GLH-200

LOUDHAILER PLUS+ INTERCOM

INSTALLATION AND CONNECTION

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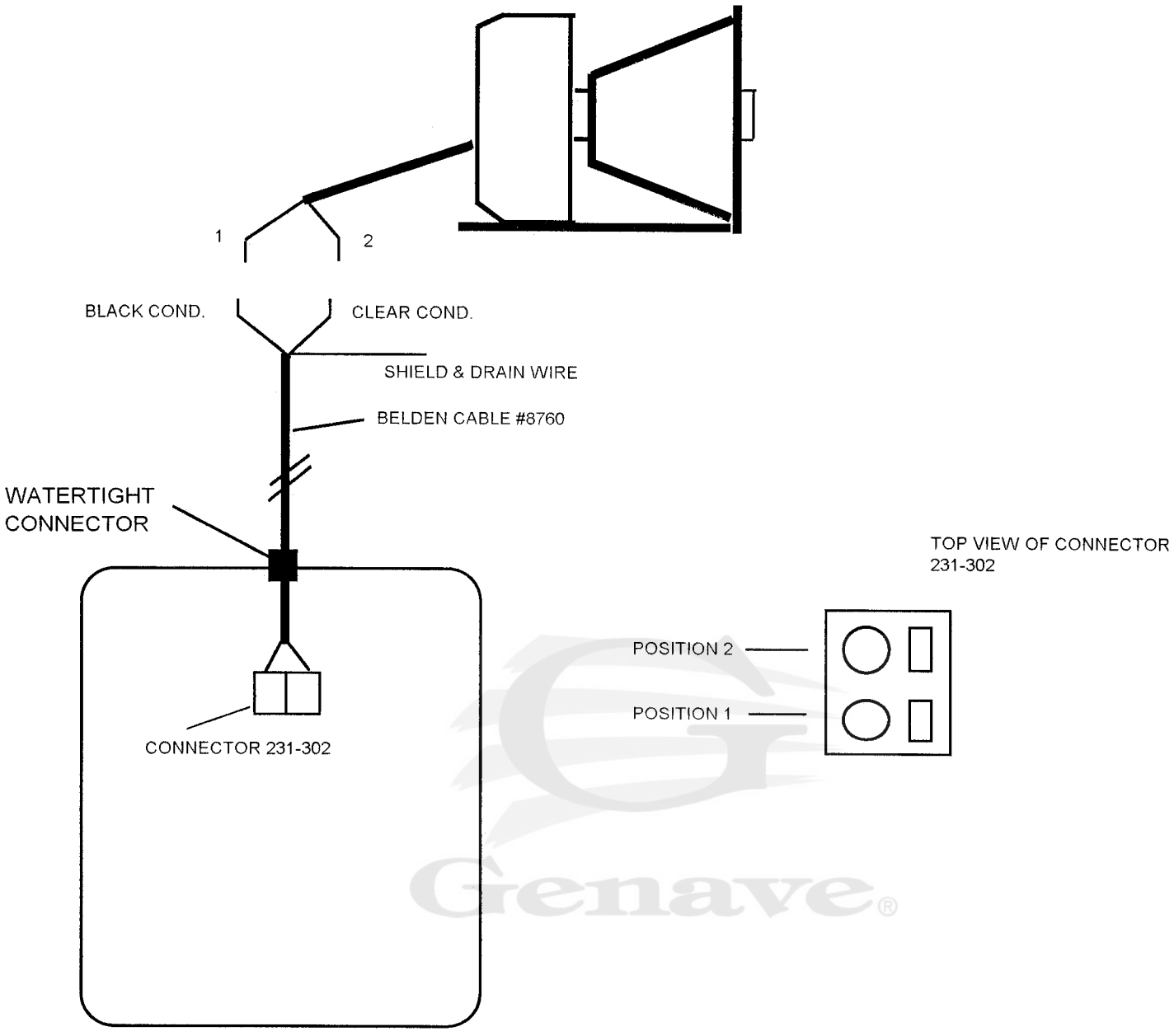
GLH200 SIREN DRIVER CONNECTION TO MASTER UNIT

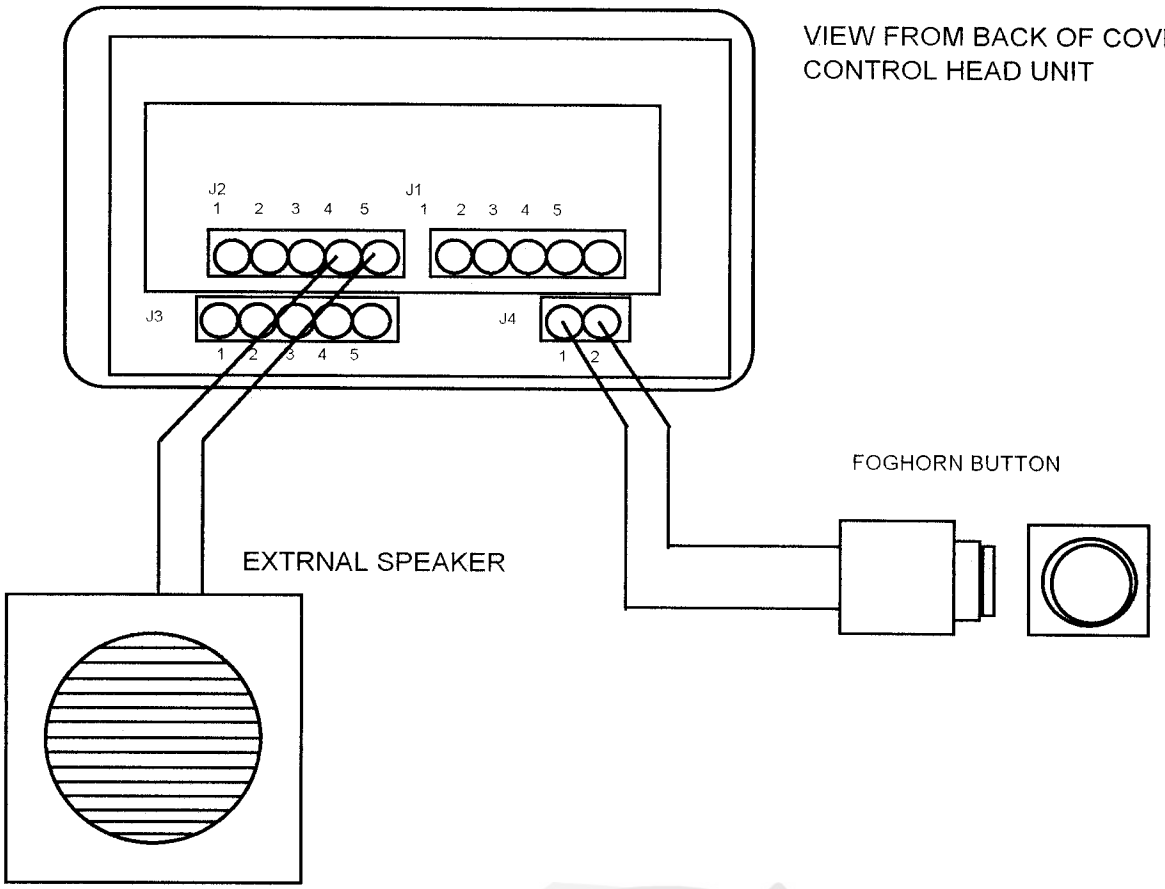


AT DRIVER:(1) MAKE CONNECTIONS ; BLACK TO 1, CLEAR TO 2. (2) ATTACH SHIELD/DRAIN WIRE TO VESSLE GROUND AT THE DRIVER END ONLY. DO NOT CONNECT SHIELD/DRAIN WIRE INSIDE OF MASTER UNIT.

AT MASTER UNIT: PASS CABLE THROUGH A WATER TIGHT CONNECTOR INTO THE CABINET. INSIDE THE CABINET, REMOVE THE EXTERNAL JACKET, FOIL SHIELD AND DRAIN WIRE TO WITHIN 1/2 " OF THE CONNECTOR. STRIP AND INSERT THE CLEAR AND BLACK WIRES INTO CONNECTOR 231-302. BLACK TO POSITION #1 CLEAR TO POSITION #2.

NOTE: REMOVE CONNECTOR 231-302 FROM HEADER BEFORE INSERTING OR REMOVING WIRES. STRAIN ON HEADER MAY CAUSE DAMAGE.

GLH200 CONTROL HEAD UNIT CONNECTION TO FOGHORN BUTTON AND SPEAKER

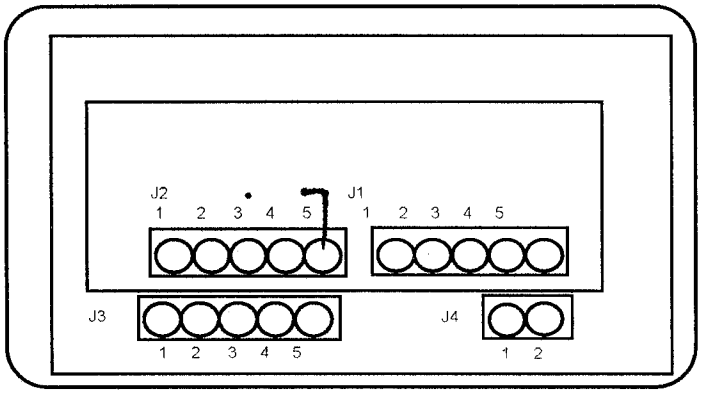


THE EXTERNAL SPEAKER IS CONNECTED TO J2 TERMINALS 4 AND 5

THE FOGHORN BUTTON IS CONNECTED TO J4 TERMINALS 1 AND 2.

