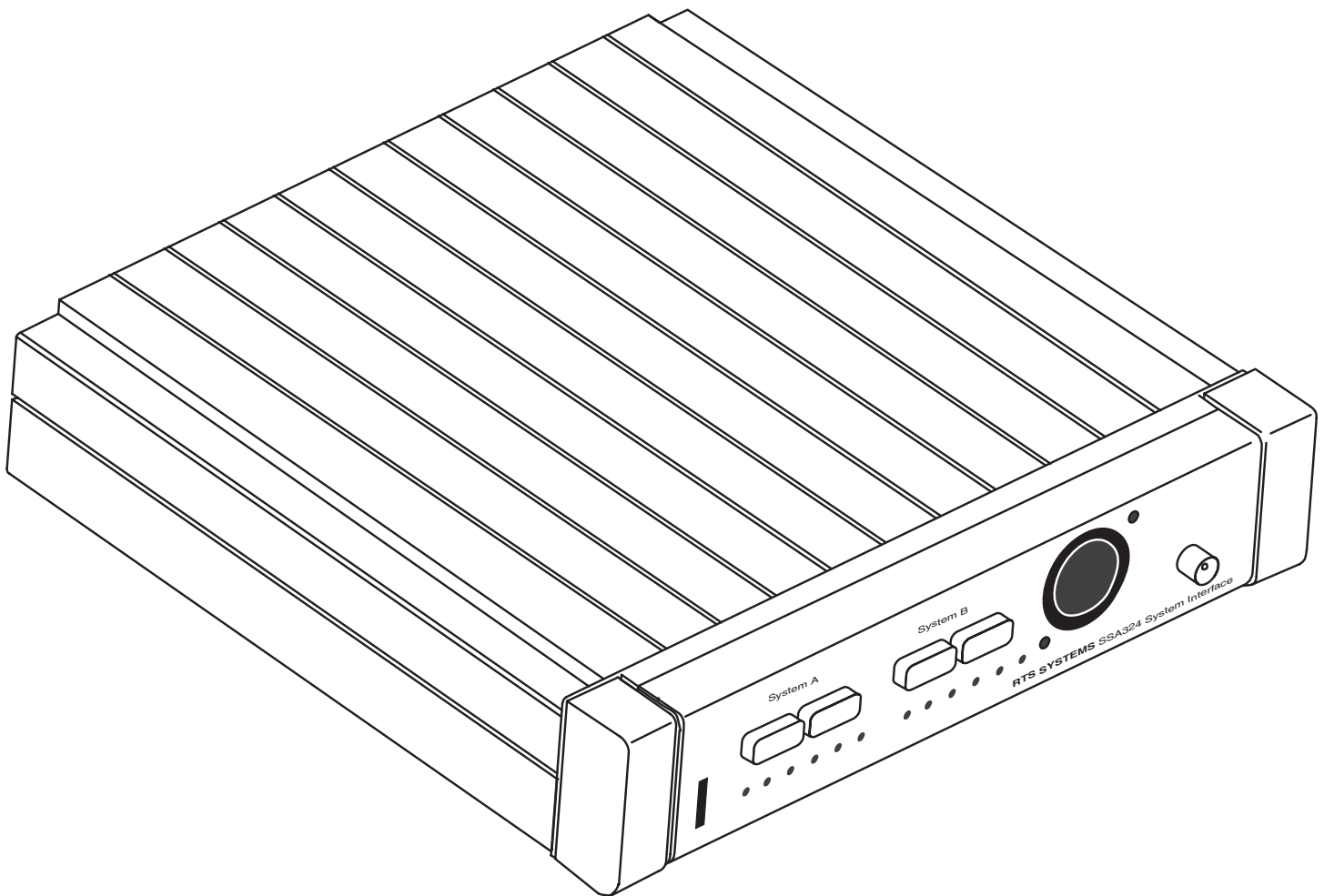


*SSA-324*  
*System Interface*  
*(System to System Adapter)*



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See the enclosed warranty card for further details.

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Technical questions should be directed to:

Customer Service Department  
RTS/Telex Communications, Inc.  
12000 Portland Avenue South  
Burnsville, MN 55337 USA  
Telephone: 800-392-3497  
Fax: 800-323-0498

## **RETURN SHIPPING INSTRUCTIONS**

Customer Service Department  
Telex Communications, Inc. (Lincoln, NE)  
Telephone: 402-467-5321  
Fax: 402-467-3279  
Factory Service: 800-553-5992

Please include a note in the box which supplies the company name, address, phone number, a person to contact regarding the repair, the type and quantity of equipment, a description of the problem and the serial number(s).

## **SHIPPING TO THE MANUFACTURER**

All shipments of product should be made via UPS Ground, prepaid (you may request from Factory Service a different shipment method). Any shipment upgrades will be paid by the customer. The equipment should be shipped in the original packing carton. If the original carton is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the equipment should be wrapped in paper and surrounded with at least four (4) inches of excelsior or similar shock-absorbing material. All shipments must be sent to the following address and must include the Proof of Purchase for warranty repair. Upon completion of any repair the equipment will be returned via United Parcel Service or specified shipper, collect.

