



DEA
Handheld Control Head
B.A.T.F.

Instruction Manual

68P80100W43-A



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Model Chart for Handheld Control Head Radios

CODE:

● = ONE ITEM SUPPLIED

MODEL	DESCRIPTION											ITEM	DESCRIPTION
W828AB	DVP PRIVATE-LINE, 8-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HBN4025A	PACKING
W828AD	DVP PRIVATE-LINE, 16-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HCN4026A/B	HANDHELD CONTROL HEAD (DVP)
W828AF	DVP PRIVATE-LINE, 32-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HCN4027A/B	HANDHELD CONTROL HEAD (DVP)
W845AB	DVP PRIVATE-LINE, 8-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HCN4028A/B	HANDHELD CONTROL HEAD (NON-DVP)
W845AD	DVP PRIVATE-LINE, 16-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HKN4216A	CONTROL HEAD CABLE (NON-DVP)
W845AF	DVP PRIVATE-LINE, 32-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HLN1170A	JUNCTION BOX AND CABLES
W845AH	PRIVATE-LINE, 8-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HKN4187A	CABLE
W845AK	PRIVATE-LINE, 16-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HKN4188A	CABLE (DVP)
W845AM	PRIVATE-LINE, 32-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HKN4215A	CONTROL HEAD CABLE
W845AN	DVP PRIVATE-LINE, 64-FREQUENCY	●	●	●	●	●	●	●	●	●	●	HLN4772A	JUNCTION BOX HARDWARE
		●	●	●	●	●	●	●	●	●	●	HLN4849A	JUNCTION BOX BOARD
		●	●	●	●	●	●	●	●	●	●	HHN4015A	DVP HOUSING
		●	●	●	●	●	●	●	●	●	●	HKN4190A	CABLE CONTROLLER BOARD
		●	●	●	●	●	●	●	●	●	●	HKN4051A	POWER CABLE AND FUSE KIT
		●	●	●	●	●	●	●	●	●	●	HLN4728A/B	CONTROLLER BOARD
		●	●	●	●	●	●	●	●	●	●	HLN4830A	HANGUP BOX
		●	●	●	●	●	●	●	●	●	●	HSN1001A	SPEAKER
		●	●	●	●	●	●	●	●	●	●	HLN4831A	HARDWARE
		●	●	●	●	●	●	●	●	●	●	6880100W43	MANUAL

MXW-1366-O

Options Chart

OPTION	DESCRIPTION
W11	Time-Out Timer
W12	RF Preamplifier
W76	Omit Hangup Box
W90	Omit All Accessories
W268	Code Storage
W304	Proper-Code Detect
W388	DES <i>DVP</i>
W391	<i>DVP</i> Security Housing
W421	Second Priority for <i>Channel Scan</i>
W427	AND Opening Squelch
W428	Time-Out Timer (duration variable by mode)
W478	Delete Coded Squelch
W494	Mode-Select Multicoded Squelch
W703	Talkback Scan



Description

1. General

The handheld control-head system has the microphone and control head in one compact handheld unit. The option is designed for the *SYNTOR X*[™] UHF or VHF conventional and *DVP*[™] mobile radios.

See the following manuals for further information:

- *SYNTOR X* VHF68P81060E05
- *SYNTOR X* UHF68P80100W45
- *SYNTOR X* UHF Range I Supplement68P80100W38
- *SYNTOR X DVP* Supplement .68P80100W31

2. Components

2.1 HCN4026A/B HANDHELD CONTROL HEAD

The control head is a handheld console for the *SYNTOR X DVP* radio. (See Figure 3A in the Operating Instructions section.) It has a built-in microphone, all the switches and indicators for operating the system, and the display and control circuits for the radio and *DVP* system. See the operating instructions and theory of operation for more details.

2.1.1 Scan On/Off Power Switch

When this switch is off (centered), the whole system (including *DVP*) is off. Moving the switch to the upper (Scn on) position turns the whole system (including *DVP*) on and enables the *Channel Scan*[™] feature. The radio scans for active programmed channels. Moving the switch to the lower (on) position turns the system on, but disables the *Channel Scan*. In this mode the radio does not scan for active programmed channels.

2.1.2 Private/Standard Switch

When this switch is in the upper (Pvt) position, the *DVP* system is in the private (or coded) mode, and the radio transmits only coded signals. When the switch is in the lower (Std) position, the *DVP* system is in the standard (or clear) mode, and the radio transmits only standard non-coded messages. In both modes the radio receives both coded and clear messages.

2.1.3 Mode Select Switch

This three-position momentary switch (center off) selects the radio's operating mode. Switching it up advances the mode by one number. Holding the switch in this position automatically advances the mode at a rate

of about three modes per second. Switching it down selects the next lower mode. Holding the switch down automatically switches to lower-numbered modes at a rate of about three modes per second. If the operator tries to advance the mode beyond the highest or lowest numbered modes, the sequence starts over again from the beginning.

2.1.4 Squelch Disable Button

During normal operation, this control toggles the radio squelch on and off. A single push on this button disables squelch so that the operator can preset the volume. Another push returns the squelch to the standard operating level. (See the System Adjustments Section for more details.) The process of programming a non-priority scan list in the field uses this control to toggle modes on and off the scan list. (To put the system in the field programming mode, the programmer must momentarily short the two program pads on the bottom of the controller board. To take it out of the field programming mode, the programmer simply turns the radio off.)

2.1.5 Volume Control Knob

This knob controls the loudness of received audio. Rotating the control to the left reduces the volume, and rotating it to the right increases the volume.

2.1.6 Ptt Button

The operator pushes the button to transmit and releases it to disable the transmitter and allow the receiver to operate.

2.1.7 Ptt Indicator

The Ptt indicator is a red LED that lights up whenever the Ptt button is pressed.

2.1.8 *DVP* Private Indicator

This indicator is an LED (labeled Pvt) that lights up whenever the radio is receiving a *DVP*-coded message.

2.1.9 List Indicator

This indicator is an LED that lights up when the displayed mode is on the nonpriority scan list.

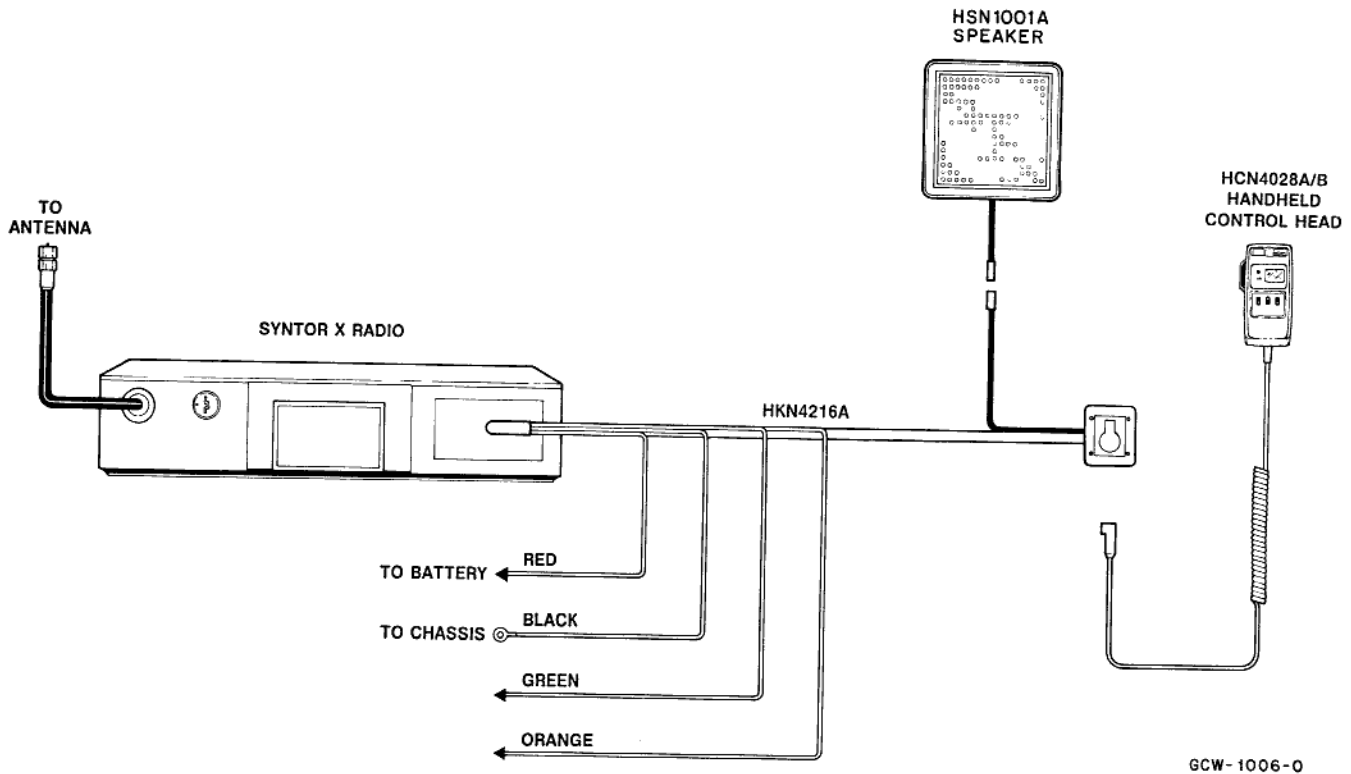


Figure 1. Overall System with DVP

2.1.10 Mode Indicator

The mode indicator is an array of LED's that displays the number of the mode selected by the operator.

2.2 HCN4027A/B HANDHELD CONTROL HEAD

This control head is similar to the HCN4026A/B, but it allows the operator to program the nonpriority scan list. (See Figure 3B in the Operating Instructions section.) Operation of all switches and indicators is the same as for the HCN4026A/B, but there is no Private/Standard switch. In its place is a Prog/Pvt/Std switch. This three-position momentary-up latching-down switch has two functions. When the switch is up (Prog), the displayed channel is alternately added to and deleted from the nonpriority list. When the switch is centered, the *DVP* system is in the private (or coded) mode, and the radio transmits only coded signals. When the switch is down (Std), the *DVP* system is in the standard (or clear) mode, and the radio transmits only standard non-coded messages. In both modes the radio receives both coded and clear messages. (See the Operating Instructions and Theory of Operation sections for more details.)