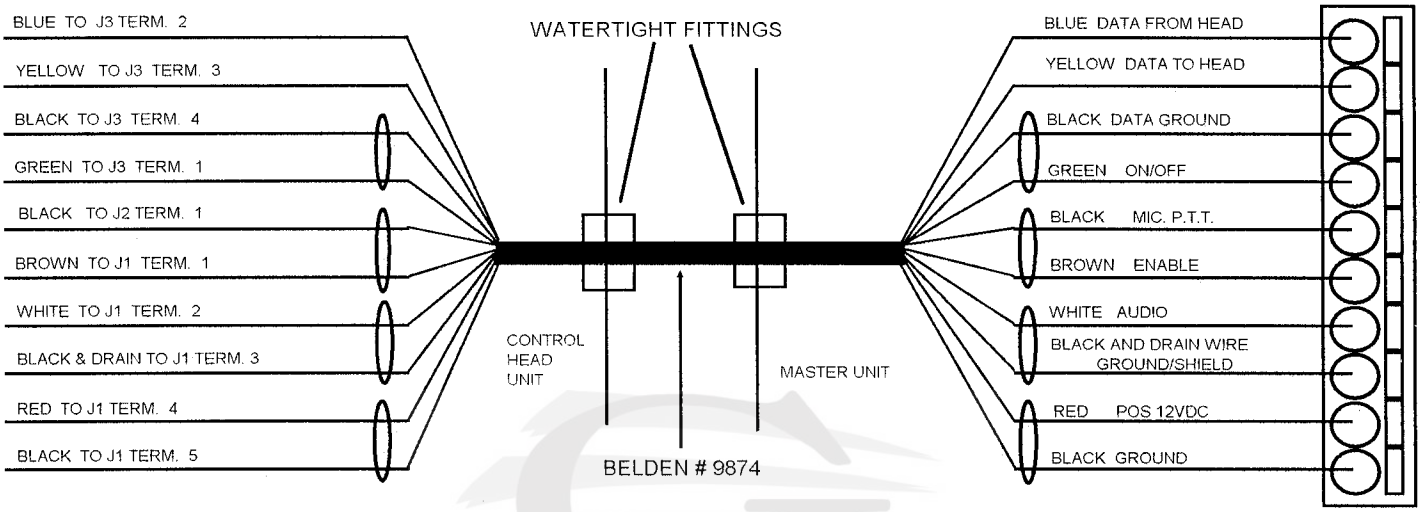
TO MAINTAIN WATER TIGHT RATING OF THE ENCLOSURE, PASS THE CABLES THROUGH WATER TIGHT FITTINGS.

GLH200 CONTROL HEAD UNIT CONNECTION TO MASTER UNIT



VIEW AS SEEN FROM BACK OF CONTROL HEAD UNIT

CONNECTOR 231-310

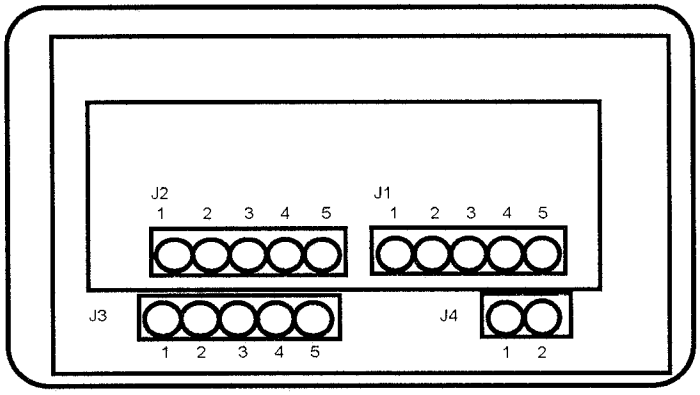


TO MAINTAIN WATERTIGHT RATING ON THE BOX, PASS THE CABLE THROUGH WATER TIGHT FITTINGS.

EACH CONTROL HEAD IS INDEPENDENT. THE GLH200 IS CAPABLE OF HANDLING 4 CONTROL HEADS.

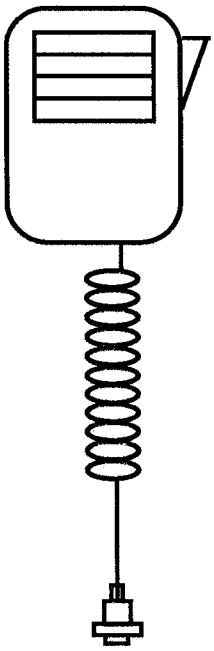
NOTE: REMOVE CONNECTOR 231-310 FROM ITS HEADER BEFORE INSERTING OR REMOVING WIRES. STRAIN ON HEADER MAY CAUSE DAMAGE.

GLH200 CONTROL HEAD UNIT CONNECTION TO EXTERNAL MICROPHONE



VIEW AS SEEN FROM BACK OF CONTROL HEAD UNIT

WATER PROOF MICROPHONE

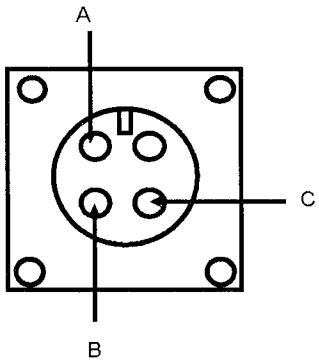


TERMINALS ARE LABELED ON EACH END OF EACH CONNECTOR.

A = AUDIO

B = AUDIO AND P.T.T. COMMON GROUND

C = PUSH TO TALK, GOES LOW WHEN SWITCH IS PRESSED



WATER TIGHT ASSEMBLIES

ASSEMBLY PLATE

WHITE AUDIO, TO J2 TERM. 3

BLUE PTT, TO J2 TERM. 1

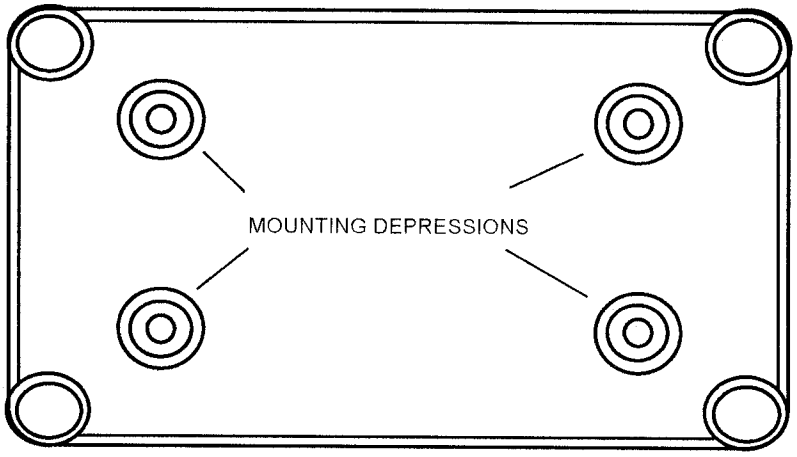
SHIELD/BARE, TO J2 TERM. 4

MICROPHONE BULKHEAD CABLE AND CONNECTOR ASSEMBLY

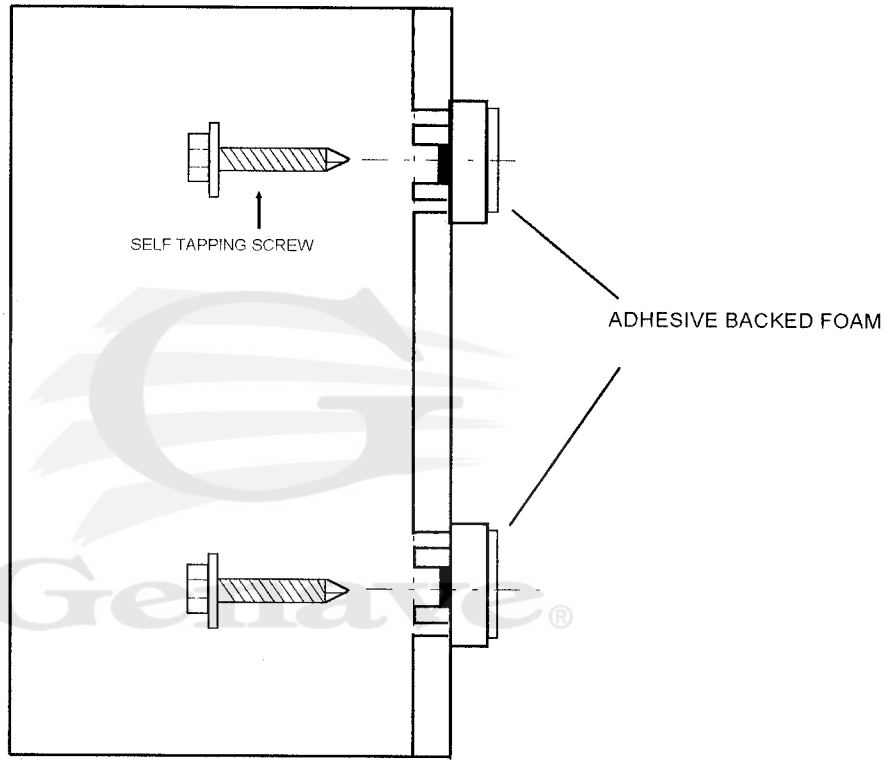
WHEN PASSING THE BULKHEAD CABLE AND CONNECTOR ASSEMBLY THROUGH A WATER TIGHT AREA, COAT THE CABLE SIDE OF THE ASSEMBLY PLATE WITH SILICONE RUBBER BEFORE ATTACHMENT TO THE AREA.

TO MAINTAIN THE WATER TIGHT RATING OF THE BOX, PASS THE CABLE THROUGH A WATER TIGHT FITTING.

GLH200 CONTROL HEAD AND CALLBOX HOUSING INSTALLATION



VIEW OF BOX WITH COVER REMOVED



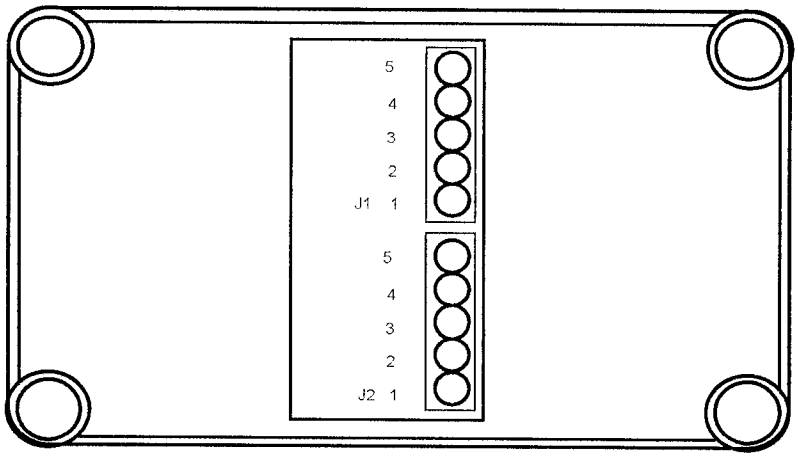
(1) REMOVE PAPER BACKING FROM ADHESIVE BACKED FOAM.