Factory Service Department  
Telex Communications, Inc.  
8601 East Cornhusker Hwy.  
Lincoln, NE 68507 U.S.A.  
Attn: Service

This package should include the following:

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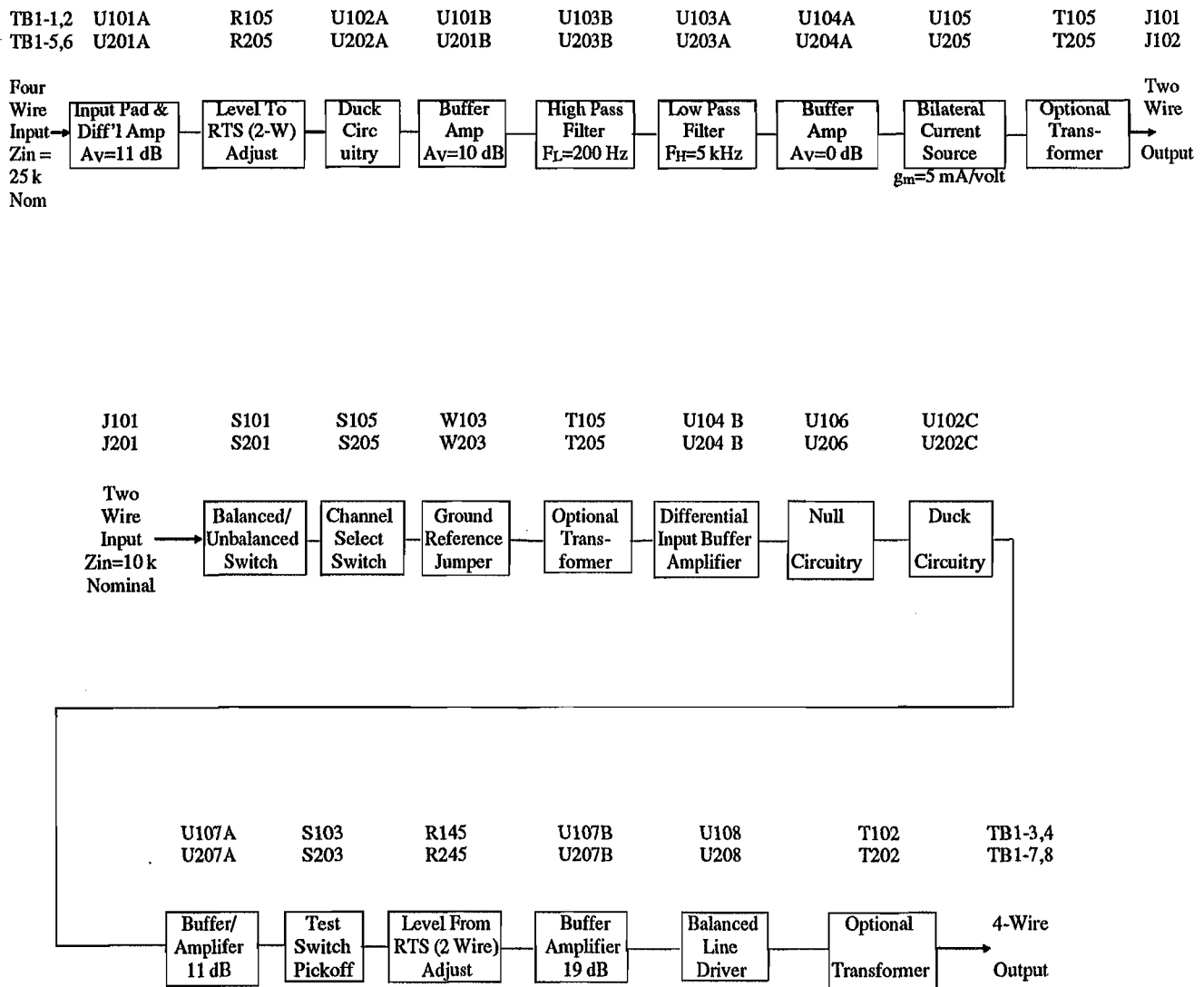


Figure 1-1  
SSA324 Block Diagram System Interface (System to System Interface)

## SECTION 1: DESCRIPTION AND SPECIFICATIONS

### 1.1 DESCRIPTION (See Block Diagram, Figure 1-1)

The Model SSA324 is a System to System Adapter (or interface). It interconnects the voice signals between different intercom systems. In addition, it can optionally interconnect "Calls" or tally signals between systems. Each SSA324 includes two two-wire to four-wire converters. The four-wire interface can deliver and accept high level signals such as those from the McCurdy intercom system. An SSA324 can also function as a two-wire to two-wire interface by interconnecting the two individual interfaces at the four-wire level. The SSA324 carries two voice channels when used as a dual two-wire to four-wire interface, and one voice channel when functioning as a two-wire to two-wire interface.

A front panel channel select switch for each of the two interfaces (A and B) will select one of two, two-wire channels. For ClearCom use, the switch will be in the Channel 2 position. For Audiocom use, a rear panel switch will select balanced two-wire operation.

Front panel controls include 1) adjustments for null, level, ducking, 2) switches for monitoring and channel select.

Rear panel controls include balance/unbalance switches for the two-wire connection of each interface. Rear panel connectors include two XLR3 connectors for two-wire, eight terminals for two four-wire interconnections, one 25 pin D connector for duplicate four-wire connections plus options connections. The terminals are useful for rapid field connections. The D connector aids rapid replacement where mean-time-to-repair is an issue and also allows option strapping.