2.3 HCN4028A/B HANDHELD CONTROL HEAD

This control head is similar to the HCN4026A/B, but it is intended for conventional non-*DVP* SYNTOR X

radios. (See Figure 3C in the Operating Instructions section.) Operation of all switches and indicators is the same as for the HCN4026A/B, except that there is no *DVP* private indicator or Pvt/Std switch. The center switch on the control head is now a Prog/List switch. This three-position momentary switch (center off) allows the operator to select the nonpriority scan list. When the switch is up (Prog), the displayed mode is alternately added to and deleted from the nonpriority list. Switching it down causes the first mode of the nonpriority list to be displayed. Holding the switch down advances the display to the next mode on the list at a rate of about two modes per second. (See the Operating Instructions and Theory of Operation sections for more details.)

2.4 HLN4728A/B CONTROLLER BOARD

This board matches the handheld control head to the SYNTOR X radio. Its circuits select display and operating frequencies, control squelch, control *DVP*, select nonpriority scan, and turn the system on and off.

2.5 HLN4849A JUNCTION BOX

This board connects the *DVP* system and the handheld control head to the radio.

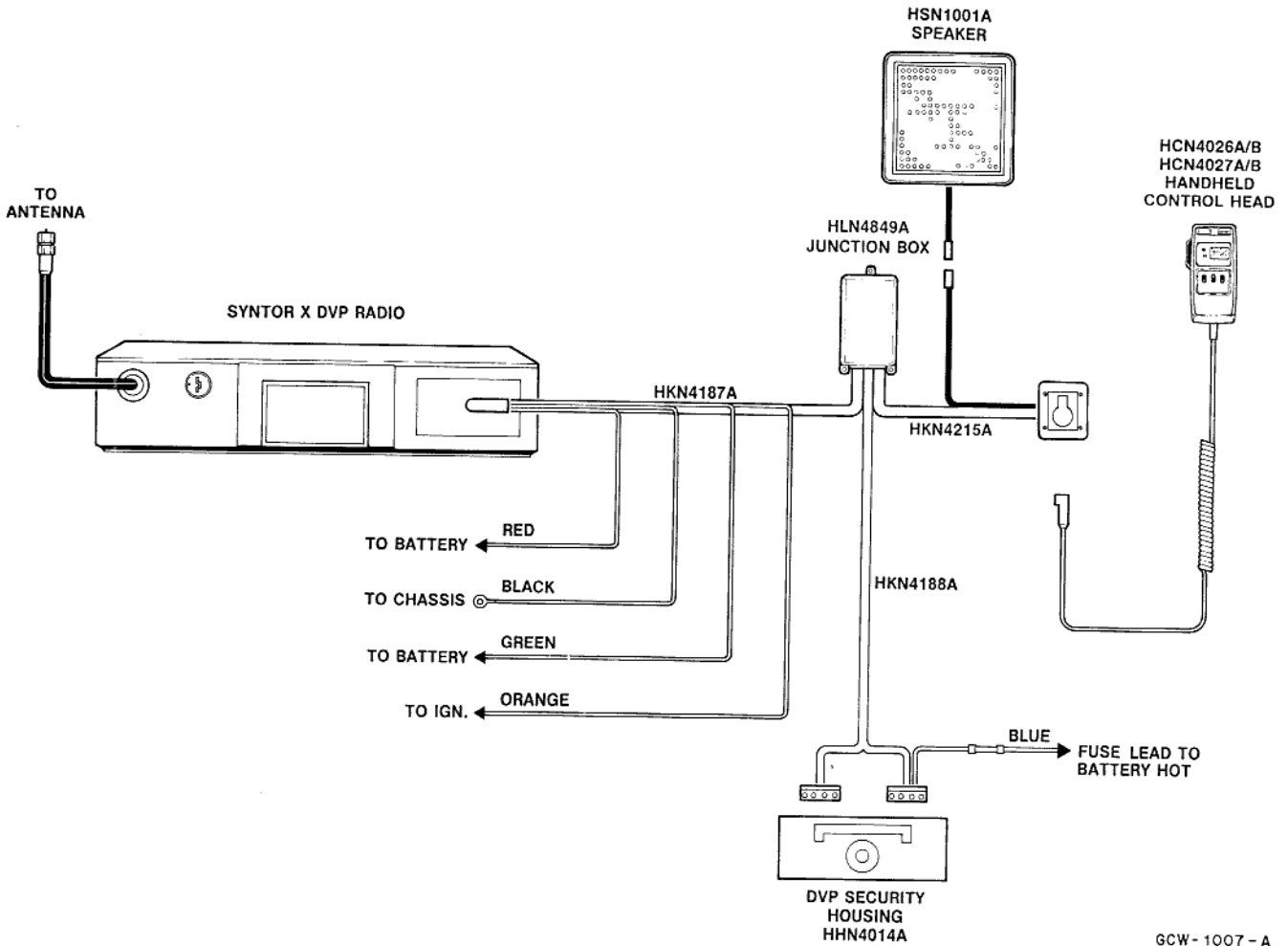


Figure 2. Overall System without DVP

GCW-1007-A

2.6 HSN1001A SPEAKER

This is the same as the standard HSN4005A speaker, except that it has a special two-pin connector instead of the standard *Systems 90*TM connector.

2.7 PL HANGUP BOX

The HLN4830A microphone hangup box, used with *Private-Line*TM and *Digital Private-Line*TM radios, automatically puts the radio in the monitor (carrier squelch) mode when the microphone comes out of the box (offhook). A slide switch on the side of the box puts the radio in the monitor mode with the microphone

still onhook. The hangup box is used only with PL systems.

2.8 INTERCONNECT CABLES (HKN4215A, HKN4187A, HKN4188A, and HKN4216A)

These cables carry power and control functions between the various parts of the system. (See Figures 1 and 2.)

3. Jumper Tables

The following tables list the jumpers, their purposes, and whether they are in or out.

Table 1. Jumpers on Lower Board of Handheld Control Head

CABLES	JUMPERS		
	1, 4	2, 3, 5	6
HCN4026A/B	IN	OUT	OUT
HCN4027A/B	IN	OUT	IN
HCN4028A/B	IN	OUT	IN

Note: Jumpers 1 through 5 are not present in B version kits.

Table 2. Jumpers on Junction Board (HLN4849A)

JU1	IN FOR MASK PROGRAMED SIREN PROCESSOR
JU2	IN FOR EPROM SIREN PROCESSOR
JU3	IN FOR SIREN
JU4	IN FOR SIREN
JU5	OUT FOR SIREN/PA
JU6	IN TO PERMIT USE OF "LIST" WHEN SIREN IS USED WITH NON-DVP RADIO
JU7	OUT FOR HANGUP BOX IN FOR NO HANGUP BOX

Table 3. Jumpers On Controller Board (HLN4728A/B)

JU101	IN TO ENABLE STORAGE OF NP LIST OUT FOR SPECIAL APPLICATIONS
JU102	IN FOR NUMERIC DISPLAY OUT FOR ALPHANUMERIC DISPLAY (UPPER-LOWER CASE)*
JU103	IN FOR POWER UP RETURN TO LAST SELECTED MODE OUT FOR POWER UP ON MODE 1
JU104	NUMBER OF MODES 8 IN 16 OUT 32 IN 64 OUT
JU105	NUMBER OF MODES 8 IN 16 IN 32 OUT 64 OUT
JU106	IN FOR SECOND PRIORITY TO FLASH AT A SLOWER RATE THAN FIRST PRIORITY (SUBJECT TO CON- STRAINT THAT FIRST PRIORITY MUST FOLLOW SELECTED MODES ON ALL MODES) OUT FOR BOTH FIRST AND SECOND PRIORITY TO FLASH AT THE SAME RATE

*The display format is such that all display characters can be shown on two seven-segment displays. This requires that some letters be shown in lower case, however.

Note: Dual-priority scan is only available in 8, 16, and 32-mode systems.

Table 4. Jumpers On Personality Board (HLN4760A)

JUMPER	DESCRIPTION	TYPE	STANDARD	HHCH
JU1	SCAN ENABLE	JUMPER	IN	OUT
JU2	PL REVERSE BURST	JUMPER	IN*	IN*
JU3	SPEC CUST APP	JUMPER	IN	IN
JU4	SPEC CUST APP	JUMPER	IN	IN
JU5	OUT FOR >64 MODES	JUMPER	IN	IN
JU6	IN FOR >64 MODES	JUMPER	OUT	OUT
JU7	NOT USED	—	—	—
JU8	IDC DATA INPUT	JUMPER	IN*	IN*
JU9	SQUELCH TAIL	JUMPER	IN	IN
JU10	PL/DPL DISABLE	JUMPER	IN	IN
JU11	DET MUTE CTRL	JUMPER	OUT	OUT
JU12	DVP MODULATION	JUMPER	OUT*	OUT*
JU13	DVP MODULATION	JUMPER	IN	IN
JU14	DISPLAY ENABLE	JUMPER	OUT	IN
JU15	CTRL HD STROBE	PLUG	OUT	IN
JU16	INPUT STRB ENABLE	PLUG	OUT	IN
JU17	OUTPUT STRB DISBL	JUMPER	IN	OUT
JU18	HANDHELD CONTROL HEAD	JUMPER	IN	OUT
JU19	HANDHELD CONTROL HEAD	JUMPER	IN	OUT
JU451	PA CURRENT DISABLE	JUMPER	OUT*	OUT*

*REVERSE FOR DVP SYSTEMS

Installation

1. General

The handheld control head system allows the radio, DVP security housing, controller board, and junction box to be mounted in the trunk or some other remote part of the vehicle. The handheld control head and speaker must remain within the operator's reach.

2. Trunk Units

2.1 DVP SYSTEMS

The trunk units—the radio, the DVP security housing, and the junction box—should be mounted on ¾-inch plywood or its equivalent (supplied by the installer). A template accompanying this manual shows where to drill holes in the mounting board.

