

ACHIEVING OPTIMUM RESULTS FROM FM TRANSMITTING EQUIPMENT WHEN USING THE DISCRIMINATE AUDIO PROCESSOR

FM Broadcast Stereo Generators incorporate pre-emphasis and bandwidth limiting in their design. This requirement is forced upon the manufacturer, as the stereo generator is subject to connection to numerous different devices connected to its input.

Audio Processing Equipment, designed for use in FM broadcasting, incorporates pre-emphasis in its design. De-emphasis is also incorporated in order that a "flat" signal can be provided to the input terminals of the generator. The generator then provides its own pre-emphasis. This is a redundant process, which can cause unfortunate side effects in the form of unwanted amplitude excursions, if the pre-emphasis and de-emphasis circuits of the transmitter and processor are not exactly complementary.

The Discriminate Audio Processor is an instrument that is designed to allow a high level of modulation with clean uncolored sound, and controlled peak excursions. In order to accomplish this, circuitry has been incorporated into the design of the FM model of the Discriminate Audio Processor that provides for pre-emphasis and bandwidth limiting.

Therefore it is recommended that the de-emphasis circuit which has been incorporated into the Discriminate Audio Processor be disabled. This is accomplished by the removal of C-21, a 1500 pf capacitor, and replacing same with a capacitor of 68 pf in value. (See pages 24 and 25 of the DAP Instruction Book for the location of this component.)

Also, since the FM Discriminate Audio Processor incorporates the necessary bandwidth limiting circuitry to complement the action of the processor, it is recommended that any bandwidth limiting circuitry in the generator be disabled. This will allow wideband operation of the generator.

The attached Application Notes are intended to assist you in the modification of your transmitting equipment to yield optimum results with the Discriminate Audio Processor.

OPTIMOD

The Processing, Pre-emphasis and Bandwidth Limiting circuits incorporated in the Optimod can be bypassed by placing the Test Switch in the "TEST" position. This will allow program material to be fed directly into the Stereo Generator section of this device via the RCA type connectors located immediately adjacent to the Test Switch on the rear panel.

The Optimod has a bridging input at this point, and requires that the Discriminate Audio Processor be terminated with a 560 ohm resistor when feeding this device.

