Service Manual

Alesis AI-2

Manual No. 73A024-A

Table Of Contents

List of Figures

2. Power Supply Test

Turn off the AI-2 and remove the top cover. (See Figure 2) See Figure 1, AI-2 Assembly Drawing, for component and test points location. To find the relevant circuit area's, see the schematic sheet 2, zone A1 thru A4. Note: The grayed areas of the schematic do not apply to the AI-2.

A. Connect a 9-12V AC output power transformer to the AI-2 POWER connector.

B. Turn the POWER switch to ON.

C. Set Ch1 of oscilloscope to 5V/div. Measure the +12V_UN signal at E9. Verify that the signal looks like a full wave rectified sinewave with a frequency of twice the AC mains frequency (either 100Hz or 120Hz) and a peak of +11.0V +/-0.5V decaying to +9.0 +/-0.5V min.

   If test fails, it may not be a power supply failure, but could be a malfunctioning IC anywhere on the main PCB, that has failed and shorted. Check if any IC is very hot. Also check rectifying diodes D10-D13.

D. Measure the -VEE signal at E8. Verify that the signal is -7.5V to -12V.

   If fails, check U32.

E. Verify that the voltage at +5V, E2, is +4.85V to +5.15V.

   If fails, check U16.

F. Verify that the voltage at -5V, E7, is -4.85V to -5.15V.

   If fails, check U14. See schematic sheet 3, zone A2.

G. Verify that the voltage at +5VR, E6, is +4.85V to +5.15V.

   If fails, regulator or other IC in the Sample Clock "can" area is bad. Board has to be replaced. See schematic sheet 2, zone C4.

F. Press the DISPLAY switch; the display should show the following:

LCD DSPL TEST, SETUP to start. Press the SETUP switch to start the FP LCD TEST. Verify that A-Z, a-z, 0-9, and special control characters are successfully displayed. Also verify that all the pixels are dark in the last display test pattern.

If test fails, check that the Display cable is plugged in correctly to J19. See the schematic sheet 4, zone C1.

J. Attach/leave the Midi cable from J5 (BRC MIDI OUT) to J6 (BRC MIDI IN). And attach a cable from J9 (CONTROL MIDI IN) to J4 (BRC MIDI THRU).

K. Press the SETUP switch to start SERIAL COM TST3. Verify that the test passes.

If test fails, replace U9A. See the schematic sheet 3, zone B3 & C3.

L. Press the DISPLAY switch; the display should show the following:
SERIAL COM TST4, SETUP to start. Move the MIDI Cable from J4 (BRC MIDI THRU) to J8 (CONTROL MIDI OUT). Signals tested: J8: MTC OUT, MIDI_TX2-, J9: MTC MERGE IN, MIDI_RX2.

M. Press the SETUP switch to start SERIAL COM TST4. Verify that the test passes.

If test fails, replace U6. See the schematic sheet 3, zone B4, C4 & D4.

N. Press the DISPLAY switch; the display should show the following:
SERIAL COM TST5, SETUP to start.
Signals tested: J10: ETX+/-, LRX+/-.

O. Attach the DB 25 Male loopback connector, wired per Figure 5, to J10 (LYNX/MICRO LYNX).

P. Press the SETUP switch to start the SERIAL COM TST5. Verify that the test passes.

If test fails, replace U10 or U11. See the schematic sheet 1, zone B1 & C1.

Q. Press the DISPLAY switch; the display should show the following:
SERIAL COM TST6, SETUP to start.
Signals tested: J11: RS422_TX+/-, RS422_RX+/-.

R. Attach the DB 9 Male loopback connector, wired per Figure 4, to J11 (EDITOR).

S. Press the SETUP switch to start the SERIAL COM TST6. Verify that the test passes.

If test fails, replace U10 or U11. See the schematic sheet 1, zone B4.

6. Sample Clock Generation Test

Signal tested: J2: 48KHz OUT

A. Press the DISPLAY switch; the display should show the following:
PLL CKT TEST, SETUP to start.

B. Press the SETUP switch to start the PLL CKT TEST; the display should show the following:
PLL CKT TEST, Test in Progress.
PLL CKT TEST, 48K/24 VCO nom.

C. Connect an oscilloscope (or frequency counter) to J2, W/C OUT. Verify that the frequency is 48.056KHz +/- 5Hz, 0V to 3.5V. The jitter of the frequency should be +/-0.2Hz.

