

MODEL SPK300L
TW INTERCOM SYSTEM
PORTABLE SPEAKER USER STATION



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RTS/Telex Communications, Inc.
12000 Portland Avenue South
Burnsville, MN 55337 USA
Telephone: 800-392-3497
Fax: 800-323-0498
Factory Service: 800-553-5992

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 Cornhusker Hwy.
Lincoln, NE 68507 U.S.A.
Attn: Service

This package should include the following:

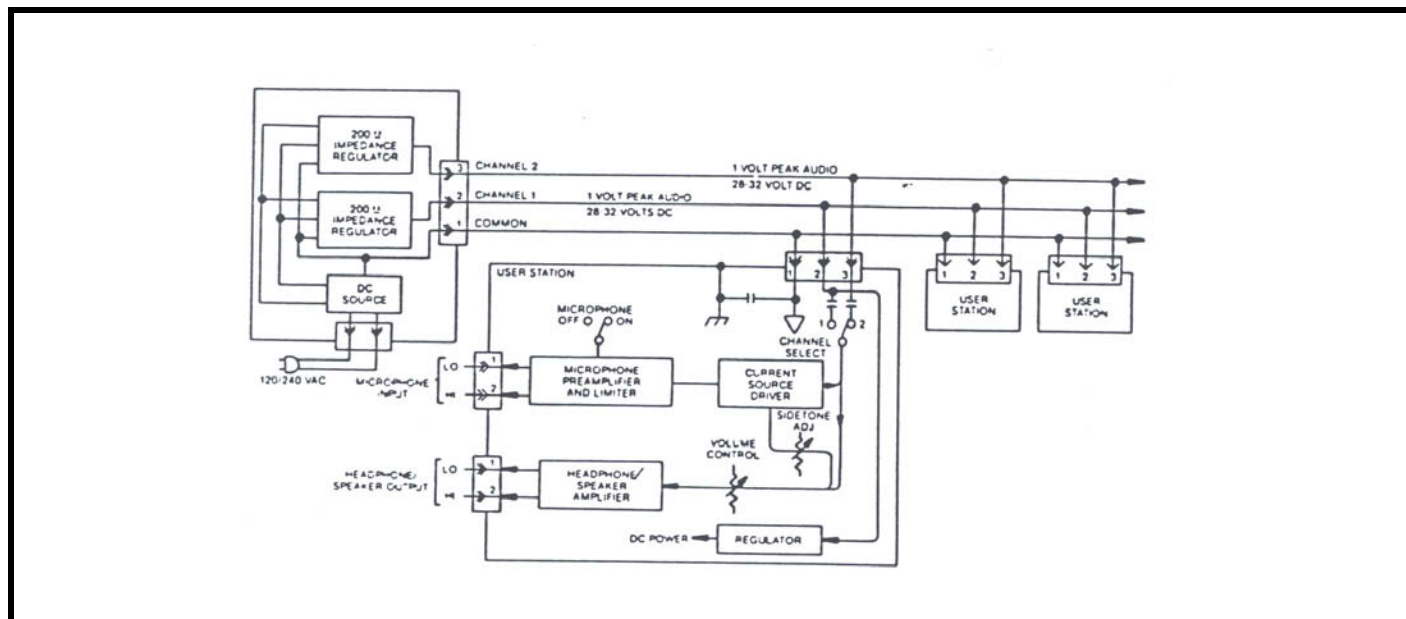


FIGURE 1. TW System Concept Block Diagram

DESCRIPTION

The Model SPK300L, a Portable Speaker User Station, is a component used in the TW INTERCOM SYSTEM. Each User Station is a communications unit along a multi-unit conference bus.

Figure 1, "TW System Concept Block Diagram," on page ii, shows User Station interconnection, and User Station connection to the system power supply.

User Station interconnection can be: 1) centrally wired, with each cable coming from a central point, or 2) distributed, where all the user stations are looped together from one to another, or 3) a combination of both. The centrally wired interconnection not only reduces interchannel crosstalk, but also allows for easier expansion into an assignable channel, multi-channel system.

Figure 1, "SPK300L Block Diagram," on page 3, shows user station functional components, input/output connections, and controls.

The SPK300L User Station has the following

functional components:

- a microphone preamplifier with limiter
- an electronic microphone switch
- a "bilateral current source" line driver
- a listen volume control
- a headphone amplifier
- a speaker amplifier
- a speaker switch
- a channel selector switch

The **Microphone Preamplifier**/limiter converts the small microphone signal to a strong line level signal conditions the signal strength from loud and soft talkers to be almost the same sends the signal to the line via the microphone switch and a "bilateral current source".

The **Bilateral Current Source** adds signal, via the channel select switch, to the line without affecting any signals already on the line. The bilateral current source also extracts the listen signal from the line and sends it to the headphone amplifier via the volume control. Some of the user's own voice signal ("sidetone") is also fed to the headphone amplifier.

The **Channel Selector Switch** selects the channel on which the user will talk and listen. The headphone amplifier output drives the user's headphones.

The **Volume Control** also feeds the speaker amplifier via the speaker switch and the speaker dim network.

The **User Station Voltage Regulator** takes power from channel 1, regardless of the channel selector switch setting (exception: local power option units). The regulator not only supplies regulated power to the user station, but also prevents unwanted interaction between the user station and the intercom line which is supplying the power. Because the regulator takes power from channel 1, channel 2 can be expanded into many channels by using a switch and, for each channel, a separate wire and a termination network consisting of a 200 ohm resistor and a 10 microfarad capacitor in series. (See the Application Diagrams in the TW Intercom Systems Technical Manual).

A TW System Power Supply terminates a line with 200 ohms.

Operational Controls

The SPK300L User Station has the following controls, described and shown in Section 3:

- Channel Select Switch
- Latching-action Microphone ON-OFF toggle switch.
- Momentary-action Microphone ON-OFF pushbutton switch.
- Speaker/Headphone Volume Control
- Call Switch /indicator
- Speaker ON/OFF switch
- Sidetone Adjustment

Connection, Inputs and Outputs

The SPK300L User Station has four input/output connectors:

- Dynamic Microphone type headset or handset
- Carbon Microphone type headset or handset
- Line Input (ties the station to the intercom line)
- Loop/extension (allows another station to access the line through the first station. Also called loop-through.

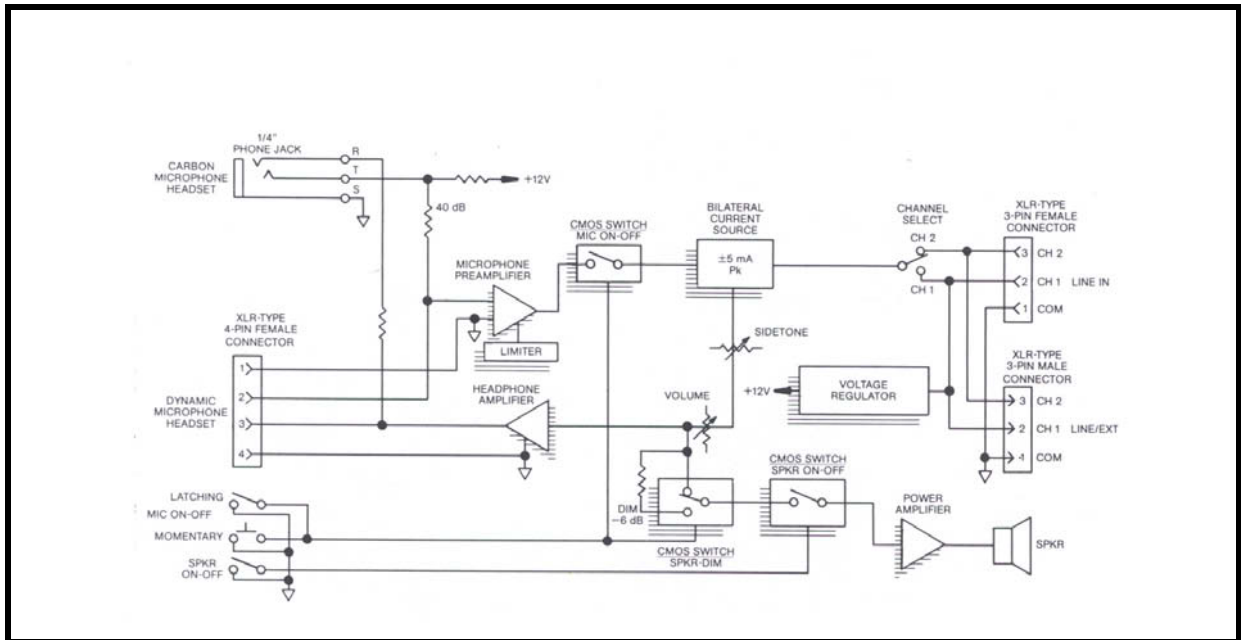


FIGURE 1. SPK300L Block Diagram

Specifications

Audio Line Voltage	1 volt, peak (0 dBm voltage-equivalent)
Average Speech Level Range	-20 dBV to -10 dBV
Absolute Maximum Speech Level	3 volts, peak (linear limit)
Audio Line Impedance, Nominal	200 50 ohms, 75 Hz to 20 kHz System will continue to operate from 50 ohms to 300 ohms.
SYSTEM DC CURRENT	
Nominal	32 volts DC
Operational Range	18 to 35 volts DC
Steady state without damage	-1.5 volts to 36 volts DC
Transient	200 volts, 8 milliseconds or less (after this time, power supply and user station fuses will open).
System DC Current	
Quiescent (per station)	10 to 40 milliamps
Dynamic (per station)	50 milliamps (w/25 ohm headphones) 70 milliamps (w/25 ohm headphones and lights) 100 milliamps (w/8 ohm speaker)
Start-Up Current	1.25 amperes, 50 units, all kinds
Fault Current	4.0 amperes, power supply at voltage >12 volts 1.0 amperes, power supply at voltage <12 volts

OPERATING DISTANCES

Maximum DC limit	5,000 ft distance along cable, power supply to single station #22 gauge wire - DC voltage drop limitation.
Maximum AC limit	10,000 ft. dry pair, power supply at each end, #22 gauge wire
System Capacitance	0.3 microgarads (cumulative effect of 10,000 ft. of maximum cable at 30 picofarads/foot)

USER STATIONS SPECIFICATIONS

Input DC voltage	20 to 35 volts DC, operating from -200 to +36 volts DC without damage.
DC Current	Quiescent, 10 to 40 milliamps 50 milliamps, typical (w/25 ohms headphones) 75 milliamps, typical (w/25 ohms headphones + lights) 100 milliamps, typical (w/8 ohm speaker)
Impedance Across Line	10,000 ohms typical; 2,000 ohms worst case dynamic operation
Ambient Temperature Range	Operating 0° C to 60° C (0° F to 140° F) Storage -55° C to 125° C (-67° F to 257° F)
Noise Contribution to 200 ohm Line	One unit: -75 dBu Ten unit: -67 dBu

MICROPHONE PREAMPLIFIER

Input Impedance *	470 ohms
Source Impedance*	200 ohms, nominal
Maximum Input Level	150 millivolts
Voltage Gain	54 dB
Frequency Response	100 Hz to 10,000 Hz, 3 dB

Introduction

Limiter Range	50 dB
Carbon Mic Excitation Current	10 milliamps, nominal

CURRENT SOURCE

Transfer Ratio	5 milliamps/1.5 volts
Output	5 milliamps into 200 ohms

HEADPHONE AMPLIFIER

Overall Voltage Gain	24 dB
Overall Voltage Gain	9 volts peak-to-peak into 25 ohms
Output Power	Headset Station: 1/2 watt into 25 ohms Speaker Station: 2 watts into 8 ohms
Frequency Response	150 Hz to 8000 Hz, 3 dB
Headphone Impedance Range	25 to 600 ohms
Sidetone Adjustment Range	20 dB to full ON

CALL LIGHT

Signaling Frequency	20,000 kHz 3dB
Flashing Rate	3Hz 2 Hz

DIMENSION

3.468" H x 1.5" W x 3.0" D (13.21 x 3.81 x 7.62 centimeters)

INSTALLATION

MECHANICAL INSTALLATION

The Model SPK300L Portable Speaker User Station is 4.0 inches (101.6 mm) high X 8.0 inches (203.2 mm) wide X 8.0 inches (203.2 mm) deep. Additional depth should be allowed for the rear panel XLR-type line connectors. When installing this unit, allow space for control access, cabling and servicing. Provide space for: cabling service loops, reaching XLR-type connector lock releases, and headset connector/cables. If the headset connector is remotely located, allow space between this cable and interference sources such as video/TV monitors, power supplies and equipment with internal power supplies. There are no ventilation requirements.

Headset Requirements

Dynamic microphone headset type:

- 50 to 1000 ohm microphone
- 25 to 1000 ohm headphone(s)

High efficiency headphones are recommended because less line current is required from the power supply. Use headphones with an impedance of 25 ohms or greater. Low impedance 8 ohm headphones are not recommended. Headphones with good acoustic isolation (20 to 40dB) improve communication in high ambient noise environments, and allow the user to use the headphones at a less tiring, lower volume.

In the headset connecting cable, prevent coupling between the microphone and headphone leads by using a shielded, twisted pair for the microphone, and a separate, twisted pair for the headphones. Do not allow headphone ground to contact microphone ground or shield. Tie the shield to microphone ground or "mic low". The headset cable can be made longer when the microphone and headphone pairs are physically separated. The wider the separation, the longer the cable length which may be used. Estimated maximum usable headphone cable lengths are as follows:

Single cable, Two shielded twisted pair	10 ft. (3 m).
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Dual ribbed cable, Two shielded twisted pair:	30 ft. (9 m).
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ELECTRICAL

Power

The SPK300L receives electrical power from either:

- (1) a system power supply (26 to 32 volts DC on line connector pins 2 (+) and 1 (com) (1 or two channel operation); or
- (2) a local power supply option (14 to 26 volts DC). A user station requires 18 to 33 volts to be a 10,000 ohm bridging impedance across the powering line, but the station can otherwise operate (as in the local power option) from 12 to 33 volts.

When using a local power supply option, each channel requires a 200 ohm load. See Figure 1-1. It is necessary to do this only once for each channel string.

Model SPK300L current requirements range from 30 to 100 mA; Since, in (1), above, the power and communications signals may share conductors, it may be necessary to overcome power losses by increasing conductor size over long runs (over 1/2 mile (804 m)). Typical operating distance for one SPK300L station is 1/2 mile (.80 km), and for one SPK300L, 1/3 mile (0.53 km) using a normal # 22 AWG conductor size.

Signal

The required number of conductors to interconnect user stations is as follows (For standard unbalanced TW user stations):

# of Channels	# of Conductors
1	2 *
1	3 **
2	3 ***

*Using a TW power supply (and possibly operating on a TW system).

**Using a non-TW power supply.

***Using a TW power supply and operating on a TW two channel system.

Use shielded cable to interconnect user stations in areas of possible electrical interference, (areas such as those near: digital equipment, high current primary power conductors ("mains"), transformers, transmitters, and lamp dimmers).

Most two channel applications may use either standard microphone cable (for convenience) or two-twisted-pair cable (considerably less expensive than microphone cable). Standard wire size for the TW Intercom System is #22 gauge wire for interconnection. For permanent installations it is recommended that each channel should have individually shielded twisted pair of at least #22 gauge wire, such as Belden #8723 for 2 channels. Connect the shield to system common but do not tie the shield to chassis, earth or connector shell ground.

Crosstalk Control

In the TW Intercom System all channels share a common circuit ground return. Crosstalk due to common ground resistance can be lowered by reducing the common ground resistance. Reduction of ground resistance can occur as a side benefit of using shielded cable, since the shield drains can be tied together and electrically parallel the circuit ground. Another way of lowering resistive crosstalk is to "homerun" all interconnecting cables to a central or "home" location. In this configuration, the ground path is short and the corresponding ground resistance is small. Crosstalk due to mutual capacitance occurs when the signal on one wire of a twisted pair couples into the other wire. Separating the two conductors with a shield greatly reduces the capacitive crosstalk.

To reduce both capacitive and resistive crosstalk and to afford a degree of RF and electrostatic shielding, use a cable which has a shielded twisted pair for each channel. Each pair consists of a conductor for the channel, a conductor for circuit ground return and a shield around the two conductors. The shield is accessed via a drain conductor. This drain conductor and the shield can augment the circuit grounds and thus lower the ground resistance.

Routing the TW Intercom System cables along the same ductways and pathways as power cabling can increase the noise and hum levels.

Moisture / Contamination Protection

When using equipment in the rain, always protect the equipment with plastic covers----also, make sure all cable connectors are lifted out of the mud or snow and protected with plastic bags. Water, mud and snow in connectors can cause considerable audible noise.

Hum Prevention

Prevent inducing hum into the system by not locating user stations near hum sources such as power transformers, electrical switch panels, lamp dimmers or TV cameras. When the microphone switch is turned on, the dynamic microphone acts as a sensitive antenna for hum sources.

Pin 3 - Channel 2

XLR-4-31/32 types (for three-Channels)

Pin 1 - Channel 1

Pin 2 - Channel 2

Pin 3 - Channel 3

Pin 4 - Common (low side of line)

USER STATION CONNECTIONS

Dynamic Microphone headset connector:

XLR-4-31 type receptacle (J1)

Input level: -55 dbu nominal

Output level to headphone: 10 volts peak-to-peak open circuit.

Pin 1 - Microphone low

Pin 2 - Microphone high

Pin 3 - Headphone low

Pin 4 - Headphone high

Carbon Microphone headset connector:

Standard 1/4" Phone Jack (J2)

Input level: -15 dbu nominal

Output to Headphone: 10 volts peak-to-peak open circuit.

Tip - Carbon Microphone

Ring - Headphone

Sleeve - Common/ground

Line input connectors: (J3/J4)

XLR-3-31/32 types (for two-channels)

Pin 1 - Common (low side of line)

Pin 2 - Channel 1

Operating Controls

The table below lists the Model SPK300L operating controls. The reference numbers in the table correspond to the circled numbers in Figure 3-1.

TABLE 1. Model SPK300L Operating Controls

REF NO.	NAME	DESCRIPTION
1	Channel Select Switch	Selects one of two channels (standard) or one of three channels (optional). The Call Light Option transmitter and receiver operate on the channel selected by this switch. The Channel Select Switch is omitted in the Single Channel (SC) option.
2	Mic ON/OFF Toggle	A latching action switch. Turning ON the microphone slightly “dims” or attenuates the speaker.
3	Mic ON/OFF Pushbutton	A momentary action pushbutton switch. Not standard with the Call Light Option. Turning ON the microphone here also slightly “dims” or attenuates the speaker.
4	Volume	A speaker / headphone volume control. May be dual control for the Duel Listen (DL) or Program (E) Option. CAUTION: Always turn this control all the way counter-clockwise (to the left) before plugging in the headset.
5	Call Light Indicator	This switch / indicator appears only on the user stations with the Switch “Call Light” option. When depressed, this switch adds a 20 kilohertz signal to the TW intercom line on the same channel that the Channel Select Switch has been set. This signal activates the Call Light Receiver on all user stations which are switched to the same channel. This switch:
6	Speaker ON / OFF	<ol style="list-style-type: none"> 1. turns the speaker on 2. disables the headset microphone 3. enables the panel
7	Sidetone	The screwdriver adjusted SIDETONE control sets the “sidetone” level during headset operation and sets the “balance” nulling during speaker / panel microphone operation.