(2) ADHERE BOX TO DESIRED LOCATION.

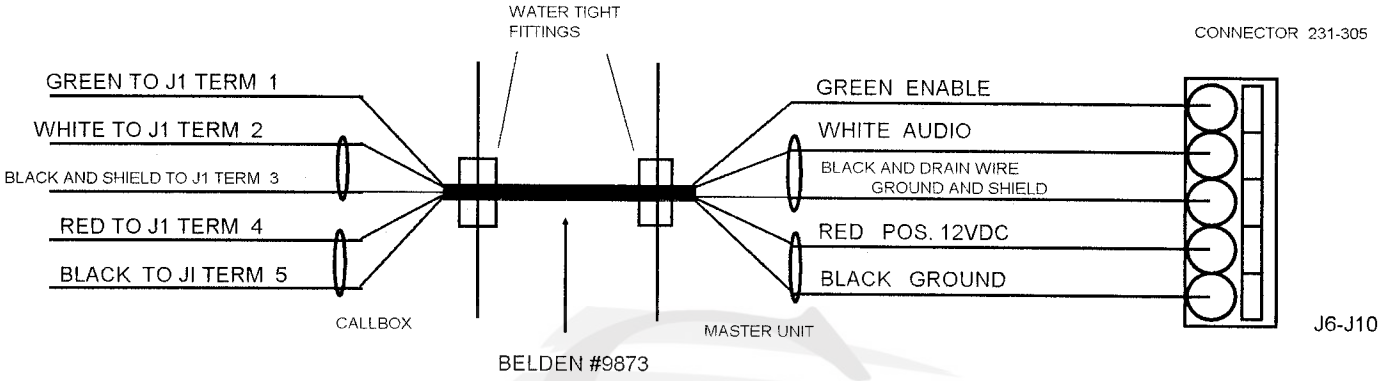
(3) ATTACH BOX TO SURFACE USING SELF TAPPING SCREWS THROUGH MOUNTING DEPRESSIONS IN BOTTOM OF BOX.

(4) CHECK SEAL OF BOX TO SURFACE.

GLH200 CALLBOX UNIT CONNECTION TO MASTER UNIT



VIEW OF BOX WITH COVER REMOVED

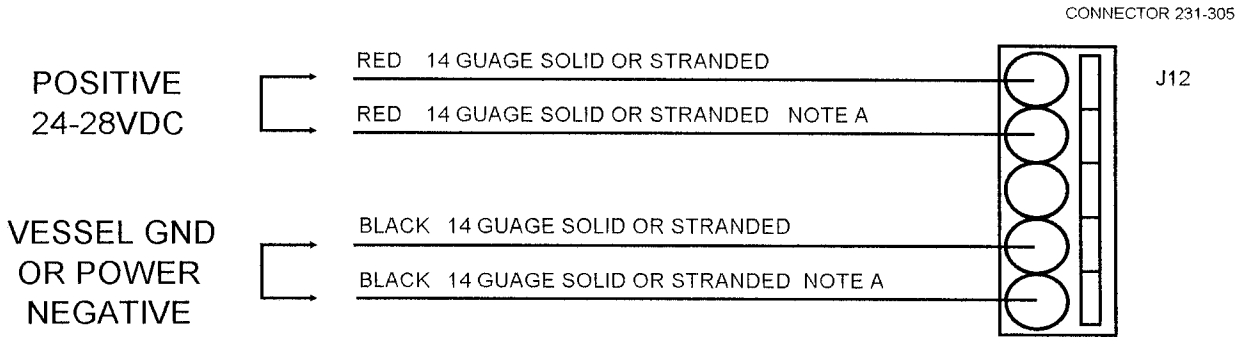


TO MAINTAIN WATER TIGHT RATING ON THE BOX, PASS THE CABLE THROUGH WATER TIGHT FITTINGS.

EACH CALL BOX IS INDEPENDENT AND THE GLH200 IS CAPABLE OF HANDLING 5 OR MORE STATIONS.

NOTE: REMOVE CONNECTOR 231-305 FROM ITS HEADER BEFORE INSERTING OR REMOVING WIRES. STRAIN ON HEADER MAY CAUSE DAMAGE.

GLH200 MASTER POWER CONNECTIONS



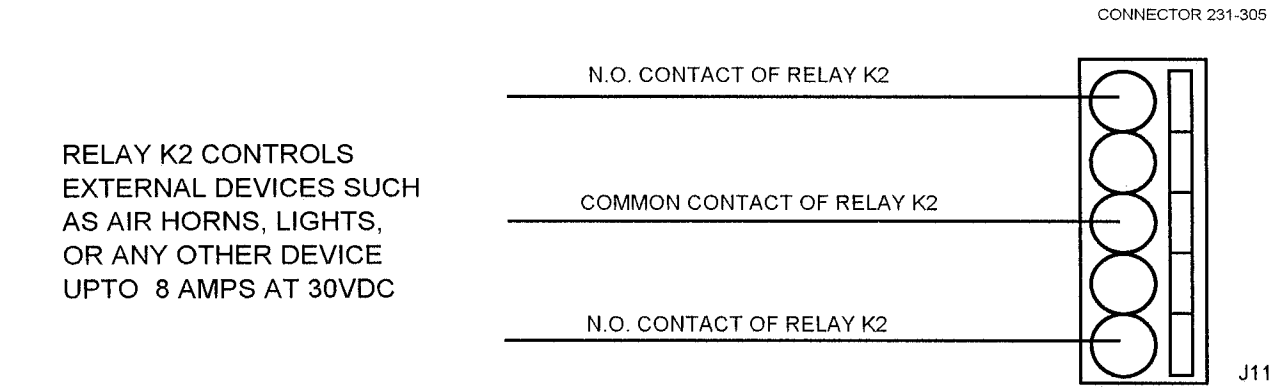
NOTE A: WHEN SUPPLY IS CLOSER THAN 25 FEET FROM UNIT, ONE CONDUCTOR IS SUFFICIENT. IF SUPPLY IS FARTHER THAN 25 FEET, BOTH CODUCTORS SHOULD BE USED

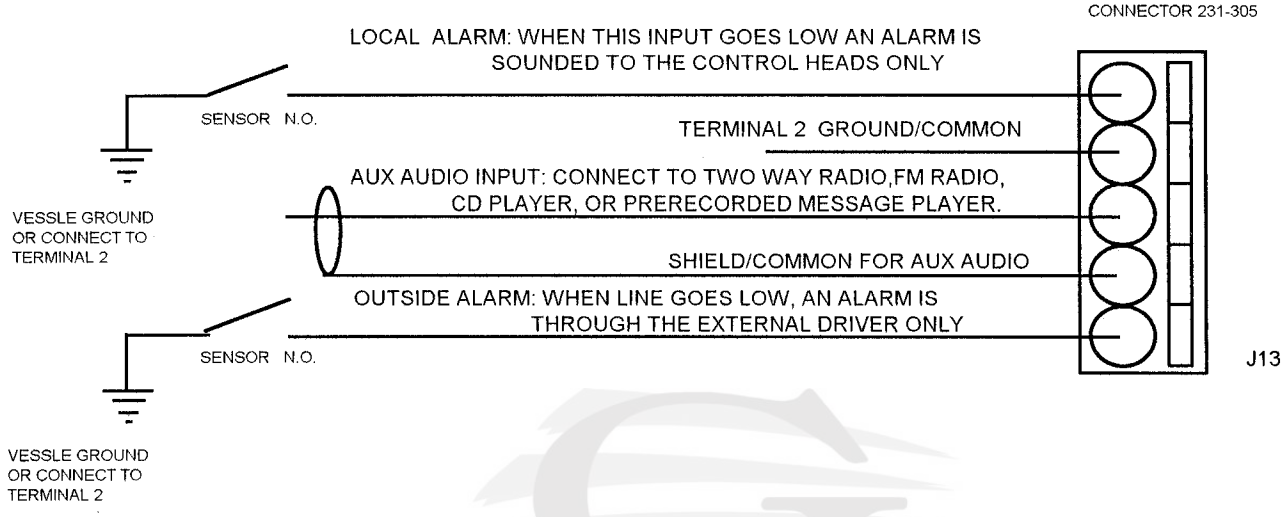
TO MAINTAIN WATER TIGHT RATING ON ENCLOSURE, PASS THE CABLE THROUGH WATER TIGHT FITTING.

WHEN GLH-200 IS NOT POWERED UP, 24VDC IS STILL SUPPLIED TO THE AMPLIFIER SECTION.

NOTE: REMOVE CONNECTOR 231-305 FROM ITS HEADER BEFORE INSERTING OR REMOVING WIRES. STRAIN ON HEADER MAY CAUSE DAMAGE.

GLH200 EXTERNAL DEVICE CONNECTION





TO MAINTAIN WATER TIGHT RATING ON ENCLOSURE, PASS ALL CABLES THROUGH WATER TIGHT FITTINGS.

DO NOT CONNECT TERMINAL 2 AT SENSOR TO VESSEL GROUND. IMPEDENCE MISMATCH MAY OCCUR. INSTEAD, CONNECT EITHER TERMINAL TWO ,OR VESSEL GROUND TO SENSOR FOR REFERENCE.

NOTE: REMOVE CONNECTOR 231-305 FROM ITS HEADER BEFORE INSERTING OR REMOVING WIRES. STRAIN ON HEADER MAY CAUSE DAMAGE

SECTION IV
MAINTENANCE MANUAL

4-1 INTRODUCTION

The maintenance section provides information for the testing, and repair of the GLH-200 Plus. This section is divided into subsections, each covering a specific part of the GLH-200.

For assistance with repairs please contact:

GENAVE/NRC
1120 220th St. W.
FARMINGTON, MN 55024

TEL 612-460-6616 FAX 612-460-6686

The GLH200 uses surface mount devices for most of its components. Repair of these components should be made by the factory. Remove the defective board and ship to the address shown above.

4-2 SYSTEM LEVEL OVERVIEW

(A) THEORY OF OPERATION

The basic function of the GLH-200 can be broken into two distinct parts. The first and primary function of the unit is the loudhailer/siren modes. The second function is a vessel wide intercom.

