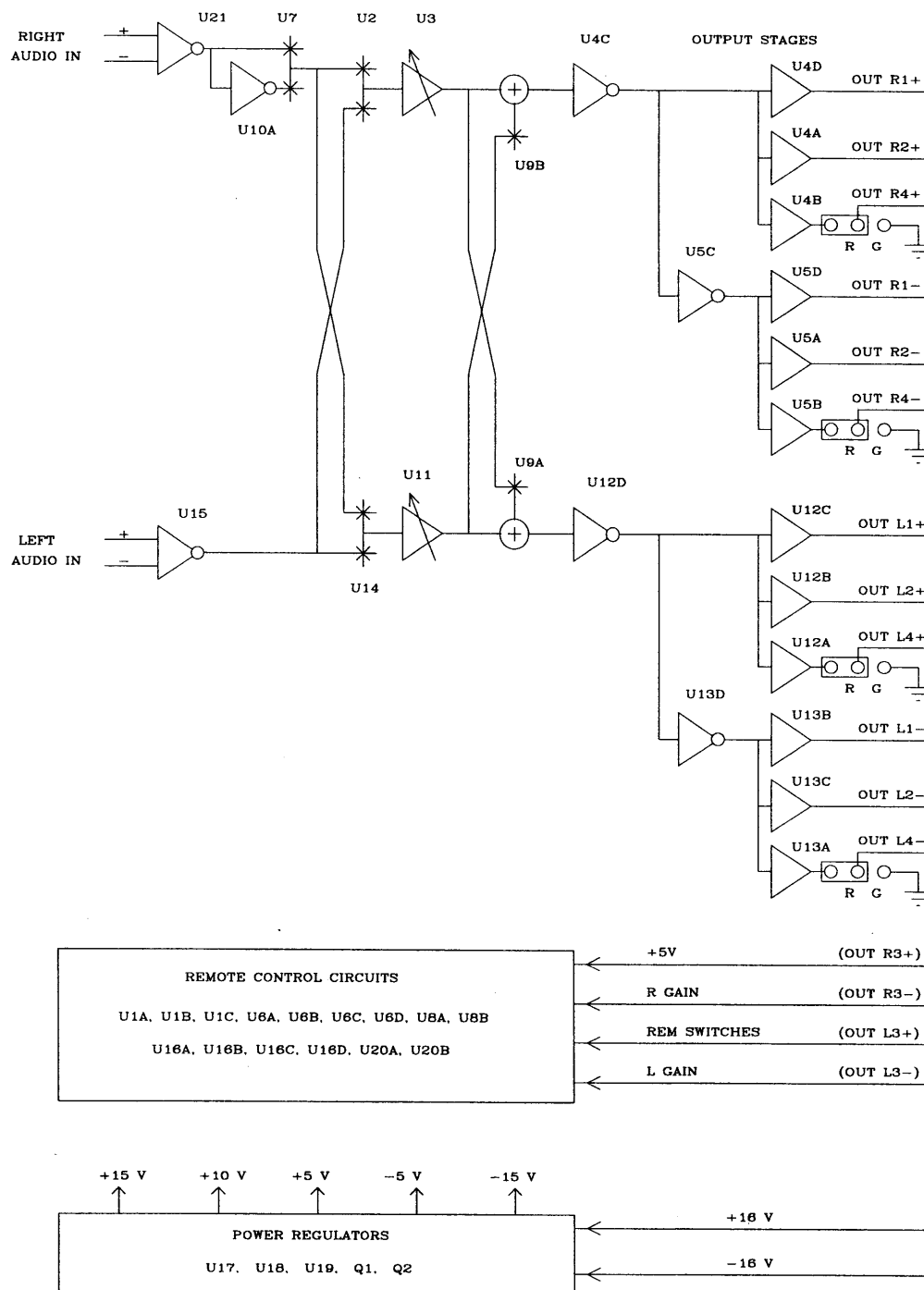


SCA-7556
Stereo Correction Amplifier
and
ARP-7556
Remote Control Panel

SCA 7556 BLOCK DIAGRAM

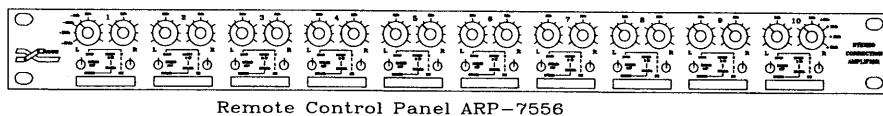


Introduction

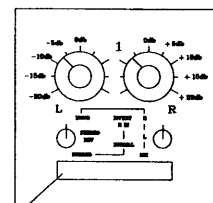
The remote controlled SCA-7556 Stereo Correction Amplifier is an exceptionally versatile product which provides a total solution to the problems commonly encountered with incoming satellite and ENG audio feeds. In addition to fault-correction functions, a special feature is the MIX to mono mode which can be used to set the commentator and background levels on International Sound feeds. The processed signal may then be fed via a router to all users.