The installation kit for the DVP housing contains mounting screws that are long enough to go through the mounting board and fasten the DVP security housing to the metal floor of the vehicle's trunk. This method of mounting makes the DVP system very secure. Orient the housing so that there is good access to the front of the box for operating the key and inserting codes. The kit also contains a template for positioning the DVP housing when the installation uses the mounting bracket.

2.2 NON-DVP SYSTEMS

See standard manuals 68P81060E05 and 68P80100W45.

3. Cables

3.1 HKN4215A CONTROL-HEAD CABLE

This cable connects the HCN4026A or the HCN4028A handheld control heads and the HSN1001A speaker to the HLN4849A junction box. Attach the 24-pin housing P2 to J2 of the junction box and route the cable to the front of the vehicle. The control-head connector is so designed that the operator can disconnect it quickly and easily if he wants to remove the control head from the vehicle. A good place to mount it is under the driver's seat, where it is easily accessible. Be sure to make allowance for the forward and backward movement of the seat.

3.2 HKN4187A RADIO CONTROL CABLE

This cable connects the SYNTOR X UHF DVP radio with the HLN4849A junction box and the vehicle's battery. Attach 36-pin connector P1 to J1 of the junction box. The large red lead goes to the HKN4052A power fuse, which in turn connects to the positive terminal of

the battery. Also route the green fuse lead to the vehicle battery and connect it to the positive terminal. Route the orange fuse lead up under the dash of the vehicle and connect it to the ignition switch battery voltage. (See the radio manual for details about the installation of the HKN4051A fuse kit.) Attach the black lead on the HKN4187A directly to the vehicle's chassis. Keep the connection to the vehicle free of paint, dirt, and grease in order to give the system a good ground connection.

3.3 HKN4188A DVP CABLE

This cable connects the *DVP* security housing to the HLN4849A junction box. Connect 24-pin connector P3 to J3 of the junction box. Route the cable to the *DVP* housing and connect P1 and P2 to their respective connectors in the *DVP* housing (*Systems 90* connectors). Route the blue fused lead to the vehicle battery and connect it to the positive terminal.

3.4 HKN4216A CONTROL-HEAD CABLE

This cable connects the HCN4027A handheld control head and the HSN1001A speaker to the radio in

a non-*DVP* system. The large red lead goes to the HKN4052A power fuse, which in turn connects to the positive terminal of the battery. Also route the green fuse lead to the vehicle battery and connect it to the positive terminal. Route the orange fuse lead under the dash of the vehicle and connect it to the ignition switch battery voltage. (See the radio manual for details about the installation of the HKN4051A fuse kit.) Attach the black lead on the HKN4187A directly to the vehicle's chassis. Keep the connection to the vehicle free of paint, dirt, and grease in order to give the system a good ground connection.

Note

When routing and connecting the system cables, follow good installation practices. Make sure that all connections are electrically sound and that all cables are secured and not routed or lying where they can be snagged, cut, or crushed.

Operating Instructions

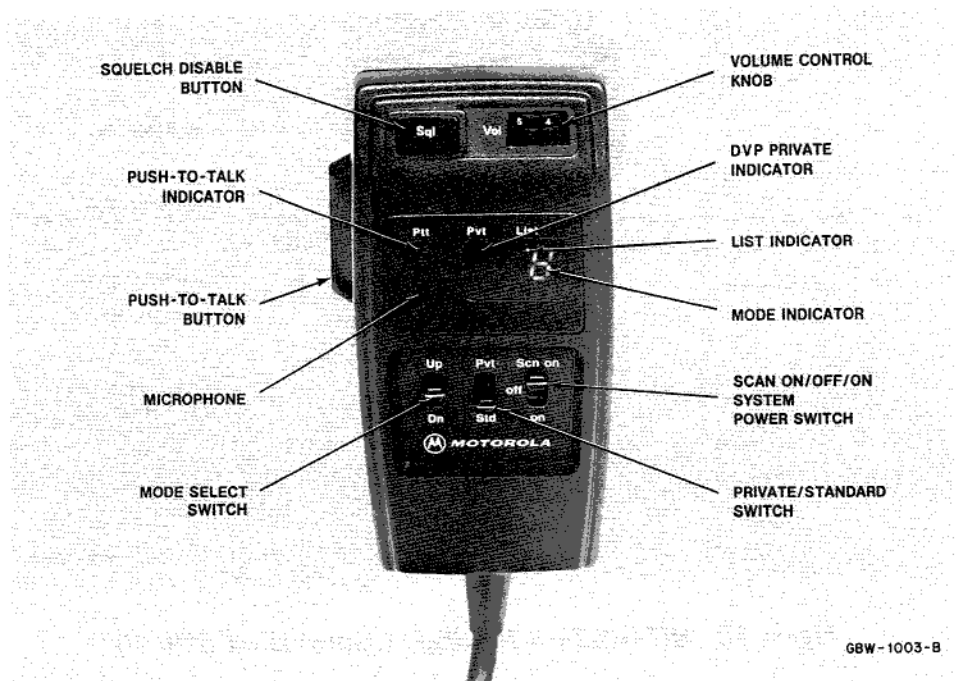


Figure 3A. HCN4026A/B Handheld Control Head (HHCH)

1. Operation of the HCN4026A/B

1.1 TO TURN THE SYSTEM ON

Push the Scan on/off/on switch down for non-scan operation or up for scan operation.

1.2 TO SELECT A MODE

Select a mode with the mode select (Up/Dn) switch. Push the switch up and release it to increase the mode number by one. Push it up and hold it to continue to increase the mode number. Push the switch down and release it to decrease the mode number by one; push it down and hold it to continue to decrease the mode number. (The mode rolls over when you hold the switch up or down after the display shows the highest or lowest numbered mode.)

1.3 TO TRANSMIT

Select either standard or private mode with the Std/Pvt switch.

Push the push-to-talk button and talk into the microphone. When you push the push-to-talk button, the Ptt

indicator lights up. A tone may sound, as well, indicating the following:

- Short tone—you have selected standard mode; your message is not encrypted.
- Beeping tone—you have selected private mode, but the code has not been loaded or has been erased.
- Continuous tone—You have selected a “no-transmit” mode.

1.4 TO RECEIVE

Select a mode.

Push the squelch disable button (Sql) once to un-squelch the radio, then use the volume control knob to adjust the loudness. Push the squelch disable button again to resquelch the radio.

Select either standard or private mode with the Std/Pvt switch.

When the radio is receiving a private message, the DVP private indicator (Pvt) lights up. The radio unmutes if the message is encrypted with the correct code. When the radio receives a standard transmission, it

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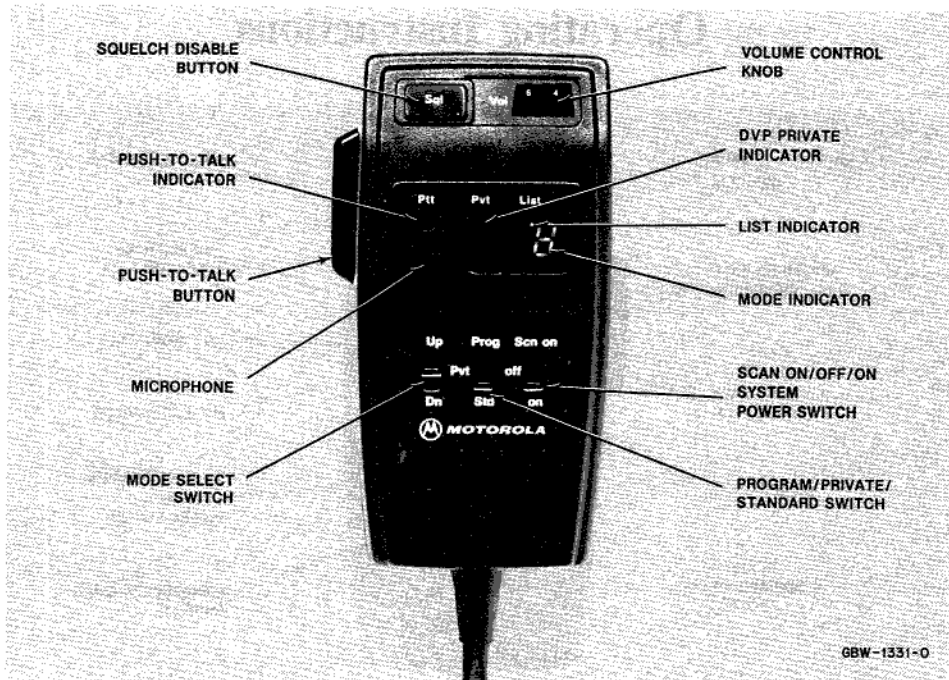


Figure 3B. HCN4027A/B Handheld Control Head (HHCH)

unmutes if the transmission has the correct *PL* tone or *DPL* code. To listen to messages that do not have the correct *PL* code or *DPL* tone, unmute the radio by pressing the squelch disable button.

1.5 TO USE SCAN WITH TALKBACK

Push the Scan on/off/on switch up. The radio now scans the internally programmed priority mode and the field-programmed NP (non-priority) list. The list indicator (List) lights up whenever the displayed mode is part of the NP list. (If the NP list has not been programmed correctly, the mode indicator displays *Er* when you turn the radio on.)

When the radio receives a priority transmission, the mode indicator display flashes the priority mode. When the priority transmission ends, the radio waits four seconds before resuming its scan, and during this time you can respond to the received message by pushing the push-to-talk button. If you do so, the radio does not resume scanning until it detects a five-second silent period.

When the radio receives an NP transmission, it displays the number of the mode on which it is receiving it, but does not flash. It remains on the NP mode four seconds after the transmission has ended, allowing you to respond by pushing the push-to-talk button. When you respond to the NP message, the NP mode becomes the priority mode, and scan does not resume until the radio detects a five-second silent period. If the radio detects a priority message while it is receiving an NP

message, it moves to the priority mode unless you have already responded to the NP message.

If the radio has dual-priority scan and receives a message on a priority-two channel, the operation is the same as for a single-priority scan except that the priority-two display flashes at a slower rate than the display for the priority-one channel.