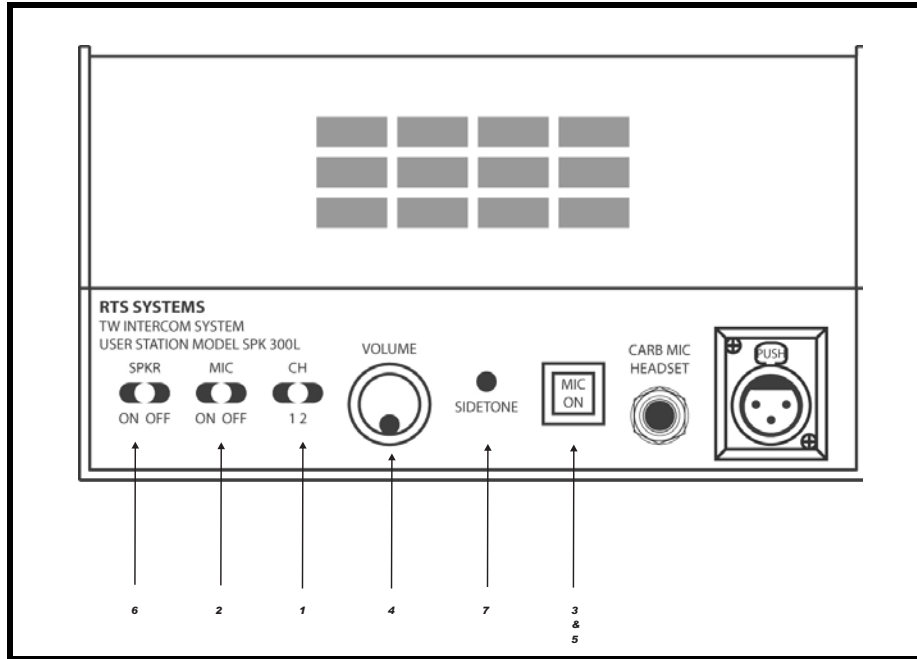


FIGURE 1. SPK300L Reference View

Adjust the Sidetone

To adjust the SIDETONE control for speaker operation, do the following:

1. Turn **ON** the speaker switch.
2. Turn **ON** the microphone switch.
3. Set the **VOLUME** control to about 50%
4. Hum into the panel microphone and adjust the **SIDETONE** for minimum sound through the loudspeaker.

To adjust the SIDETONE control for headset operation, do the following:

1. Turn **OFF** the speaker switch.
2. Turn **ON** the microphone switch.
3. Plug in a headset.
4. Set the **VOLUME** control to about 50%.
5. Turn the **SIDETONE** control fully counter-clockwise, then adjust it clockwise for a comfortable level of your own voice while talking into the headset microphone.

EN5541 - Installation, Local Power Option, RMS300 and SPK300L

The RMS300 and SPK 300 can be powered from an external (local) power supply of between 18 to 33 volts DC. the local power option, as supplied by RTS Systems, uses a power supply assembly (RTS # 9020-4425-00), which is 117 VAC, 60 Hz in, 24 VDC 400 mA out.

To modify the RMS300 or SPK300L for local power operation, do the following:

1. Remove diode D26 from the CC300 P.C. board.
2. Add J6, 4-pin jack (Calrad #30-454, RTS # 2013-0005-00), to the back panel.
3. Wire, as shown in the diagram below. Pin 1 = common, Pin 2 = external supply + (18 to 33 VDC).

4. Wire PG, 4-pin plug (Calrad #30-453, RTS # 2013-0016-00) to the external supply: Pin 1 = common, Pin 2 = external supply +.
5. Plug P6 into J6 on the RMS300 or SPK300L back panel.

NOTE: If using RTS local power option kit 9002-5541-00, the external supply will already be wired to P6. Obsolete products have been discontinued and are no longer available for purchase.

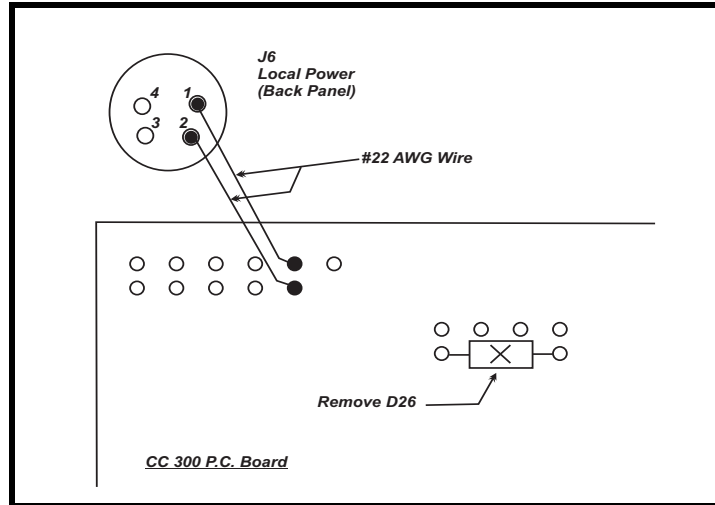


FIGURE 2. CC300 P.C. Board modifications.

When a system is constructed using locally powered user stations, it is essential that all channels are terminated with a 200 ohm system termination. System terminations (see diagram below) include:

An RTS System TW power supply *

- A discrete 200 ohm resistor for each locally supplied channel
- When application of a D.C. voltage is expected or possible, a 10 microfarad / 50 Volt capacitor in series with the 200 ohm resistor for each locally supplied channel.

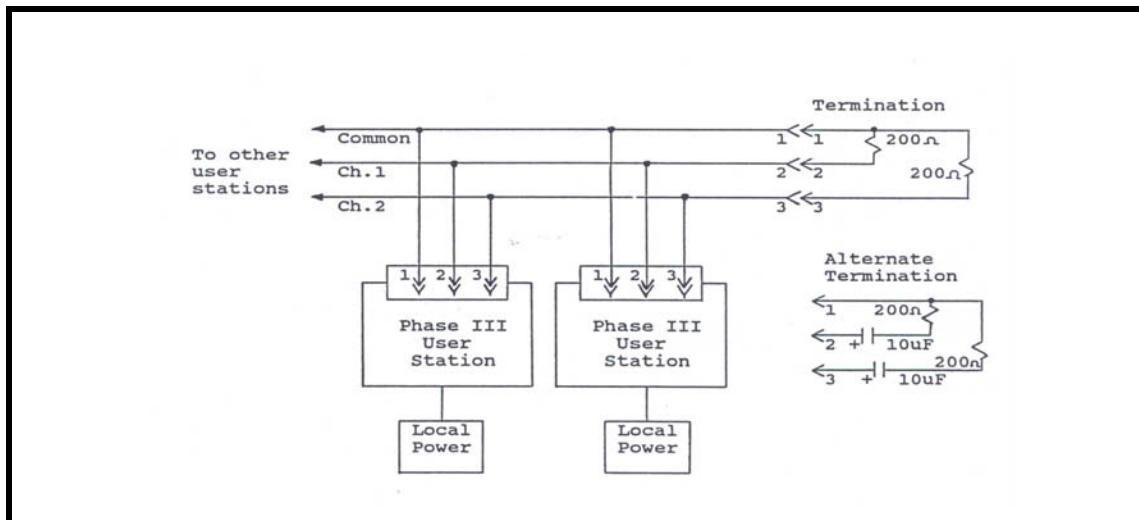


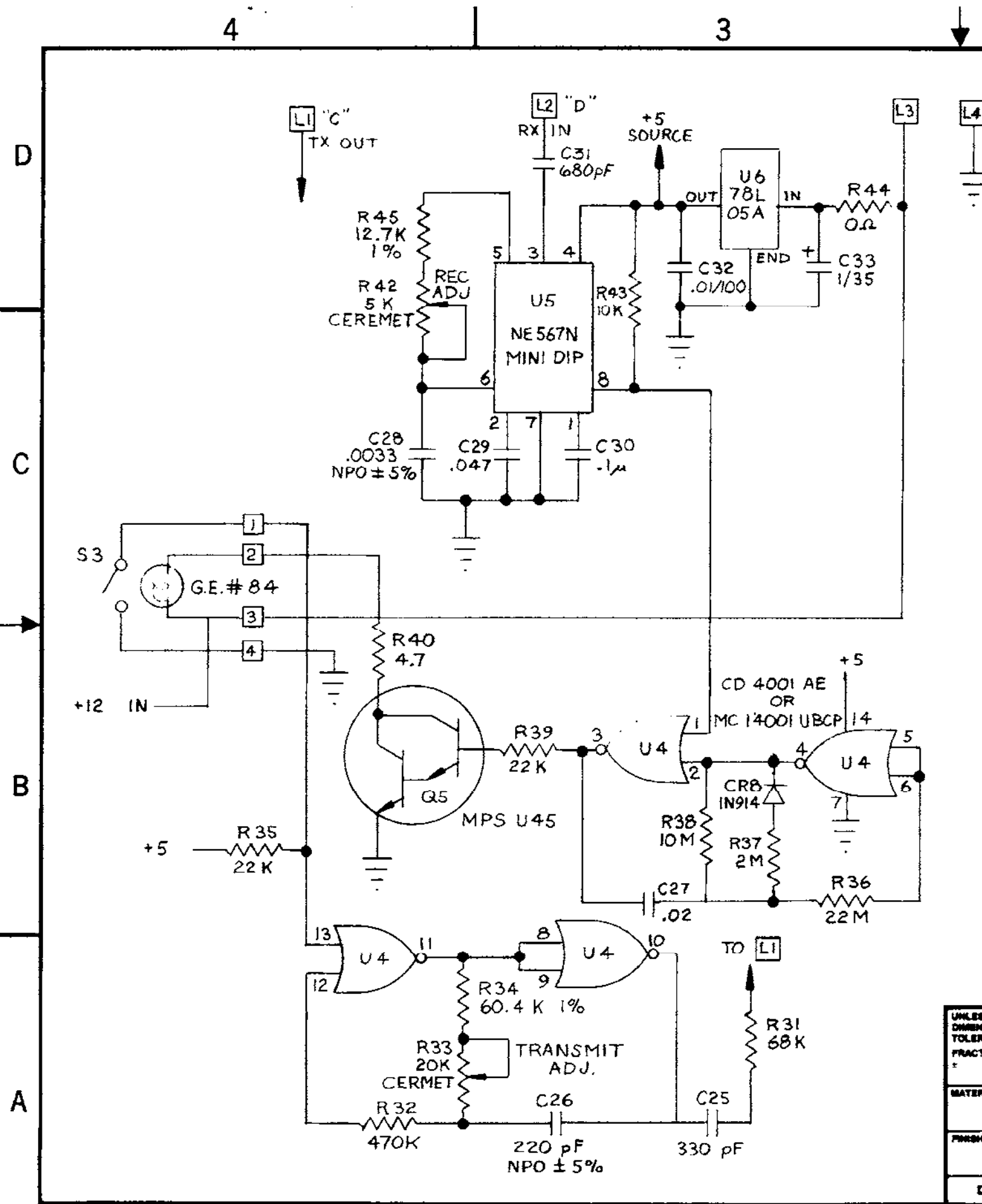
FIGURE 3. Power Supply diagram

*Examples of RTS System power supplies are:

PS8, PS10, PS15, PS20, PS30, PS31, PS50, and PS60.

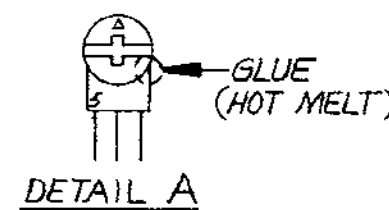
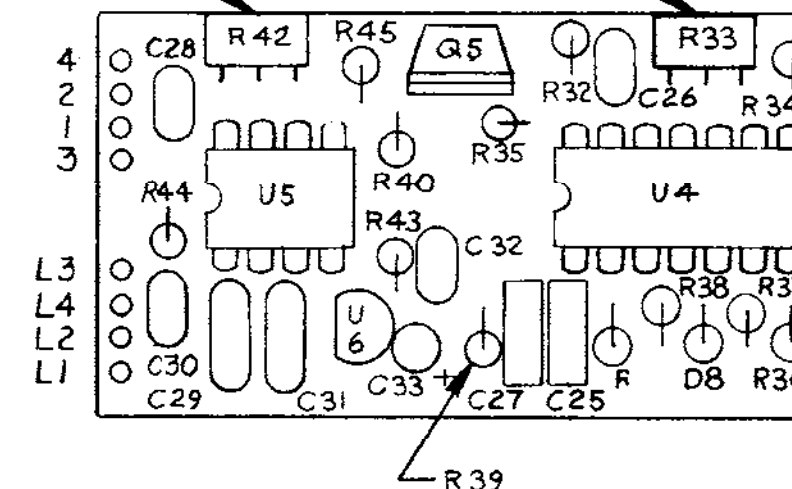
Model SPK300L

<u>Number</u>	<u>TitleS</u>
D2712	Schematic Diagram, CC300, page 1 of 3
SD2712	Schematic Diagram, CC300, page 2 of 3
SD2712	Schematic Diagram, CC300, page 3 of 3
	Wiring for External Microphones
SD3585	Servicing Diagram, Model RMS300/SPK300L,
WD2712	Wiring Diagram, pg. 1 of 7
	SPK/RMS300 Standard -L Option and Local Power Option
WD2712	Wiring Diagram, pg. 2 of 7
	SPK/RMS300 3CH and 3CH-L Options
WD2712	Wiring Diagram, pg. 3 of 7
	SPK/RMS300-DL
WD2712	Wiring Diagram, pg. 4 of 7
	SPK/RMS300, FB Option
WD2712	Wiring Diagram, pg. 5 of 7
	SPK/RMS300-DL-3CH
WD2712	Wiring Diagram, pg. 6 of 7
	SPK/RMS300 Program Input Option
WD2712	Wiring Diagram, pg. 7 of 7
	SPK/RMS300 DL (Dual Listen) - E (Program Input)
SD3487	Servicing Diagram, Light Signaling Circuit
	CC-28, Phase III configuration



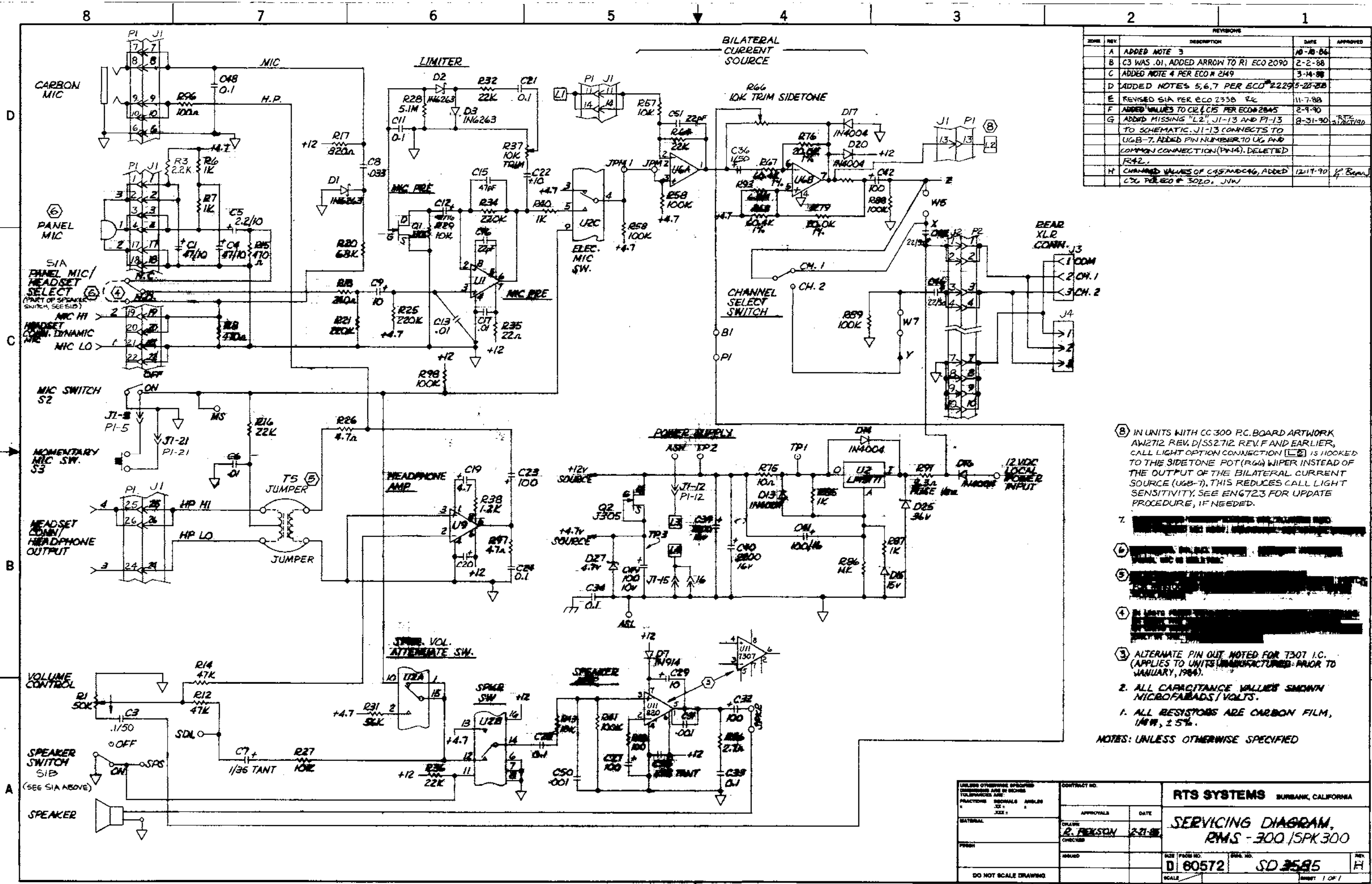
REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	CHANGE VALUE OF R37 WAS 10M PER ECO # 1893	4-13-87	
	B	ADDED LOCATION OF PADS 1-4 & L1-L4	8-12-87	
	C	C31 WAS 330PF & R32 WAS 330K PER ECO #1995	7-7-89	
	D	ADDED NOTE 1 PER ECO #2781	1-8-90	