The remote controls deal with the following common situations:

- Incorrect gain of Left, Right or both channels
- Inversion of one channel phase
- Reversal of Left and Right channels
- One channel missing or too noisy to use
- MIX mode for International Sound feeds



Remote Control Panel ARP-7556



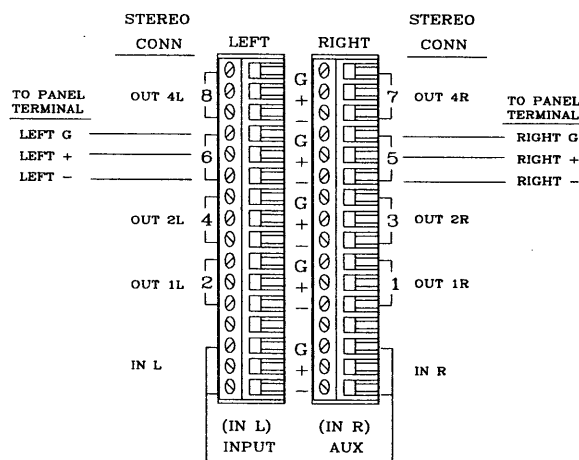
Control Panel Detail
Label Space

The companion remote panel, model ARP-7556 sold separately, has controls for ten amplifiers mounted on an attractive 1 rack-unit panel. This allows all functions to be controlled from a convenient location. Wiring between the panel and tray is by means of two audio cables for each amplifier to be controlled. Alternatively, the amplifier can be controlled by customer-supplied 10K potentiometers and toggle switches. A 600 ohm output version is also available as model SCA-7556-600.

Installation

To install this amplifier and control panel:

1. Connect the input and output signals to the terminals on the rear of the card tray. Follow the stereo connections in the figure below. Note that the connector designations for outputs 1-8 are for mono amplifiers.



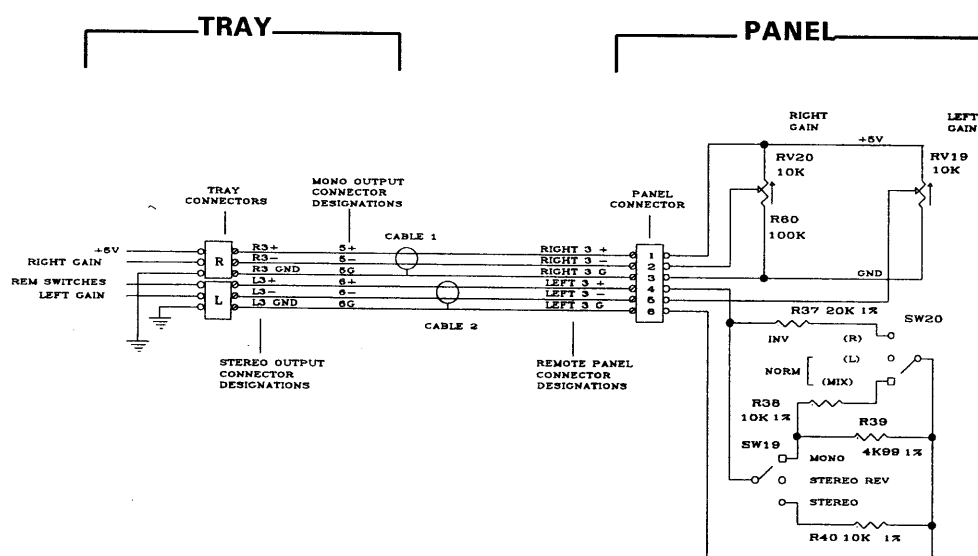
TRAY CONNECTOR

2. Ensure that the TRAY TYPE jumpers on the amplifier are correctly set for either a GVG tray or a Ross tray.

Caution: If the amplifier is to be used in a GVG* tray and the jumpers are set to the ROSS position, damage to the amplifier could result.

If the GVG* settings are used in a ROSS tray, stereo output 4 will be missing.