As long as the radio receives no transmissions while scanning, it displays the selected mode. If it receives a priority message with an incorrect *PL* tone or *DPL* code, the display flashes the priority mode, but the radio does not unmute. To listen to a message with incorrect *PL* or *DPL*, press the squelch disable button.

If the radio receives an NP message with an incorrect *PL* tone or *DPL* code, the display flashes the selected mode and the received mode alternately, and the radio does not unmute.

1.6 TO FIELD-PROGRAM NONPRIORITY SCAN

The HCN4026A/B handheld control head has no scan programming controls, but you can change the non-priority scan list in the field. Such programming does not affect the operation of the scan, which remains the same as described above. To program the system:

- (1) Remove the bottom cover of the radio.
- (2) Switch the Scan on/off/on switch on the handheld control head to on.

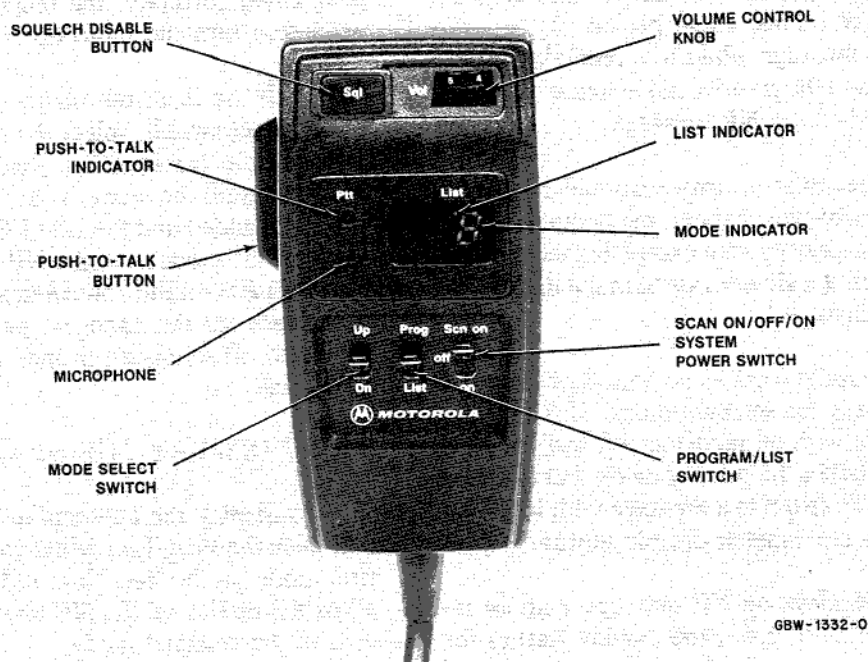


Figure 3C. HCN4028A/B Handheld Control Head (HHCH) (non-DVP)

(3) Find the two scan program pads on the controller board. Connect the two program pads briefly with a short circuit. (This momentary connection converts the squelch switch on the control head into a scan programming switch, and it now retains this function until the radio is shut off.)

(4) To add a mode to or remove one from the nonpriority list, change the number in the display to that of the mode you want to add or delete, and then push the squelch switch. If the mode was not on the nonpriority list, it is now; if it was on the list, it has now been removed. In the former case, the List LED on the control head lights, and in the latter case it goes out.

(5) When you have finished programming the scan list, store the revised list by switching the Scan on/off/on to off (center).

(6) Replace the bottom cover.

2. Operation of the HCN4027A/B

2.1 TO TURN THE SYSTEM ON

To turn the system on, select a mode, transmit, and receive, follow the instructions for the HCN4026A/B in Sections 1.1 to 1.4.

2.2 TO PROGRAM THE SCAN LIST

Push the Scan on/off/on switch up. The radio now scans the internally programmed priority mode and the operator-selectable NP (non-priority) list. The list indicator (List) lights up whenever the displayed mode is

part of the NP list. (If the NP list has not been programmed correctly, the mode indicator displays *Er* when you turn the radio on.)

Push the Scan on/off/on switch down. With the mode select switch, select the mode to be added to or deleted from the scan list. Push the Prog/Pvt/Std switch up to program the mode. If the mode is *not* on the NP List, it is added and the List LED on the control head lights; if the mode *is* on the NP List, it is removed and the List LED on the control head goes out. When you have made all the changes, push the Scan on/off/on switch to off to store the new NP Scan List.

2.3 TO USE SCAN WITH TALKBACK

Push the Scan on/off/on switch up.

When the radio receives a priority transmission, the mode indicator display flashes the priority mode. When the priority transmission ends, the radio waits four seconds before resuming its scan, and during this time you can respond to the received message by pushing the push-to-talk button. If you do so, the radio does not resume scanning until it detects a five-second silent period.

When the radio receives an NP transmission, it displays the number of the mode on which it is receiving it, and does not flash. It remains on the NP mode four seconds after the transmission has ended, allowing you to respond by pushing the push-to-talk button. When you respond to the NP message, the NP mode becomes

the priority mode, and scan does not resume until the radio detects a five-second silent period. If the radio detects a priority message while it is receiving an NP message, it moves to the priority mode unless you have already responded to the NP message.

If the radio has dual-priority scan and receives a message on a priority-two channel, the operation is the same as for a single-priority scan except that the priority-two display flashes at a slower rate than the display for the priority-one channel.

As long as the radio receives no transmissions while scanning, it displays the selected mode. If it receives a priority message with an incorrect *PL* tone or *DPL* code, the display flashes the priority mode, but the radio does not unmute. To listen to a message with incorrect *PL* or *DPL*, push the squelch disable button.

If the radio receives an NP message with an incorrect *PL* tone or *DPL* code, the display flashes the selected mode and the received mode alternately, and the radio does not unmute.

3. Operation of the HCN4028A/B

3.1 TO TURN THE SYSTEM ON

Push the Scan on/off/on switch down for non-scan operation or up for scan operation.

3.2 TO SELECT A MODE

Select a mode with the mode select (Up/Dn) switch. Push the switch up and release it to increase the mode number by one. Push it up and hold it to continue to increase the mode number. Push the switch down and release it to decrease the mode number by one; push it down and hold it to continue to decrease the mode number. (The mode rolls over when you hold the switch up or down after the display shows the highest or lowest numbered mode.)

3.3 TO TRANSMIT

Push the push-to-talk button and talk into the microphone. When you push the push-to-talk button, the Ptt indicator lights up. A tone may sound, as well, indicating that you have selected a "no-transmit" mode.

3.4 TO PROGRAM THE SCAN LIST

Push the Scan on/off/on switch up. The radio now scans the internally programmed priority mode and the operator-selectable NP (non-priority) list. The list indicator (List) lights up whenever the displayed mode is part of the NP list. (If the NP list has not been

programmed correctly, the mode indicator displays *Er* when you turn the radio on.)

Push the Scan on/off/on switch down. With the mode select switch, select the mode to be added to or deleted from the scan list. Push the Prog/List switch up to program the mode. If the mode is *not* on the NP List, it is added and the List LED on the control head lights; if the mode *is* on the NP List, it is removed and the List LED on the control head goes out. When you have made all the changes, push the Scan on/off/on switch to off to ensure proper storage of the new NP Scan List.

3.5 TO DISPLAY THE NP LIST

To display the contents of the NP (non-priority) list, push the Prog/List switch down. This displays the first mode on the list. Hold it down to scroll through all of the modes on the NP scan list. Release it to return to the selected mode.

3.6 TO RECEIVE

Select a mode.

Push the squelch disable button (Sql) once to un-squelch the radio, then use the volume control knob to adjust the loudness. Push the squelch disable button again to resquelch the radio.

When the radio receives a transmission, it unmutes if the transmission has the correct *PL* tone or *DPL* code. To listen to messages that do not have the correct *PL* tone or *DPL* code, unmute the radio by pressing the squelch disable button.

3.7 TO USE SCAN WITH TALKBACK

Push the scan on/off/on switch up.

When the radio receives a priority transmission, the mode indicator display flashes the priority mode. When the priority transmission ends, the radio waits four seconds before resuming its scan, and during this time you can respond to the received message by pushing the push-to-talk button. If you do so, the radio does not resume scanning until it detects a five-second silent period.

When the radio receives an NP transmission, it displays the number of the mode on which it is receiving it, but does not flash. It remains on the NP mode four seconds after the transmission has ended, allowing you to respond by pushing the push-to-talk button. When you respond to the NP message, the NP mode becomes the priority mode, and scan does not resume until the

radio detects a five-second silent period. If the radio detects a priority message while it is receiving an NP message, it moves to the priority mode unless you have already responded to the NP message.

If the radio has dual-priority scan and receives a message on a priority-two channel, the operation is the same as for a single-priority scan except that the priority-two display flashes at a slower rate than the display for the priority-one channel.

As long as the radio receives no transmissions while scanning, it displays the selected mode. If it receives a priority message with an incorrect *PL* tone or *DPL* code, the display flashes the priority mode, but the radio does not unmute. To listen to a message with incorrect *PL* or *DPL*, press the squelch disable button.

If the radio receives an NP message with an incorrect *PL* tone or *DPL* code, the display flashes the selected mode and the received mode alternately, and the radio does not unmute.