The SSA324 replaces the Model TWI224 and TWI222 interfaces where powering from the intercom is not required. Differences between the Model TWI224 / TWI222 interface and Model SSA324 include the following: 1) The SSA324 is self (locally) powered, the TWI224 / TWI222 is usually powered from the TW line or may be locally powered. 2) The SSA324 has a maximum output at the four-wire output port of +22 dBm, the TWI224 / TWI222 maximum output is 9 dBm.

### 1.2 SPECIFICATIONS

#### 1.2.1 FUNCTIONAL SPECIFICATIONS

The Model SSA324 consists of two two-wire to four-wire converters in a single package (converter A and converter B). If the two converters are interconnected, the Model SSA324 then functions as two-wire to two-wire converter. The method of interconnection is as follows: converter A's four-wire output is connected to converter B's four-wire input; converter A's four-wire input is connected to converter B's output.

Converter A's two-wire port is driven by an active balanced bilateral current source (an optional transformer may be added). Converter B's two-wire port is similar to Converter A's.

Converter A's four-wire output port is driven by an active balanced voltage line driver (or via an optional transformer). A build-out resistor (about 33 ohms) in each leg of the differential output maintains stability driving long cables. Converter B's four-wire output port is similar to converter A's.

The optional transformers can be used to provide higher common mode voltage isolation between the four-wire system(s) and the two-wire systems.

Converter A's four-wire input port is active balanced, bridging, ten thousand ohms impedance. Converter B's four-wire input port is similar to converter A's. (An optional transformer is available for the four-wire input(s)).

#### Ducking (bilateral)

Adjustable, 0 to 30 dB. Toggles from one direction to the other (threshold is factory set). There is one adjustment for interface A and one for interface B. Each interface has depth level adjustment (front panel).

#### Monitoring

Uses standard headset. Front Panel has six pin female XLR type headset connector.

Switch on front panel activates the monitoring function. User uses headset microphone or a built in oscillator to adjust for null in headset earphones (or via a built-in oscillator which is jumper selected by a jumper on the printed circuit board).

#### Nulling

There are three null adjustments associated with each two-wire port. These are resistive (medium), capacitive (high), and inductive (low) nulls. Medium, High, and Low refers to frequency ranges; medium centers about 1 kilohertz, high, 3 kilohertz, low, 300 hertz.

#### Level Adjustments

There are two level adjustments for interface A (to-from two-wire) and two for interface B (to-from two-wire).

## Application

The Model SSA324 applications include the following:

1. Interface audio signals between intercom systems as shown in Table 1-1, below.

Table 1-1  
Number of Channels Interfaced with the Model SSA324 by System

System 1	System 2					
	McCurdy/ Generic 4W 4W Bal	Audiocom 2W Bal	ClearCom 2W Unbal	RTS/2WB 2W Bal	RTS/2WU 2W Unbal	RTS/4WB 4W Bal
McCurdy/Generic 4W	0	2	2	2	2	1
Audiocom	2	1	1	1	1	2
ClearCom	2	1	1	1	1	2
RTS/2WB	2	1	1	1	1	2
RTS/2WU	2	1	1	1	1	2
RTS/4WB	1	2	2	2	2	1

2. Interface (using optional plug in boards) the following non-audio signals:

- Audiocom call signal to Audiocom call signal.
- RTS Systems call signal to RTS Systems call signal.
- RTS Systems call signal to form C relay contact transfer.
- Audiocom call signal to form C relay contact transfer.
- Contact closure to RTS Systems call signal generation.
- Contact closure to Audiocom call signal generation.
- ClearCom to RTS Systems call and vice versa.

## 1.2.1 ELECTRICAL SPECIFICATIONS

(Specifications at 120VAC line voltage)

### Individual Interface Specification (each of two individual interfaces)

#### Two-Wire Input

Impedance: 5,000 ohms +100%, -20% single ended,  
10,000 ohms +100%, -20% differential

Operating Levels: -20 dBu to +0 dBu, nominal

#### Two-Wire Output

Impedance: 5,000 ohms 20% single ended,  
10,000 ohms 20% differential

Operating Levels: 0.1 mA to 10 mA, nominal

#### Four-Wire Input

Impedance: 10,000 ohms minimum single ended,  
20,000 ohms minimum differential

Operating Levels: -10 dBu to +8 dBu, nominal

#### Four-Wire Output

Impedance: ohms single ended or differential

Operating Levels: -10 dBu to +8 dBu, nominal

#### Transfer Functions (Duck Level set to no ducking)

Voltage Gain, Four-Wire In to Two-Wire Out\*

Level Pot 100% rotation: 0 3 dB

Level Pot 50% rotation: -15 dB 4 dB

#### Transfer Functions (Duck Level set to no ducking)

Voltage Gain, Two-Wire In to Four-Wire Out\*\*

Level Pot 100% rotation: 22 dB 3 dB

Level Pot 50% rotation: 8 dB 4 dB

#### Frequency Response (Reference: 1 kilohertz, 0 dBu input)

Four-Wire Input to

Two-Wire Output: 200 hertz to 5 kilohertz, +1, -4 dB, typical

Two-Wire Input to

Four Wire Output: 250 hertz to 5 kilohertz, +1, -4 dB, typical

Signal-to-Noise Ratio (Reference: 1 kilohertz, 0 dBu at two-wire)