3. Connect the wiring to the ARP-7556 remote panel. Standard audio shielded cables should be used. Maximum cable length should not exceed 1000 ft. (305 meters).



Cable Connections to Remote Panel

If you are not using ARP-7556 remote panel, refer to the circuit description - ARP 7556 Remote Panel (see page 10-8) in this manual for help in designing a panel or computer interface or follow the schematic diagram in the previous figure.

It is intended that this amplifier should operate at unity gain. In some rare situations it may be necessary to provide a loss or gain when the remote control pots are at the center (0dB) position. This can be accomplished by adjusting R CAL (RV1) and L CAL (RV2) with the card on the extender until the desired gain is obtained. A gain offset of approximately +/- 6 dB is possible. Otherwise, do not touch these factory-calibrated adjustments.

4. There is space on the remote panel at the bottom of each control group to add a label to identify the function of each group. See the Control Panel Detail illustration on page 10-3. The label is to be user-supplied. Make and affix the labels as desired.

Operation

All operating controls are on the remote panel. There is a calibrated gain control for right and left channels. The gain of each channel may be adjusted over a +/- 20 dB for a 100 to 1 amplification control range.

The panel switches may be set as required to provide correction to the stereo signal. The left-most switch of each amplifier control group determines the main operating mode. Each mode is further affected by the setting of the right-most switch. The modes and sub-modes are as follows:

- | | |
|---------------|---|
| 1) STEREO | This is the normal position. The signal goes through the amplifier without correction. The other switch determines the phase of the right input signal as follows: |
| INVERT R IN | Inverts the right input phase. |
| NORMAL | Right and left input phase are not affected |
| 2) STEREO REV | Left and right inputs are reversed. The right input feeds the left output, the left input feeds the right output. The other switch determines the phase of the right input signal as follows: |
| INVERT R IN | Inverts the right input phase. |
| NORMAL | Right and left input phase are not affected. |
| 3) MONO | The output signal is mono, both the right and left outputs are fed from the same source. The source is determined by the second switch as follows: |
| R | The right input feeds both right and left outputs. |
| L | The left input feeds both right and left outputs. |
| MIX | The right and left inputs are combined into a mono signal. This is fed to both left and right outputs. The relative mixing level of each input is set by the gain controls. |

Because this amplifier is intended for remote-controlled operation, there are no local controls on the card.

Specifications

Input	Input Impedance	>35K Ω , balanced
	Max Input Level	+28 dBu
	Common Mode Rejection	>100 dB @ 60 Hz >75 dB @ 20 KHz
Output	Number of Outputs	3 per Channel (Ross Tray) 2 per Channel (GVG* Tray)
	Max Output Level	+26 dBu [+22 dBm]
	Output Impedance	48 Ω [600 Ω]
	Output Isolation	>70 dB
Performance	S/N Ratio	>92 dB (unity gain) relative to +8 dBu
	Gain Range	+/- 20 dB
	Frequency Response	+/- 0.02 db at 20 Hz to 10 KHz -0.08 db at 20 KHz
	Total Harmonic Distortion + Noise	<0.02%
	Intermodulation	<0.02% (SMPTE)
	Crosstalk between Amplifiers	>100 dB
	Interchannel Crosstalk	>85 dB
	Power Consumption @ +8 dBu output	2.4 W [3.2 W]
All tests performed at +18dBu and cover 20 Hz to 20 KHz unless otherwise specified. All measurements made with an Audio Precision System One Test set. Performance of the 600 ohm version is similar, except where indicated []. GVG* is a trademark of The Grass Valley Group Inc.		

Circuit Description (SCA 7556 Module)

Both the right channel and left channels employ identical circuits so only the right channel description follows.

The input stage, U21, performs the function of converting the balanced input signal into an unbalanced (single ended) signal for further processing.

This stage is unique because it functions exactly as if the amplifier had a floating transformer input. This gives the distribution amplifier the very desirable ability to accept any out-of-balance input signal and produce a perfectly balanced output. As a consequence, it also has an exceptional ability to reject common mode hum and noise over the whole audio band.

The input circuit includes diodes to protect the amplifier against damaging input noise spikes.

Switch circuit U7 can select the output directly from the input amplifier U21 or the output of inverting amplifier U10A. This allows this signal to be inverted if the stereo phasing needs correction.

Switch U2 normally passes the Right input signal. If there is a need to reverse the right and left inputs, this switch can select the left channel. Similar switch U14 in the left signal path will simultaneously select the right signal.