SEE DETAIL A



1 GLUE SHOULD BE APPLIED TO LOWER RIGHT CORNER OF POT.
NOTES: UNLESS OTHERWISE SPECIFIED

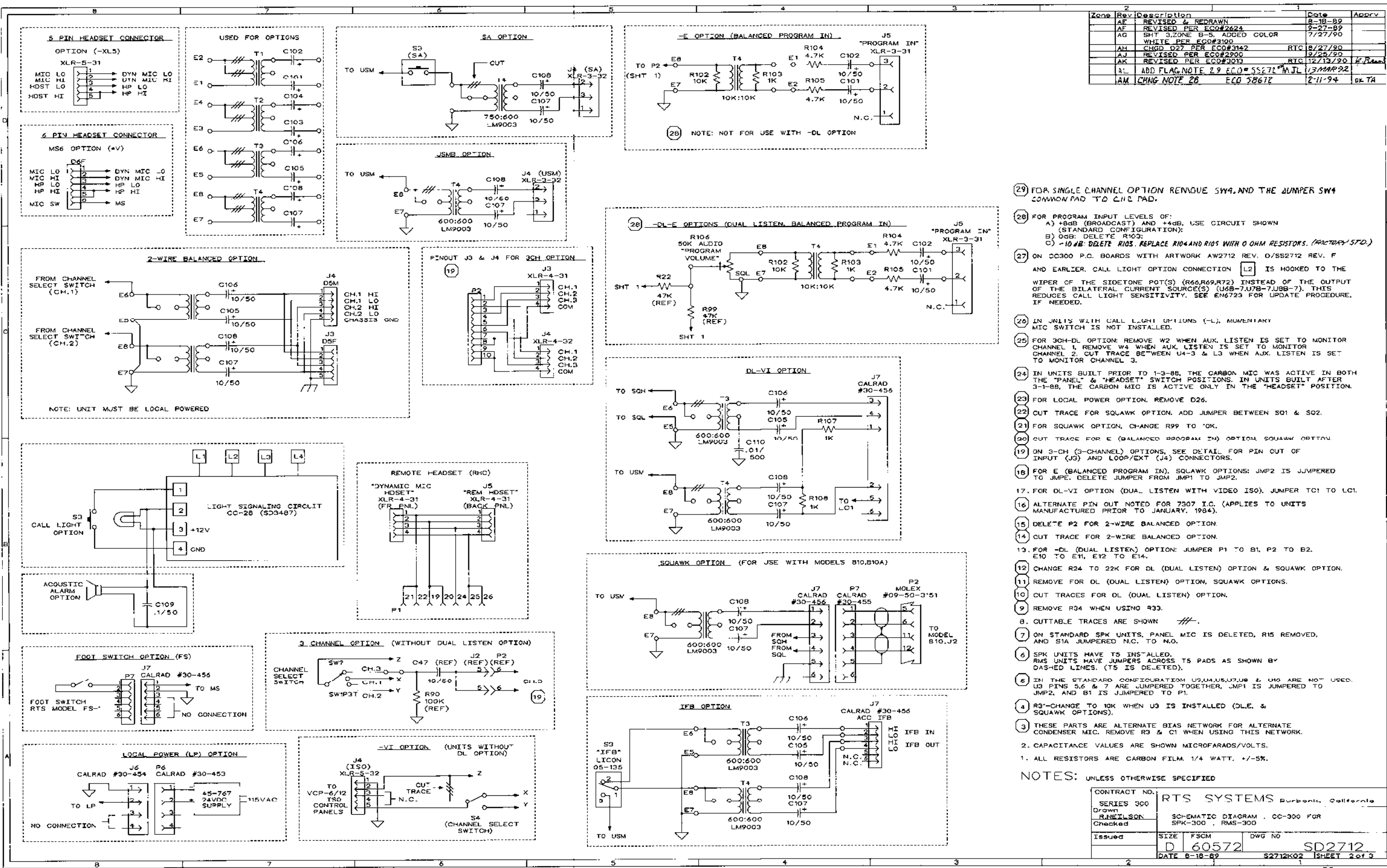
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± ± .XXX ±	CONTRACT NO.		RTS SYSTEMS BURBANK, CALIFORNIA			
	APPROVALS	DATE	SERVICING DIAGRAM, LIGHT SIGNALING CIRCUIT, CC-28, PHASE THREE CONFIGURATION.			
MATERIAL	DRAWN D. MARTINEZ	9-7-83	SIZE FSCM NO. DWG. NO. REV.			
FINISH	CHECKED		B 60572		SD 3487 D	
DO NOT SCALE DRAWING	ISSUED		SCALE		SHEET 1 OF 1	



REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
A	ADDED NOTE 3		10-8-86
B	C3 WAS .01, ADDED ARROW TO R1 ECO 2090		2-2-88
C	ADDED NOTE 4 PER ECO # 2149		3-14-88
D	ADDED NOTES 5, 6, 7 PER ECO # 2229-5-22-88		
E	REVISED SIA PER ECO 2338		11-7-88
F	ADDED VALUES TO C2, C5 PER ECO # 2845		2-9-90
G	ADDED MISSING "L2", J1-13 AND P1-13 TO SCHEMATIC. J1-13 CONNECTS TO U6B-7. ADDED PIN NUMBER TO U6 AND COMMON CONNECTION (P14). DELETED R42.		8-31-90
H	CHANGED VALUES OF C45 AND C46, ADDED C56 PER ECO # 3020. JNW		12-17-90

- 8 IN UNITS WITH CC 300 P.C. BOARD ARTWORK AW212 REV. D/SS2.112 REV. F AND EARLIER, CALL LIGHT OPTION CONNECTION (L2) IS HOOKED TO THE SIDETONE POT (R66) WIPER INSTEAD OF THE OUTPUT OF THE BILATERAL CURRENT SOURCE (U6B-7). THIS REDUCES CALL LIGHT SENSITIVITY. SEE ENG723 FOR UPDATE PROCEDURE, IF NEEDED.
- 7 [REDACTED]
- 6 [REDACTED]
- 5 [REDACTED]
- 4 [REDACTED]
- 3 ALTERNATE PIN OUT NOTED FOR T307 I.C. (APPLIES TO UNITS MANUFACTURED PRIOR TO JANUARY, 1984).
- 2 ALL CAPACITANCE VALUES SHOWN MICROFARADS/VOLTS.
- 1 ALL RESISTORS ARE CARBON FILM, 1/4W, 2.5%.
- NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS DECIMALS ANGLES XXX .XXX .XXX		CONTRACT NO.		RTS SYSTEMS BURNBANK, CALIFORNIA	
MATERIAL		APPROVALS		DATE	
PART		DRAWN		2-21-88	
CHECKED		R. FIKSON			
ISSUED		PAGE NO.		PAGE NO.	
DO NOT SCALE DRAWING		D 60572		SD 3585	
		SCALE		SHEET 1 OF 1	

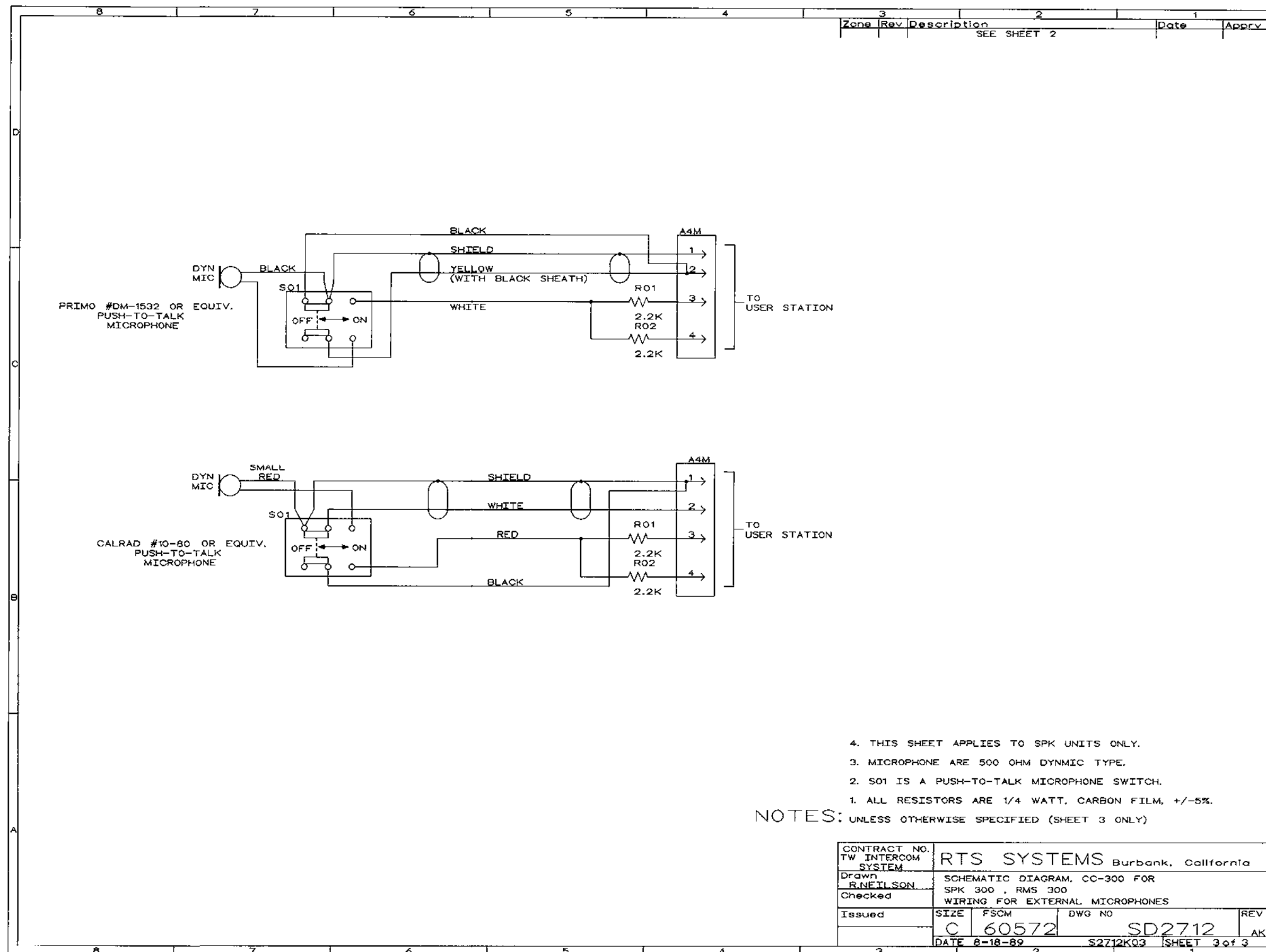


Zone	Rev	Description	Date	Apprv
AF	REVISED & REDRAWN		8-18-89	
AF	REVISED PER ECO#2424		9-27-89	
AG	SHT 3 ZONE B-S, ADDED COLOR		7/27/90	
AH	WHITE PER ECO#3100			
AH	CHSD 027 PER ECO#3142	RTC	8/27/90	
AJ	REVISED PER ECO#2900		9/25/90	
AK	REVISED PER ECO#3013	RTC	12/13/90	J. Bann
AL	ADD FLAG NOTE 2.9 ECO#55672	MAJL	1/3/MAR/92	
AM	CHNG NOTE 2.8 ECO 58612		2-11-94	DL TA

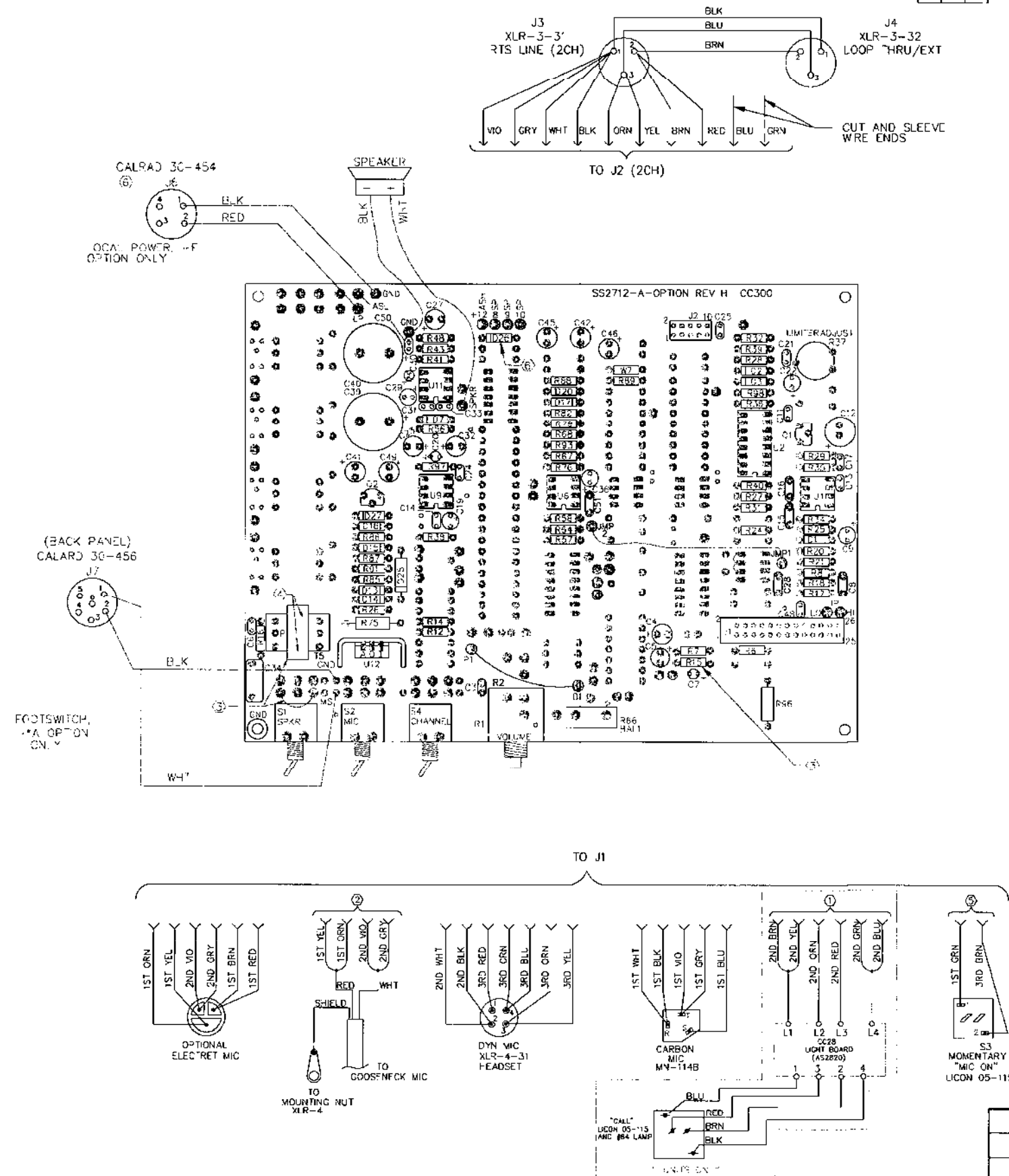
- (29) FOR SINGLE CHANNEL OPTION REMOVE SW4 AND THE JUMPER SW4 COMMON PAD TO CH2 PAD.
- (28) FOR PROGRAM INPUT LEVELS OF:
A) +8dB (BROADCAST) AND +4dB, USE CIRCUIT SHOWN (STANDARD CONFIGURATION):
B) 0dB: DELETE R103:
C) -10dB: DELETE R103, REPLACE R104 AND R105 WITH 0 OHM RESISTORS. (FACTORY STD.)
- (27) ON CC300 P.C. BOARDS WITH ARTWORK AW2712 REV. D/SS2712 REV. F AND EARLIER, CALL LIGHT OPTION CONNECTION L2 IS HOOKED TO THE WIPER OF THE SIDETONE POT(S) (R66, R69, R72) INSTEAD OF THE OUTPUT OF THE BILATERAL CURRENT SOURCE(S) (U6B-7, U7B-7). THIS REDUCES CALL LIGHT SENSITIVITY. SEE EN6723 FOR UPDATE PROCEDURE, IF NEEDED.
- (26) IN UNITS WITH CALL LIGHT OPTIONS (-L), MOMENTARY MIC SWITCH IS NOT INSTALLED.
- (25) FOR 3CH-DL OPTION: REMOVE W2 WHEN AUX. LISTEN IS SET TO MONITOR CHANNEL 1, REMOVE W4 WHEN AUX. LISTEN IS SET TO MONITOR CHANNEL 2. CUT TRACE BETWEEN U4-3 & L3 WHEN AUX. LISTEN IS SET TO MONITOR CHANNEL 3.
- (24) IN UNITS BUILT PRIOR TO 1-3-88, THE CARBON MIC WAS ACTIVE IN BOTH THE "PANEL" & "HEADSET" SWITCH POSITIONS. IN UNITS BUILT AFTER 3-1-88, THE CARBON MIC IS ACTIVE ONLY IN THE "HEADSET" POSITION.
- (23) FOR LOCAL POWER OPTION, REMOVE D26.
- (22) CUT TRACE FOR SQUAWK OPTION. ADD JUMPER BETWEEN SQ1 & SQ2.
- (21) FOR SQUAWK OPTION, CHANGE R99 TO 10K.
- (20) CUT TRACE FOR E (BALANCED PROGRAM IN) OPTION, SQUAWK OPTION.
- (19) ON 3-CH (3-CHANNEL) OPTIONS, SEE DETAIL FOR PIN OUT OF INPUT (J3) AND LOOP/EXT (J4) CONNECTORS.
- (18) FOR E (BALANCED PROGRAM IN), SQUAWK OPTIONS: JMP2 IS JUMPED TO JMP1. DELETE JUMPER FROM JMP1 TO JMP2.
17. FOR DL-VI OPTION (DUAL LISTEN WITH VIDEO ISO), JUMPER TO1 TO LC1.
- (16) ALTERNATE PIN OUT NOTED FOR 7307 I.C. (APPLIES TO UNITS MANUFACTURED PRIOR TO JANUARY, 1984).
- (15) DELETE P2 FOR 2-WIRE BALANCED OPTION.
- (14) CUT TRACE FOR 2-WIRE BALANCED OPTION.
13. FOR -DL (DUAL LISTEN) OPTION: JUMPER P1 TO B1, P2 TO B2. E10 TO E11, E12 TO E14.
- (12) CHANGE R24 TO 22K FOR DL (DUAL LISTEN) OPTION & SQUAWK OPTION.
- (11) REMOVE FOR DL (DUAL LISTEN) OPTION, SQUAWK OPTIONS.
- (10) CUT TRACES FOR DL (DUAL LISTEN) OPTION.
- (9) REMOVE R34 WHEN USING R33.
8. CUTTABLE TRACES ARE SHOWN ---.
- (7) ON STANDARD SPK UNITS, PANEL MIC IS DELETED, R15 REMOVED, AND S1A JUMPED N.C. TO N.O.
- (6) SPK UNITS HAVE TS INSTALLED. RMS UNITS HAVE JUMPERS ACROSS TS PADS AS SHOWN BY DASHED LINES. (TS IS DELETED).
- (5) IN THE STANDARD CONFIGURATION U2, U4, U5, U7, U8 & U10 ARE NOT USED. U3 PINS 5, 6 & 7 ARE JUMPED TOGETHER, JMP1 IS JUMPED TO JMP2, AND B1 IS JUMPED TO P1.
- (4) R3-CHANGE TO 10K WHEN U3 IS INSTALLED (DL-E, & SQUAWK OPTIONS).
- (3) THESE PARTS ARE ALTERNATE BIAS NETWORK FOR ALTERNATE CONDENSER MIC. REMOVE R3 & C1 WHEN USING THIS NETWORK.
2. CAPACITANCE VALUES ARE SHOWN MICROFARADS/VOLTS.
1. ALL RESISTORS ARE CARBON FILM, 1/4 WATT, +/-5%.