Two-Wire to Four-Wire: -60 dB

Four-Wire to Two-Wire: -60 dB

Crosstalk (Reference: 1 kilohertz, 0 dBu)

System A to System B,

Two-wire to Two-wire

200 hertz to 5 kilohertz: -50 dB,

#### Environmental

##### Temperature

Operating: 0° to 50° celsius

Storage: -40° to 85° celsius

Humidity: 0 to 95%, non-condensing

#### Mains Voltage

Standard: 120 volts 10%, 50-60 hertz

\*P Option: 230 volts 10%, 50-60 hertz

#D Option: 100 volts + 10%, -5%, 50-60 hertz

#### Mains Amperes

Standard: 0.20A @ 120 volts 10%, 50-60 hertz

\*P Option: 0.10A @ 230 volts 10%, 50-60 hertz

#D Option: 0.22A @ 100 volts + 10%, -5%, 50-60 hertz

#### Dimensions

Height: 1.72 inches (44 millimeters)

Width: 8.19 inches (208 millimeters)

Depth: 8.00 inches (204 millimeters)

#### Weight

SSA324\*\*\*: 5.0 pounds (2.3 kilograms)

MCP1: 1.0 pounds (0.45 kilograms)

MCP2: 1.0 pounds (0.45 kilograms)

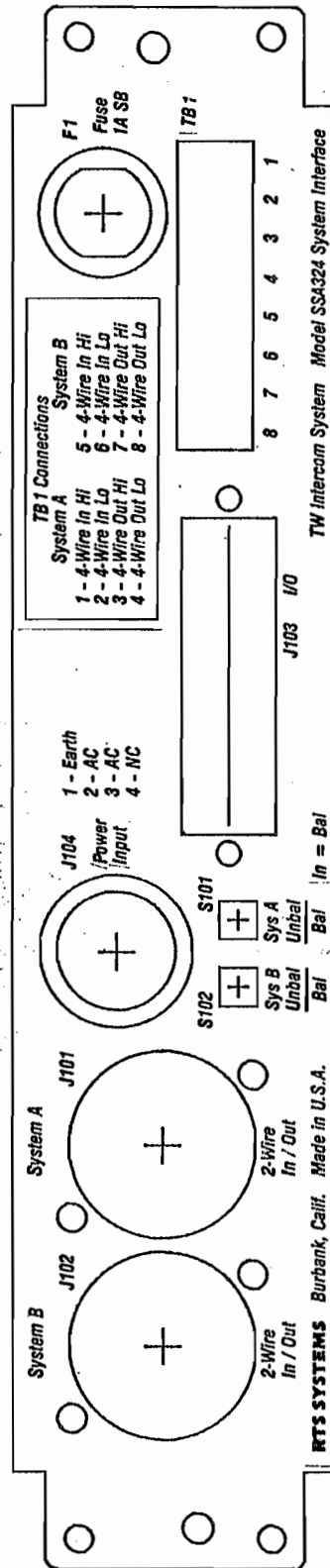
Finish: Thermoplastic front panel, aluminum case, light gray finish.

#### Notes:

\* Where two-wire output voltage is output current times termination impedance, and termination impedance is 200 ohms 33nF.

\*\* Null pots set for maximum null, 200 ohm 33nF nominal two-wire line.

\*\*\* SSA324 weight with optional transformers in place.



21 20

Figure 2-1  
Rear Panel, Model SSA324 System Interface



## SECTION 2: INSTALLATION

### 2.1 MECHANICAL INSTALLATION

The Model SSA324 can be installed in 3 ways: a single unit mounted in a half rack space using an optional Model MCP2 Kit for rack mounting a single unit; or two SSA324 supplies mounted side by side using the optional MCP1 Kit for rack mounting two units side by side; or free standing using the optional MCP8 Kit for adding side channels for non-rack mounting portable use.

### 2.2 ELECTRICAL INSTALLATION

The connection for the headset used to set-up the interface is on the front panel, all other connections are on the rear panel.

Figure 2-1 shows the rear panel connections. System A two-wire connection is at J101, System B, J102. These are XLR-3-31 (female) type connectors. System A and B four-wire connections are at both TB1 and J103. J103 also contains connections to the option card, when installed. Low voltage alternating current power is applied to J104 (16 volts, AC).

Connector Pin-outs are listed below.

#### Two-Wire (J101, J102)

	Audiocom Bal.*	ClearCom Unb.**	RTS Bal.*	RTS Unb.
CH1	2,3	3	2,3	2
CH2	-	-	-	3
Com	1	1	1	1

\*S101 (System B) and/or S102 (System A) set to in position for balanced operation.

\*\* If option board installed and ClearCom call light operation is required, move jumper W103 (System A) and/or jumper W203 (System B) on motherboard to 2,3 position. Jumper J103- 7, 20 for System A, and/or J103- 12, 25 for System B.

