

MAINTENANCE MANUAL

AUDIO ALC MODULE
ROA 117 2261

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SPECIFICATIONS

Input Voltages	+12 Vdc ± 10%
Current Drain	23 mA (typical)
Temperature	-30°C to +60°C
Dimensions	8.0 inches Long x 4.0 inches Wide
Circuits	6
Input Impedance	600 Ohms
Gain	+12.5 dB
Nominal Output Level	245 mV

CONNECTOR J1 DEFINITION

Connection	Signal Name	Input/Output	Analog/Digital	Level
J1-A1	Ground	O	A	0 Vdc
J1-A3	AUDIO IN 1 (T)	I	A	
J1-A5	AUDIO IN 2 (T)	I	A	
J1-A7	AUDIO IN 3 (T)	I	A	
J1-A9	AUDIO IN 4 (T)	I	A	
J1-A11	AUDIO IN 5 (T)	I	A	

Continued



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Continued

Connection	Signal Name	Input/Output	Analog/Digital	Level
J1-A13	AUDIO IN 6 (T)	I	A	
J1-A19	AUDIO OUT 1	O	A	
J1-A21	AUDIO OUT 2	O	A	
J1-A23	AUDIO OUT 3	O	A	
J1-A25	AUDIO OUT 4	O	A	
J1-A27	AUDIO OUT 5	O	A	
J1-A29	AUDIO OUT 6	O	A	
J1-A32	Ground	O		0 Vdc
J1-B1	Ground	O		0 Vdc
J1-B19	AUDIO OUT 1	O	A	
J1-B21	AUDIO OUT 2	O	A	
J1-B23	AUDIO OUT 3	O	A	
J1-B25	AUDIO OUT 4	O	A	
J1-B27	AUDIO OUT 5	O	A	
J1-B29	AUDIO OUT 6	O	A	
J1-B32	Ground			0 Vdc
J1-C1	Ground			0 Vdc
J1-C3	AUDIO IN 1 (R)	I	A	
J1-C5	AUDIO IN 2 (R)	I	A	
J1-C7	AUDIO IN 3 (R)	I	A	
J1-C9	AUDIO IN 4 (R)	I	A	
J1-C11	AUDIO IN 5 (R)	I	A	
J1-C13	AUDIO IN 6 (R)	I	A	
J1-C19	AUDIO OUT 1	O	A	
J1-C21	AUDIO OUT 2	O	A	
J1-C23	AUDIO OUT 3	O	A	
J1-C25	AUDIO OUT 4	O	A	
J1-C27	AUDIO OUT 5	O	A	
J1-C29	AUDIO OUT 6	O	A	
J1-31	Power	I		12 Vdc
J1-C32	Ground	O		0 Vdc

DESCRIPTION

Audio Automatic Level Control (ALC) module ROA 117 2261 provides clear voice audio processing for six independent audio channels in GPS Simulcast Systems (Figure 1). The ALC Module is designed for “transparent” (0 dB gain, 0 dB loss) operation at the normal system level of -10dBm, and to maintain this -10 dBm output level with input fluctuations of ±10 dB or more (gain is limited to 12.5 dB). The response to input fluctuations has a time constant of 10 mSec.

Each input is transformer coupled (T1-T6) and expects a 600 ohm balanced line. The output is single ended, low impedance, intended to drive several audio distribution module inputs in parallel.

ALC modules plug into Control Point Sync Shelf slots 15 - 18 (Refer to Maintenance Manual AE/LZB 119 1903). The module in slot 15 performs ALC for Simulcast channels 1, 5, 9, 13, 17 & 21. The module in slot 16 performs ALC for Simulcast channels 2, 6, 10, 14, 18 & 22. The module in slot 17 performs ALC for Simulcast channels 3, 7, 11, 15, 19 & 23. The module in slot 18 performs ALC for Simulcast channels 4, 8, 12, 16, 20 & 24.