NOTES: UNLESS OTHERWISE SPECIFIED

CONTRACT NO.	SERIES 300	RTS SYSTEMS
Drawn	R. NELSON	Burbank, California
Checked		
Issued		
SIZE	FSCM	DWG NO.
D	60572	SD2712
DATE	8-18-89	S2712K02 SHEET 2 of 3



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	AG	REDRAWN LW CAD PER ECO #2900	12-10-90	
	AH	REVISED PER ECO #3013	12-18-90	
	AI	REVISED PER ECO #3020	12-19-90	
	AK	REVISED PER ECO #3158	12-20-90	L BROWN
	AL	REVISED PER ECO #3301	1-14-91	L BROWN
	AM	REVISED PER ECO #3400	9-3-91	L BROWN
	AN	REVISED PER ECO #3656	10-1-92	
	AP	ADD SHT 13 ECO #57100	2-1-93	
	AR	ADD SHT 14 ECO #57105	2-2-93	
	AS	ADD SHT, REV. STATUS; CHG. SHT 8 ECO #57173	2-7-93	
	A-	CHANGE SHEETS 6, 7 AND 13 ECO #58612	28 FEB 94	
	AV	CHG. SHTS 6, 7, AND 13 ECO 58128	8-23-94	
	AW	CHG. SHT 3 ECO #59488	8/11/94	
	AX	ADD SHT 15 ECO# 61129	11-6-95	JC

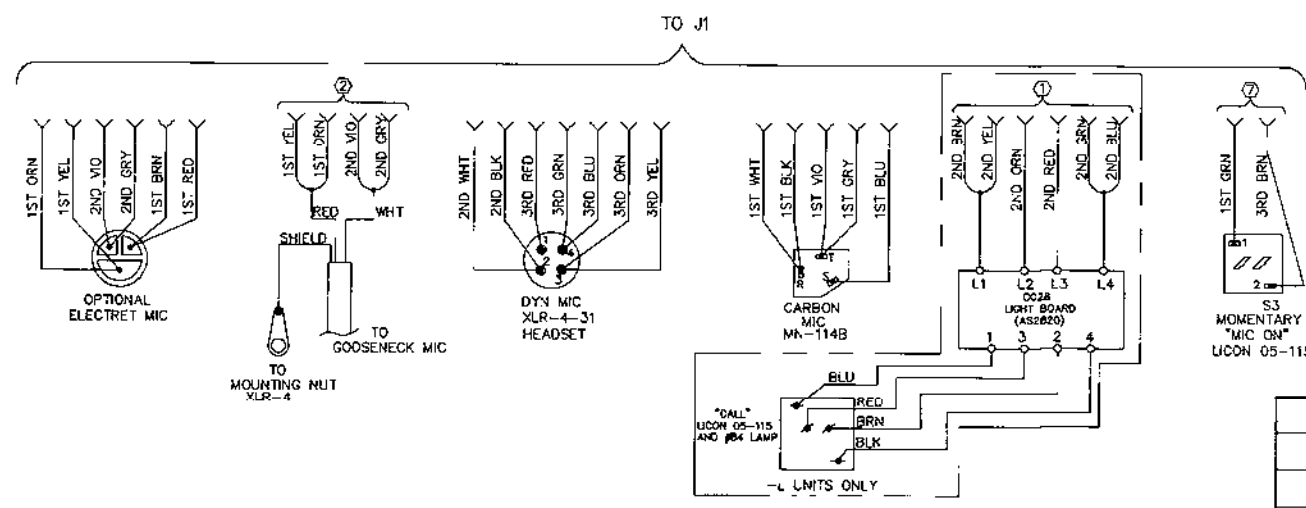
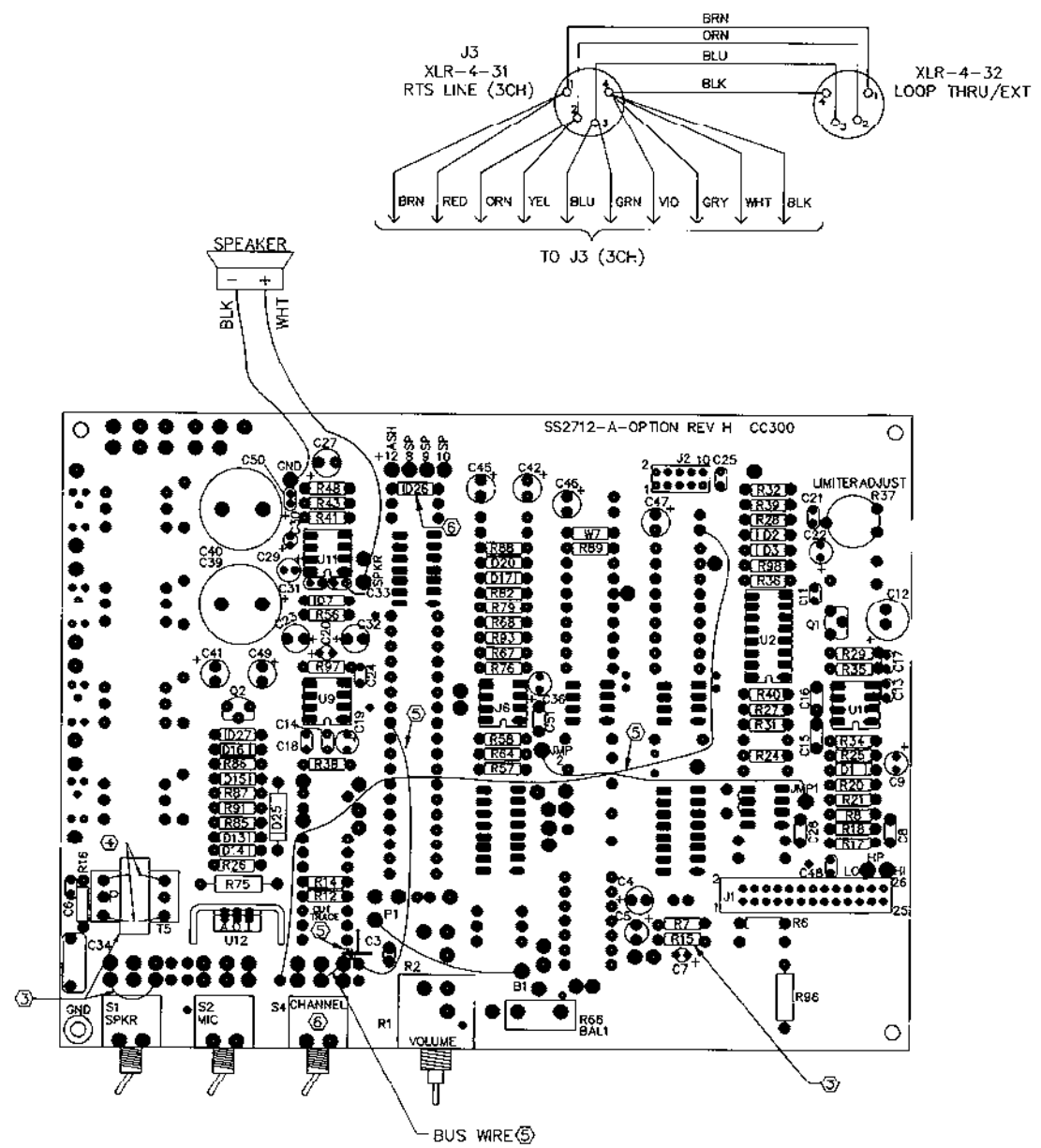


- ⑤ FOR LOCAL POWER OPTION: REMOVE D26, ADD J6, AND WIRE J6 TO P.C.B. AS SHOWN.
- ⑤ IN MODELS WITH -L OPTION S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- ④ INSTALL JUMPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- ③ INSTALL JUMPER, T5(RTS#2306-G006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES. CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : (N.F.S. OTHERWISE SPECIFIED)

05-115	UNLESS OTHERWISE SPECIFIED		CONTRACT NO.		RTS SYSTEMS		BURBANK, CALIFORNIA, USA	
	REMOVE ALL BURRS & BREAK SHARP EDGES		SERIES 300					
	HOLE TOLERANCES: .005		APPROVALS		DATE		WIRING DIAGRAM	
	AND .00411-1987, N1972		DRAWN		12-10-93		SPK/RMS 300 STANDARD, -L OPTION	
	DIMENSIONS ARE IN INCHES		J.WELDON				LOCAL POWER OPTION (-L)	
	TOLERANCES ARE:		CHECKED				FOOTSWITCH OPTION (-*A)	
	FRACTIONS		ISSUED				SIZE FSCM NO.	
	±.75						DWG NO.	
	DECIMALS						D 60572	
	±.005						WD2712	
	±.030						SCALE	
	±.010						D-2712/AXIS/RTS	
NEXT ASSY	USED ON						SHEET 1 OF 5	
APPLICATION								

REVISIONS			
ZONE	REV	DESCRIPTION	DATE
		SEE SHEET 1	

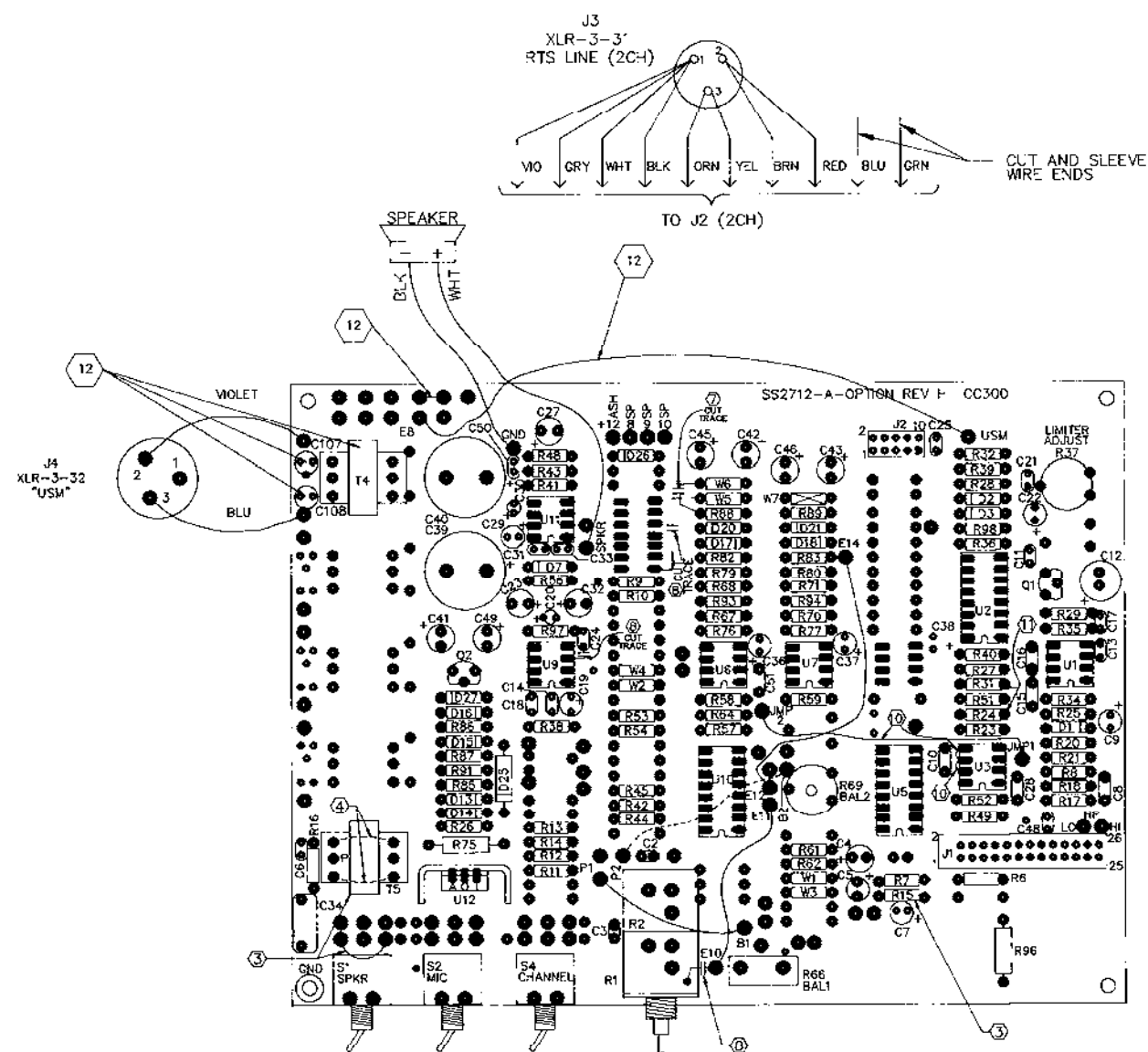


- ⑦ IN MODELS WITH -L OPTION S3 IS NOT USED, CUT AND SLEEVE WIRE ENDS.
- ⑥ S4 IS A 3 POSITION TOGGLE SWITCH, C AND K 7211 SPYABE.
- ⑤ FOR THE 3CH OPTION, MODIFY THE STANDARD CC-300 P.C. BOARD AS FOLLOWS: CUT 1 TRACE (CIRCUIT SIDE)
ADD R90 (220K), C47 (22μF/50V)
ADD 3 JUMPERS (CIRCUIT SIDE)
- ④ INSTALL JUMPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- ③ INSTALL JUMPER, T5(RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER AND 0.015, 0.007, 0.002 DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/16 .005 .001 30'		CONTRACT NO. SERIES 300		RTS SYSTEMS BURBANK, CALIFORNIA, USA	
APPROVALS DRAWN J.WELDON		DATE 12-10-90		WIRING DIAGRAM- SPK/RMS 300 3CH AND 3CH-L OPTIONS	
CHECKED		ISSUED		SIZE FSCM NO. DWG NO. REV D 60572 WD2712 AL	
MATERIAL		FINISH		SCALE W2712L02.DWG SHEET 2 OF	
NEXT ASSY		USED ON		APPLICATION	

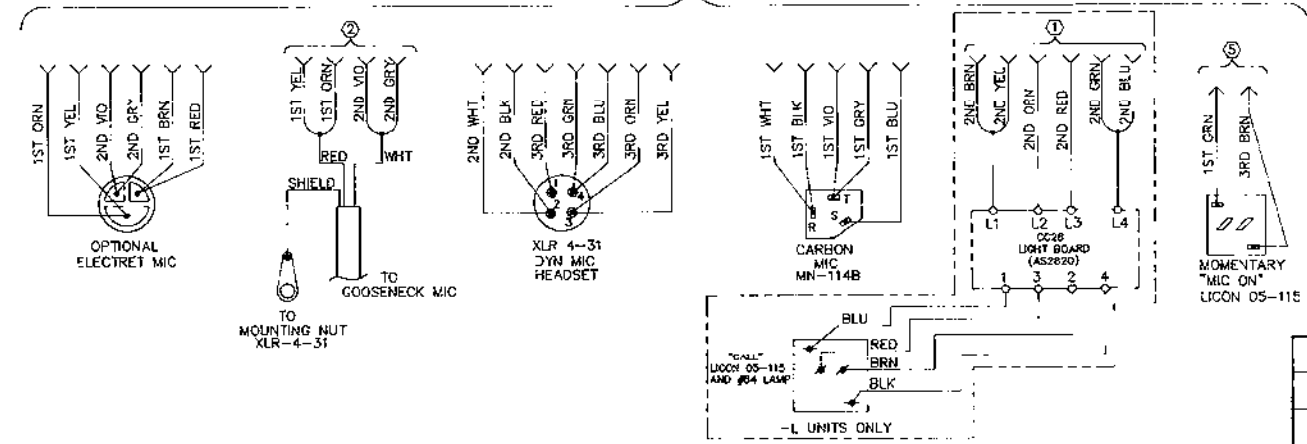
REVISIONS		DATE	APPROVED
ZONE/REV	DESCRIPTION		
	SEE SHEET ONE		



- ⑫ FOR -USMB (S):
- A) ADD: T4(LM9003), C107 AND C108(10/50 ELECT RADIAL), QTY 1 JUMPER, QTY 1 BUS WIRE.
 - B) BACK PANEL:
ELIMINATE "LOOP THRU" WIRES BETWEEN XLR-3-31 (RTS LINE) AND J4 (LOOP THRU).
ERASE "LOOP" FROM BACK PANEL. ENGRAVE "USM" INSTEAD. WIRE J4 AS SHOWN.

