0.1 and 0.2mHy. In order to bring erase head circuit inductance within the range which can be accommodated by the Electronics, the 380 mother board incorporates a 390μHy inductor directly in series with the erase head to raise total circuit inductance to 0.5 or 0.6mHy. The board strapping for SCULLY machines should thus be for a head of this inductance; straps "B" and "C".

Unfortunately, this is something of a compromise. A portion of the erase head current is wasted in the series inductor, sacrificing some erasure depth. Should erasure turn out to be less than required, it will be necessary to replace the erase head with one of higher inductance. Erase heads with inductance between 0.5 and 2.0mHy may be used; however, the 390μHy inductor should be removed from the mother board and a shorting strap placed across the terminals. Erase head tuning will then follow the procedure on pages 8 and 9 of the Manual.

A NORTRONICS 9127 is a 0.5mHy FULL-TRACK erase head suitable for monaural machines; the 9227 a 0.5mHy TWO-TRACK head for stereo recorders. If the new head does not replace an existing NORTRONICS head, a NORTRONICS QK-91 Mounting Kit will also be required.

All other operational aspects of the 380 are as described in the Manual.



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	APPROVED	TITLE	SCHEMATIC, CHASSIS 380-01 (FOR SCULLY 280)
TOLERANCES .XL ± .01 .XL ± .005 ANGLES ± 1	MATERIAL / FINISH —	PAGE 1 OF 1	DWG NO 159600 ISSUE A