If signal amplitude is missing/wrong, replace U34. See the schematic sheet 3, zone D2. If frequency is wrong, check crystal Y1. If Y1 is OK, return board for factory service. See the schematic sheet 1, zone D1. See also schematic sheet 2, zones B3, C3, B4 and C4. (The circuit in the "can" area is not shown.)

The above suggested repairs apply to next four steps.

D. Press the STORE switch to go to the next test; the display should show the following: PLL CKT TEST, 48K/30 VCO NOM.

Verify that the oscilloscope indicates a frequency of 48.074KHz +/- 5Hz. The jitter of the frequency should be +/-0.2Hz.

E. Press the STORE switch to go to the next test; the display should show the following: PLL CKT TEST, 38K/30 VCO LOW.

Verify that the oscilloscope indicates a frequency of 38.008KHz +/- 5Hz. The jitter of the frequency should be +/-0.2Hz.

F. Press the STORE switch to go to the next test; the display should show the following: PLL CKT TEST, 58K/30 VCO HIGH.

Verify that the oscilloscope indicates a frequency of 58.013KHz +/- 5Hz. The jitter of the frequency should be +/-0.2Hz.

G. Press the STORE switch to go the next test; the display should show:
PLL CKT TEST, PLL LOCK Test. Press the SETUP switch; verify that the test passes.

H. Press the STORE switch to get out of the test.

8. Video Sync Separator Test

A. Press the DISPLAY switch 3 times (skip the Miscellaneous Test 1 & 2, factory use only); the display should show the following:

VID FLD TEST, SETUP to start.

B. Attach a coax cable and terminator(s) per the following table. Press the SETUP switch to perform the test. Verify each table entry:

SYNC TYPE	75 OHM TERMINATION	PASS/FAIL
C SYNC	NONE	_____
C SYNC	ONE TERMINATION	_____
C SYNC	TWO TERMINATIONS	_____
COL BARS	ONE TERMINATION	_____
COL BARS	TWO TERMINATIONS	_____
BLK BURST	NONE	_____
BLK BURST	ONE TERMINATION	_____
BLK BURST	TWO TERMINATIONS	_____
PAL	NONE	_____
PAL	ONE TERMINATION	_____
PAL	TWO TERMINATIONS	_____

If test fails, check U12 and U15. See the schematic sheet 3, zone A3 & A2.

10. Word Clock In Test

A. Set the squarewave generator output to be 48000Hz +/- 100Hz, 0V to 5V. Attach the squarewave generator to the W/C IN connector, J13.

B. Turn off the AI-2, hold the STORE switch, turn the power on, and let go of the STORE switch. The display should indicate that the memory was cleared and will scroll through the default user settings; the unit is ready to accept commands.

C. Press the SETUP switch once, press the MENU switch five times, and then the UP switch once, the display should show:
Setup: REFERENCE
Input: W/C, Int

D. Verify the REF LED on the AI-2 front panel becomes steady on. This indicates that the AI-2 has locked to the input 48KHz signal.

If test fails, replace U6. See the schematic sheet 3, zone B2.