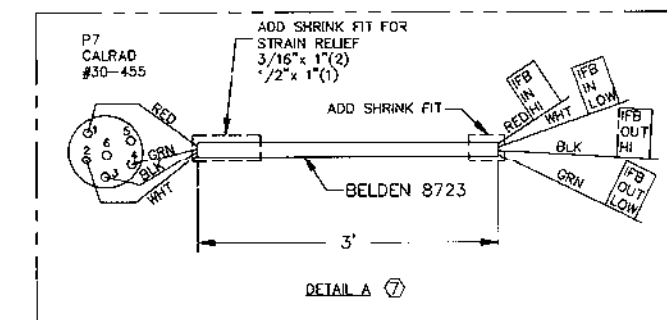
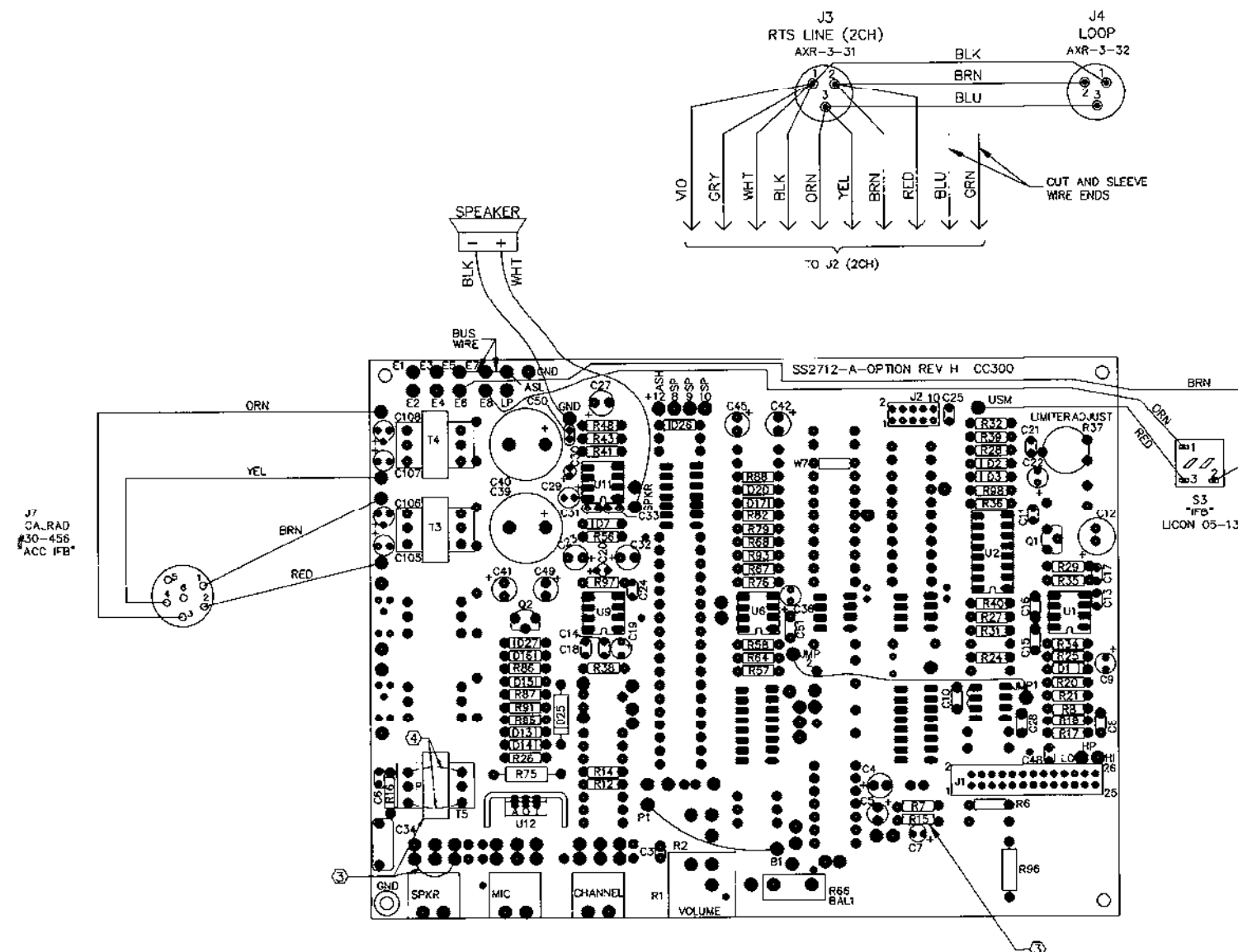
- ① CHECK VALUES OF R24 (SHOULD BE 22K), R31 (SHOULD BE 10K).
- ⑩ REMOVE JUMPER (3 PLACES) IF INSTALLED.
- 9. REMOVE R57 AND W7 IF INSTALLED.
- ⑧ CUT TRACE (3 PLACES) ON CIRCUIT SIDE FOR -DL OPTION.
- ⑦ CUT TRACE ON COMPONENT SIDE FOR -DL OPTION.
- 6. USE CC300 STUFFED WITH DUAL LISTEN OPTION PARTS (9030-3587-00).
- ⑤ IN MODELS WITH -L OPTION S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- ④ INSTALL JUMPERS IN PLACE OF T5 ON RMS 300 SERIES ONLY.
- ③ INSTALL JUMPER, T5(RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ② GOOSENECK M.C NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : UNLESS OTHERWISE SPECIFIED



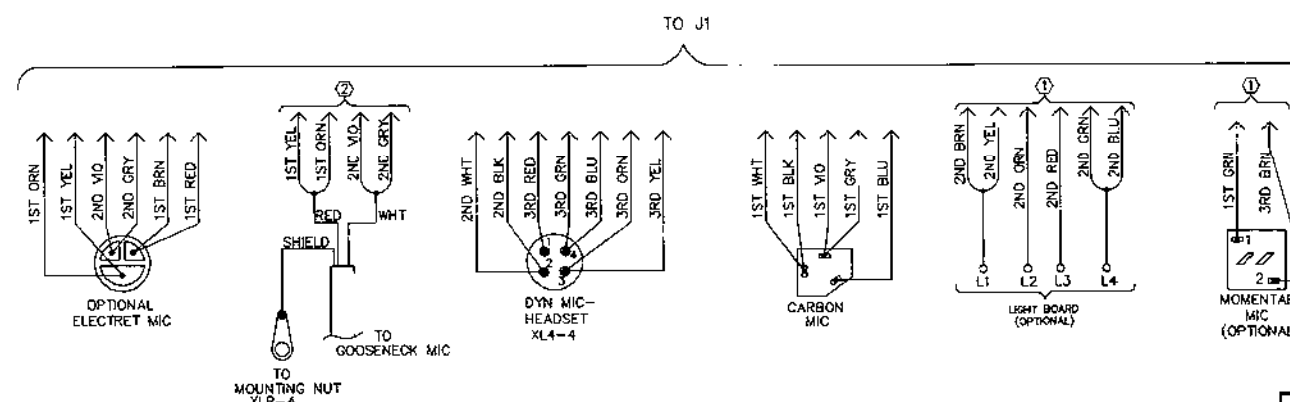
UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER ASTM B46.11-1987, R1972 DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ±1/16 ±0.005 ±30'		CONTRACT NO. SERIES 300		RTS SYSTEMS BURBANK, CALIFORNIA, USA	
APPROVALS		DATE		10-3-90	
DRAWN J. WELDON		CHECKED		ISSUED	
NEXT ASSY		USED ON		APPLICATION	
MATERIAL		FINISH		SCALE	
D. 60572		WD2712		SHEET 3	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
		SEE SHEET ONE		



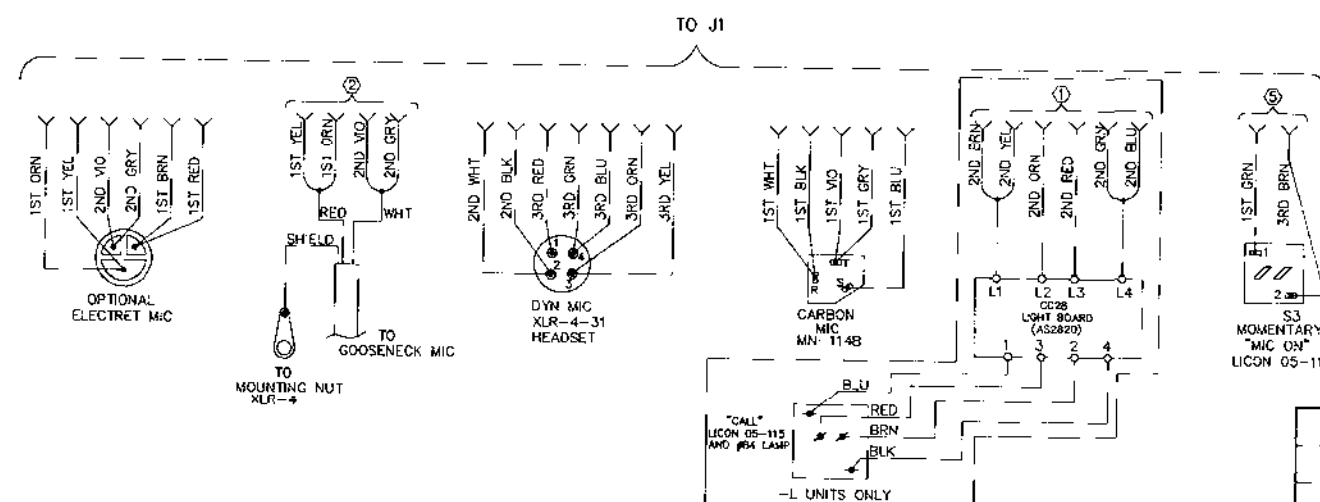
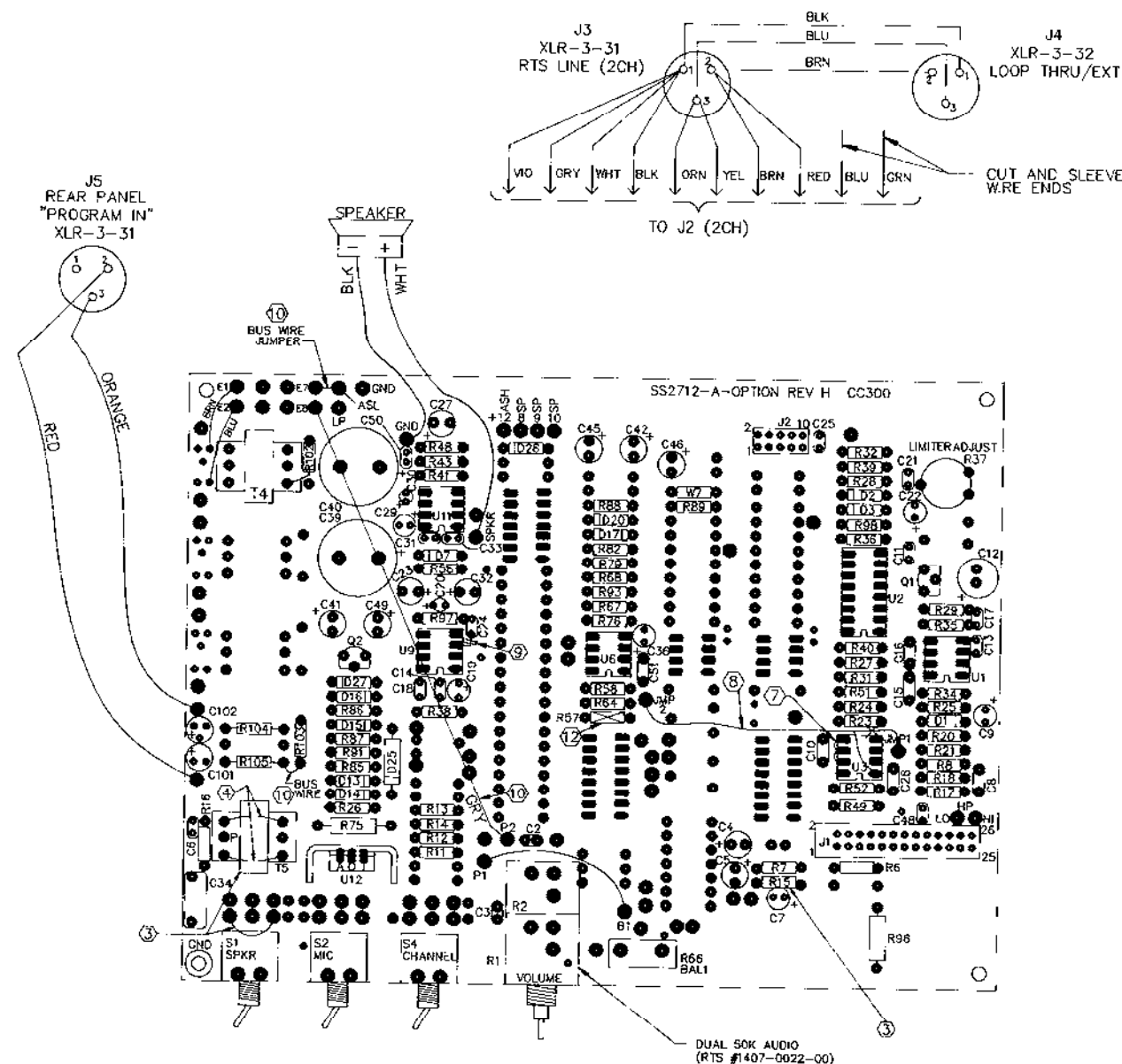
- ⑦ ASSEMBLE IFB OPTION CABLE AS SHOWN IN DETAIL A. PLUG P7 INTO J7.
- 6 FOR IFB OPTION, ADD THE FOLLOWING PARTS TO CC-300: T3, T4 (LM9003) C-05-C108 (10/50V RADIAL ELECTROLYTIC), BUS WIRE JUMPERS BETWEEN E5, E7 AND ASL.
- 5 FOR IFB OPTION: a) ADD J7, CALRAD #30-456, 6 PIN JACK TO REAR PANEL, WIRE AS SHOWN. b) ADD S3, LICON 05-135, MOMENTARY ACTION SWITCH, WIRE AS SHOWN. LENS CAP (WHITE) SHOULD BE ENGRAVED "IFB", TAKES NO LIGHT BULB.
- ④ INSTALL JUMPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- ③ INSTALL JUMPER, T5(RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD OR MOMENTARY MIC, CUT AND SLEEVE WIRE ENDS.

NOTES: UNLESS OTHERWISE SPECIFIED



UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER ANSI B91.1-1967, R1972 DIMENSIONS ARE IN INCHES (UNLESS OTHERWISE SPECIFIED) DECIMALS X .000 XX .000 XXX .010		CONTRACT NO. SERIES 300		RTS SYSTEMS BURBANK, CALIFORNIA, USA	
APPROVALS		DATE		WIRING DIAGRAM SPK/RMS 300-IFB	
DRAWN J. WELDON		11-28-90		REV AL	
CHECKED L. BROWN		11-30-90		SCALE	
ISSUED		SIZE FSCM NO. D160572		DWG NO. WD2712	
FINISH		H2712L04.DWG		SHEET 4 OF	
APPLICATION		NEXT ASSY		USED ON	

REVISIONS							
ZONE	REV	DESCRIPTION				DATE	APPROVE
	AM	ADD: NOTE 13; CHG. NOTE 6. ECO # 58672				28 FEB '94	MK
	AN	CHG: NOTE 13 SEE ECO		ECO #59128	JJJ	5-23-94	<i>[Signature]</i>

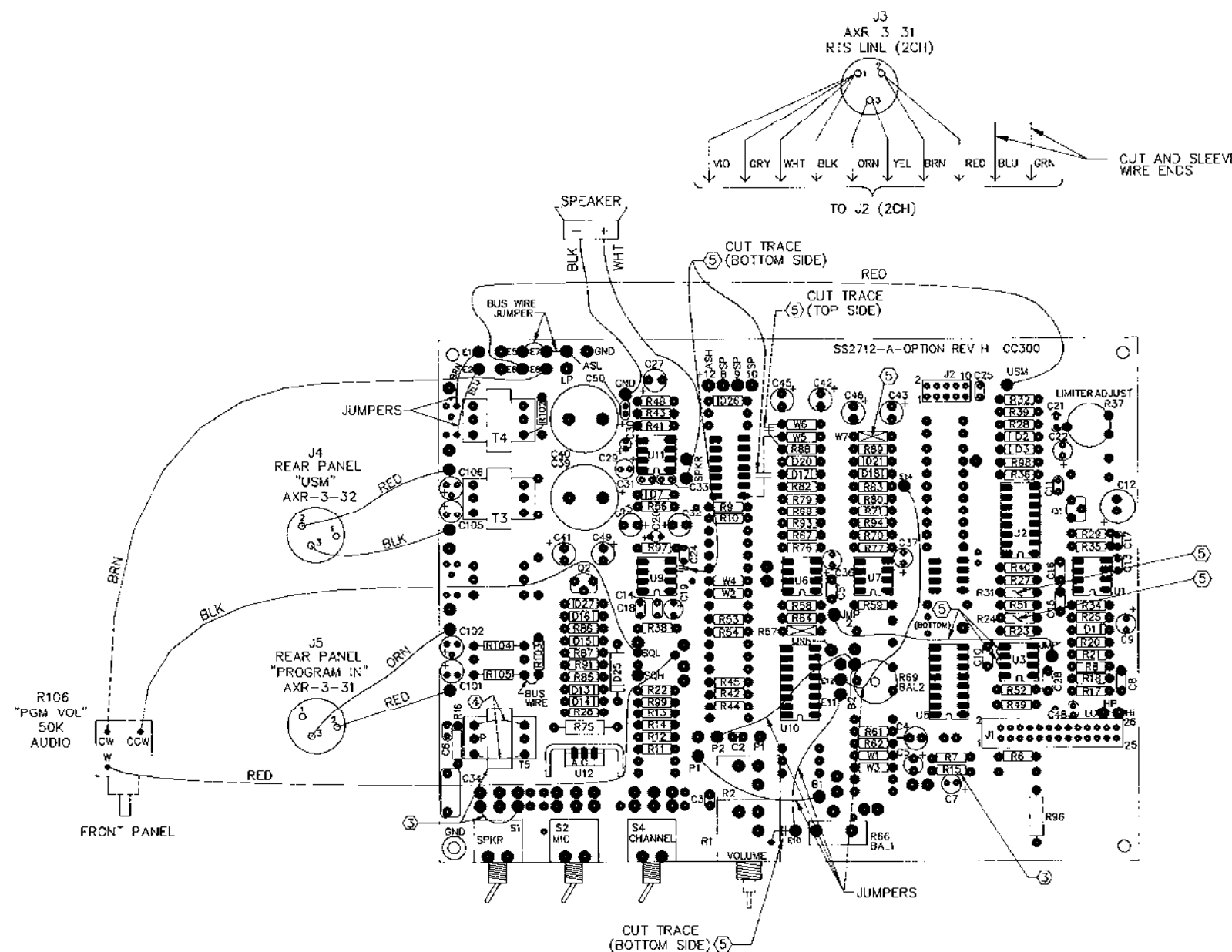


- ⑬ FOR PROGRAM INPUT LEVELS OF:
A) + 8 dB (BROADCAST) AND + 4 dB. USE CIRCUIT SHOWN. R103 (1K), R104: R105 (4.7K) (STANDARD CONFIGURATION);
B) 0 dB: DELETE R103.
C) -10dB (FACTORY STANDARD): DELETE R103, REPLACE R104, R105 WITH 0 OHM RESISTORS.
- ⑭ REMOVE R57 FOR PROGRAM INPUT (-C) OPTION.
- ⑮ FOR PROGRAM INPUT (-C) OPTION: ADD J5 TO REAR PANEL. WIRE AS SHOWN.
- ⑯ ADD JUMPER FOR PROGRAM INPUT (-C) OPTION.
- ⑰ CUT TRACE FOR PROGRAM INPUT (-C) OPTION. (CIRCUIT SIDE)
- ⑱ FOR PROGRAM INPUT (-C) OPTION: MOVE JUMPER FROM JMP1 & JMP2 TO U3-1 & JMP2.
- ⑲ FOR PROGRAM INPUT (-C) OPTION: REMOVE JUMPERS AT U3 PINS 5, 6 AND 7.
- ⑳ FOR PROGRAM INPUT (-C) OPTION: ADD C2(.1/50), C10(100pF), C18(.001/100), C28(22pF), C101 AND C102(10/50), R11 AND R13(47K), R23(150K), R49 & R102(10K), R51(100K), R52(22K), R103, R104, R105 (SEE NOTE 13), T4(42TMO18), U3(3558 AND 8-PIN SOCKET). CHANGE R1 FROM SINGLE TO DUAL POT, CHANGE R31 VALUE TO 10K.
- ㉑ IN MODELS WITH -L OPTION S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- ㉒ INSTALL JUMPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- ㉓ INSTALL JUMPER, T5(RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ㉔ GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ㉕ FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