Theory of Operation

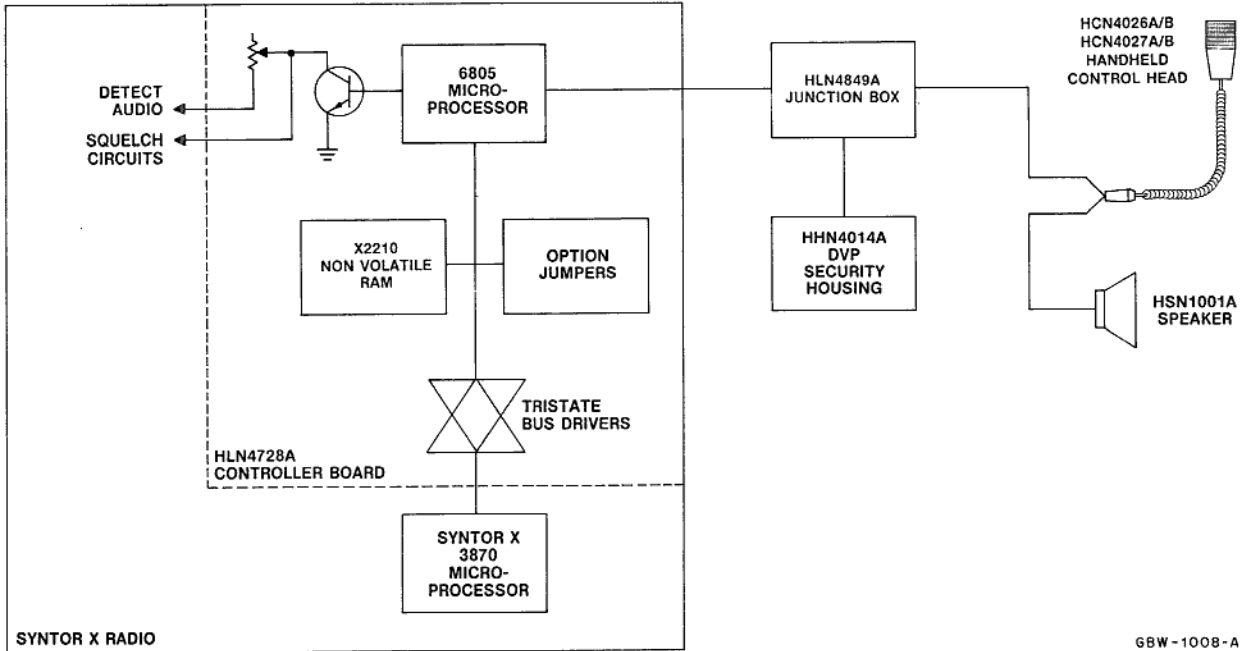


Figure 4A. Block Diagram of DVP System

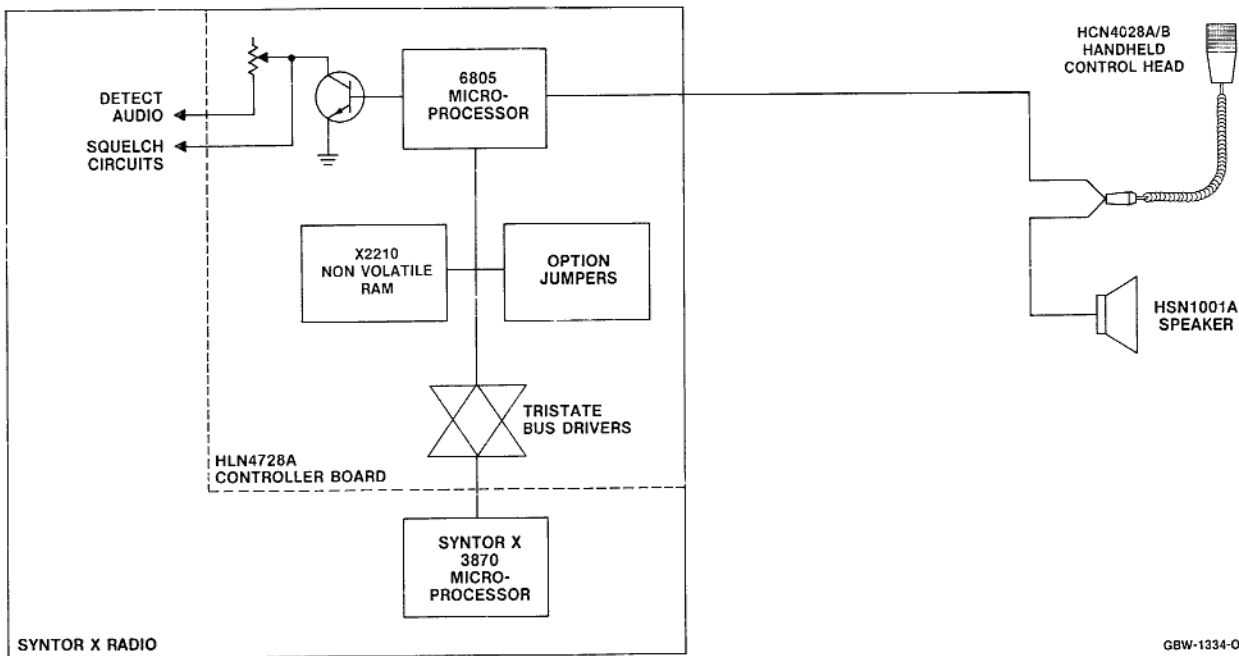


Figure 4B. Block Diagram of a Non-DVP System

1. HLN4728A/B Controller Board

This board replaces the bidirectional bus drivers normally found in the SYNTOR X radio and connects the microprocessor of the radio to the handheld control head. U101, a microprocessor, performs the controller functions. A nonvolatile memory stores the nonpriority

scan list and retains it when the power is off, and also remembers which mode was selected when the radio was turned off.

1.1 M6805 MICROPROCESSOR

This microprocessor, U101, has a predetermined permanent internal program that gives the processor its

operating instructions. U101 obtains its primary plus-five-volt power from the internal *SYNTOR X* plus-five-volt regulator. It uses a 3.6-MHz crystal for its system clock.

1.2 NONVOLATILE MEMORY

The nonvolatile RAM, U102, receives a recall pulse from R125 and C106 when the system starts up. This moves stored data from the nonvolatile portion of the chip to the RAM portion. Whenever the RAM data is to be read or modified, U103, U104, and U105 interrupt the bus to the radio and the lines become memory inputs and outputs. When the system shuts down, Q107 turns off and R126 pulls the store pin low to store data from the volatile portion of the memory in the nonvolatile portion. The nonvolatile memory has a finite number of store cycles. Therefore the system software calculates and stores a check sum each time the non-priority scan list is changed. If on power-up the stored check sum does not agree with the recalculated check sum, the display on the control head shows *Er* for a short time before operation is allowed with the possibly defective nonpriority scan list. This indicates that the unit may require service.

2. Mode Lines

The mode lines between the controller board and the radio microprocessor carry signals identical to those between any *SYNTOR X* microprocessor and its bidirectional bus drivers. The signals carried on the mode lines going through J1 (main radio connector) have now been redefined to allow operation of the handheld control head. This includes serial display data and parallel switch data.

3. System On/Off Operation

K101 controls power to the system. Q101 drives Q102 to turn K101 on and off. A capacitor between the base and emitter of Q101 gives a short delay between the time the system is turned off and the time power is actually removed. This allows the operator to switch from scanning to non-scanning operation (across the Off position of the switch) without shutting down the system. Q112, which forms a voltage sense circuit, allows the system to store the active (selected) mode before shutting down when the ignition switch is turned off. Any capacitance on the vehicle ignition line (orange lead circuit) can delay radio turn-off when the ignition is turned off. This delay can last several seconds.

4. Radio Squelch

Trim pot R106, which controls the radio squelch, can be set through the controller board after the radio cover has been removed and *PL* or *DPL* (if installed) are disabled. The radio operator can unsquelch the radio by pushing the squelch button on the control head. This switch is tied to an input port on U101 that (through software) toggles Q104 on or off while simultaneously disabling or enabling *PL* or *DPL* with Q105 and Q106.

5. Scan Operation

5.1 GENERAL

The *SYNTOR X* radio can have as many as thirty-two preprogrammed modes. Each mode has a transmit frequency and a receive frequency. *Channel Scan* lets the operator hear traffic on any one of the receive frequencies programmed into any of the modes. It does this by monitoring each receive frequency in turn for ten milliseconds. If *Channel Scan* finds a carrier on a frequency, it listens for 300 milliseconds—long enough to determine whether or not the signal is valid for its mode. Any signal is valid if the mode is programmed for carrier squelch. If the mode is programmed for *PL* or *DPL*, however, the signal must have the proper *PL* tone or *DPL* code in order to be valid, and *Channel Scan* determines whether or not it does. If the signal is not valid, *Channel Scan* goes on to check the next mode. If the signal is valid, *Channel Scan* unsquelches the audio and lets it be heard in the speaker. Scan operation is the same for both standard (clear) and private (coded) messages, although for private messages the scan uses the *DVP* code to determine if the signal is valid.

In its simplest form, *Channel Scan* cycles through all the programmed scan modes available in the radio, monitoring each one in turn for a short interval, starting with the first mode and going to the last mode, then starting at the first mode again. Upon finding a mode with a valid signal on it, *Channel Scan* stops scanning until traffic ceases on that mode's frequency. Then the scan resumes by checking the next mode.

One or two modes can be programmed as priority modes. If this is the case, *Channel Scan* checks the priority modes after it checks each nonpriority channel. If the scan detects a valid signal on a nonpriority mode, it stops on that mode, just as it would do if there were no priority modes. However, the scan then leaves the active mode every 300 milliseconds (one priority mode) or 350 milliseconds (two priority modes) to check for activity on the priority modes. If the scan detects a valid signal on a priority mode, it stops scanning and stays on that mode until activity on that mode ceases. Then it resumes scanning at the mode on which it was operating before the priority mode interrupted it.

5.2 TALKBACK SCAN

The transmitter steering feature of Talkback allows the operator's first transmission to go out on the last active channel, so that he does not have to reset the mode switch before transmitting. The scan delay after a transmission (scan-revert delay) gives the other station time to prepare its reply. Without this delay, *Channel Scan* could find activity on another channel as soon as the operator dekeyed. If it did, the operator would then miss an incoming response, because activity on one nonpriority channel will not override activity on another. This scan-revert delay also allows the operator to monitor an ensuing conversation between other parties on the last transmit channel without having the conversation blocked by scan. The conversation can be any length, as long as it starts within five seconds of transmitter dekey and has no carrier or *PL* or *DPL*-detect dropouts longer than three seconds. The squelch control setting is important because an unsquelched radio will continue to monitor the last transmit mode indefinitely.

To defeat the scan-revert delay for any reason (to transmit on a different selected mode), the operator can toggle the Scan on/off switch.