The gain-controlling DC voltage originates at a remote panel potentiometer where it is variable between 0 and +5 volts (low and high gain respectively). Regulator U18 provides 5 volts to the gain potentiometers. The gain control signal is amplified, inverted and shifted by buffer U8A. The amplifier gain is provided by circuit U3. The amount of gain or loss gain is determined by the DC voltage from U8A applied to U3 pin 11.

Switch U9B allows the output of the gain control stages to be added and applied to both right left outputs. This results in the gain controls acting as a mono mixer between inputs.

The A channel positive line outputs are driven by unity-gain stages U4A, U4B, U4D. These circuits are designed to be very stable and to not oscillate at any normal line load. The negative output stages U5A, U5B, U5D are driven by unity-gain inverter U5C.

The remote panel switches cause binary-related current levels to be drawn from the Rem Switch line. These operate a cascade of amplifiers, comparators and logic circuits to produce the control voltages for the signal switches and thus determine the amplifier operating modes. The control circuit includes amplifiers U16A, U16B, U16C, U16D; Comparators U20A, U20B; Logic gates U6A, U6B, U6C, U6D; logic switches U1A, U1B, U1C. LED indicators are provided on the card edge to confirm selection of the various operating modes.

The power to the signal circuits is filtered by Q1 and Q2. U17, U18 and U19 provide a regulated source of +10 volts, +5 volts and -5 volts respectively. The audio output stages are powered directly from the +15 volt and -15 volt inputs.

Alignment

NOTE:

Do not make any adjustment of the preset potentiometers unless you have the required test equipment and have determined that there is a definite need to do so.

A) Common-Mode Balance

RV3 and RV4 are used to balance the common-mode rejection of the input amplifiers. To adjust the R INPUT BAL control:

1. Place the amplifier on the extender board.
2. Use a short jumper wire to connect the frame R INPUT plus and minus terminals together.
3. Connect an audio generator between one of the frame right inputs and ground. Set the generator frequency to 1 KHz and generator output level to +20 dBu.
4. Connect a balanced-input sensitive audio level meter or distortion analyser to a balanced pair of amplifier R-channel outputs.

5. With the output level meter set to the most sensitive scale, adjust the A BAL potentiometer to obtain the lowest possible output level. It should be possible to obtain an output level of at least -80 dBu. (100dB below +20 dBu). Seal the pot.
6. Proceed in a similar manner to set the L INPUT BAL pot.
7. Disconnect the test set up.

B) Gain Range Calibration

1. Place the amplifier on the extender board.
2. Connect an audio generator balanced output to the amplifier right input. Set the generator frequency to 1 KHz and generator output level to +0 dBu.
3. Connect a balanced-input sensitive audio level meter or distortion analyser to a balanced pair of amplifier R-channel outputs.
4. Set the remote right gain control for 2.42 volts DC, as measured between TP1 and ground.
5. Set the R CAL control RV1 to obtain 0 dBu on the output level meter. Seal RV1. Proceed in a similar manner using left channel connections to set the L CAL pot.
6. Disconnect the test setup and put the amplifier board back into the frame.

Circuit Description (ARP 7556 Remote Panel)

The panel has ten identical groups of controls, each one of which will control a single amplifier. The potentiometers for RIGHT GAIN and LEFT GAIN are fed by a source of +5 volts from the card tray. Nominal unit gain is obtained with a voltage of +2.5 volts.

The two switches each have three positions and select the various operating modes. The input wire to the switches (identified as "REM SWITCHES") is always at a level of +5 volts. The switches connect various combinations of resistors to the voltage source. The currents drawn by the resistors have a binary relationship to each other and each can enable a particular mode. The resultant total current detected by the amplifier module determines the particular combination of modes to be provided.