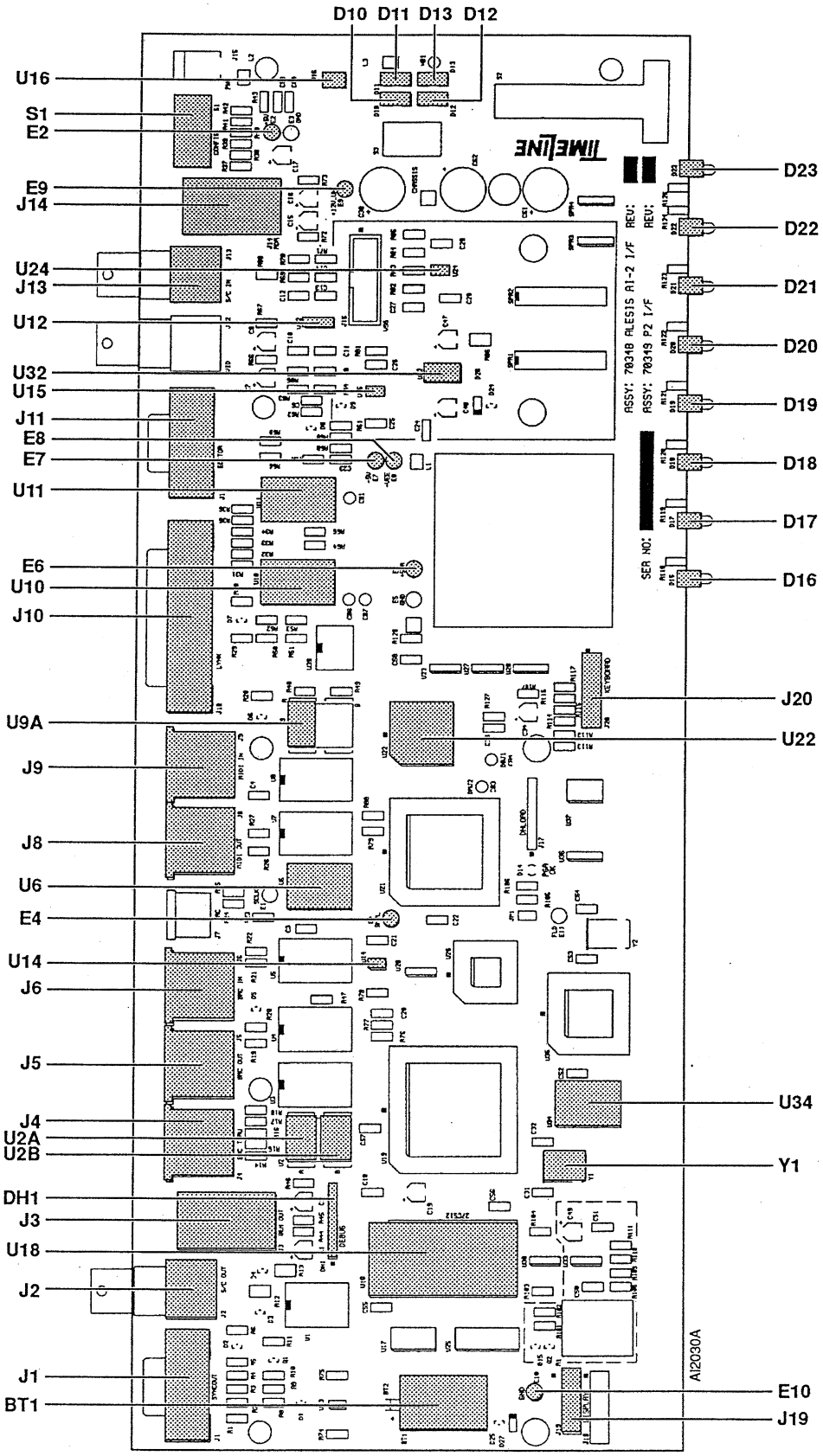


Figure 1. AI-2 PCB Assembly Drawing

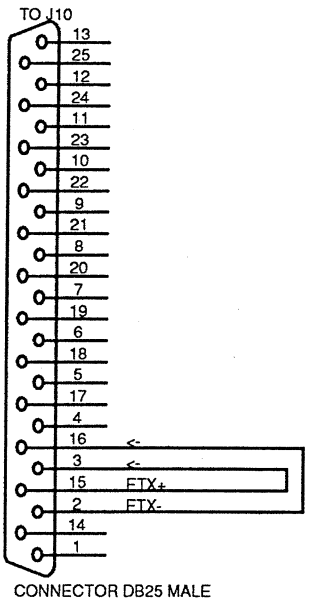
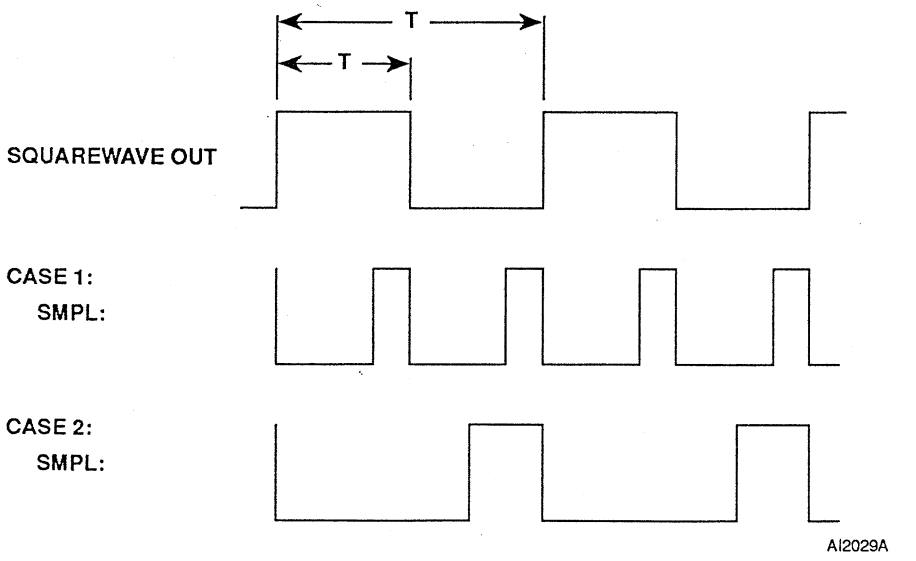


Figure 5. Lynx Loopback Connector Schematic



EITHER SMPL CASE IS ACCEPTABLE.
SMPL CAN BE LOCKED ON EITHER FALLING OR RISING EDGE OF SQUAREWAVE OUT.