CIRCUIT ANALYSIS

LEVEL CONTROL

The circuitry is based on dual gain control circuit SA571 and is a standard application of that part. Resistors R1 - R6 are chosen to provide a maximum gain of 12.5 dB. Resistors R7 - R12 set the output level to -10dBm. Each IC package contains two functional units, so that three IC’s (U1-U3) are sufficient for 6 voice paths. The module operates from a standard +5 Vdc supply, with on-board automatic thermister fuse F1 to prevent collapsing the supply in the event of a failure.

INPUTS

Inputs for each of the six (6) channels come from voters in the voting self. The balanced pair input for each of 6 channels is on connectors:

AUDIO IN 1 is on:

J1 - A3 (Tip)

J1 - C3 (Ring)

AUDIO IN 2 is on:

J1 - A5 (Tip)

J1 - C5 (Ring)

AUDIO IN 3 is on:

J1 - A7 (Tip)

J1 C7 (Ring)

AUDIO IN 4 is on:

J1 - A9 (Tip)

J1 - C9 (Ring)

AUDIO IN 5 is on:

J1 - A11 (Tip)

J1 - C11 (Ring)

AUDIO IN 6 is on:

J1 - A13 (Tip)

J1 - C13(Ring)

OUTPUTS

Audio outputs from the ALC Module are sent to an Audio Distribution Module located in the Audio Distribution Shelf for further processing.

Rows A, B & C of the ALC Module are connected in parallel to maintain low impedance and improve circuit integrity as follows:

AUDIO OUT 1 is on:

J1 - A19, B19, C19

AUDIO OUT 2 is on:

J1 - A21, B21, C21

AUDIO OUT 3 is on:

J1 - A23, B23, C23

AUDIO OUT 4 is on:

J1 - A25, B25, C25,

AUDIO OUT 5 is on:

J1 - A27, B27, C27

AUDIO OUT 6 is output on:

J1 - A29, B29, C29

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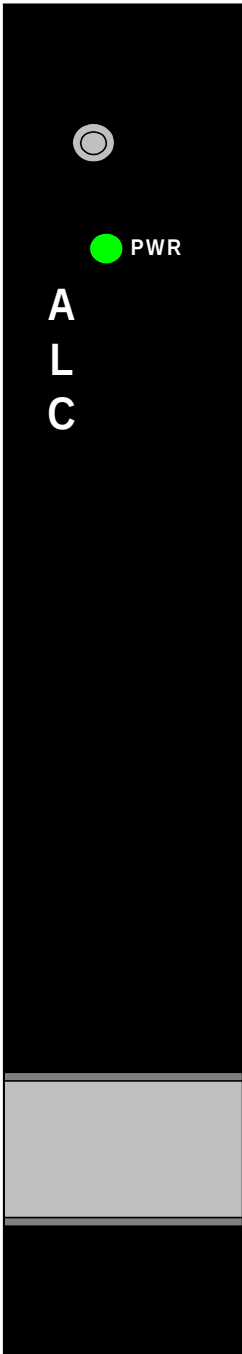


Figure 1 - Front Panel

AUDIO ALC TEST PROCEDURE

Equipment Required:

- + 12 Vdc Power Supply
- Multimeter (Volt/Ohmmeter)
- Function Generator (Sin Wave)

Continuity Test:

Using the multimeter, check for a short circuit between Power (+12 Vdc and ground)

Procedure:

1. Apply +12 Vdc Power to the power pin C31 and ground Pin A1, B1 and C1
2. Check all ground and power pin connectors:

Power: C31
Ground: A1, B1, C1, A32, B32, C32
3. Using a 1000 Hz test tone, vary the voltages on the inputs and check and record the output voltage. The corresponding output voltage should be 245 mV ±50 mV.