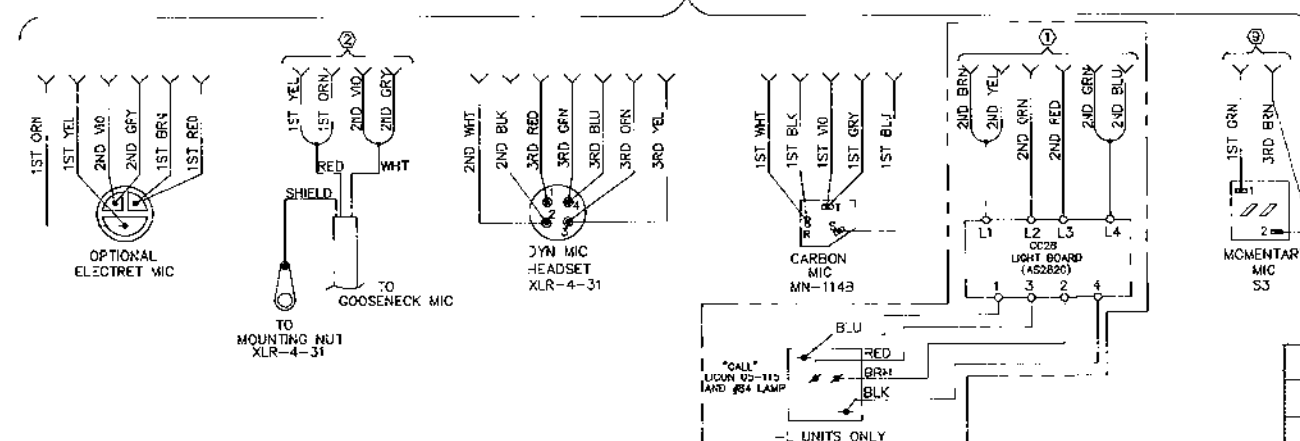
NOTES: UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES FOR ANSI 98.11-1987, R1972 DIMENSIONS ARE IN INCHES FRACTIONS ARE DECIMALS 1/16 3/160 XX 1/32 XX 1/64		CONTRACT NO. SERIES 300	RTS SYSTEMS BURBANK, CALIFORNIA, USA	
APPROVALS J. WELDON	DATE 12-10-90	WIRING DIAGRAM- SPK/RMS 300 PROGRAM INPUT OPTION(C) (DO NOT USE WITH DL)		
CHECKED	ISSUED	SIZE D.160572	FSCM NO. WD2712	DWG NO. WD2712
NEXT ASSY	USED ON	FINISH	SCALE	W2712M06.DWG
APPLICATION		SHEET 6		

REVISIONS			
ZONE	REV	DESCRIPTION	DATE
AM	ADD: NOTE 10; CHG. NOTE 6. ECO # 58672		28 FEB '94 MK
AN	CHG: NOTE 10 SEL ECO ECO #59128	JJJ	5 23 94



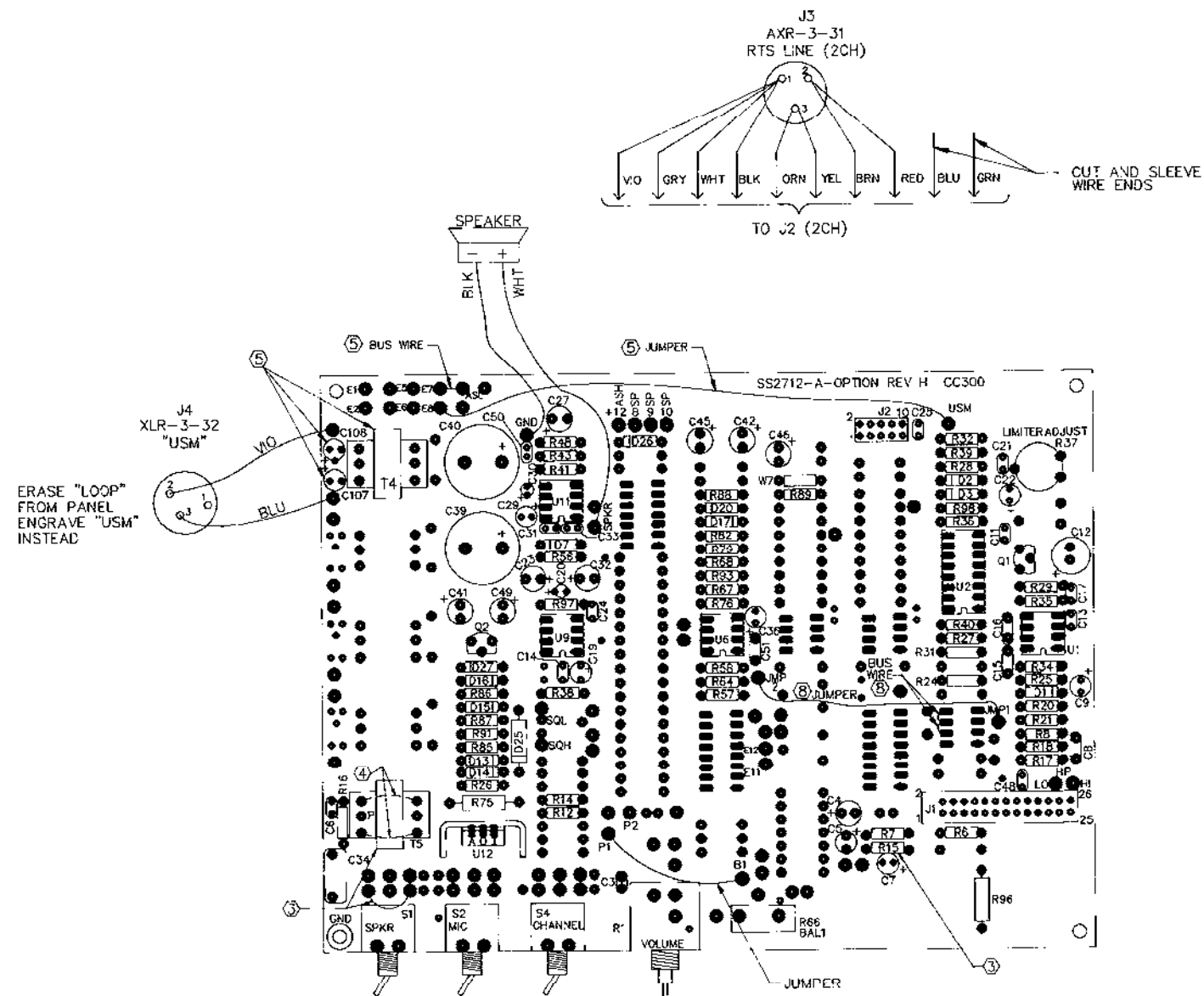
- ⑩ FOR PROGRAM INPUT LEVELS OF:
A) -8 dB (BROADCAST) AND +4dB, USE CIRCUIT SHOWN. R103 (1K), R104 & R105 (4.7K) (STANDARD CONFIGURATION).
B) 0 dB: DELETE R103.
C) -10 dB (FACTORY STANDARD); DELETE R103, REPLACE R104 AND R105 WITH 0 OHM RESISTORS.
- ⑨ IN MODELS WITH -L OPTION, S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
8. FOR LABEL INFORMATION ON RMS300-BCS (DUAL LISTEN, PROGRAM INPUT, AND UNSWITCHED MIC) SEE DRAWING FD6166.
- ⑦ FOR UNSWITCHED MIC OPTION WHEN PROGRAM INPUT OPTION IS PRESENT: ADD T3(LM9003), C105 AND C106 (10uF/50V ELEC), 24 AWG RED WIRE JUMPER (E6 TO USM) ON BOTTOM SIDE OF BOARD, 22 AWG BUS WIRE (E5 TO E7) ON BOTTOM SIDE OF BOARD. USE J4 (LOOP CONN) WITH TWO 24 AWG WIRE JUMPERS (J4-2 TO C106 AND J4-3 TO C105). FOR THE USM CONNECTOR (J4) ERASE "LOOP/EXT" AND ADD LABEL "USM" (SEE NOTE 8).
6. FOR PROGRAM INPUT OPTION WHEN DUAL LISTEN OPTION IS PRESENT: ADD T4(MOUSE 42TM018), C101 AND C102 (10uF/50V ELEC), R22 & R99(47K), R102(10K), R103, R104, R105 (SEE NOTE 10). 50K AUDIO POT (THIS PGM VOL POT IS MOUNTED ON THE FRONT PANEL) WITH THREE 24 AWG WIRE JUMPERS (CW OF PGM VOL TO E8, CCW OF PGM VOL POT TO SQL, AND W OF PGM VOL POT TO WIPER OF R30) ON THE TOP SIDE OF THE BOARD. ADD 22 AWG BUS WIRE (E7 TO ASL, R103 TO R105) ON BOTTOM SIDE OF THE BOARD. ADD J5(3-PIN FEM XLR CONN) WITH TWO 24 AWG WIRES (J5-2 TO C101 AND J5-3 TO C102) ON THE TOP SIDE OF THE BOARD. ADD JUMPERS FROM C107(-) PAD TO E2 & FROM C108(-) PAD TO E1 (BOTTOM SIDE OF BOARD).
- ⑤ FOR DUAL LISTEN OPTION: CUT ONE TRACE (W6 TO R88) ON THE TOP SIDE OF THE BOARD. CUT THREE TRACES (U9-3 TO C24, U4-1 TO W5, E10 TO E9) ON THE BOTTOM SIDE OF THE BOARD. REMOVE R57 AND W7. REMOVE THREE JUMPERS (JMP1 TO JMP2, U3-5 TO U3-6, AND U3-6 TO U3-7) ON BOTTOM SIDE OF THE BOARD. CHANGE R24 TO 22K, 1/4W, 5% AND R31 TO 10K, 1/4W, 5%. ADD DUAL LISTEN OPTION COMPONENTS PER PARTS LIST 9030358700.
- ④ ON RMS300 UNITS ONLY: TRANSFORMER T5 IS NOT INSTALLED. ADD TWO 24 AWG RED WIRE JUMPERS IN PLACE OF T5 ON BOTTOM SIDE OF THE BOARD AS SHOWN.
- ③ ON SPK300 UNITS ONLY: INSTALL JUMPER ACROSS S1. INSTALL TRANSFORMER T5(RTS #230600600), AND REMOVE RESISTOR R15.
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES. CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.



NOTES : UNLESS OTHERWISE SPECIFIED

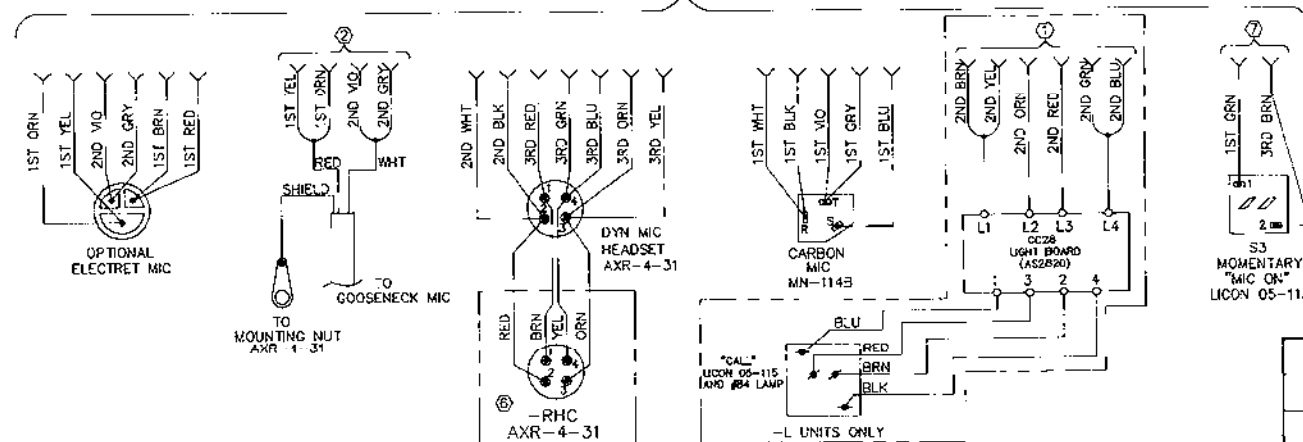
UNLESS OTHERWISE SPECIFIED: REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER ANSI B91.1-1987, R1912 DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES 2/1/16 .001 .001 .001		CONTRACT NO. SERIES 300		RTS SYSTEMS SUNBANK, CALIFORNIA, USA	
APPROVALS		DATE		WIRING DIAGRAM— SPK/RMS 300-B(DUAL LISTEN) -C (PROGRAM INPUT) -S (USMB), -BCL	
DRAWN J.WELDON		12-10-90		SIZE FSCM NO. D.60572	
CHECKED		ISSUED		DWG NO. WD2712	
NEXT ASSY		USED ON		SCALE W2712M07.DWG	
APPLICATION				SHEET 7	

REVISIONS		DATE	APPROVED
ZONE	REV	DESCRIPTION	
AM	8	ADD NOTE 8; ADD BALLOONS 5 & 8 ECO# 57173	KS
		2-17-93	



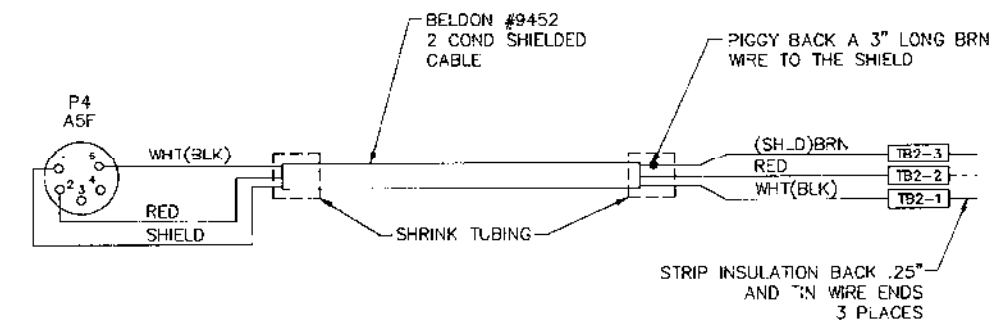
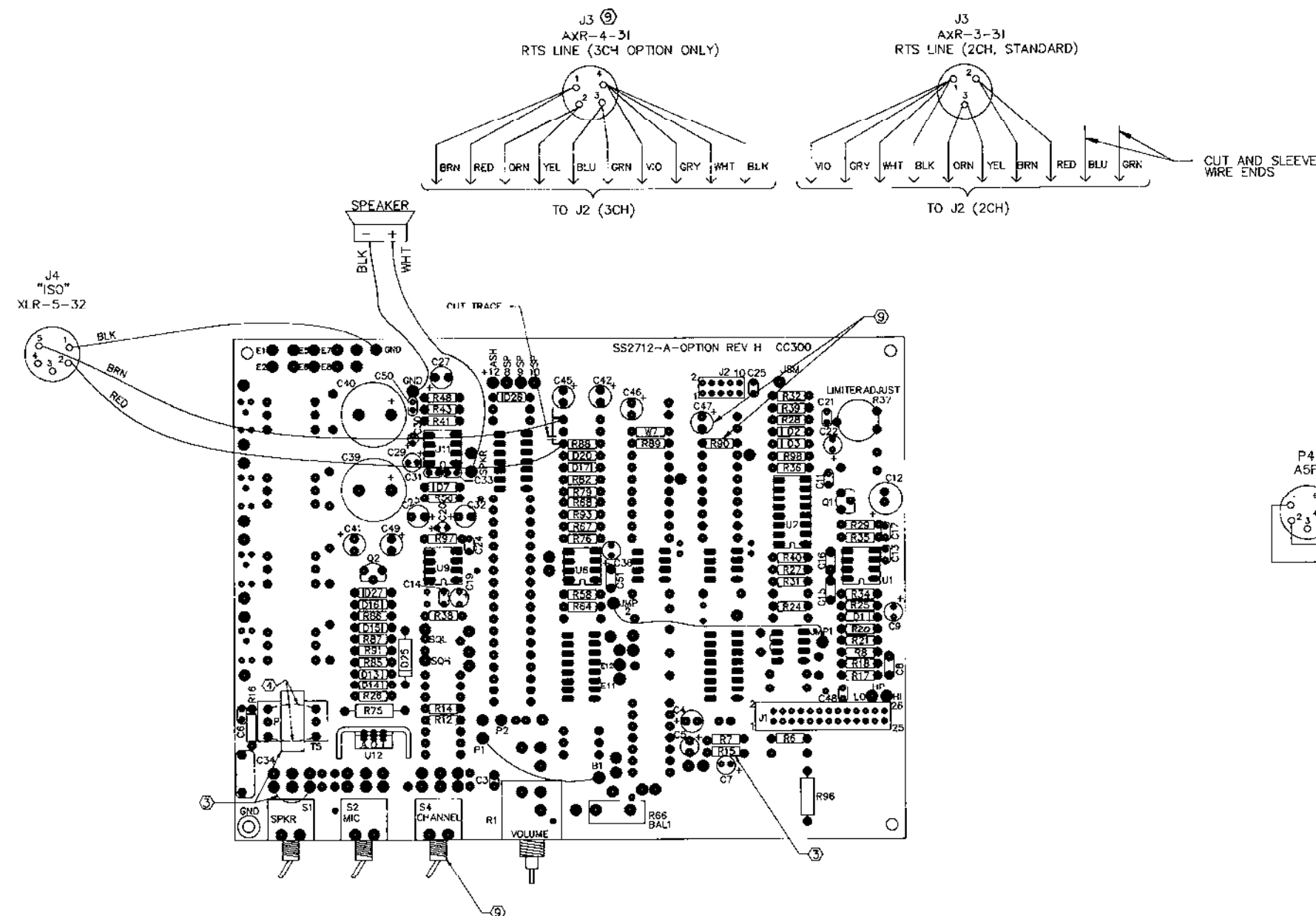
- ⑤ INSTALL QTY. 1 JUMPER AND QTY. 2 BUS WIRES FOR S AND -M ONLY.
- ⑦ IN MODELS WITH -L OPTION, S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- ⑥ FOR RHC OPTION (*M), ADD J5 (XLR-4-31) IN THE BACK PANEL. ERASE PROGRAM INPUT AND LABEL "REMOTE HEADSET" WIRE TO THE FRONT PANEL AS SHOWN.
- ⑤ FOR -USMB (S):
a) ADD: T4 (LM9003), C107 AND C108 (0.50 ELFC" RADIAL), QTY 1 JUMPER, QTY 1 BUS WIRE.
b) BACK PANEL:
ELIMINATE "LOOP THRU" WIRES BETWEEN XLR-3-31 (RTS LINE) AND J4 (LOOP THRU). ERASE "LOOP" FROM BACK PANEL. ENGRAVE "USM" INSTEAD. WIRE J4 AS SHOWN.
- ④ INSTALL JUMPER IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- ③ INSTALL JUMPER AND REMOVE R15 ON SPK-300 SERIES ONLY. ADD T5 (RTS#2306-0006-00).
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : UNLESS OTHERWISE SPECIFIED