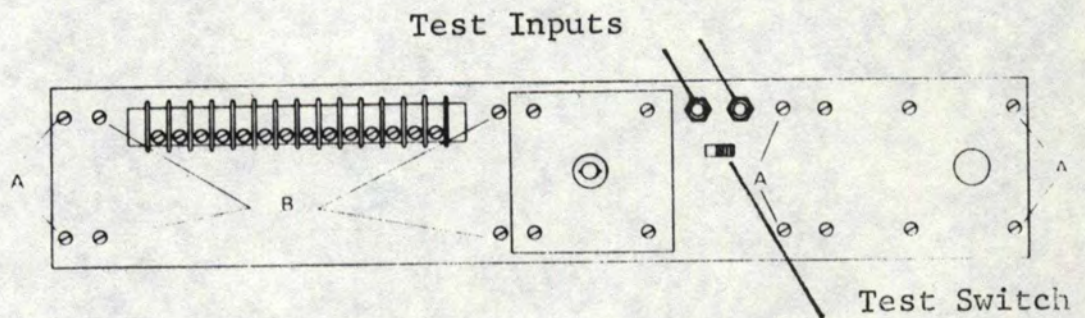


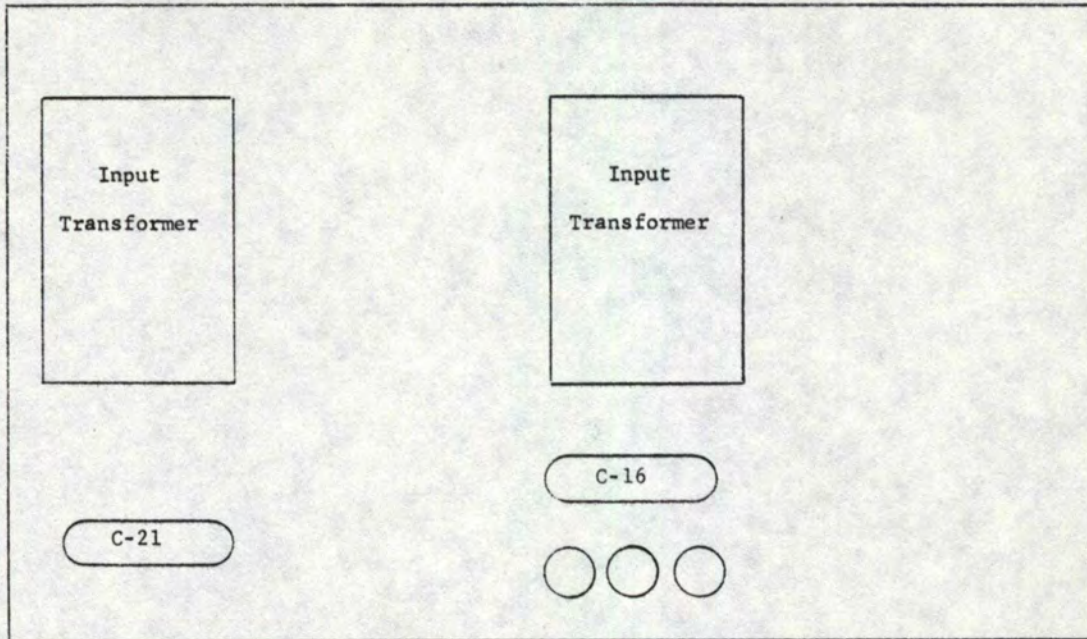
FIG. V 1: REAR PANEL ACCESS

From Optimod Instruction Manual

Disabling of the De-emphasis circuit on both Discriminate Audio Processors is required.

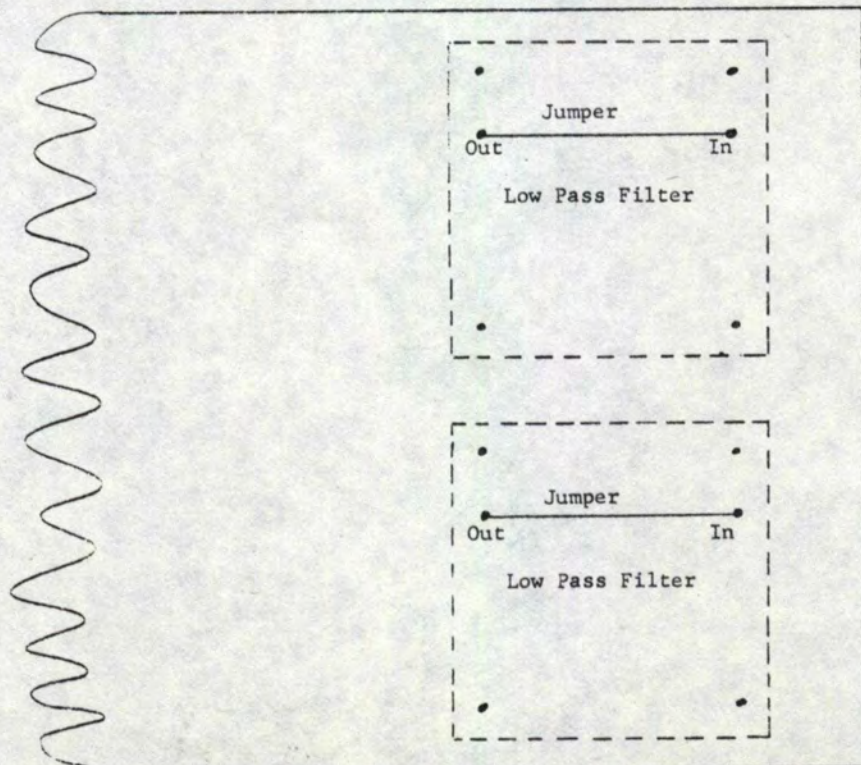
Removal of the Pre-emphasis Circuit from the FM Exciter

Remove the Rear Panel of the Exciter, and observe the Component Board whose layout is illustrated below. Remove the two 1500 pf Dipped Mica Capacitors designated as C-16 and C-21.



Removal of the Low Pass Filters from the Stereo Generator

Remove the Stereo Generator card from the exciter, and observe the layout as illustrated below. The four mounting screws located in the corners of the filter are to be removed. Next unsolder the four terminals that provide the electrical connections to the filter. The use of a solder sucker or a solder wick will be helpful in this endeavor. Physically remove the filter from the board, and connect the terminals marked "IN & "OUT" with jumpers.



HARRIS MS-15 STEREO ANALOG MODULE

The following figures are from the Harris Instruction Manual. Figure 3-1 is a pictorial view of the Stereo Analog Module. This illustration will be helpful in locating the changes required to operate this module without Pre-emphasis, Bandwidth Limiting and OVSC circuitry. Figure 4-1 is a block diagram of this module, and is intended to be helpful in the understanding of the changes, which are recommended.