SCA-7556

Bill of Materials

7556A-001

Item	QTY	REF	Part	Description	Part Number
1	3	C26,C39,C40	NVC	NO VALUE CAPACITOR DCAPSR21	-----
2	2	R84,R6	NVR	NO VALUE RESISTOR 5%	-----
3	12	R8,R10,R12,R14,R36,R38, R60,R62,R64,R66,R86,R88	NVR 1%	NO VALUE RESISTOR 1%	-----
4	4	TP7,TP8,TP9,TP10	NVTP	NO VALUE TEST POINT	-----
5	2	C38,C30	22p	CAPACITOR CERAMIC 100V 2% 22p	201-220
6	6	C5,C7,C13,C21,C23,C24	47p	CAPACITOR CERAMIC 100V 2% 47p	201-470
7	2	C49, C50			
8	2	C2,C28	1u 206-100	CAPACITOR CERAMIC 50V 20% 1u0	206-100
9	22	C1,C6,C8,C9,C10,C11,C12, C14,C15,C16,C17,C18,C22, C25,C27,C29,C31,C32,C34, C37,C41,C48	100n	CAPACITOR GLASS 100n	225-100
10	4	C3,C4,C19,C20	100u 250-005	CAPACITOR TANTALUM 6.3V 100u	250-005
11	2	C43,C46	47u	CAPACITOR TANTALUM 16V 47u	250-006
12	7	C33,C35,C36,C42,C44,C45, C47	6u8	CAPACITOR TANTALUM 25V 6u8	250-008
13	1	J1	311-035	CONNECTOR 2X25P PCB MNT RECEPTACLE 90DEG	311-035
14	11	CR1,CR2,CR3,CR4,CR5,CR6, CR7,CR8,CR9,CR10,CR11	1N4148	DIODE SIGNAL GP 1N4148	360-005
15	1	CR12	1N4738A	DIODE ZENER GLASS 1WATT 5% 1N4738A	360-017
16	2	DS6,DS2	361-021	LED GREEN 1 ELEMENT 90DEG	361-021
17	4	DS1,DS3,DS4,DS5	361-024	LED YELLOW 1 ELEMENT 90 DEG	361-024
18	1	MP1	365-003	PCB EJECTOR	365-003
19	1	JP1	403-004-16	HEADER 16 PIN 2 ROW MALE PL.23 BL.1 LL.1	403-004-16
20	1	U16	TL084A	BIMOS QUAD OPER AMPLIFIER SUF "CN"	500-001
21	2	U18,U17	LM78L05	POSITIVE VOLTAGE REGULATOR	500-024
22	1	U19	LM79L05	NEGATIVE VOLTAGE REGULATOR	500-025
23	1	U8	TL082	DUAL JFET INPUT OPER AMP SUF "ACP"	500-075
24	2	U1,U9	74HC4053	TRIP 2-CHANNEL ANAL MULT/DEM	502-065
25	1	U6	74HC00	QUAD 2-INPUT NAND GATE	503-032
26	1	U20	TLC372C	DUAL DIFFERENTIAL COMPARATOR TLC372C	504-126
27	1	U10	NE5532N	INT-COMPENSATED DUAL LO-NOISE OP AMP	504-129
28	2	U15,U21	SSM-2143P	-6dB DIFFERENTIAL LINE RECEIVER	504-130
29	4	U4,U5,U12,U13	TLE2064CN	JFET-INPUT HIGH-OUT POWER QUAD OP AMP	504-155
30	2	U3,U11	SSM-2018TP	TRIMLESS VOLTAGE CONTROL AMP	504-161
31	3	U2,U7,U14	SSM-2412P	DUAL AUDIO ANALOG SWITCH	504-167
32	4	JPPLUG1D,JPPLUG1C, JPPLUG1B,JPPLUG1A	603-005	JUMPER 2-POSITION LOW PROFILE	603-005
33	2	RV4,RV3	100R 1T	VARIABLE RESISTOR 1/4 DIA 1-TURN 100R	710-002
34	2	RV2,RV1	100K 1T	VARIABLE RESISTOR 1/4 DIA 1-TURN 100K	710-011
35	1	PCB	7556-001-03	STEREO CORRECTION AMP	7556-001-03
36	2	F2,F1	1R 1%	RESISTOR 1/4W 1% 1R	810-100