Note

Scan is also inhibited in the same way after a transmission on the mode-select channel—which may or may not be in the scan list.

5.3 OPERATING MODES

5.3.1 Nonpriority Scan

When no channel is active, the scan sequence is NP1 (Nonpriority Mode One), NP2, NP3...NP1, NP2, NP3...etc. If any mode has an active frequency with the correct *PL* tone or *DPL* code, the scan stops on that mode. When the frequency becomes inactive, the scan resumes with the next mode. The scan stops for 0.3 second on any mode that is receiving a signal with the wrong *PL* tone or *DPL* code. It does not unmute the audio, however, unless the *PL* hangup box switch is in the monitor position or the microphone is offhook.

5.3.2 Single-Priority Scan

When no channel is active, the scan sequence is NP1, P1, NP2, P1, NP3, P1...NP1, P1, NP2...etc. If

the priority channel becomes active, the scan stops until the priority channel becomes inactive. The audio unmutes only if the proper *PL* tone or *DPL* code is present—or the *PL* hangup box switch is in the monitor position or the microphone is offhook.

If a nonpriority channel becomes active and the signal has the correct *PL* tone or *DPL* code (or if the mode is carrier squelch), the scan stops on this channel, but switches to the priority channel to sample it every 0.3 second. It remains on the priority channel for 10 milliseconds, then returns to the active nonpriority channel (if it finds the priority channel inactive). The audio unmutes while the scan is on the active nonpriority channel, and mutes while the scan is on the inactive priority channel.

If a nonpriority channel becomes active but the signal has the wrong *PL* tone or *DPL* code, the scan stops for 0.3 second (audio muted, display lighted), then continues on as if the channel were inactive.

5.3.3 Dual-Priority Scan

With no active channel, the scan sequence is NP1, P1, P2, NP2, P1, P2, NP3.... If the priority-one channel becomes active, it operates exactly as described in Section 5.3.2.

If the priority-two channel becomes active, sampling of P1 continues at 0.3-second intervals. The audio unmutes if the *PL* tone of the *DPL* code is correct (or if the channel is programmed for carrier squelch), except during the sampling of P1.

If a nonpriority channel becomes active and the signal has the correct *PL* tone or *DPL* code (or the mode is programmed for carrier squelch), the scan stops on the active nonpriority channel. Every 0.35 second, the scan samples P1 and P2. The audio remains unmuted except during the priority sampling intervals.

If a nonpriority channel becomes active with an incorrect *PL* tone or *DPL* code, the operation is the same as for single-priority scan with an active nonpriority mode with the wrong *PL* tone or *DPL* code, except that the scan sequence is different: NPX, P1, P2, NP (X plus 1), P1, P2....

Maintenance

1. General

Although the system is carefully adjusted at the factory, some additional adjustment may be needed in the field.

2. Squelch

- (1) Switch the Scan on/off switch to Scan on.
- (2) Remove the bottom cover of the radio.
- (3) (Note: *PL* must be disabled for this step.) Find the squelch adjustment pot (labeled *Sql*) on the controller board (HLN4728A/B). Turn the pot counterclockwise as far as it will go. Squelch noise should now sound in the speaker.
- (4) Turn the squelch adjustment pot clockwise until the radio squelches. If the pot goes all the way clockwise

without squelching the radio, push the squelch disable button on the control head once. This should squelch the radio. Now repeat Steps 3 and 4.

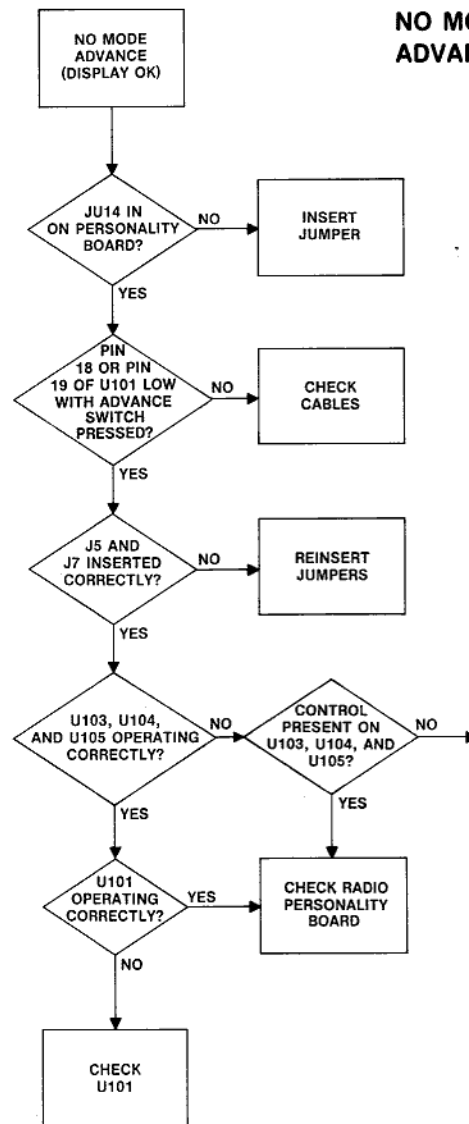
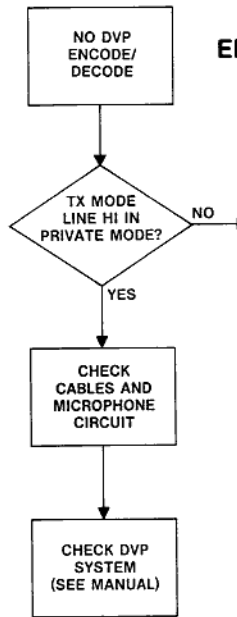
3. *DVP*

To adjust the *DVP*, follow the instructions in the *DVP* manual. Note that the two pushbutton switches and the three lights on the security housing have no function in this system.

4. Memory Module

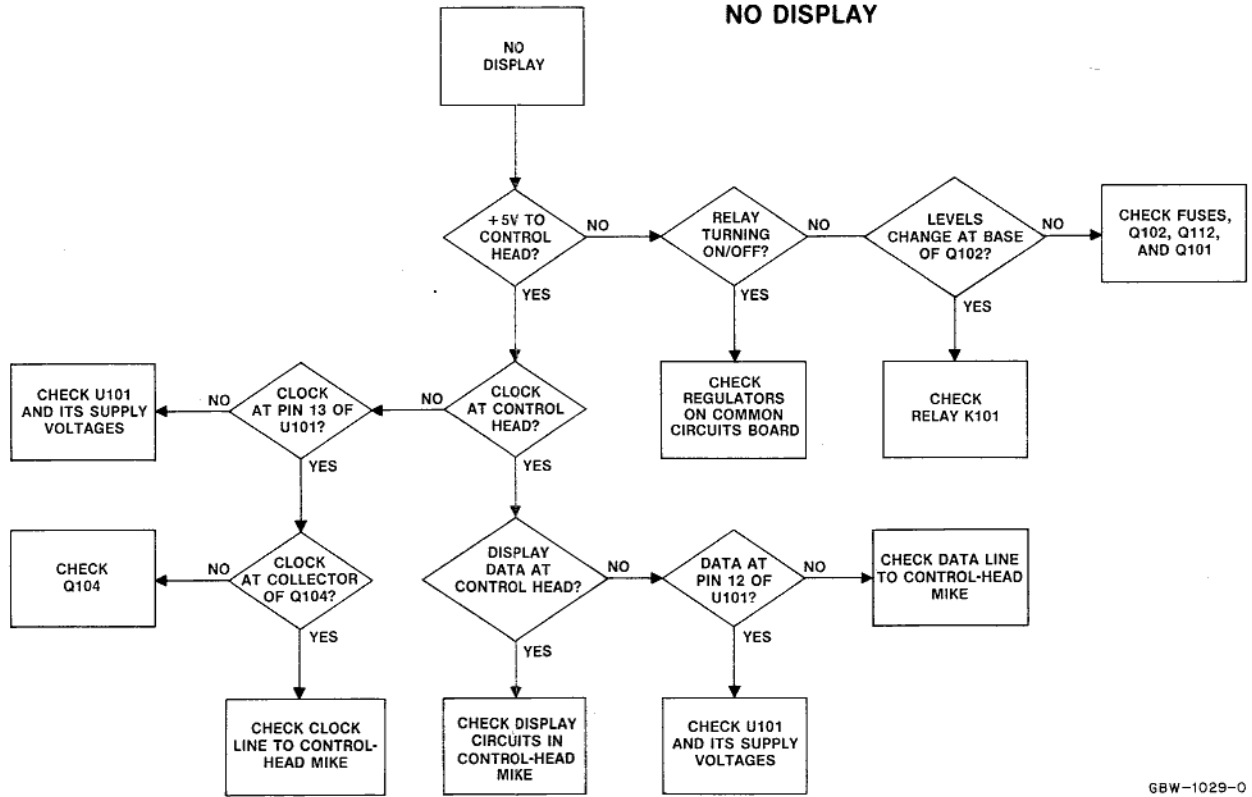
If it is necessary to remove or replace the memory module in the radio, first remove the controller board by loosening the four screws that secure it to the chassis. Do not attempt to remove the memory module through the hole in the controller board.