#### TB1 Four-Wire Connections

	System A TB1-	System B TB1-
Audio In Hi	1	5
Audio In Lo	2	6
Audio Out Hi	3	7
Audio Out Lo	4	8

#### J104 Power Input

Earth	1
16VAC	2
16VAC	3
No Conn.	4

#### J103 I/O

1	Earth
2	4-Wire Audio In Hi, System A
15	4-Wire Audio In Lo, System A
3	4-Wire Audio Out Hi, System A
16	4-Wire Audio Out Lo, System A
4	4-Wire Audio In Hi, System B
17	4-Wire Audio In Lo, System B
5	4-Wire Audio Out Hi, System B
18	4-Wire Audio Out Lo, System B
6	Call Send GND (A)
19	Call Send Hi (A)
7	DC Call Sig En GND (A)
20	DC Call Sig En Hi (A)
8	Relay Contact NO (A)
9	Relay Contact COM (A)
21	Relay Contact NC (A)
22	Relay Contact NO (B)
23	Relay Contact COM (B)
10	Relay Contact NC (B)
11	Call Send GND (B)
24	Call Send Hi (B)
12	DC Call Sig En GND (B)
25	DC Call Sig En Hi (B)

#### Front Panel Dyn. Mic. Headset Connector

1	Mic Lo
2	Mic Hi
3	Headphone Com
4	Left Headphone Hi
5	Right Headphone Hi
6	No Connection

#### Motherboard Test Signal Jumper

Place jumper on W2 for tone test signal, W3 for voice test signal. Test signal used with headset and front panel nulling adjustments to null return two-wire signal.

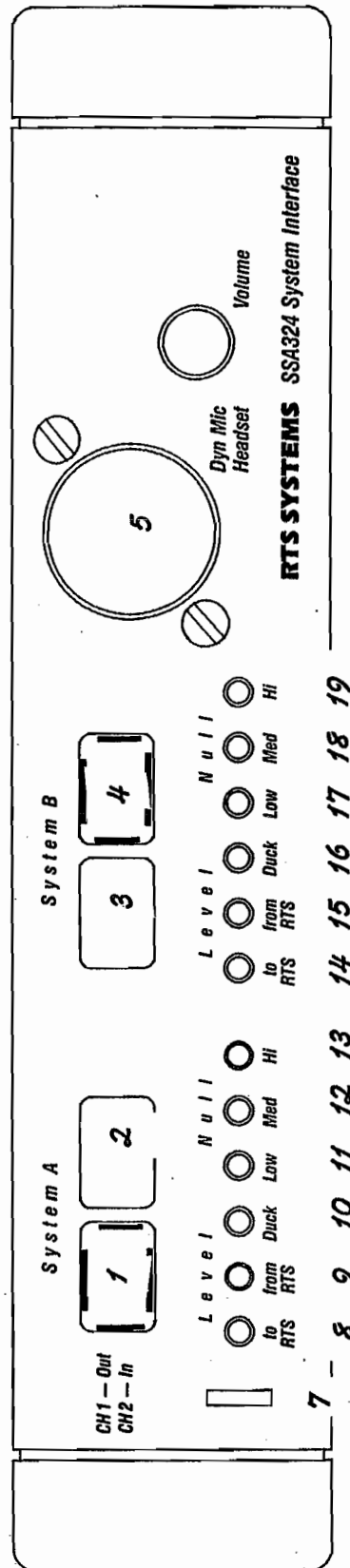


Figure 3-1  
SSA324 Front Panel

## SECTION 3: OPERATION

### 3.1 CONTROLS AND CONNECTORS

#### Front Panel

##### Switches

1. Channel Select switch, CH1 out / CH2 in, Sys. A.
2. Press momentary switch for nulling System A Two-wire.
3. Channel Select switch, CH1 out / CH2 in, Sys. B.
4. Press momentary switch for nulling System B Two-wire.

##### Connectors

5. XLR6-31 Female 6 pin headset connector (DYN MIC HEADSET)

##### Controls

6. Monitor headphone level (VOLUME).

##### Indicator

7. Indicator (Power) Green LED.

##### Controls

8. LEVEL TO RTS, System A.
9. LEVEL FROM RTS, System A.
10. DUCK Level, System A.
11. Inductive (LOW) null, System A.
12. Resistive (MEDIUM) null, System A.
13. Capacitive (HIGH) null, System A.
14. LEVEL TO RTS, System B.
15. LEVEL FROM RTS wire, System B.
16. DUCK Level, System B.
17. Inductive (LOW) null, System B.
18. Resistive (MEDIUM) null, System B.
19. Capacitive (HIGH) null, System B.

#### Rear Panel

##### Switches

20. Unbalance (Out) Balance (In) / Select Two-Wire, System A
21. Unbalance (Out) Balance (In) / Select Two-Wire, System B

## 3.2 OPERATION

### 3.2.1 NULLING

Preset Controls as Follows:

To/From RTS	Set to Midway
Duck Level	Set to CW
Low	Set to Midway
Med	Set to Midway
Hi	Set to CCW
Volume	10 O'Clock

#### Press Test Switch

If test signal tone, adjust Med for null, then Hi, then Low.  
If test signal voice, say ahhh into microphone, adjust Med for null, then Hi, then Low.

#### Release Test Switch

### 3.2.2 LEVEL SETTING

Have Talkers 1 and 2 on Four-Wire System, Talkers 3 and 4 on Two-Wire System. Adjust To / From RTS Controls so that all Talkers can hear other at about the same level regardless of which system the other talkers may be on.