UNLESS OTHERWISE SPECIFIED		CONTRACT NO.		SERIES 300		RTS SYSTEMS		BURBANK, CALIFORNIA, USA	
TOLERANCES PER ANSI Y14.1-1987, R10.2 UNLESS OTHERWISE SPECIFIED		APPROVALS		DATE		DRAWN		J. WELDON	
TOLERANCES ARE: FRACTIONS X 1/16 X 1/32 X 1/64 X 1/128 X 1/256 X 1/512 X 1/1024 X 1/2048 X 1/4096 X 1/8192 X 1/16384 X 1/32768 X 1/65536 X 1/131072 X 1/262144 X 1/524288 X 1/1048576 X 1/2097152 X 1/4194304 X 1/8388608 X 1/16777216 X 1/33554432 X 1/67108864 X 1/134217728 X 1/268435456 X 1/536870912 X 1/1073741824 X 1/2147483648 X 1/4294967296 X 1/8589934592 X 1/17179869184 X 1/34359738368 X 1/68719476736 X 1/137438953472 X 1/274877906944 X 1/549755813888 X 1/1099511627776 X 1/2199023255552 X 1/4398046511104 X 1/8796093022208 X 1/17592186044416 X 1/35184372088832 X 1/70368744177664 X 1/140737488355328 X 1/281474976710656 X 1/562949953421312 X 1/1125899906842624 X 1/2251799813685248 X 1/4503599627370496 X 1/9007199254740992 X 1/18014398509481984 X 1/36028797018963968 X 1/72057594037927936 X 1/144115188075855872 X 1/288230376151711744 X 1/576460752303423488 X 1/1152921504606846976 X 1/2305843009213693952 X 1/4611686018427387904 X 1/9223372036854775808 X 1/18446744073709551616 X 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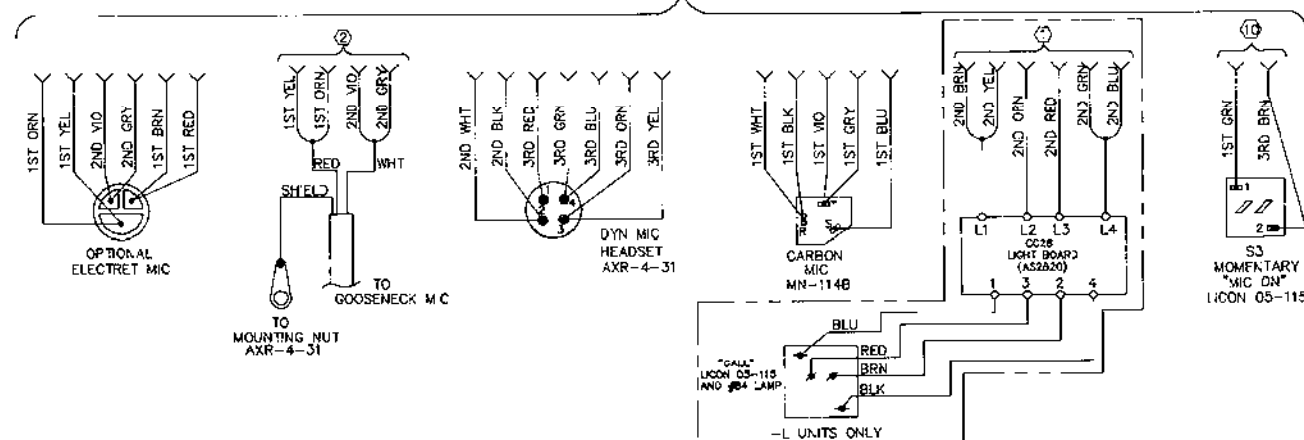
REVISIONS		DATE	APPROVED
ZONE/REV	DESCRIPTION		
	SEE SHEET 1		



DETAIL A

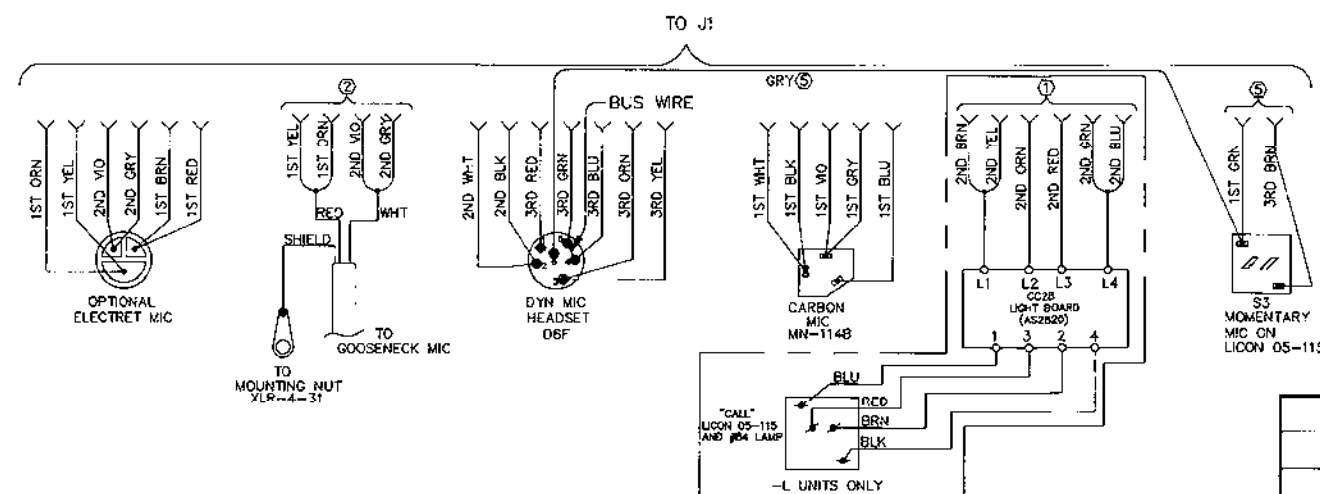
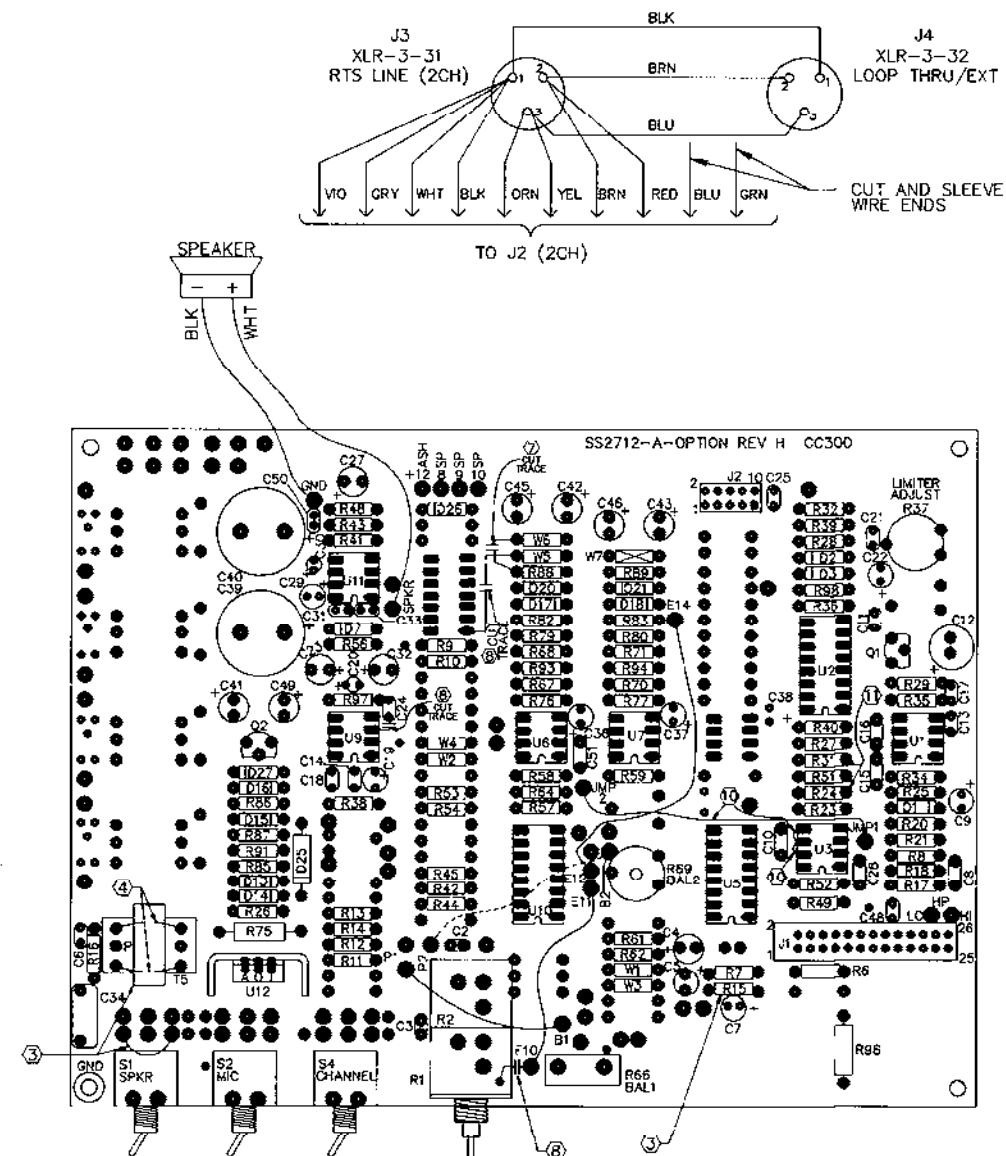
- ⑩ IN MODELS WITH -L OPTION, S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- ⑨ FOR UNITS WITH -3CH (A) OPTION ONLY:
- J3 IS AN AXR-4-31 CONNECTOR
 - S4 IS A 3-POSITION SWITCH (RTS#1903-0059-00)
 - R90(100K) AND C47(22JF/50V) ARE ADDED
8. THIS DRAWING DOES NOT APPLY TO UNITS WHICH ALSO INCLUDE THE -DL (B) OPTION.
- ⑦ MAKE UP A 3FT LONG CABLE AS SHOWN IN DETAIL A. MAKE WIRE LABELS "TB2-1", "TB2-2" AND "TB2-3" USING 8pt HELVETICA LIGHT, B.LK ON CLEAR TAPE. PLUG CONNECTOR INTO THE "ISO" CONNECTOR ON THE BACK PANEL.
- ⑥ USE AN XLR-5-32 FOR THE "ISO" CONNECTOR. WIRE AS SHOWN.
5. DELETE SILKSCREEN "LOOP/EXT" FROM BACK PANEL. COVER WITH LABEL "ISO". (MAKE "ISO" LABEL WITH KROY TYPE, 8pt. HELVETICA LIGHT.)
- ④ INSTALL JUMPERS IN PLACE OF "TS ON RMS-300 SERIES ONLY.
- ③ INSTALL JUMPER, T5 (RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : UNLESS OTHERWISE SPECIFIED



		UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER ANSI B94.11-1987, R1972 DIMENSIONS ARE IN THOUS FRACTIONS DECIMALS ANGLES 1/16 .001 1/8 .005 1/4 .010 1/2 .020 3/4 .030 .0004 .010 1/32		CONTRACT NO. SERIES 300		RTS SYSTEMS BURBANK, CALIFORNIA, USA	
		MATERIAL		APPROVALS		DATE	
				DRAWN J. WELDON		2-10-90	
				CHECKED		WIRING DIAGRAM- MODELS: SPK/RMS300-V(+B), SPK/RMS300-VI-L(+BL), SPK/RMS300-3CH-VI(+B), SPK/RMS300-3CH-VI-L(A+B.)	
NEXT ASSY		USED ON		ISSUED		SIZE FSCM NO. DWG NO. REV	
		FINISH				D 60572 WD2712 AL	
APPLICATION						SCALE --- W2712L09.DWG SHEET 9 OF 9	

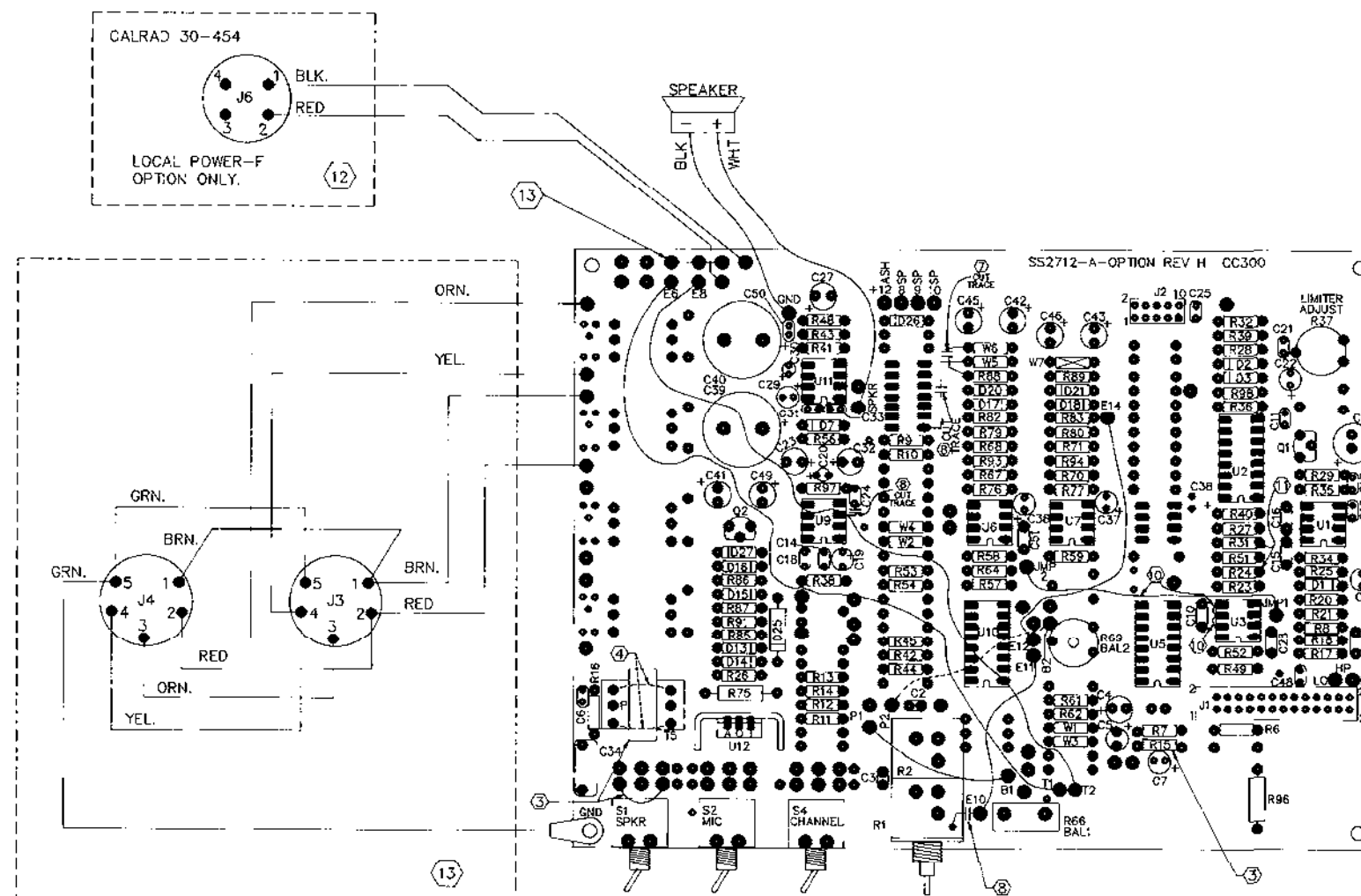
REVISIONS			
ZONE	REV	DESCRIPTION	DATE
		SEE SHEET ONE	
APPROVED			



- ① CHECK VALUES OF R24 (SHOULD BE 22K), R31 (SHOULD BE 10K).
- ⑩ REMOVE JUMPER (3 PLACES) IF INSTALLED.
9. REMOVE R57 AND W7 IF INSTALLED.
- ⑧ CUT TRACE (3 PLACES) ON CIRCUIT SIDE FOR -DL OPTION.
- ⑦ CUT TRACE ON COMPONENT SIDE FOR -DL OPTION.
6. USE CC300 STUFFED WITH DUAL LISTEN OPTION PARTS (9030-3587-00).
- ⑤ IN MODELS WITH -L OPTION S3 IS NOT USED. CUT AND SLEEVE 3RD BRN WIRE. WIRE 1ST GRN TO PIN 6 OF D6F CONNECTOR AND DELETE GRY WIRE.
- ④ INSTALL JUMPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- ③ INSTALL JUMPER, T5(K15#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- ② GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

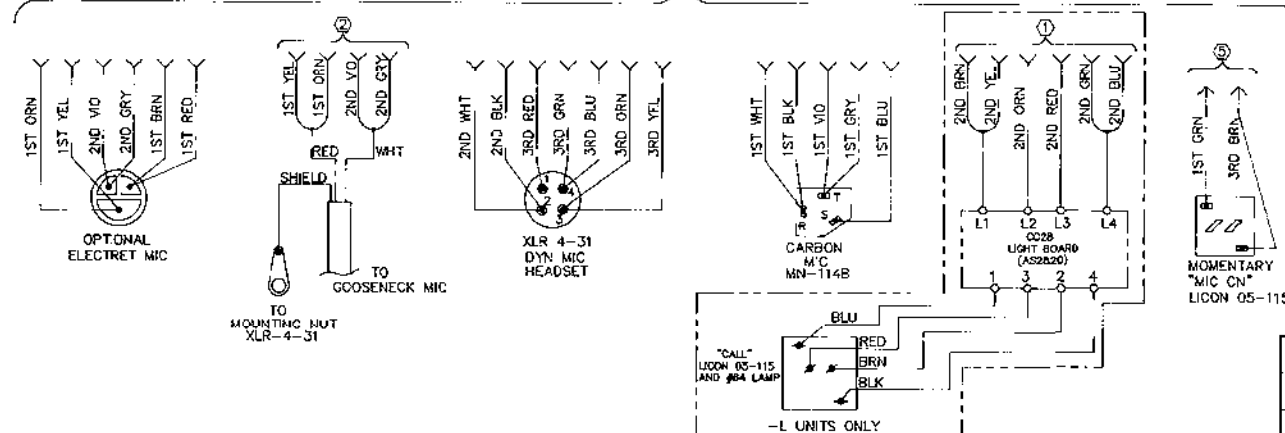
NOTES : UNLESS OTHERWISE SPECIFIED

UNLESS OTHERWISE SPECIFIED REMOVE ALL BURS & BREAK SHARP EDGES HOLE DIMENSIONS PER ASTM B44.11-1967, R1972 DIMENSIONS ARE IN INCHES FRACTIONS ARE: 1/16 DECIMALS X .005 X .010 X .001 .010		CONTRACT NO. SERIES 300		RTS SYSTEMS BURBANK, CALIFORNIA, USA	
NEXT ASSY		USED ON		APPROVALS	DATE
APPLICATION				DRAWN J.WELDON	10-3-90
				CHECKED	
				ISSUED	
				SIZE	FSCM NO.
				DWG NO.	REV
				SCALE	W2712L10.DWG
				SHEET 10 OF	1



