

PCB 75046

18.1 Introduction

This PCB supports either one or two option filter sub boards, such as "A, B, C" Weighting, 80 kHz Low Pass, etc. It provides power, signal paths, and signal path switching, which responds to the "OPTION A" and "OPTION B" buttons on the front panel of the MJS401D, and the corresponding remote commands.

Figure 18.1.1 below shows the block diagram.

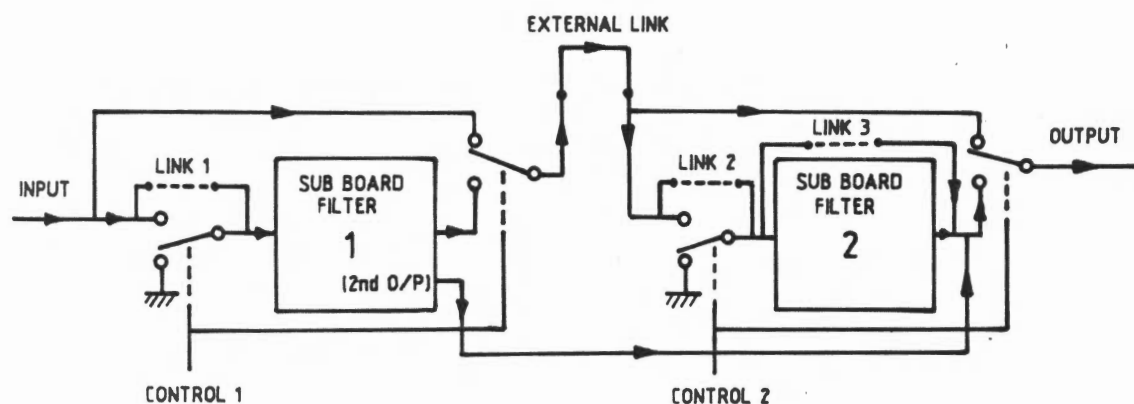


Figure 18.1.1 Block Diagram

18.2 Circuit Description

18.2.1 Signal path switching

With a logic low level on SKT2/6, the first filter logic control line, switches IC1/3,4 and IC2/3,4 are closed. The signal arriving at SKT2/8 from earlier filters is routed through IC2/3,4 to the first filter output, SKT1/1, bypassing the sub board filter 1. The input of the latter is grounded via IC1/3,4.

With a logic high level on SKT2/6, switches IC1/1,16 and IC2/1,16 are closed instead. The signal at SKT2/8 is routed to the input of sub board filter 1 at its pin 2/1. The output of sub board filter 1, at its pin 1/1, is routed via IC2/1,16 to SKT1/1.

The first filter output, SKT1/1, is linked on the main motherboard to the second filter input, SKT1/2.

The second section works identically to the first. Logic control is at SKT1/4, and output is taken from SKT1/3. IC1/6,5 and IC2/6,5 are closed when the second filter sub board is bypassed (logic low level); IC1/8,9 and IC2/8,9 are closed when the second filter is activated.

18.2.2 Power supplies

±18 V are passed through to the sub boards at their pins 2/5 and 2/6. Logic +5 V is also passed via pins 2/4. No decoupling is necessary on the option filter motherboard. The filter sub boards provide decoupling locally as necessary.

±18 V are also used by the analogue switches, IC1 and IC2.

A low power +5 V is derived by R2 and R3, and decoupled by C1, to set the logic thresholds of IC1 and IC2.

18.2.3 Links

Links 1 and 2 should only be fitted if IC1 is NOT fitted. IC1 has the task of grounding the inputs of the two sub board filters. This task is not strictly necessary if the filters have little or no gain at any frequency. However, IC1 is always fitted at the factory, so links 1 and 2 should not be fitted unless IC1 has to be removed due to device failure, and cannot be replaced.