(B) LOUDHAILER/SIREN FUNCTIONS

Loudhailer/siren functions originate at a control head. When an operator selects a function, the control head's microprocessor encodes the function and sends the code over the data lines to the master unit. The master unit receives the code and determines if the codeis valid before acting upon it. If all data is correct, the master sends a message to the control heads to update their light emitting diodes display. The master then acts upon the function until a new function is sent to the master.

Note:
If the function is "hail" audio is collected by the control head and sent over the audio lines to the master where it is routed to the amplifiers. In the "listen mode" the driver collects the audio and sends it to the control heads.

(C) INTERCOM

The intercom functions of the GLH-200 are completely separate from that of the siren. Calls to the other intercom stations can be made at any time by any station. The intercom funtion of the

control heads can be selectively turned on or off by either the keypad or by a specified number of quick microphone button clicks (see operating instructions). If a contolhead has the volume turned down, a call box can alert the operator to turn their volume up by pressing the P.T.T. button three times quickly, this will give the control head a beep.

4-3 DETAILED THEORY OF OPERATION

(A) CONTROL HEAD

(1) POWER: All power to the control head comes from the master unit. 12 VDC is sent to the control head and is applied to pins J1-5 and J1-6. The power ON/OFF switch on the control head goes directly to the microprocessor in the master unit. A switch closure either awakens the microprocessor to turn on the power supply relay, or tells the processor to power the system down. To test if the ON/OFF signal is being sent, connect an oscilloscope to terminal 1of J3. This terminal should normally be at 5 VDC. Upon a switch closure, it should go to 0 VDC.

(2) SELECTION OF A FUNCTION: The microprocessor U1,scans the key pad via U6 (keypad encoder) and upon detection of a key closure, the processor determines the code to send to the master unit where it is acted upon.

(3) SELECTION OF A SPEAKER: The GLH-200 is capable of driving four speakers. A selection of a speaker is coded by the controlhead and sent to the master unit. The master then selects the appropriate I/O card for the desired speaker.

(4) SELECTION OF THE HAIL/INTERCOM VIA MICROPHONE: See GENERAL INFORMATION

(5) FOGHORN BUTTON: The manual FOGHORN button is encoded the same as any of the switches, and the data sent to the master unit. The Foghorn sound is then generated by the sound generator board in the master unit. The foghorn button grounds J4 pin 1 which is sent to the controlhead's microprocessor where the signal is encoded and sent to the master unit. The master unit will generate a foghorn sound until the button is released.

(6) VOLUME LEVELS, INTERCOM & HAIL: The Listen/Intercom volume control is used to control the audio sent TO the controlhead. The audio passes through U7 (digitally controlled potentiometer) and on to the audio amplifier board. U7 is controlled directly from U1 and with each press of the up or down key, U7 is adjusted. As the Listen/Intercom keys are pressed, a beep will be heard which is generated by U1 and will increase or decrease in volume as the Listen/Intercom volume is increased or descreased. The Hail volume control is used to control the audio FROM the controlhead. With each press of the up or down key, U1 sends a code to the master unit to increase or decrease U12 (digitally controlled pot.) within the master unit. No beep will be heard on the speaker as the hail volume is adjusted.

(7) DATA COMMUNICATION TO MASTER: The communications between the mater unit and the controlheads is in RS232 format (+15v and -15v). The data is level shifted via Q3 and Q4 (Nchannel mosfets) between logic levels and RS232 levels.

(8) DISPLAY LIGHTS: The display lights of the controlhead are selected by U1 and driven by U2,U3 and U4 (latching octal drivers). The signal desciding which led's to light comes from the master unit. The controlheads by themselves cannot descide to light an led upon a key closure. This is done to ensure that all controlheads show the same event happening at the same time.

(9) MICROPROCESSOR: The heart of the controlhead is U1 (motorola MC68HC11E9 micrprocessor). This chip controls all input and output functions, debounces the keypad, querries the master unit, and performs self checks on the fly. When power is supplied to the controlhead, U1 is sent into a suspended animation mode until U5 (power on / low voltage detect reset) determines that the power is stable and safe to let U1 start its operation. If the power drops below +5 vdc while U1 is running, U5 will stop U1 and keep it in suspended animation until the voltage returns to normal. When released by U5, U1 cleans house, readies its memory for operation, sets the outputs and inputs to known states and then waits for three seconds to hear from the master unit. If the master does not call, the controlhead will ask the master unit for the latest information on what it should be doing. If the master unit does not reply, the controlhead will ask again three times. If the master never replies, the controlhead shuts down.

(10) BEEPER: With each press of the keypad, an internal beeper gives an audible indication to the operator.

(11) MICROPHONE & BULK HEAD CONNECTOR: See installation section for pinout of microphone connection.

(B) CALLBOX

(1) POWER: All power to the call box comes from the master unit. 12 VDC is sent to J1 terminal 4. it is filtered at the call box by a 470ufd capacitor.

(2) AUDIO TX: When intitiating a call, the P.T.T. button is pressed, this causes J2 term 1 to go to 0 volts pulling relay K1. Audio from the microphone passes through the outbound audio amp, through U1B, through R5, through K1 to J1 term 2 where it is sent to the other call boxes. At the same time J1 term 1 (P.T.T. BUS) is connected to gound via K1 and speaker LS1. The Anti-Click Circuit is also conneted to the P.T.T. bus and when transmitting, Q1 is turned on grounding R16 which enables U1A ,this prevents an audible click in the speaker when moving from TX to RX.

(3) AUDIO RX: Audio from other call boxes and controlheads enters J1 term. 2. The audio passes through K1 and R10 where the listening level is set. At the same time, a low P.T.T. signal enters via J1 term. 1 enabling the anti click circuit of U1C and Q1. While U1A is enabled, the audio passes through U1A to the audio amplifier TDA2003. The audio then passes through C3 and K1 to J2 term. 5 where it is connected to the speaker.

(C) MASTER UNIT

(1) POWER SUPPLY: All power used by the GLH200 system is distributed through the master unit. Raw 24 VDC power enters the power connector, goes through F1 then passes to U9 and U10 for voltage reduction. CR4 is a reverse voltage protection diode that will open F1 if the power is reverse connected. The master unit is operational whenever power is applied. The controlheads can be turned on and off via K1, U8 and their power key. R34 is an inrush current limiter to slow down the instantaneous current upon power up of the controlheads.

(2) HIGH POWER AMPLIFIER: The GLH200 is equipped with a 200 watt amplifier that automatically reduces its power according to the number of drivers connected to its outputs. The amplifier consists of two main parts. The first is the amplifier

board which is mounted to the master unit's mother board. This amplifier board determines bias, amplitude of the signal and drive level to the outputs. The second part is the output transistors Q205,Q206 and the output transformer T202. This part of the amplifier is mounted on the master unit's door for cooling. F2 supplies power to the amplifier and CR5 is a reverse voltage protection diode for F2. Audio is selected fom U7b or U7c and passes through U12 to U13a where it is amplified and sent through U11 (mosfet switch) to the amplifier. When the master unit generates sounds, these are developed in the sound generator board and sent directly to the amplifier board. The high power sound from the amplifier is then sent to the I/O modules.

(3) I/O MODULES: There are four I/O modules. Each module controls the audio sent to a driver unit and audio received from the driver for the listen mode. K1 selects the audio direction (output or input). If selected as an input, the audio is sent from the driver unit to U1 and U2 which amplify the signal and send the signal to U7d on the mother board for redistribution to the controlheads.

(4) SOUND GENERATOR MODULE: All sounds generated by the GLH200 originate within the sound generator board. The microprocessor U1 determines the signal characteristics to be generated and sends these variables to U1 (audio generator) on the sound generator board. The audio generator creates the sinusiods which are passed onto U2 (digital filter) for cleaning. U3 (voltage inverter) creates the negative voltage for U2.

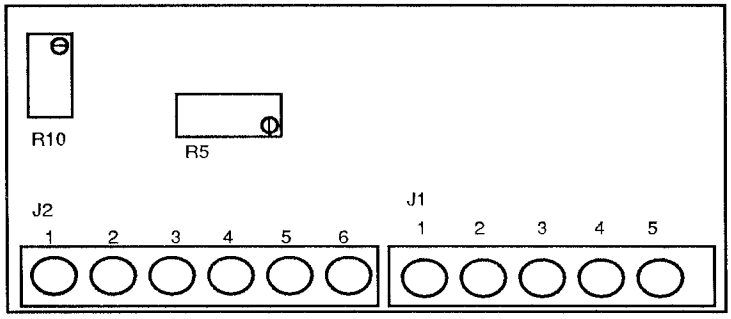
(5) ALARM INPUTS: The GLH200 has inputs for detection of alarm trips. See operations manual for more information.

(6) MICROPROCESSOR: The heart of the entire GLH200 system is the master unit's microprocessor U1. U1 (motorola MC68HC11E9) controls all output and input functions as well as controlling the sound generator.

(D) DRIVER

(1) Driver unit: The GLH200 is capable of driving upto four 100 watt 8 ohm drivers Each driver unit is used for both sending and receiving of audio when in the hail mode.

LEVEL SETTINGS FOR THE GLH-200 INTERCOM



TO SET LISTEN LEVEL *

WITH POWER APPLIED TO UNIT:
(1) INJECT A 1.2V P-P AT @ 1000HZ TO J1 TERM 2 WITH RESPECT TO J1 TERM 5.
(2) WITH A SCOPE PROBE ON J2 TERM 5 AND REFERENCING AGAINST J2 TERM 6, ADJUST R10 FOR AN OUTPUT OF 6V P-P ON THE SCOPE.