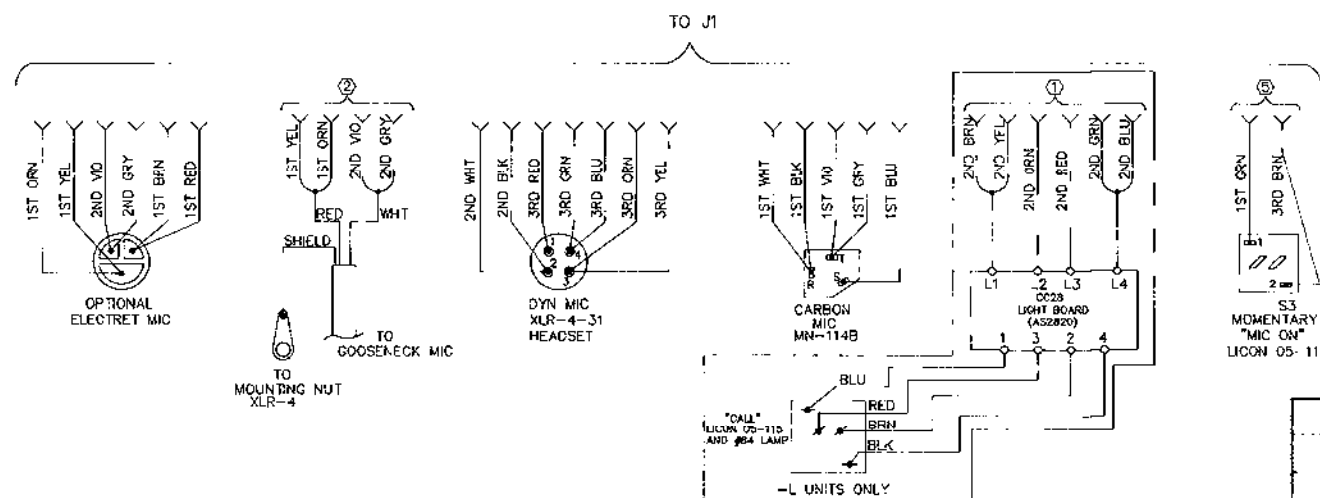
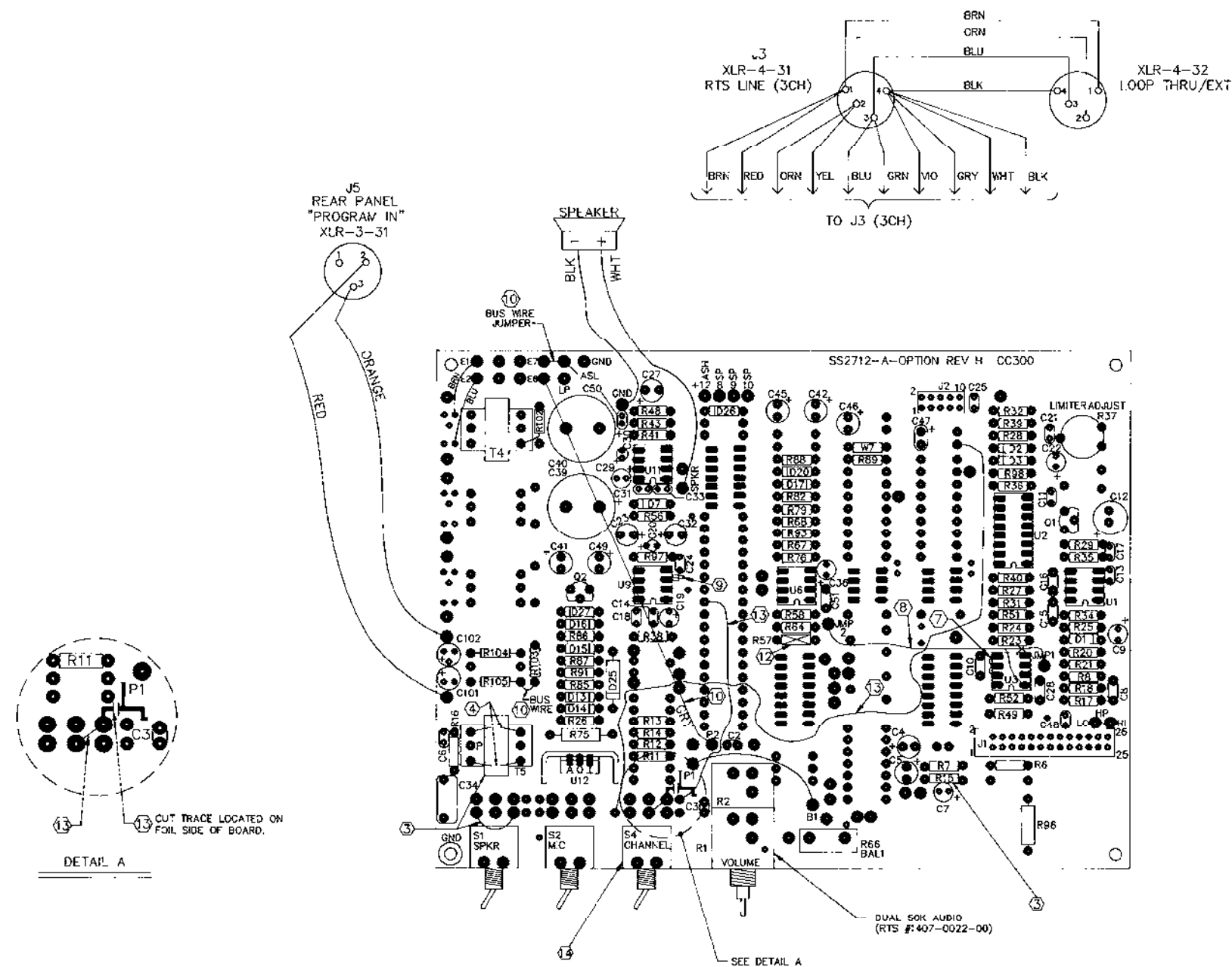
15. CONNECT T1 TO E6 AND T2 TO E8.
14. CONNECT J3 AND J4 AS SHOWN.
13. SHORT E5 AND E7 AND ASL WITH BUS WIRE FOR 2 WIRE BALANCED OPTION.
12. FOR LOCAL POWER OPTION: REMOVE D26, ADD J6 TO THE P.C.B. AS SHOWN.
11. CHECK VALUES OF R24 (SHOULD BE 22K), R31 (SHOULD BE 10K).
10. REMOVE JUMPER (3 PLACES) IF INSTALLED.
9. REMOVE R57 AND W7 IF INSTALLED.
8. CUT TRACE (3 PLACES) ON CIRCUIT SIDE FOR -DL OPTION.
7. CUT TRACE ON COMPONENT SIDE FOR -DL OPTION.
6. USE CC300 STUFFED WITH DUAL LISTEN OPTION PARTS (9030-3587-00).
5. IN MODELS WITH -L OPTION S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
4. INSTALL JUMPPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
3. INSTALL JUMPER, T5(RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
2. GOOSENECK MIC NOT USED ON SPK-300 SERIES. CUT AND SLEEVE WIRE ENDS.
1. FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : UNLESS OTHERWISE SPECIFIED



UNLESS OTHERWISE SPECIFIED		CONTRACT NO.		RTS SYSTEMS	
REMOVE ALL BURRS & BREAK SHARP EDGES		SERIES 300		BURLINGAME, CALIFORNIA, USA	
FRACTIONS ARE IN INCHES		APPROVALS		DATE	
TOLERANCES ARE:		DRAWN		9-30-92	
FRACTIONS ARE:		CHECKED		10-05-92	
FRACTIONS ARE:		ISSUED			
MATERIAL		FINISH		SIZE	
NEXT ASSY		USED ON		FSCW NO.	
APPLICATION				DWG NO.	
				WD2712	
				SCALE	
				W2712A12.DWG	
				SHEET 12 OF	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	A	RELEASE TO MFG. ECO# 57100		KS
	B	ADD: NOTE 15; CHG. NOTE 6. ECO # 58672	28 FEB '94	MMK
	C	CHG: NOTE 15 SEE ECO ECO #59128	5-23-94	MMK

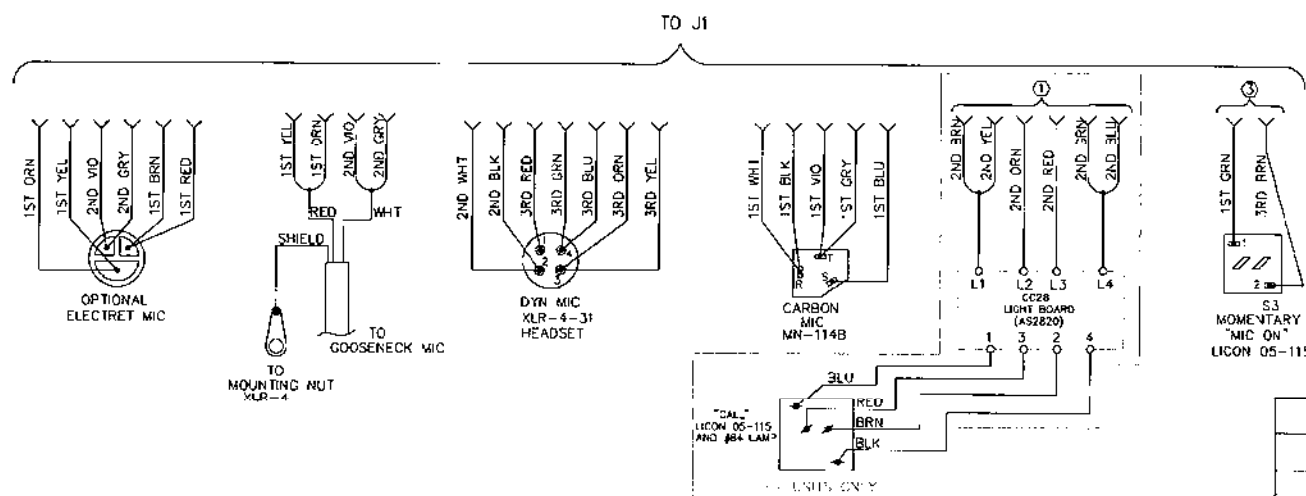
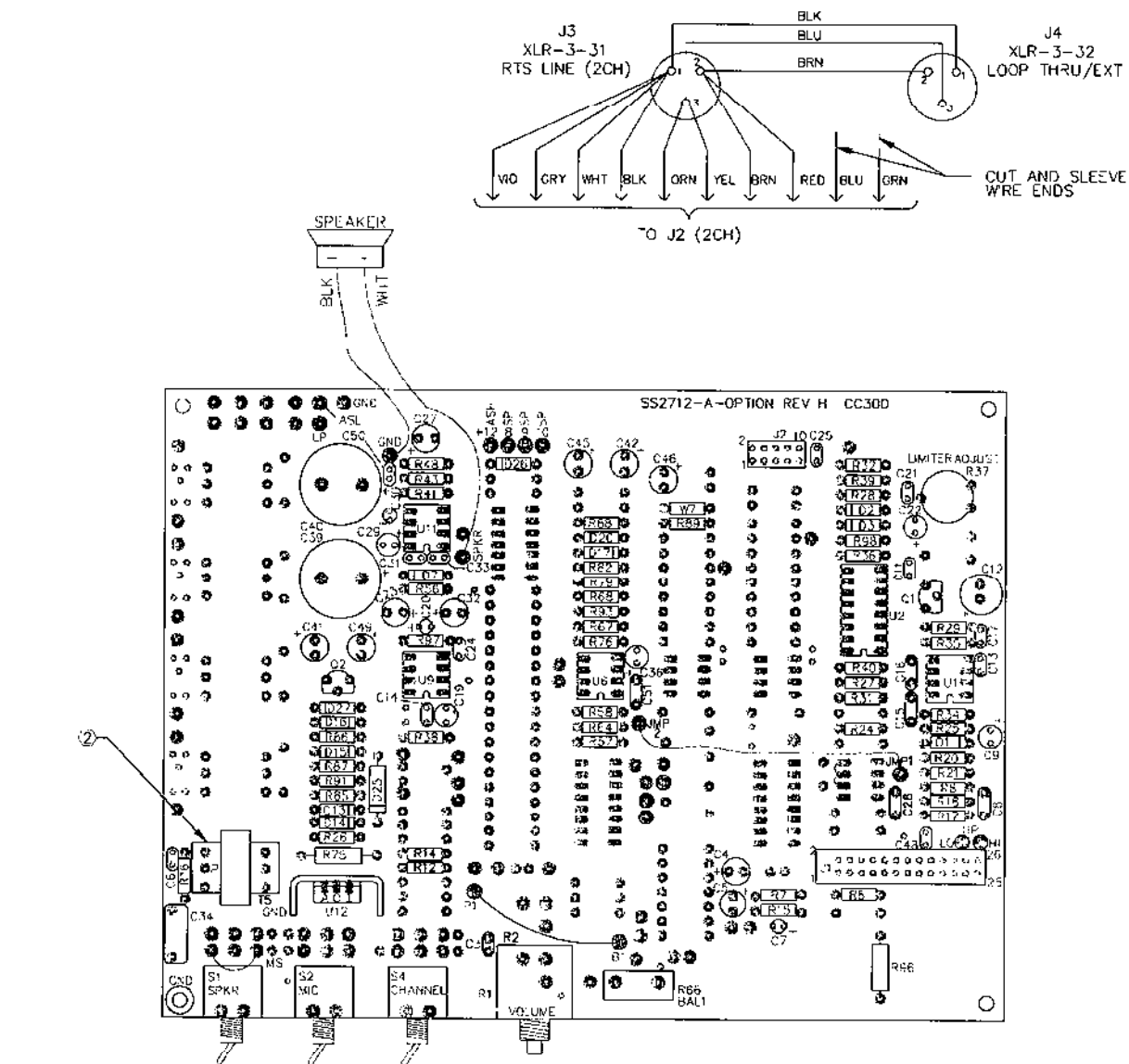


- 15) FOR PROGRAM INPUT LEVELS OF:
A) +8 dB (BROADCAST) AND +4 dB, USE CIRCUIT AS SHOWN. R103 {1K}, R104, & R105 {4.7} (STANDARD CONFIGURATION):
B) 0 dB: DELETE R103.
C) -10 dB (FACTORY STANDARD): DELETE R103, REPLACE R104, & R105 WITH 0 OHM RESISTORS.
- 14) S4 IS A 3 POSITION TOGGLE SWITCH, C AND K 7211 SPYABE.
- 13) FOR THE 3CH OPTION, MODIFY THE STANDARD CC-300 P.C. BOARD AS FOLLOWS: CUT 1 TRACE (CIRCUIT SIDE).
ADD R90 (220K), C47 {22uF/50V}.
ADD 3 JUMPERS (CIRCUIT SIDE).
- 12) REMOVE R57 FOR PROGRAM INPUT {-C} OPTION.
11. FOR PROGRAM INPUT{-C} OPTION: ADD J5 TO REAR PANEL. WIRE AS SHOWN.
- 10) ADD JUMPER FOR PROGRAM INPUT{-C} OPTION.
- 9) CUT TRACE FOR PROGRAM INPUT{-C} OPTION. (CIRCUIT SIDE)
- 8) FOR PROGRAM INPUT{-C} OPTION: MOVE JUMPER FROM JMP1 & JMP2 TO U3-1 & JMP2.
- 7) FOR PROGRAM INPUT{-C} OPTION: REMOVE JUMPERS AT U3 PINS 5,6 AND 7.
- 6) FOR PROGRAM INPUT{-C} OPTION: ADD C2(.1/50), C10(100pF), C18(.001/100), C28(22pF), C101 AND C102(10/50), R11 AND R13(47K), R23(150K), R49 & R102(10K), R51(100K), R52(22K), R103, R104, R105 (SEE NOTE 15), T4(42TM018), U3(3558 AND 8-PIN SOCKET). CHANGE R1 FROM SINGLE TO DUAL POT, CHANGE R3: VALUE TO 10K.
- 5) IN MODELS WITH -L OPTION S3 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- 4) INSTALL JUMPERS IN PLACE OF T5 ON RMS-300 SERIES ONLY.
- 3) INSTALL JUMPER, T5(RTS#2306-0006-00) AND REMOVE R15 ON SPK-300 SERIES ONLY.
- 2) GOOSENECK MIC NOT USED ON SPK-300 SERIES, CUT AND SLEEVE WIRE ENDS.
- 1) FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES : UNLESS OTHERWISE SPECIFIED

05-115		UNLESS OTHERWISE SPECIFIED: REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER ANSI B91.11-1987, R1992 DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ±1/16 ±.000 ±.001 ±.030 ±.002 ±.010		CONTRACT NO. SERIES 300		RTS SYSTEMS		BURENKA, CALIFORNIA, USA	
		APPROVALS		DATE		DRAWING DIAGRAM			
		DRAWN		1-29-83		SPK/RMS 300 PROGRAM INPUT OPTION(C)			
		K.S.				(DO NOT USE WITH DL), 3CH OPTION (A)			
		CHECKED							
		ISSUED							
MATERIAL						SIZE		FSCM NO.	
						D 160572		DWG NO.	
								WD2712	
NEXT ASSY		USED ON				SCALE --		W2712B1.3 DWG	
APPLICATION		FINISH						SHEET 13	

SHEET	REVISION	REVISIONS			DATE	APPROVED
		ZONE	REV	DESCRIPTION		
REV.	STATUS	A	RELEASE	ECO# 41123		



- ③ IN MODELS WITH -L OPTION 53 IS NOT USED. CUT AND SLEEVE WIRE ENDS.
- ② INSTALL T5(RTS#2306-006-00) ON SPK-300 SERIES ONLY.
- ① FOR MODELS WITHOUT LIGHT BOARD, CUT AND SLEEVE WIRE ENDS.

NOTES: UNLESS OTHERWISE SPECIFIED

05-115

		UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER MIL-STD-113, 1507, 11374 DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS .1/16 DECIMALS .005 ANGLES .30°	CONTRACT NO. SERIES 300		RTS SYSTEMS BURBANK, CALIFORNIA, USA	
			APPROVALS	DATE	WIRING DIAGRAM- SPK 300 L*G	
NEXT ASSY	USED ON	MATERIAL	DRAWN J.WELDON	12 10 30		
			CHECKED			
APPLICATION		FINISH	ISSUED		SIZE	FSCM NO.
					D 60572	WD2712
			SCALE		2 1/2" X 1 1/4" = 1" (15.000)	SHEET 15