Input Pins	Voltage Input	Output Pin	Voltage Output
A3, C3	2.45 Vac (+10 dB)	C19	
A3, C3	0.775 Vac (-0 dB)	C19	
A3, C3	0.245 Vac (-10 dB)	C19	
A3, C3	0.0775 Vac (-20 dB)	C19	

Input Pins	Voltage Input	Output Pin	Voltage Output
A5, C5	2.45 Vac (+10 dB)	C21	
A5, C5	0.775 Vac (-0 dB)	C21	
A5, C5	0.245 Vac (-10 dB)	C21	
A5, C5	0.0775 Vac (-20 dB)	C21	

Input Pins	Voltage Input	Output Pin	Voltage Output
A7, C7	2.45 Vac (+10 dB)	C23	
A7, C7	0.775 Vac (-0 dB)	C23	
A7, C7	0.245 Vac (-10 dB)	C23	
A7, C7	0.0775 Vac (-20 dB)	C23	

Input Pins	Voltage Input	Output Pin	Voltage Output
A9, C9	2.45 Vac (+10 dB)	C25	
A9, C9	0.775 Vac (-0 dB)	C25	
A9, C9	0.245 Vac (-10 dB)	C25	
A9, C9	0.0775 Vac (-20 dB)	C25	

Input Pins	Voltage Input	Output Pin	Voltage Output
A11, C11	2.45 Vac (+10 dB)	C27	
A11, C11	0.775 Vac (-0 dB)	C27	
A11, C11	0.245 Vac (-10 dB)	C27	
A11, C11	0.0775 Vac (-20 dB)	C27	

Input Pins	Voltage Input	Output Pin	Voltage Output
A13, C13	2.45 Vac (+10 dB)	C29	
A13, C13	0.775 Vac (-0 dB)	C29	
A13, C13	0.245 Vac (-10 dB)	C29	
A13, C13	0.0775 Vac (-20 dB)	C29	

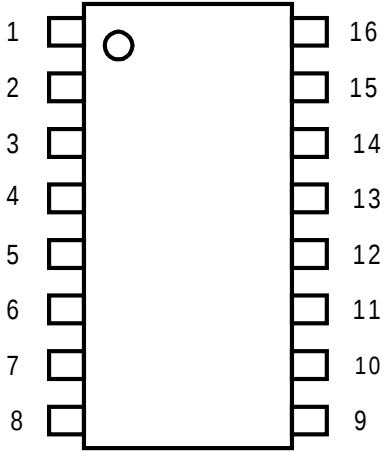
AUDIO ALC MODULE
ROA 117 2261

SYMBOL	PART NO.	DESCRIPTION
---CAPACITORS---		
C1 thru C6	RJE 599 2167/1	Tantalum: 1 µF ±10%, 16 V min.
C7 thru C18	RJE 599 1167/1	Tantalum: 1 µF ±20%, 16 V min.
C19 thru C24	RJE 599 1207/22	Tantalum: 2.2 µF ±20%, 16 V min.
C25 thru C30	RJE 599 2258/1	Tantalum: 10 µF ±10%, 16 V min.
C31 thru C36	RJC 463 3022/33	Ceramic: 33 pF ±5%, 50 VDCW.
C37	RJE 559 1258/1	Tantalum: 10 µF ±20%, 25 V min.
C38	RJC 464 3035/1	Ceramic: .01 µF
C38 thru C44	RJE 599 1207/22	Tantalum: 2.2 ±10%, 16 Vmin.
---LED---		
DS1	RKZ 433 637/3	12 V green
---CONNECTOR---		
J1	RPV 403 804/03	96 Pin, VME, right angle.
---RESISTORS---		
R1 thru R6	REP 624 656/39	390 k ohms ±1%
R7 thru R12	REP 624 655/43	43 k ohms ±1%
R19 thru R24	REP 624 655/33	33 k ohms ±1%
R25 thru R30	REP 624 6653/62	620 ohms ±1%
R31	REP 624 654/1	1 k ohms ±10%
---TRANSFORMERS---		
T1 thru T6	REG 135 57/1	600 ohm, 1:1
---INTEGRATED CIRCUIT---		
U1 thru U3	RYT 101 6005/C	Dual Gain Control Circuit :Sim to SA 571 1C