CHECK VR2
I LOWER
TROL HEAD
BOARD

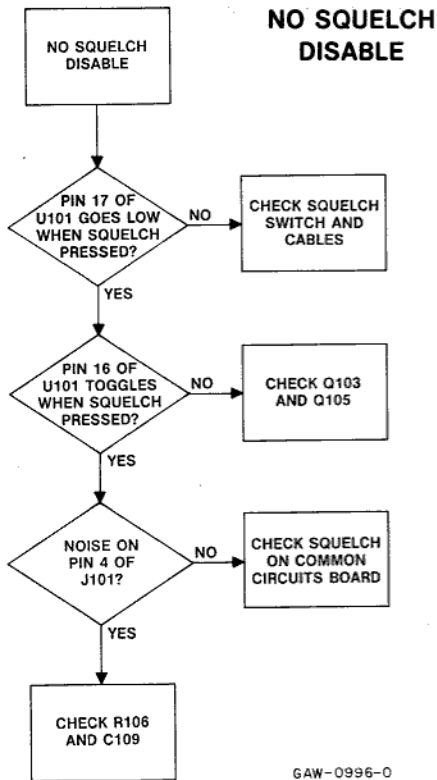
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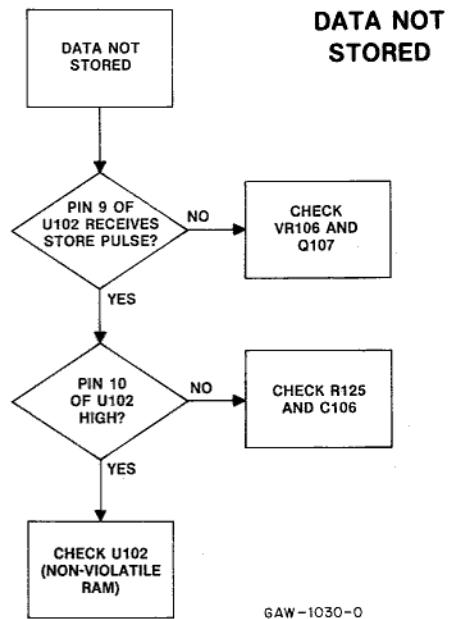
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CHECK Q111
AND CR110

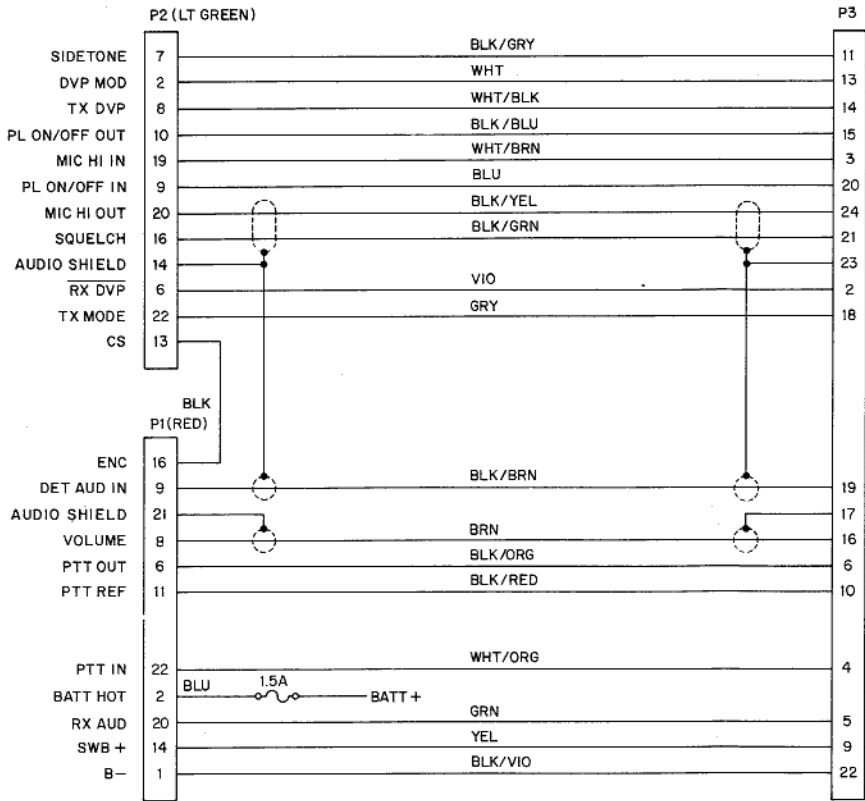
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GAW-0996-0

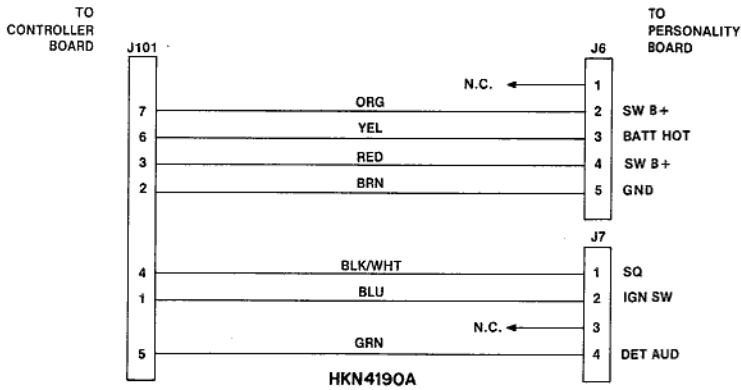
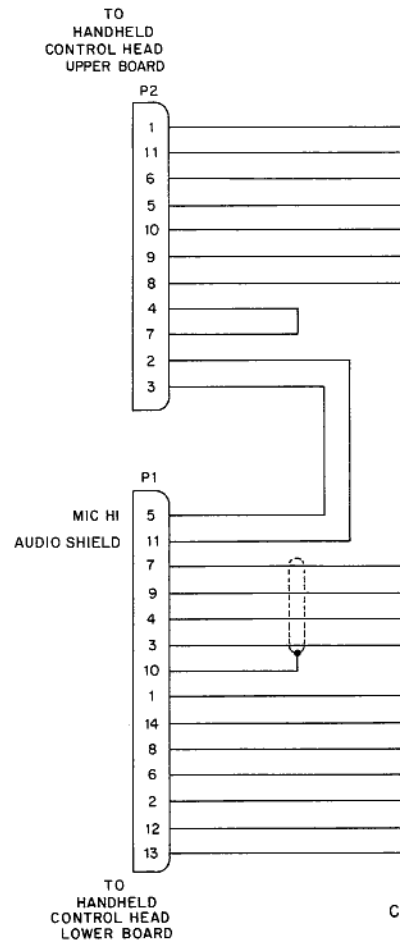


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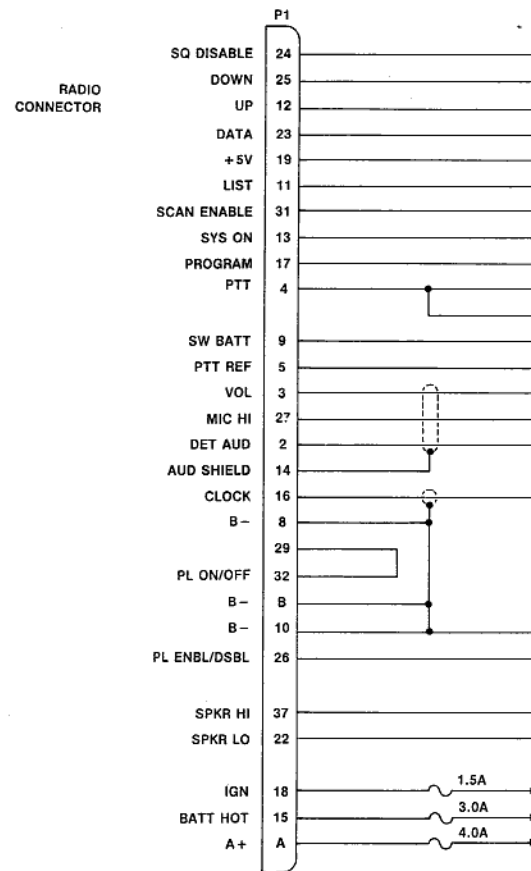
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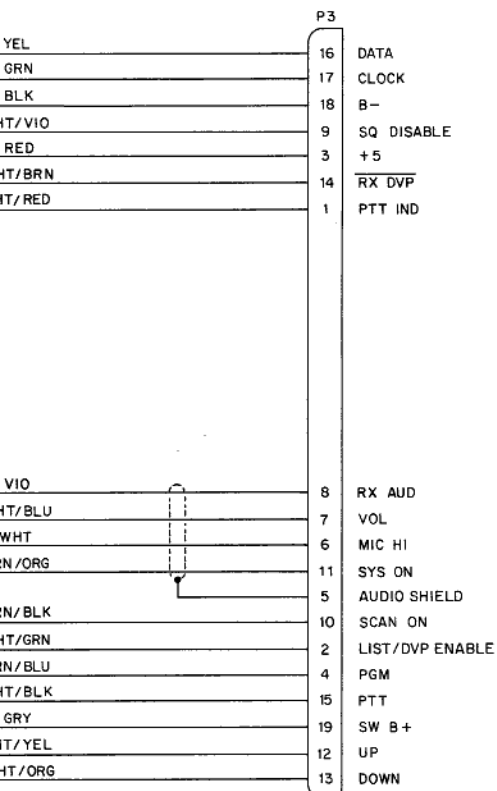
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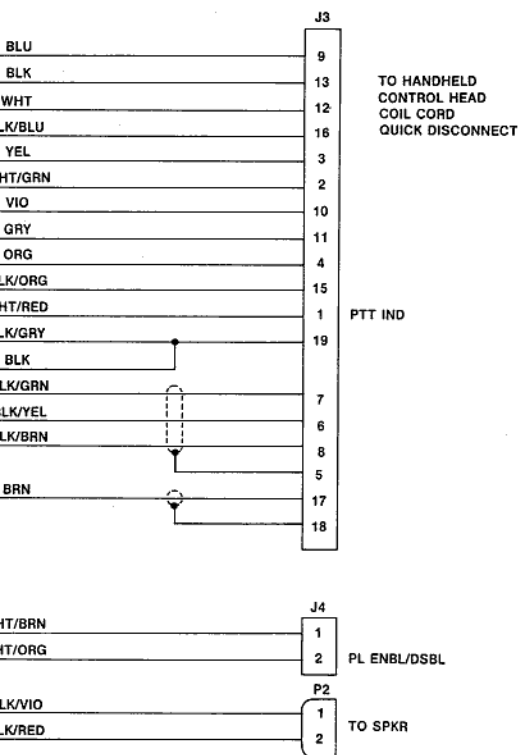
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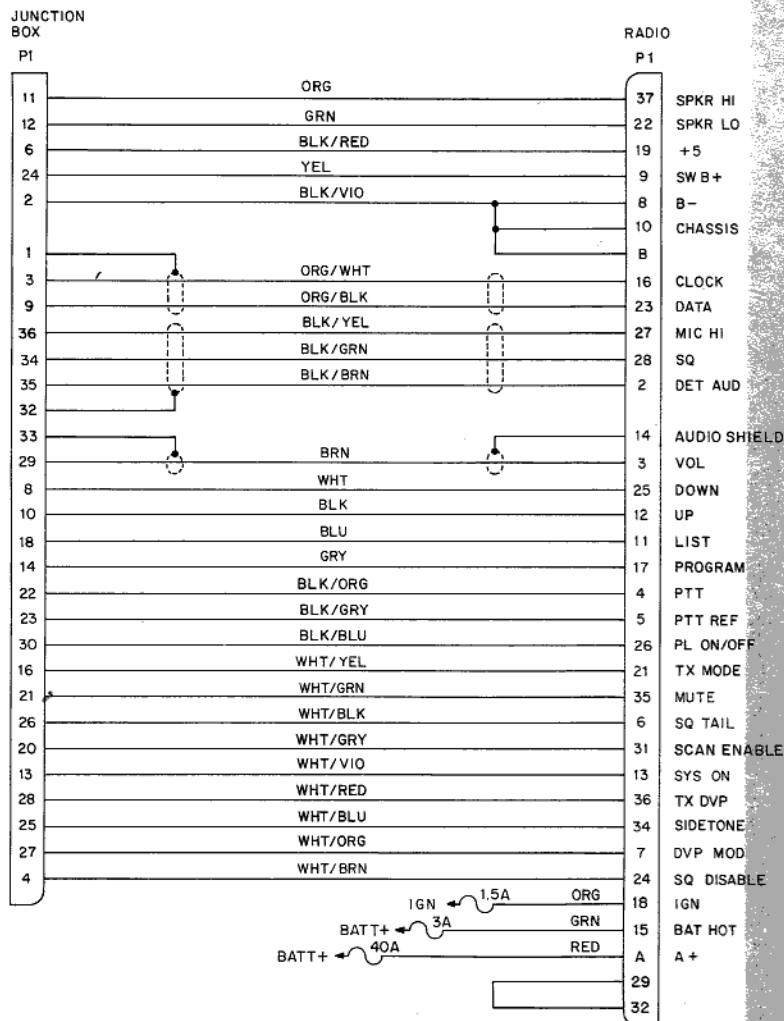
NDHELD
ROL HEAD
L CORD