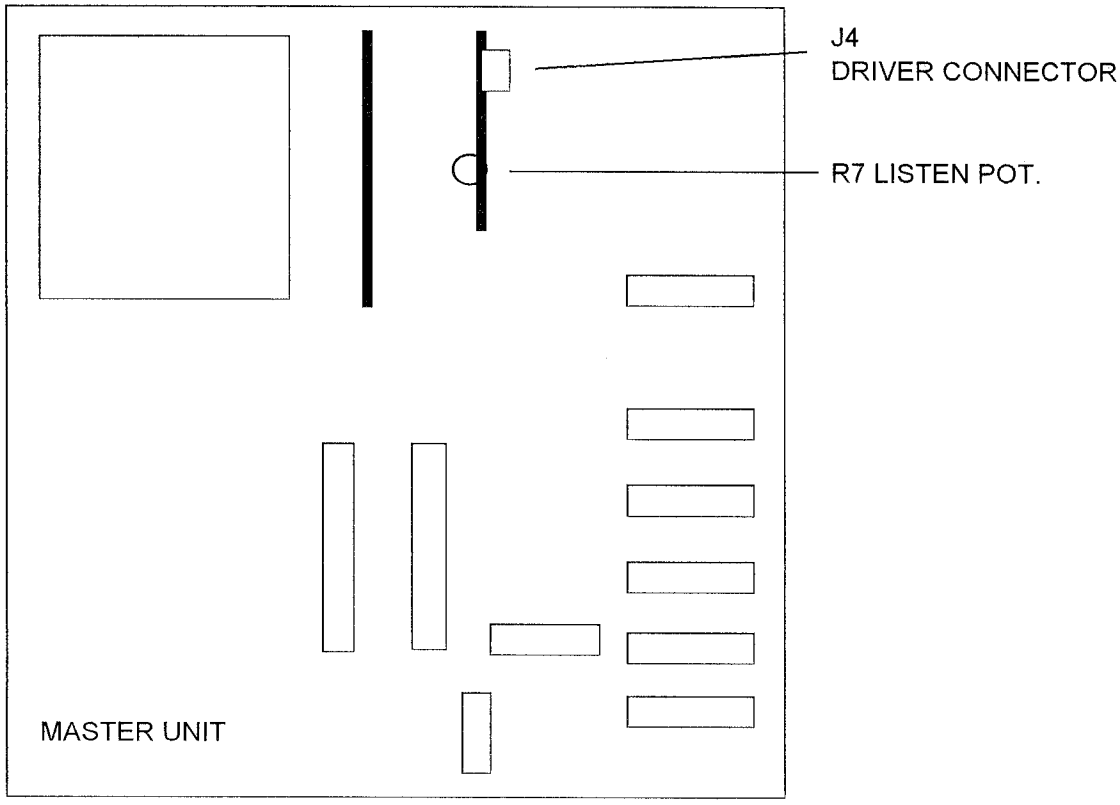
*NOTE : IF THE INTERCOM UNIT IS LOCATED IN A CONTROL HEAD SKIP THIS SECTION SINCE CONTROLHEAD LISTEN LEVELS ARE ADJUSTED VIA THE LISTEN UP/DOWN KEYS ON THE KEYPAD.

TO SET OUTPUT LEVEL

WITHOUT POWER TO UNIT:
(1) REMOVE MICROPHONE FROM J2 TERM 3
(2) APPLY POWER AND INJECT A 30 mV P-P SIGNAL AT J2 TERM 3 W.R.T J2 TERM 4.
(3) WITH THE SCOPE PROBE ON J1 TERM 2, PRESS THE P.T.T. SWITCH AND ADJUST R5 FOR AN OUTPUT OF 1V P-P.
(4) RECONNECT MICROPHONE AND TEST.

FOR FINE ADJUSTMENTS AT THE CONTROLHEAD FOR OUTPUT POWER, ADJUST R5 UNTIL DESIRED SIGNAL LEVEL IS ACHIEVED. NOTE THAT AN INCREASE IN THE OUTPUT POWER MAY INDUCE FEEDBACK IN THE INTERCOM MODE. SWITCH TO INTERCOM MODE AND TEST, IF FEEDBACK IS PRESENT, ADJUST R5 UNTIL FEEDBACK IS REMOVED. TEST HAIL MODE AT BOTH DECKS TO ASSURE NO FEEDBACK AT FULL POWER.

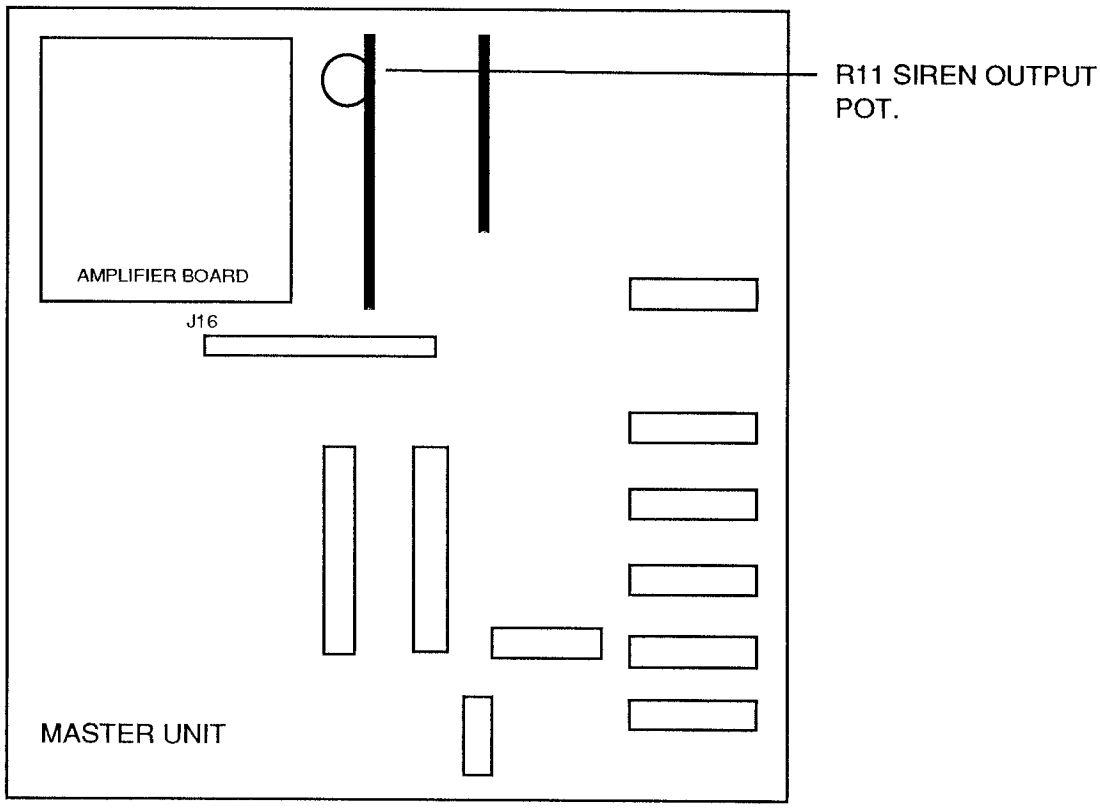
LEVEL SETTINGS FOR GLH-200 HAILING LISTEN MODE



TO SET LEVELS FOR HAIL LISTEN

(1) DISCONNECT DRIVER UNIT FROM J4.
(2) CONNECT A 130 mV P-P SIGNAL TO J4.
(3) APPLY POWER TO UNIT AND SELECT UP HAIL FUNCTION
(4) WITH AN OSCILLOSCOPE, MEASURE THE VOLTAGE ON J9 TERMINAL 4 (AUDIO) WHILE ADJUSTING R7 FOR AN OUTPUT OF 500 mV P-P

LEVEL SETTINGS FOR GLH-200 SIREN/HAIL MODE



TO SET LEVELS FOR HAIL OUTPUT

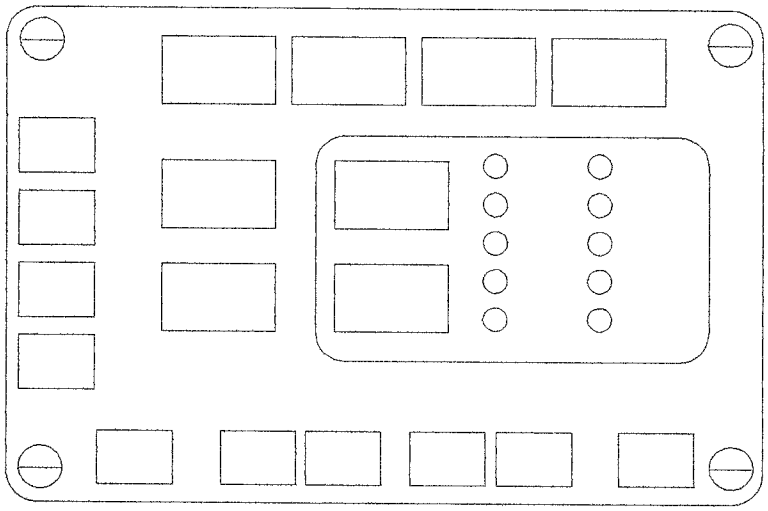
HAIL OUTPUT LEVELS ARE SET WHEN THE INTERCOM LEVELS ARE SET AT THE CONTROL HEAD. SEE SHEET "LEVEL SETTINGS FOR GLH-200 INTERCOM.