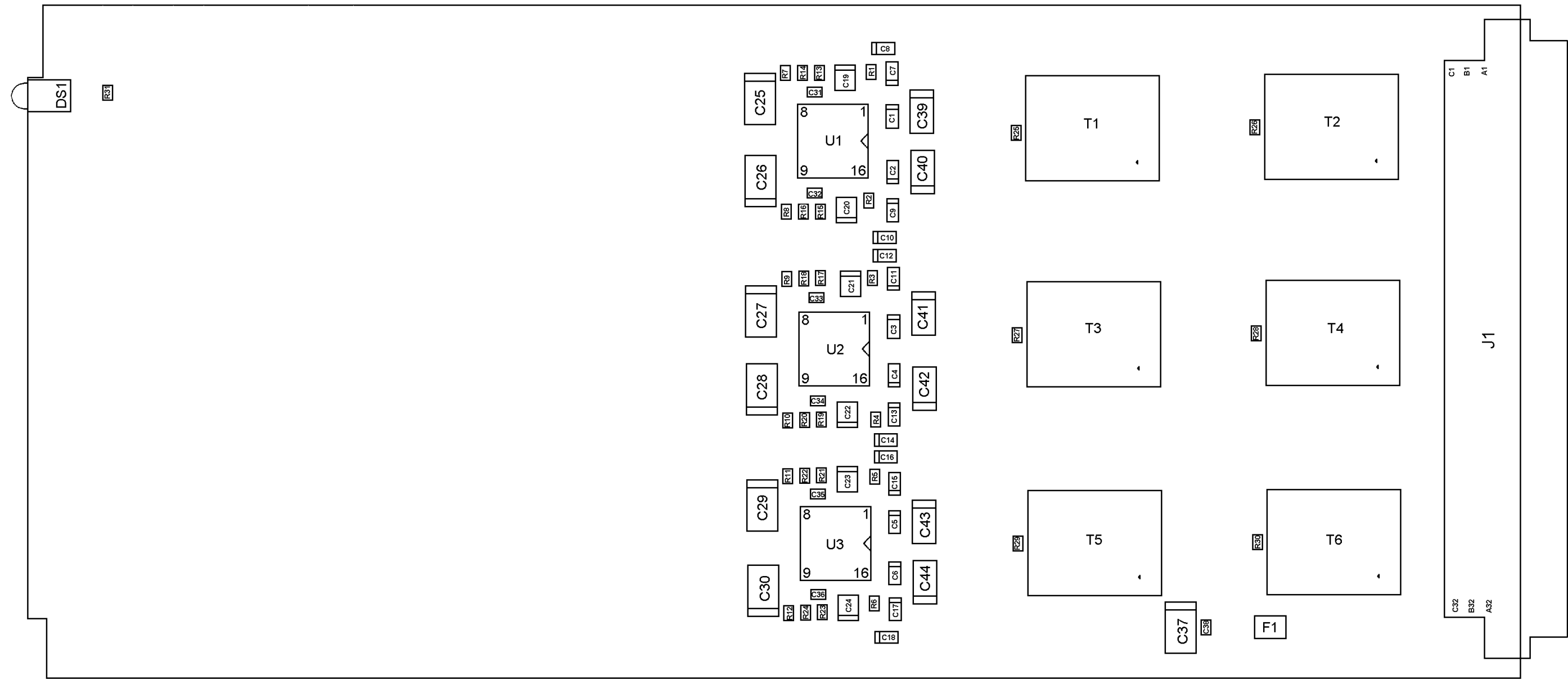
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

U1-U3
Dual Gain Control Circuit

RYT 101 6005/C (SA 571)



Terminal	Symbol	Function
1	Rect, Cap 1	Capacitor input to rectifier 1
2	Rect, In 1	Input rectifier 1
3	(G Cell in 1	Variable gain cell 1
4	GND	Ground
5	Inv. in 1	Inverter input 1
6	Res. R3 1	20k resistor 1
7	Out 1	Output 1
8	THD trim 1	Harmonic distortion trim 1
9	THD trim 2	Harmonic distortion trim 2
10	Out 2	Output 2
11	Res. R3 2	20k resistor 2t
12	Inv. In 2	Inverter input 2
13	Vcc	Supply voltage
14	(G Cell in 2	Variable gain cell 2
15	Rec, in 2	Input rectifier 2
16	Rect, Cap 2	Capacitor input to rectifier 2



Audio ALC Module

(1078 ROA 117 2261, Rev. A)