### 3.2.3 DUCK SETTING

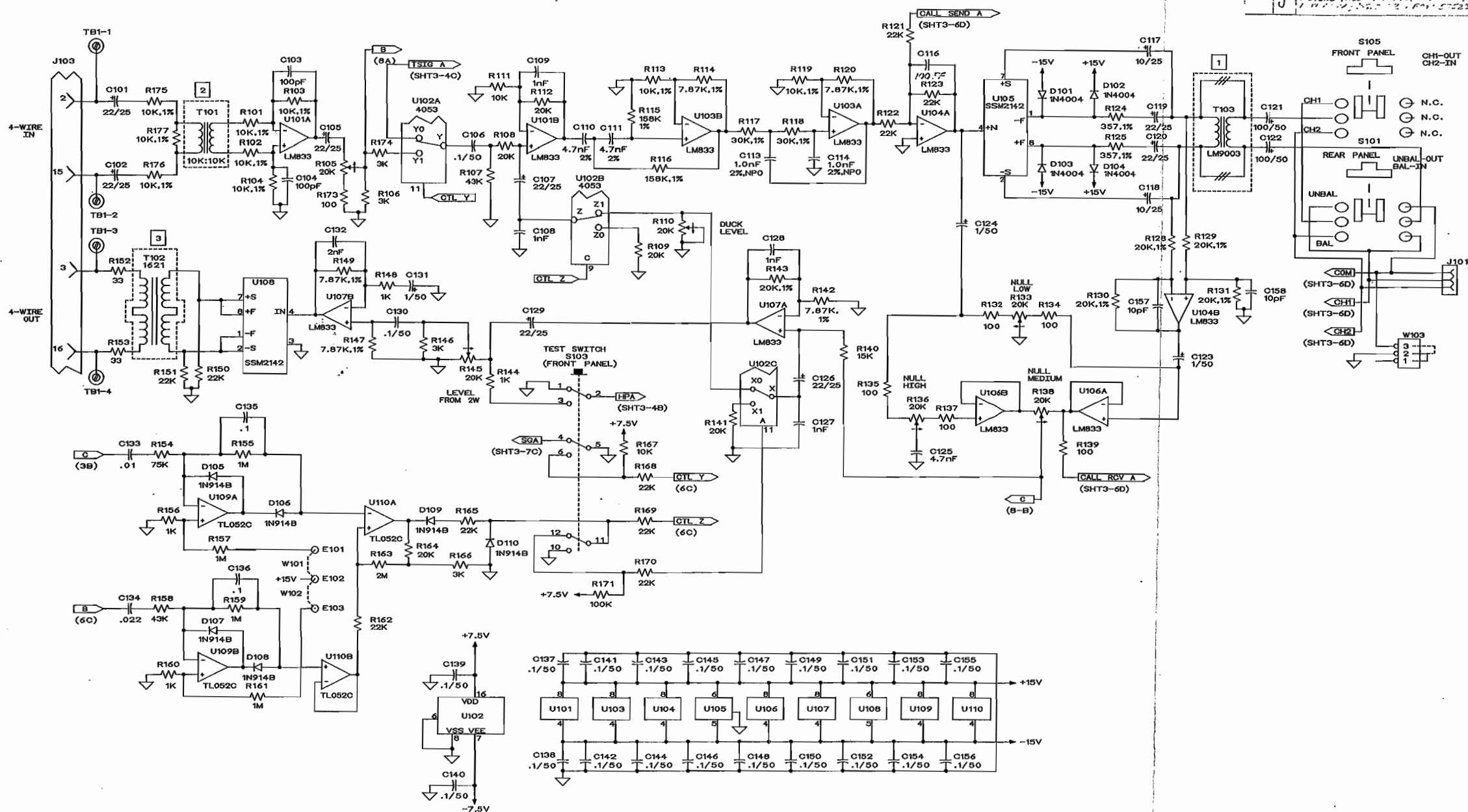
#### Duck Level

Adjust Duck Level only if full duplex operation is not possible because of feedback. Adjust Duck Level carefully from CW towards CCW. Only a very small amount of ducking should be used.

## **SECTION 7: DIAGRAMS**

<b><u>Document Number</u></b>	<b><u>Size</u></b>	<b><u>Title</u></b>
SD6926	B	Schematic Diagram- System To System Adapter, Model SSA324, Sht 1 of 3
SD6926	B	Schematic Diagram- System To System Adapter, Model SSA324, Sht 2 of 3
SD6926	B	Schematic Diagram- System To System Adapter, Model SSA324, Sht 3 of 3
AS6926	B	Assembly Diagram, PCA, System To System Adapter, Model SSA324

## INTERFACE A



Zone	Rev	Description	Date	Apprv
A		UPDATED FROM PROTOTYPE	6/6/91	
B		REVISED PER ECOM #3431	6/24/91	
C		CHG. SH2 ECO #5421 ECO # 54231	9/14/91	T.A.
D		CHG. SH2 ECO #54323	9/14/91	T.A.
E		CHG. SH1, SH2 ECO #54966	12/17/91	T.A.
F		CHG. SH2 ECO #54966 FROM MAIL (S-7) TO FEMALE (S-3) 2.E.F. 5.5.3	12/17/91	MS
G		CHG. SH2 ECO #54966 FROM MAIL (S-7) TO FEMALE (S-3) 2.E.F. 5.5.3	7-21-92	MS
H		CHG. SH2 ECO #54966 FROM MAIL (S-7) TO FEMALE (S-3) 2.E.F. 5.5.3	7-21-92	MS
I		CHG. SH2 ECO #54966 FROM MAIL (S-7) TO FEMALE (S-3) 2.E.F. 5.5.3	7-21-92	MS
J		CHG. SH2 ECO #54966 FROM MAIL (S-7) TO FEMALE (S-3) 2.E.F. 5.5.3	7-21-92	MS