Remove the Stereo Analog Module from the mainframe and perform the following operations:

A) REMOVAL OF THE PRE-EMPHASIS CIRCUIT

Locate the Pre-emphasis jumpers J-1 and J-2. Move these jumpers to the "FLAT" position for both channels. Locate and physically remove capacitors C-4 and C-26. These capacitors bridge the Pre-emphasis network, and should be removed when operating this module in the "FLAT" or no Pre-emphasis condition.

B) REMOVAL OF THE DTR FILTER

Locate the DTR Filter jumpers J-3 and J-5. Move these jumpers to the "INT" position for both channels. This bypasses the DTR Filter.

C) REMOVAL OF THE 17.5 kHz LOW PASS FILTER

Locate Low Pass Filter FL-2. Physically remove this filter from the circuit board, then connect a strap between the in and out connections on the circuit board. It is IMPORTANT that this filter is physically removed, otherwise it will bridge the strap and degrade the performance of the module.

D) REMOVAL OF THE OVSC CIRCUITRY

Locate the OVSC "clipper" jumpers J-4 and J-6. Move these jumpers to the "INT" position for both channels. This bypasses the clipping action of this module

In addition to the changes outlined above, it is necessary to disable the De-emphasis circuitry in the Discriminate Audio Processor.

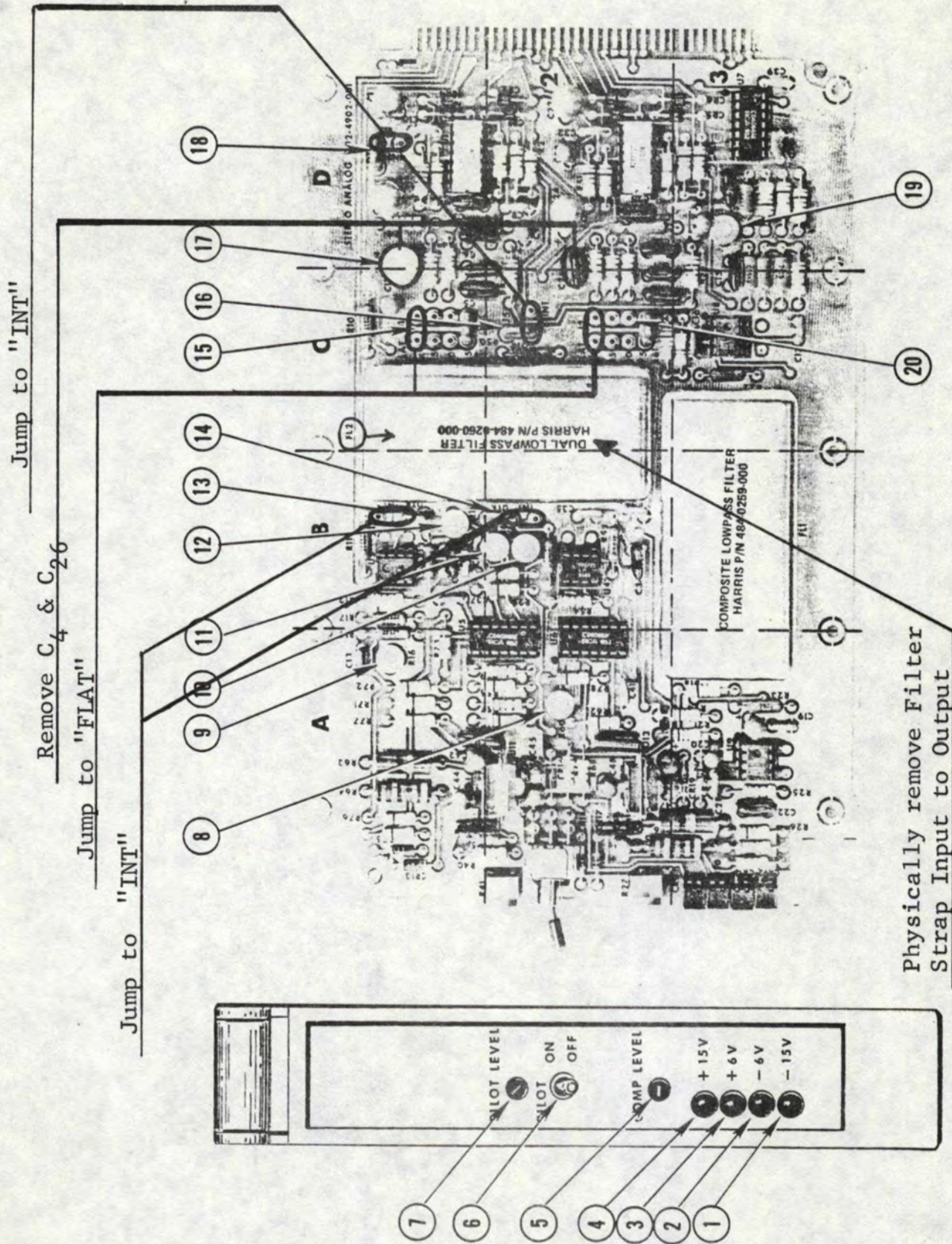
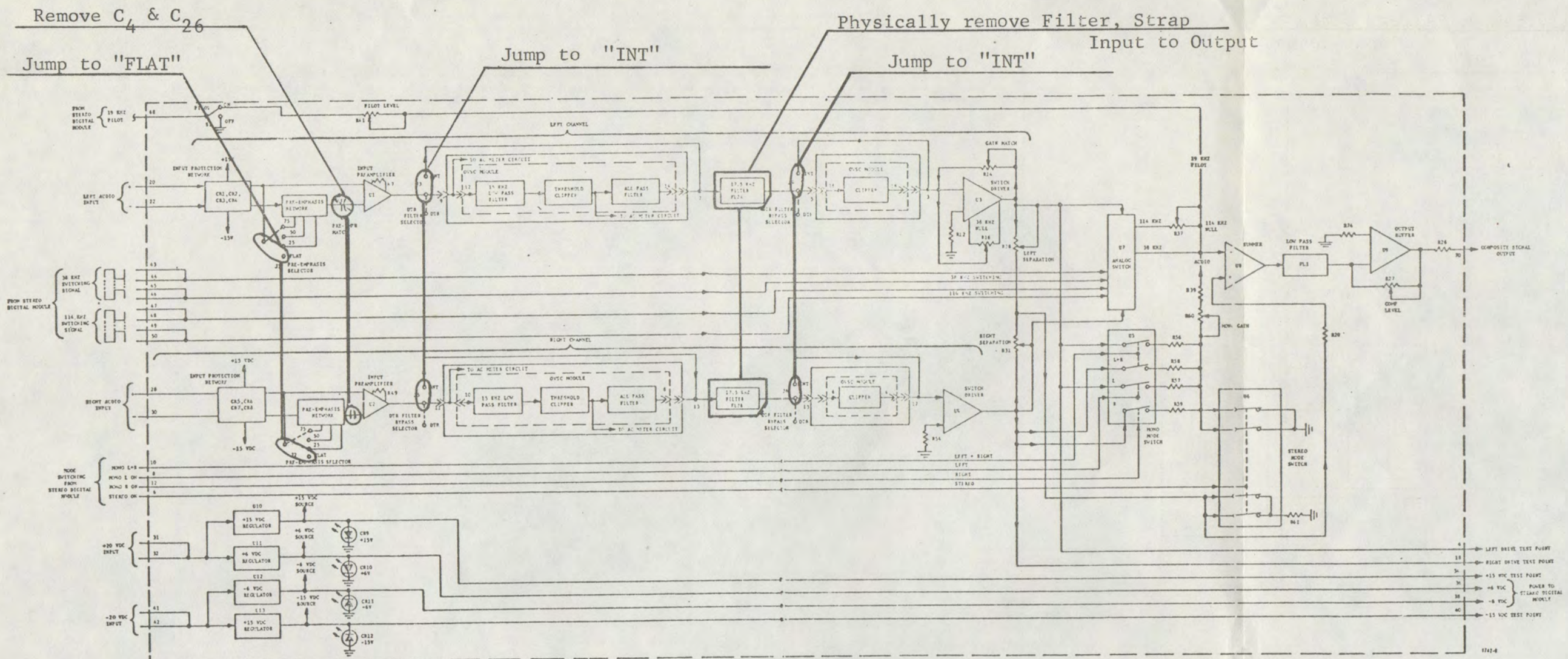


Figure 3-1. STEREO ANALOG Module

WARNING: Disconnect primary power prior to servicing.



- NOTES
1. PINS 1, 2, 19, 21, 23 THROUGH 27, 29, 47, 48, 51, 52 CONNECT TO GROUND
 2. SHOW IN STEREO OPERATION

FIGURE 4-1. STEREO ANALOG MODULE BLOCK DIAGRAM

MOSELEY ASSOCIATES SCG-9

Moseley Associates provides instructions in their Technical Manual for disabling the Pre-emphasis, and for the removal of the plug-in Low-pass filters.

In addition to these changes, it is necessary to disable the De-emphasis circuitry in the Discriminate Audio Processor.

IN APPRECIATION

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