SCA-7556 Stereo Correction Amplifier & ARP-7556 Remote Control Panel

37	2	R50,R25	1K5 1%	RESISTOR 1/4W 1% 1K5	813-150
38	2	R102,R104	2K87 1%	RESISTOR 1/4W 1% 2K87	813-287
39	12	R9,R11,R13,R15,R37,R39, R61,R63,R65,R67,R87,R89	4K75 1%	RESISTOR 1/4W 1% 4K75	813-475
40	2	R4,R28	9K09 1%	RESISTOR 1/4W 1% 9K09	813-909
41	10	R1,R21,R24,R47,R51,R79, R94,R97,R108,R120	10K 1%	RESISTOR 1/4W 1% 10K	814-100
42	2	R31,R83	18K2 1%	RESISTOR 1/4W 1% 18K2	814-182
43	10	R7,R29,R32,R34,R35,R54, R55,R56,R58,R59	20K 1%	RESISTOR 1/4W 1% 20K	814-200
44	2	R53,R26	47K5 1%	RESISTOR 1/4W 1% 47K5	814-475
45	2	R114,R70	52K3 1%	RESISTOR 1/4W 1% 52K3	814-523
46	1	R75	84K5 1%	RESISTOR 1/4W 1% 84K5	814-845
47	4	R22,R23,R49,R52	100K 1%	RESISTOR 1/4W 1% 100K	815-100
48	2	R78,R2	158K 1%	RESISTOR 1/4W 1% 158K	815-158
49	2	R100,R98	267K 1%	RESISTOR 1/4W 1% 267K	815-267
50	1	R103	499K 1%	RESISTOR 1/4W 1% 499K	815-499
51	1	R96	866K 1%	RESISTOR 1/4W 1% 866K	815-866
52	1	R76	1M 1%	RESISTOR 1/4W 1% 1M	816-100
53	12	R16,R17,R18,R19,R20,R40, R41,R42,R43,R44,R68,R69	24R	RESISTOR 1/2W 5% 24R	825-240
54	2	R115,R92	47R	RESISTOR 1/2W 5% 47R	825-470
55	1	R101	100R	RESISTOR 1/2W 5% 100R	826-100
56	1	R109	150R	RESISTOR 1/2W 5% 150R	826-150
57	2	R110,R112,R122,R123	330R	RESISTOR 1/2W 5% 330R	826-330
58	2	R95,R93	680R	RESISTOR 1/2W 5% 680R	826-680
59	3	R33,R57,R116	1K	RESISTOR 1/2W 5% 1K	827-100
60	1	R119	2K2	RESISTOR 1/2W 5% 2K2	827-220
61	2	R71,R73	2K7	RESISTOR 1/2W 5% 2K7	827-270
62	2	R106,R46	4K7	RESISTOR 1/2W 5% 4K7	827-470
63	1	R74	5K6	RESISTOR 1/2W 5% 5K6	827-560
64	3	R72,R77,R111	10K	RESISTOR 1/2W 5% 10K	828-100
65	2	R85,R5	20K	RESISTOR 1/2W 5% 20K	828-200
66	3	R99,R105,R107	47K	RESISTOR 1/2W 5% 47K	828-470
67	2	R3,R80	68K	RESISTOR 1/2W 5% 68K	828-680
68	4	R45,R48,R117,R118	100K	RESISTOR 1/2W 5% 100K	829-100
69	2	R81,R27	180K	RESISTOR 1/2W 5% 180K	829-180
70	4	R90,R91,R113,R121	10K 0.5%	RESISTOR 1/4W 0.5% 10K	840-059
71	2	R30,R82	1K 840-063	THEMISTOR 1/8W 2% 1K	840-063
72	6	TP1,TP2,TP3,TP4,TP5,TP6	910-010	TEST POINT	910-010
73	1	Q1	2N3904	TRANSISTOR N-P-N	950-016
74	1	Q2	2N3906	TRANSISTOR P-N-P	950-018

SCA-7556-600

7556-001A Issue: 3B (600 ohm version)

Bill of Materials same as per SCA-7556 above with the following exceptions:

Item 2:	20K 1/2W 5%	RESISTOR 1/2W 5% 20K	828-200
Item 3:	4K75 1/4W 1%	RESISTOR 1/4W 1% 4K75	813-475
Item 52:	300R 1/2W 5%	RESISTOR 1/2W 5% 300R	826-300