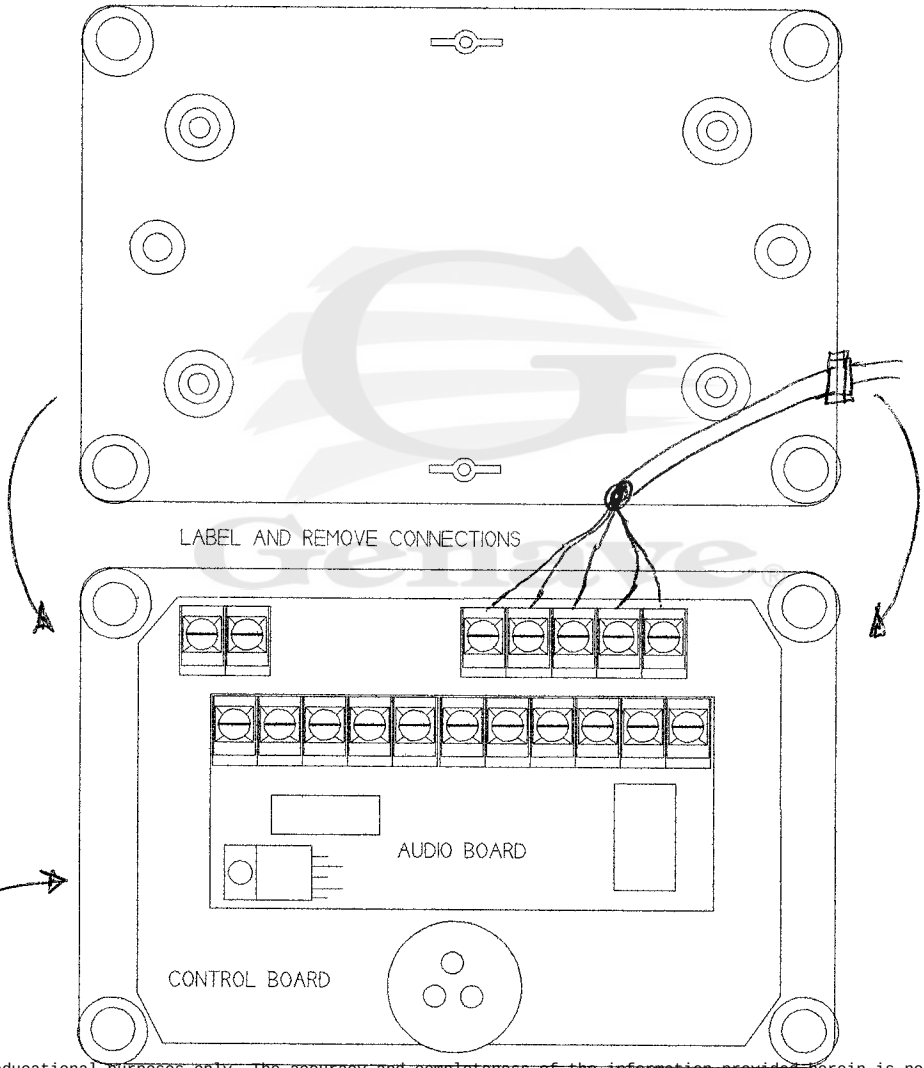
TO SET LEVELS FOR SIREN OUTPUT

(1) DISCONNECT DRIVER FROM J4 ON I/O BOARD AND CONNECT A 200 WATT 8 OHM RESISTIVE LOAD TO J4.
(2) WITH POWER NOT APPLIED, REMOVE BOTH OF THE CONNECTORS TO THE AMPLIFIER BOARD.
(3)APPLY POWER AND SELECT WAIL FUNCTION . WITH AN OSCILLOSCOPE, MEASURE THE VOLTAGE ON J16 TERMINAL 8 (WHITE WIRE TO AMP. BOARD). ADJUST R11 FOR A PEAK TO PEAK VOLTAGE OF 2 VOLTS. DISCONNECT POWER AND RECONNECT BOTH CONNECTORS TO THE AMPLIFIER BOARD.
(4) RECONNECT POWER AND SELECT WAIL FUNCTION. MEASURE THE OUTPUT WAVE ACROSS J4. ADJUST R11 VERY CAREFULLY FOR A SIGNAL OF 40 VOLTS PEAK TO PEAK (28.28 VOLTS RMS) THIS GIVES AN OUTPUT POWER OF 100 WATTS.
(5) RETURN UNIT TO OPERATING CONFIGURATION AND TEST

WARNING: R11 IS VERY SENSETIVE, AND SMALL ONLY SMALL ADJUSTMENTS SHOULD BE MADE. TOO LARGE OF AN INPUT TO THE AMPLIFIER WILL CAUSE THE OUTPUT TRANSISTORS TO BE DESTROYED.
BE CERTAIN THAT POWER IS DISCONNECTED BEFORE CONNECTING OR DISCONNECTING THE AMPLIFIER BOARD, DAMAGE MAY RESULT IF POWER IS PRESENT.

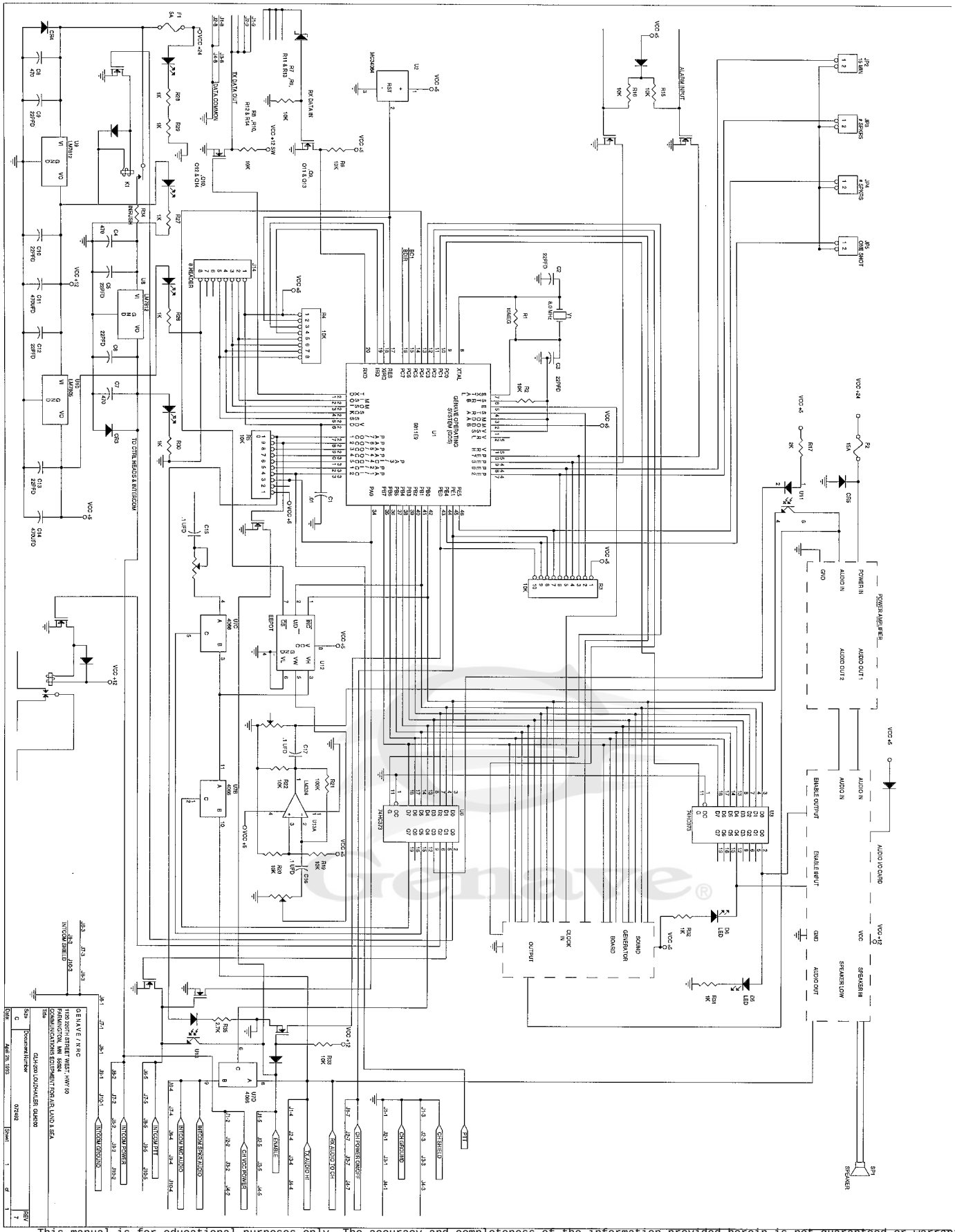
REMOVE FRONT HALF OF CONTROLHEAD BY LOOSENING THE FOUR CAPTIVE FASTENERS ON THE FRONT





SEND THIS HALF

(1) DISCONNECT ORANGE CONNECTORS FROM MASTER UNIT BOARD.
(2) REMOVE MASTER UNIT BOARD BY LOOSENING BACK PLANE SCREWS.
(3) REMOVE DOOR BY REMOVING HINGE SCREWS.
(4) REMOVE REMAINDER OF ENCLOSURE FROM VESSEL.
NOTE: ORANGE CONNECTORS ARE KEYED TO FIT ONLY THEIR CORRECT SLOT. NO NEED TO MARK LOCATIONS.



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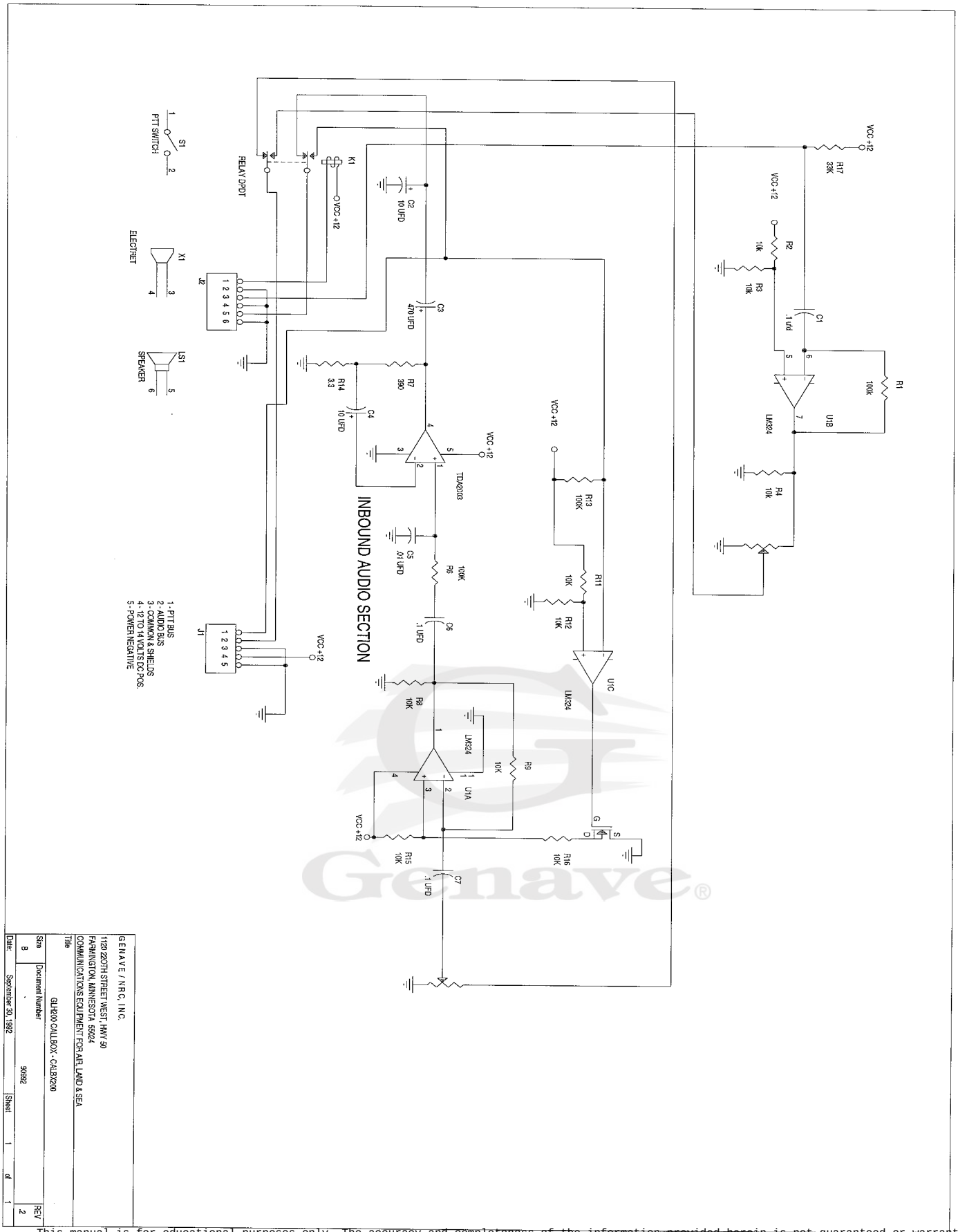