3 TRANSFORMERS T102 AND T202 NORMALLY NOT INSTALLED.

2 TRANSFORMERS T101 AND T201 NORMALLY NOT INSTALLED.

1 TRANSFORMERS T103 AND T203 NORMALLY NOT INSTALLED.  
CUT TRACES ON P.C.B. AS SHOWN IF TRANSFORMERS ARE  
TO BE USED.

NOTES: UNLESS OTHERWISE SPECIFIED

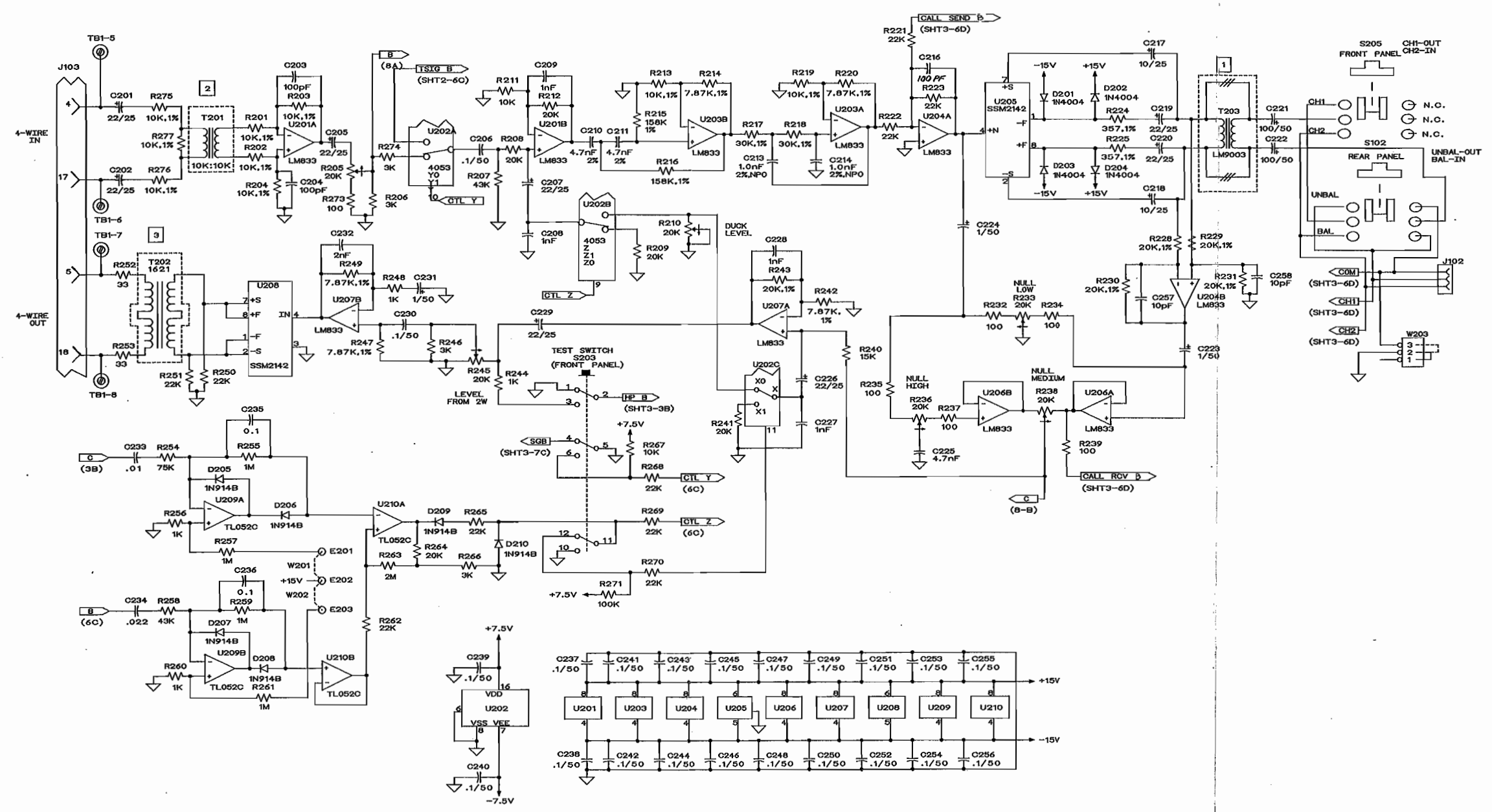
LAST USED: C158,D110,E103,J101,R177,  
S103,T103,U110,W103

NOT USED: R126,R127

CONTRACT NO.		RTS SYSTEMS Burbank, California	
Drawn R.T. CRUZ Checked		SCHEMATIC DIAGRAM- SYSTEM TO SYSTEM ADAPTER, MODEL SSA324	
Issued		SIZE F 3/8" X 5/8"	DWG NO
		D 60572	SD6926
		DATE 4/3/91	SA9226B01 SHEET 1 of 3