ARP-7556
Bill Of Materials

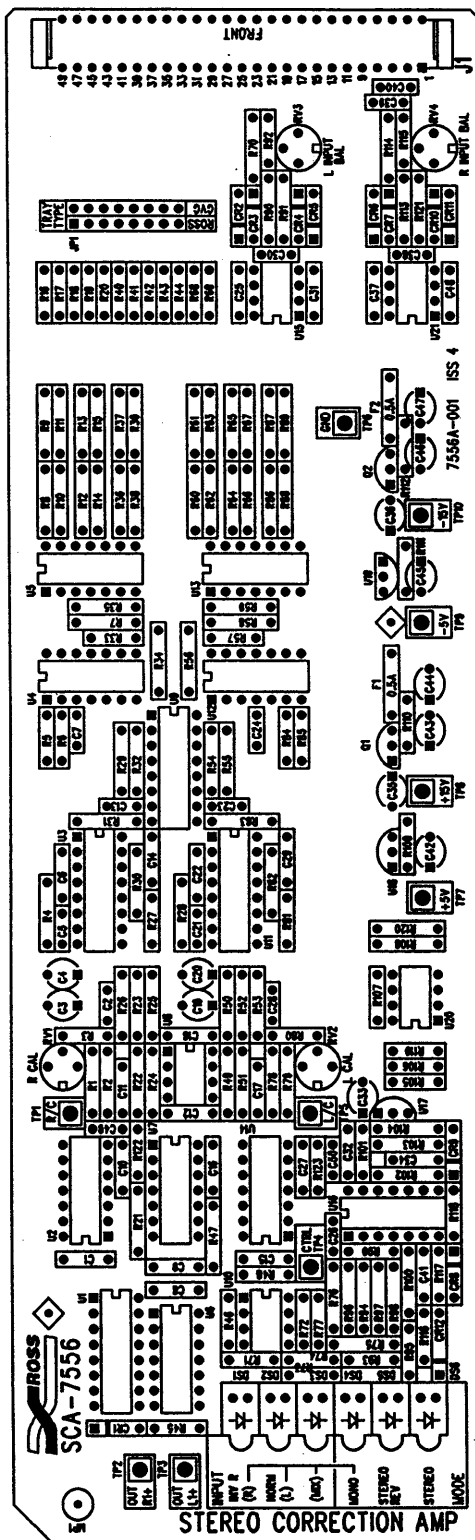
7556A-002

Item	QTY	REF	Part	Description	Part Number
1	20	RV1,RV2,RV3,RV4,RV5,RV6, RV7,RV8,RV9,RV10,RV11, RV12,RV13,RV14,RV15,RV16, RV17,RV18,RV19,RV20	10K 701-022COMP	PANEL POT 10K S TAPER (COMPONENT SIDE MNT)	701-022
2	20	RV21,RV22,RV23,RV24,RV25, RV26,RV27,RV28,RV29,RV30, RV31,RV32,RV33,RV34,RV35, RV36,RV37,RV38,RV39,RV40	100K 1T	VARIABLE RESISTOR 1/4 DIA 1-TURN 100K	710-011
3	1	PCB	7556-002-03	STEREO CORRECTION AMP CONTROL PANELPCB	7556-002-03
4	10	R3,R7,R11,R15,R19,R23, R27,R31,R35,R39	4K99 1%	RESISTOR 1/4W 1% 4K99	813-499
5	20	R2,R4,R6,R8,R10,R12,R14, R16,R18,R20,R22,R24,R26, R28,R30,R32,R34,R36,R38, R40	10K 1%	RESISTOR 1/4W 1% 10K	814-100
6	10	R1,R5,R9,R13,R17,R21,R25, R29,R33,R37	20K 1%	RESISTOR 1/4W 1% 20K	814-200
7	20	R41,R42,R43,R44,R45,R46, R47,R48,R49,R50,R51,R52, R53,R54,R55,R56,R57,R58, R59,R60	100K	RESISTOR 1/2W 5% 100K	829-100
8	12	MP1,MP2,MP3,MP4,MP5, MP6,MP7,MP8,MP9,MP10, MP11,MP12	850-026	SCREW 4-40 5/16 BIND	850-026
9	20	SW1,SW2,SW3,SW4,SW5, SW6,SW7,SW8,SW9,SW10, SW11,SW12,SW13,SW14, SW15,SW16,SW17,SW18, SW19,SW20	LAB95-0116	SWITCH TOGGLE PCB MOUNT SPDT	LAB95-0116
10	10	J1,J2,J3,J4,J5,J6,J7,J8, J9,J10	LAB95-0148	CONNECTOR 6P PCB MNT TERM STRIP 0.138	LAB95-0148