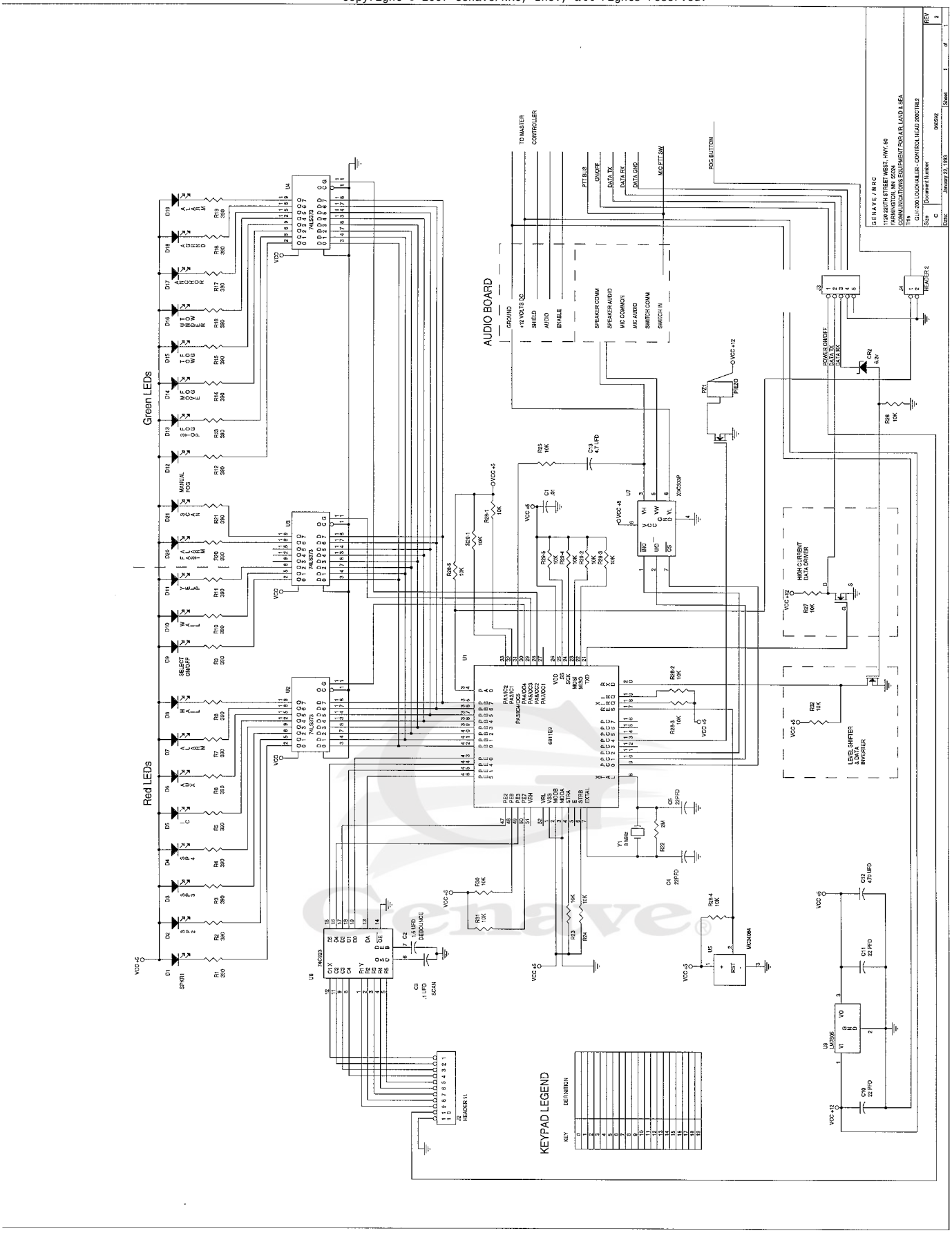

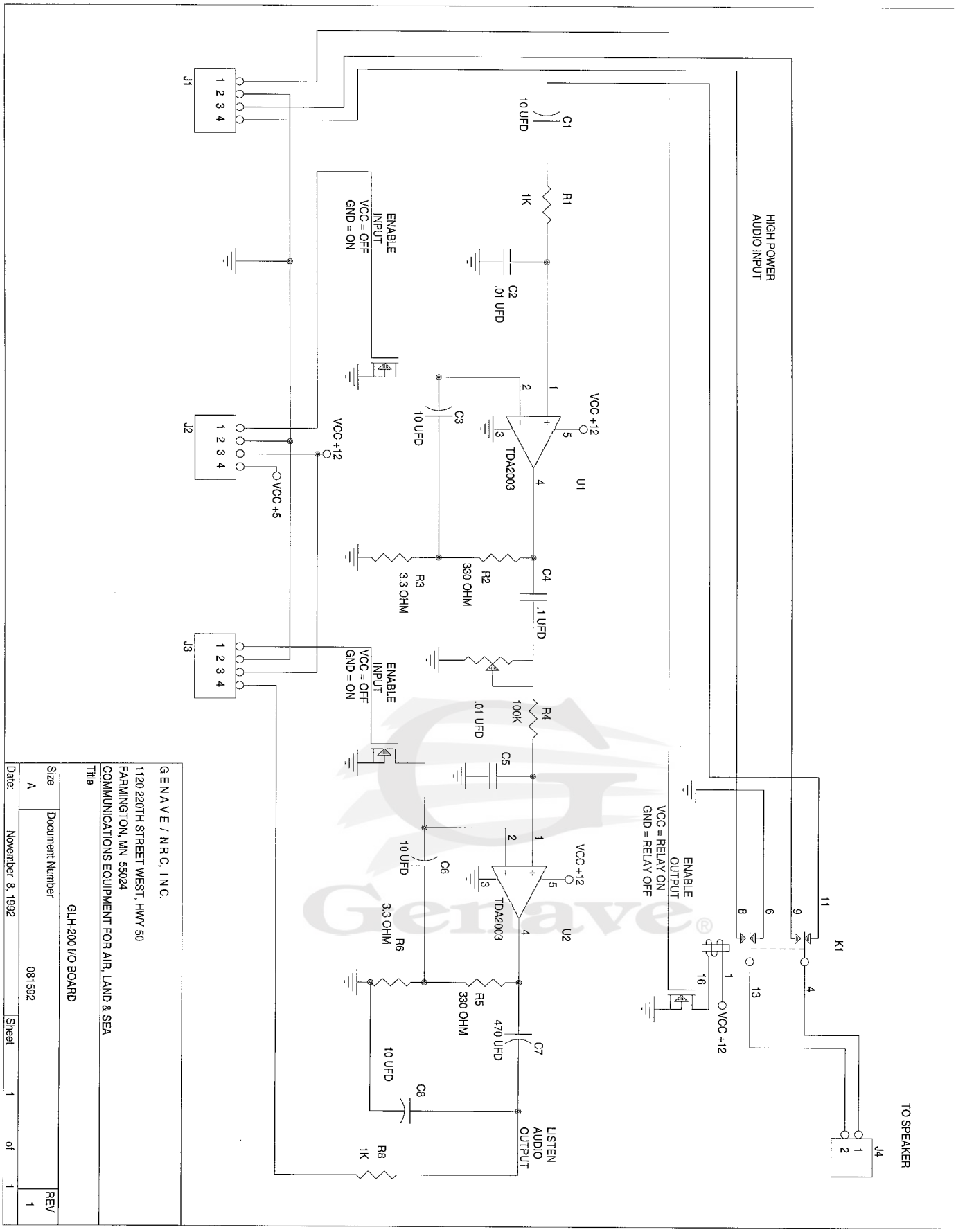

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Title: GLH-200 I/O BOARD

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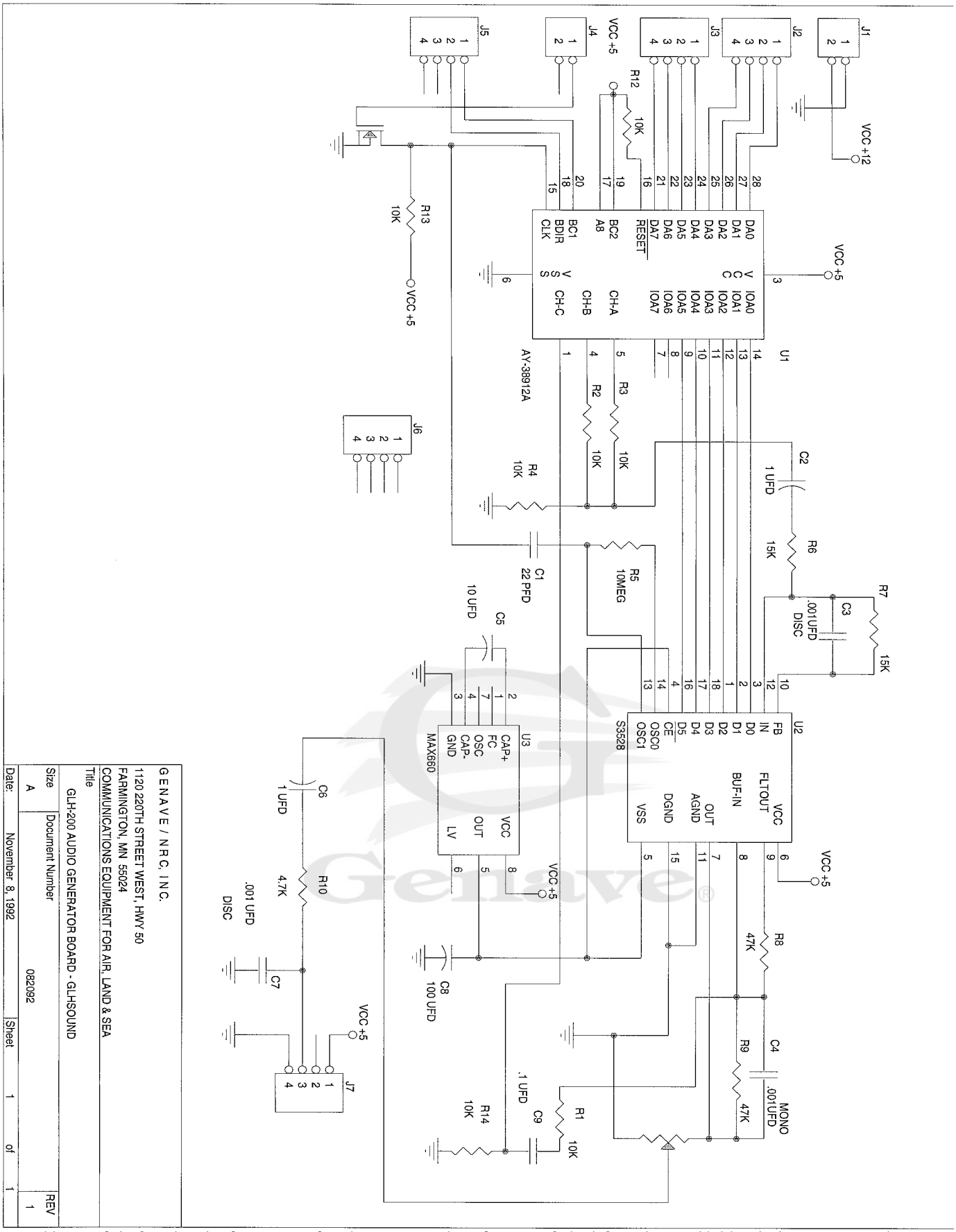