INTERFACE B

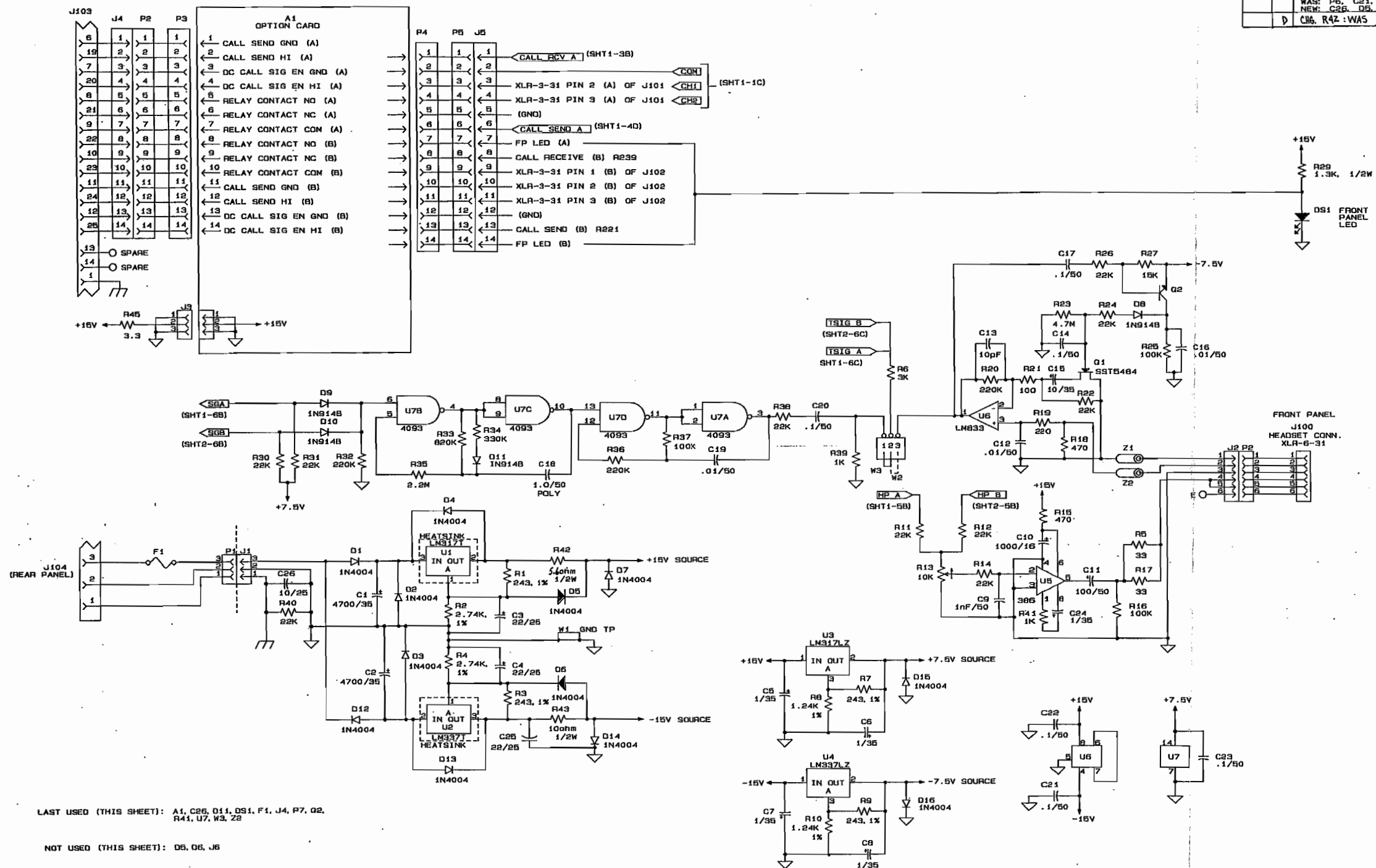
Zone	Rev	Description	Date	Apprv.
E		CHG. J103 PINOUTS FROM MALE TO FEMALE - Eco# 55B9B	7.1.15	
F		CH. V.A. CH. 1 & 2 N.C. 20	8.1.15	
G		CHG. C216 VALUE WAS: 100pF, DETECTED 225pF WAS: 100pF	5-20-22	



LAST USED: C258,D210,E203,J201,  
R277,S203,T203,U210,W203  
NOT USED: R226,R227

CONTRACT NO.		RTS SYSTEMS Burbank, California	
Drawn	R.T. CRUZ	SCHEMATIC DIAGRAM- SYSTEM TO SYSTEM	
Checked		ADAPTER, MODEL SSA324	
Issued		SIZE	FSCM DWG NO
		D 60572	SD6926
		DATE 6/3/91	S6926B02 SHEET 2 of 3

Zone	Rev	Description	Date	Apprv
C		ECO 54323 WAS: P6, C21, R40, R42, R43, P8 NEW: C24, D5, D8	8/14/91	T.A.
D		CHG. R42: WAS 10 OHM; ECO# 56020	7-21-92	pe JC



LAST USED (THIS SHEET): A1, C26, D11, DS1, F1, J4, P7, Q2, R41, U7, W3, Z2

NOT USED (THIS SHEET): D5, Q6, J6

LAST USED: C24, DS1, D16, J2, Q2, R43, U7

CONTRACT NO.		RTS SYSTEMS Burbank, California	
Drawn	B.T. CRUZ	SCHEMATIC DIAGRAM- SYSTEM TO SYSTEM ADAPTER, MODEL SSA324	
Checked			
Issued			
SIZE	FSCM	DWG NO	SD6926
DATE	6/29/91	56926803	SHEET 3 of 3