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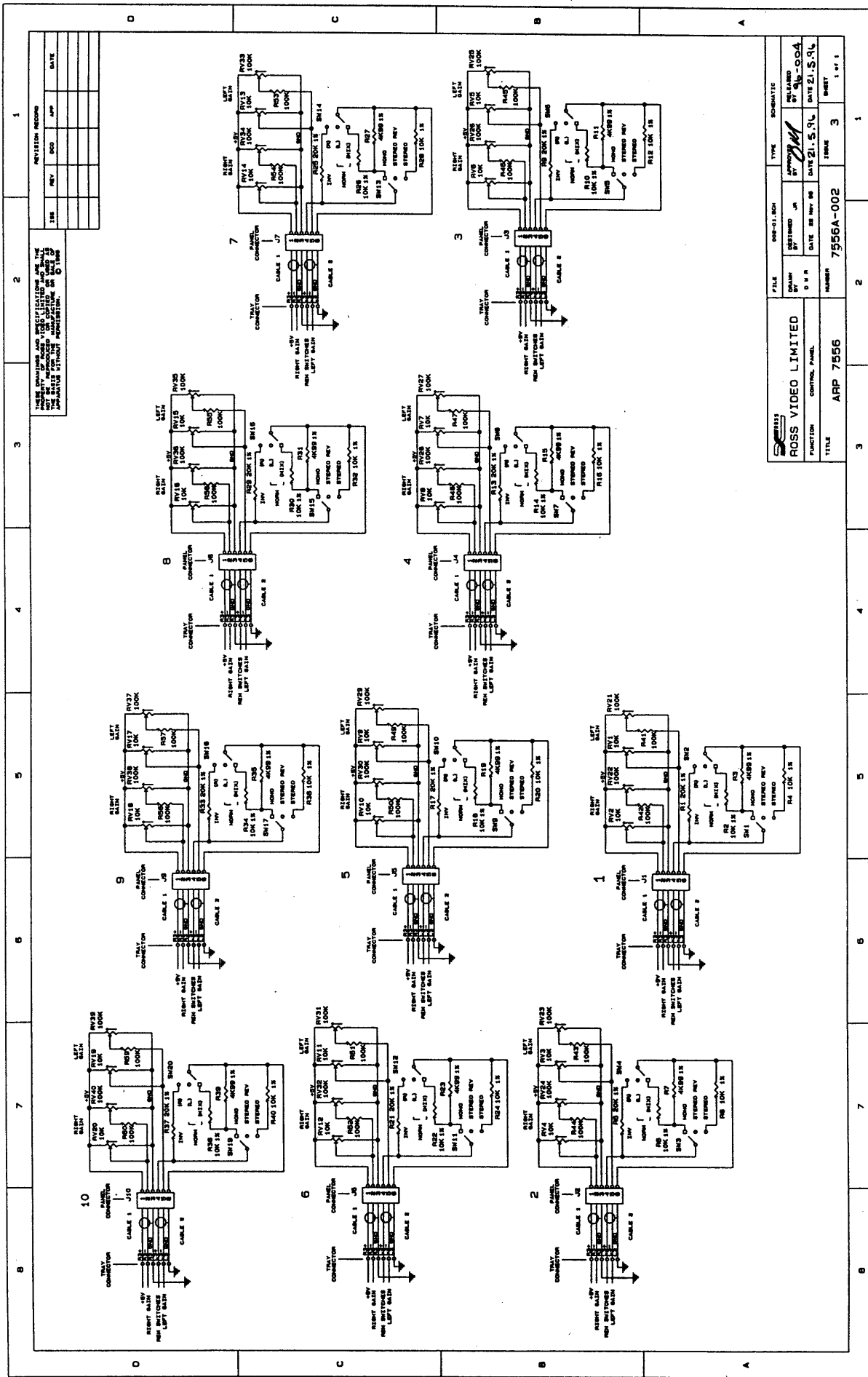
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JP1 = ROSS/GVG TRAY TYPE
 TP1 = RIGHT CALIBRATE
 TP2 = OUT R+
 TP3 = OUT L+
 TP4 = CONTROL
 TP5 = LEFT CALIBRATE
 TP6 = LEFT INPUT BALANCE
 TP7 = +5V
 TP8 = +15V
 TP9 = -5V
 TP10 = -15V



FILE	DATE	TYPE	REVISION
ROSS VIDEO LIMITED	1984	J.A.	1
SCA-7556	1984	J.A.	1
SCA-7556-001	1984	J.A.	1
SCA-7556-001	1984	J.A.	1

7556A-001A 04 1=1



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REVISION RECORD			
REV	REV	REV	DATE
1	2	3	4

ROSS VIDEO LIMITED		FILE	908-01-001	TYPE	SCHEMATIC
FUNCTION: CONTROL PANEL		DESIGNED BY	DATE	BY	DATE
TITLE: APP 7556		NUMBER	7556A-002	THREE	3
		DATE	21.5.96	DATE	21.5.96
		BY	DATE	BY	DATE
		DATE	21.5.96	DATE	21.5.96
		DATE	21.5.96	DATE	21.5.96



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