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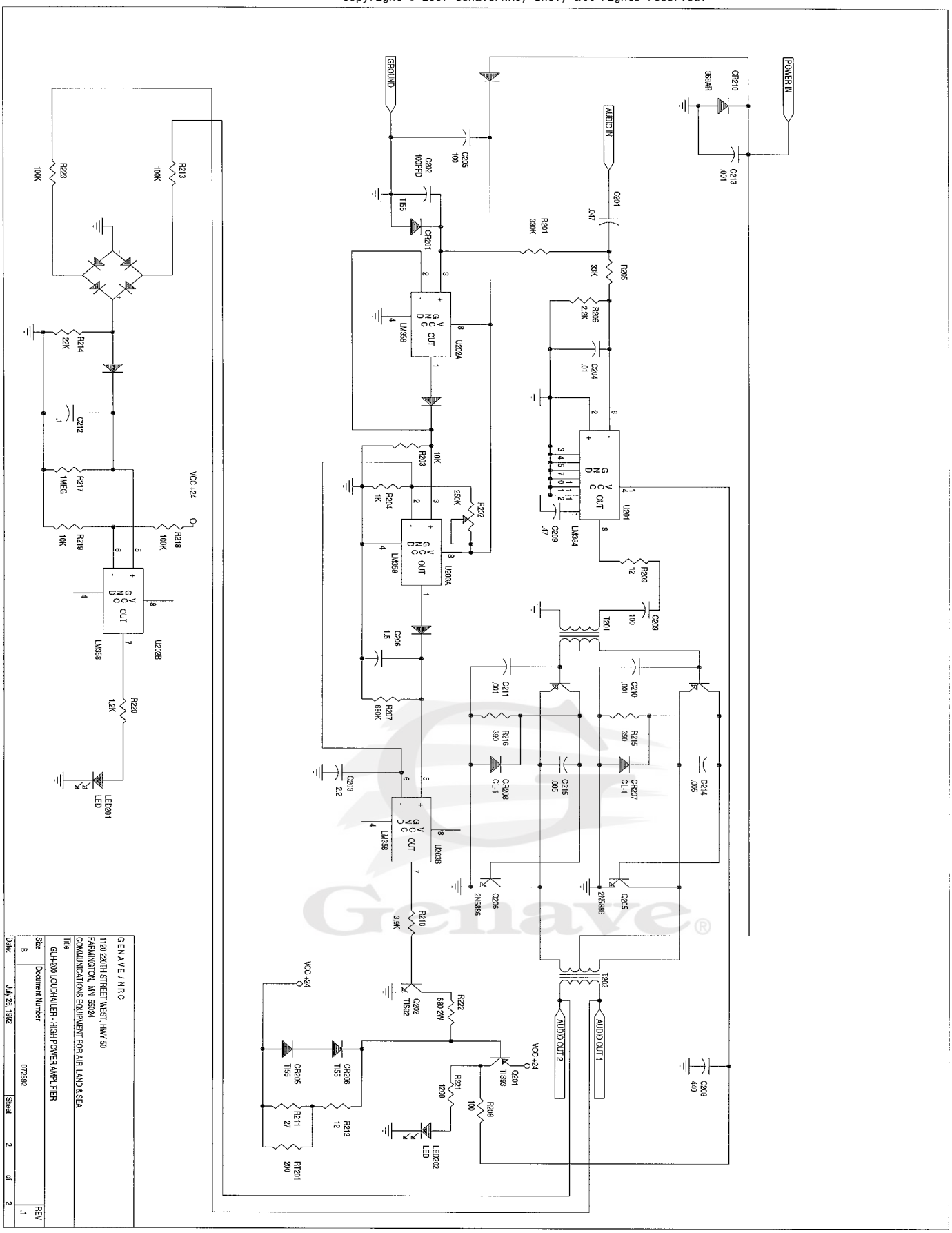

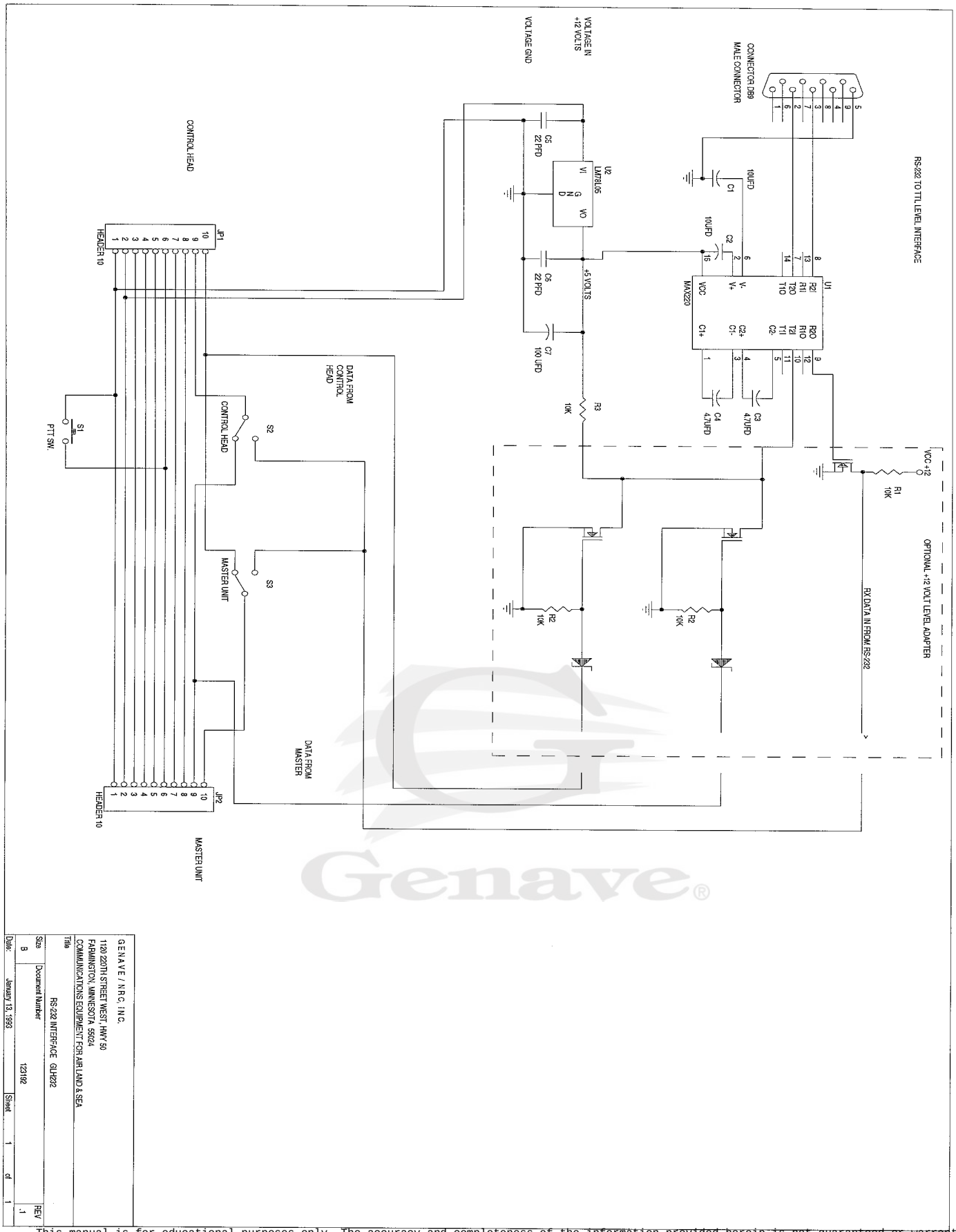

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Size	Document Number	REV
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