Figure 6. Time Code Sample Definition

Part Number	Description		Quantity
20221	RES MF SM 200K 1/8W 5% R83	1206	1 EA
20226	RES MF SM 27R 1/4W 5% R13,R86	1210	2 EA
20230	RES MF SM 3K 1/8W 5% R70	1206	1 EA
20233	RES MF SM 0R 1/8W R37,R45,R84,R108	1206	4 EA
20235	RES MF SM 300K 1/8W 5% R98,R100	1206	2 EA
20232	RES MF SM 91K 1/8W 5% R76	1206	1 EA
20304	RES PREC SM 348R 1/8W 1% R89	1206	1 EA
21A014	CAP ELECT 1000UF 25V RADIAL C30,C61 NOTE: ONLY USE AFTER USE UP OF 21A009 (QTY OF 3) AT REFERENCE DESIGNATIONS; C30,C61 & C62		2 EA
21C005	CAP POLY .1 UF 50V RADIAL C44		1 EA
21C008	CAP POLY 1.0 UF 50V RADIAL C46		1 EA
21101	CAP ELECT SM 10uF 35v SM C1,C7,C9,C15,C16,C17,C19,C36,C47,C48,C49	EC5	11 EA
21402	CAP CER SM .1uF 50V C4,C11,C13,C18,C20,C21,C22,C24,C25,C26,C27,C28, C29,C33,C37,C39,C55,C56,C57,C50,C51,C58	1206	22 EA
21402	CAP CER SM .1uF 50V R63	1206	1 EA
21403	CAP CER SM .001uF 100V NPO C23	1206	1 EA
21405	CAP CER SM 22pF 50V C12,C14,C31,C32,C53,C54	1206	6 EA
21408	CAP CER SM 100pF 100V C5,C43	1206	2 EA
21413	CAP CER SM 330pF 50V NPO C8,C10	1206	2 EA
22101	SEMI DIODE SM 1N914 D1,D3,D4,D5,D6,D7,D8,D9	SOT23	8 EA
23A015	OPTO LED ROUND T1, GRN D14		1 EA
23A017	OPTO LED ROUND T1, RED, RIGHT-ANGLE D18		1 EA
23A014	OPTO LED ROUND T1, GRN, RIGHT-ANGLE D16,D17,D19,D20,D21,D22,D23		7 EA

Part Number	Description		Quantity	
24N023	IC INTFC 26LS31 RS-422 LINE DRIVER U10		1	EA
24R004	IC REG 780-05 +5V PREC U16		1	EA
24R007	IC REG LM317 VOLT REG ADJUSTABLE TO92 AV# LM317LZ MFG. NATIONAL U30		1	EA
31D010	CONN D PCB 9 PIN FEM RT ANG W/SCR LOCK J1,J11		2	EA
32A001	CONN .100 HDR 1ROW 2 PIN DH1: INSTALL CONNECTOR IN PIN 7 AND 8.		1	EA
32B004	CONN .100 HDR 2ROW 16 PIN J20		1	EA
32B018	CONN .100 HDR 2ROW 16 PIN SHR, .6"H SLIM J16		1	EA
32B022	CONN .100 HDR 2ROW 14 PIN J19		1	EA
49A002	CONN MISC DIN-5, FEMALE, PCB R/A, LO-PRO J4,J5,J6,J8,J9		5	EA
49B006	CONN MISC BNC, PCB RT-ANG, METAL J2,J12,J13		3	EA
49E002	CONN MISC PHONE JACK, PCB, R/A LO-PROFIL J3,J14		2	EA
49H002	CONN MISC, TP, LOOP E1,E3,E4,E5,E10		5	EA
52E001	TRAN COIL BEAD FERRITE	2PTH	3	EA
59B002	ELECT MISC XTAL 12.0000 MHZ Y1		1	EA
59B004	ELECT MISC XTAL 3.6864 MHZ Y2		1	EA
59F003	ELECT MISC BATT LITH 3.6V, 1/2 AA BT1		1	EA
70D120	ASSY CBL RIB FEM-16 TO TRANS-16, 4"		1	EA