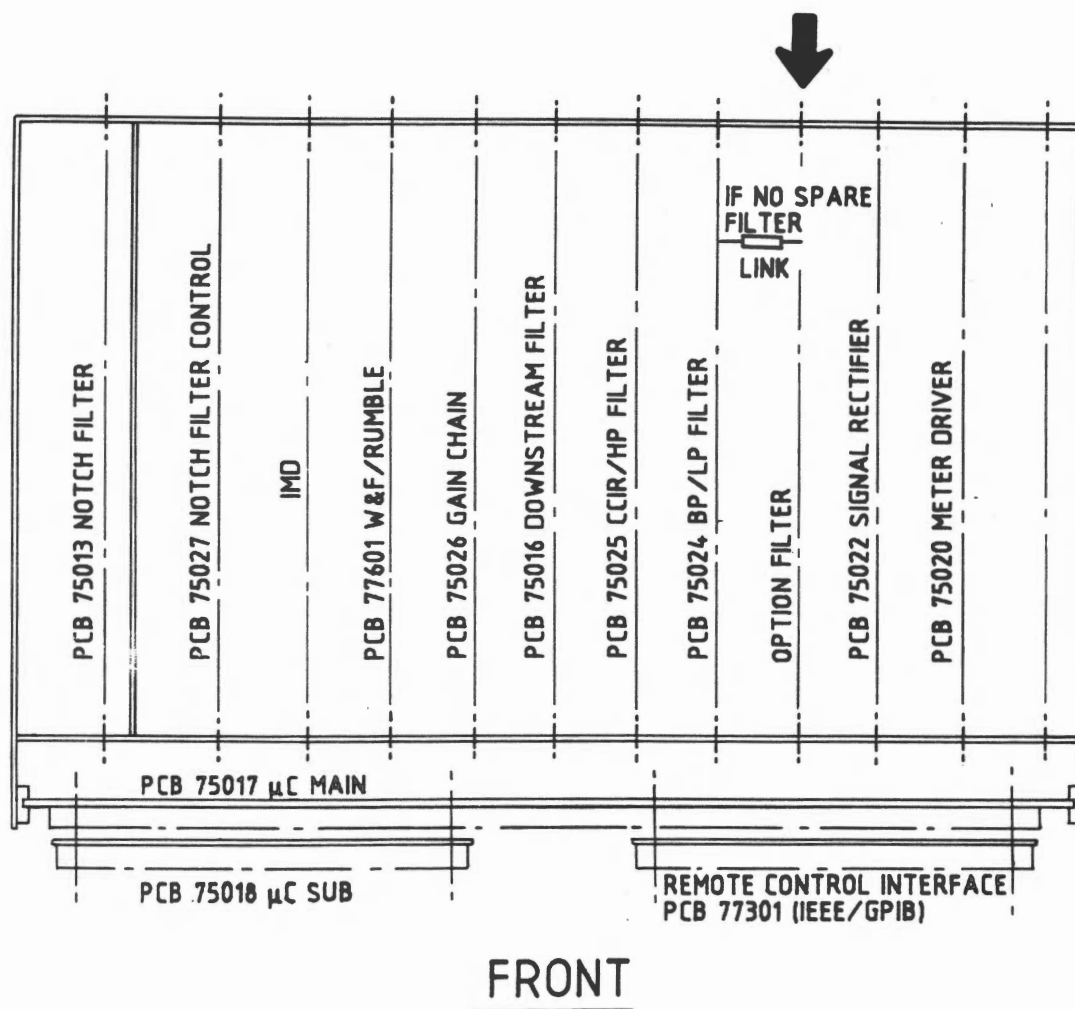
Link 3 is fitted if no filter is fitted which responds to the second filter control input, SKT1/4. This ensures continuity of the signal path if the "OPTION B" button is pressed.

Note that it is possible to have two filter characteristics on one sub board. The "A, B, C" filter (Section 19) is an example. Link 3 should be removed if there are two characteristics in use, regardless of whether they are on one sub board or two.

18.3 Removal/Replacement

Remove the top cover retaining screws and remove the top cover.

With the instrument facing you, the Option Filter Motherboard is installed in the 9th slot from the left in the main card frame. Verify by noting the printing on the motherboard ("SPARE FILTER").



MJS401D PCB Location Guide

Remove the card by grasping the top corners and gently pulling up.

Option filter sub boards are retained by M3 screws and nuts. To remove an option filter sub board, unscrew the three nuts on the component side of the sub board using a 5.5 mm A/F nut driver. Lift off the shakeproof washers, then lift the sub board gently off the option filter motherboard, keeping the two boards parallel at all times in order not to damage the connectors between the boards.

When replacing a sub board, use a drop of low strength thread locking compound, e.g. Bostik T22, on each thread before replacing the nuts. Otherwise, replacement is the opposite of removal. Carefully line up the connectors before pushing down and ensure the card is properly held within the guides.

Extender card PCB 75032 may be used to facilitate repair and calibration.

18.4 Fault Finding

Use extender card PCB 75032.

18.4.1 Filter 1 Activation

Select "OPTION A" filter on the instrument front panel. The red LED above the switch should illuminate. Failure to illuminate indicates a fault in the switch itself, LED, encoders or microcomputer system. See section 12 to repair the switch, LED or encoders, and section 3 for the microcomputer system.

The LED labelled Filter 1 on the extender should illuminate indicating that the switch, encoder and microcomputer output are functional.

If this does not illuminate, remove the option filter motherboard from the extender. If the Filter 1 LED now illuminates then a fault is likely in the logic circuit input IC1, IC2, R4. If Filter 1 still remains off, check for +5 V on PL2/6. If this is missing the fault is in the microcomputer, motherboard or interconnections.

If the logic circuits appear correct, check for signal continuity through IC1/3 and IC1/4 to the input of sub board filter 1, out again to IC2/1, and through to IC2/16.

Failure of the signal to appear at IC1/3 indicates a failure earlier in the system.

If the signal appears on SKT1/1, but not SKT1/2, then the fault is definitely on the motherboard PL1 or contact failure between SKT1 and PL1.

18.4.2 Filter 2 Activation

Select "OPTION B" filter on the instrument front panel. The red LED should illuminate. Failure to illuminate indicates a fault in the switch itself, LED, encoders or microcomputer system. See section 12 to repair the switch, LED or encoders, and section 3 for the microcomputer system.

The LED labelled Filter 2 on the extender should illuminate indicating that the switch, encoder and microcomputer output are functional.

If this does not illuminate, remove the option filter motherboard from the extender. Illumination of the Filter 2 LED now indicates a fault in the logic circuit input IC1, IC2, R1. If Filter 2 still remains off, check for +5 V on PL1/4. If this is missing the fault is in the microcomputer, motherboard or interconnections.

If the logic circuits appear correct, check for signal continuity through IC1/8 and IC1/9 to the input of sub board filter 2, out again to IC2/8, and through to IC2/9.

Failure of the signal to appear at IC1/8 indicates a failure elsewhere in the system, probably on the Filter 1 section of this PCB, or between connector SKT1 and the motherboard.

18.5 Calibration

There are no calibration adjustments to be made on the option filter motherboard. Calibration of the sub board filters themselves is the subject of other individual sections of this manual.

REVISION			
NO	DATE	CHANGE	APPROVED
1	2-9-85	PROTOTYPE	
2	9-10-85	F.I. AN0137	J.D. H. 100