GCW-1002-A



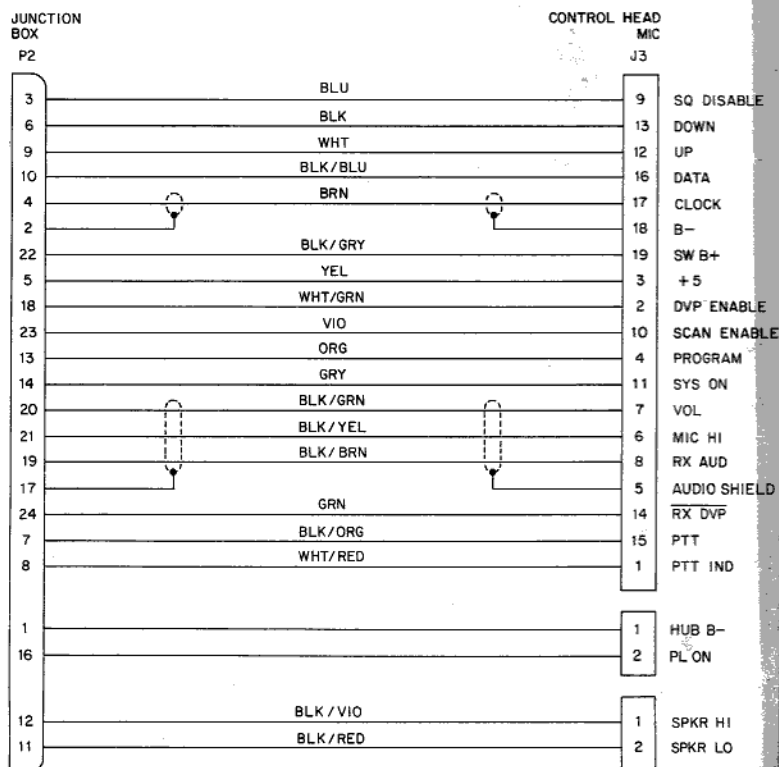
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GCW-1351-0



HKN4187A

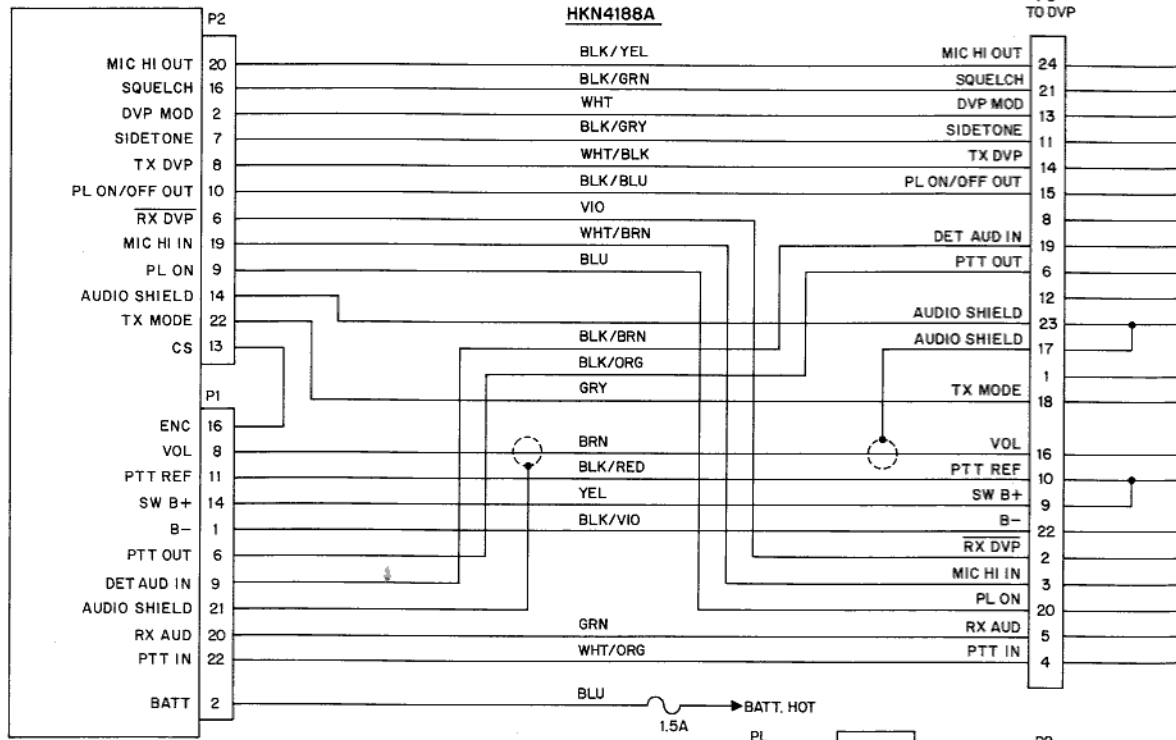
GCW-1000-A



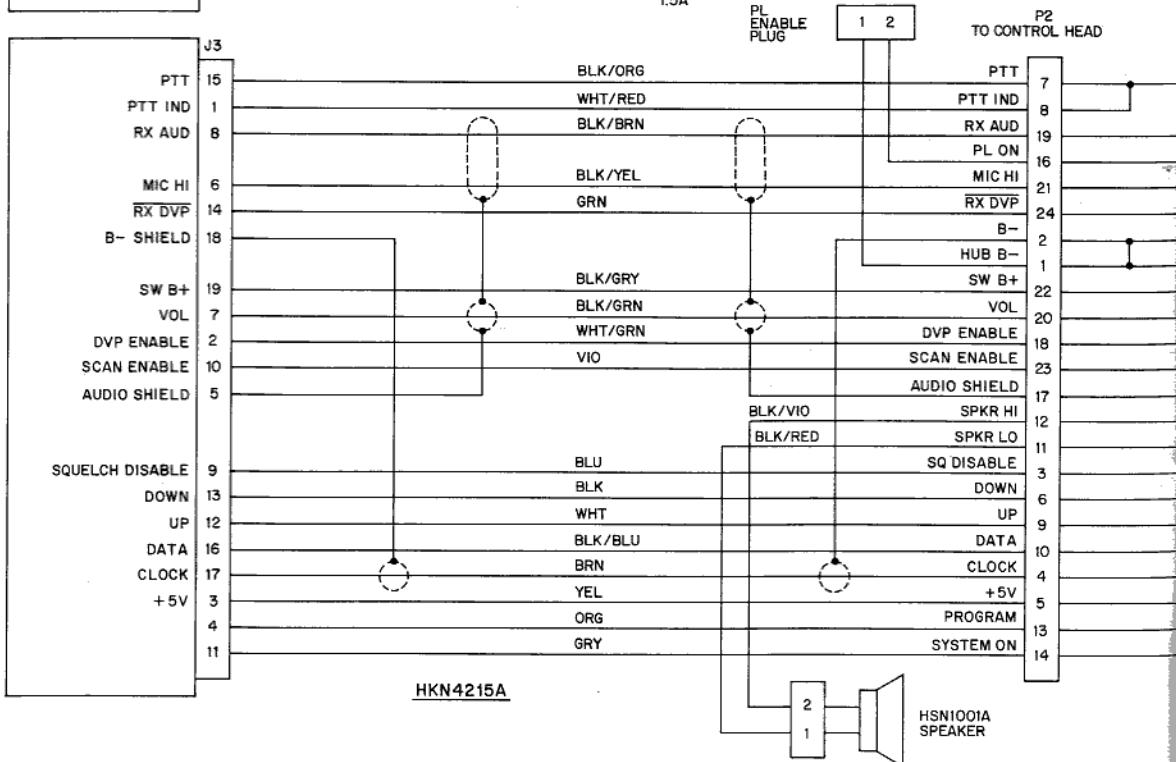
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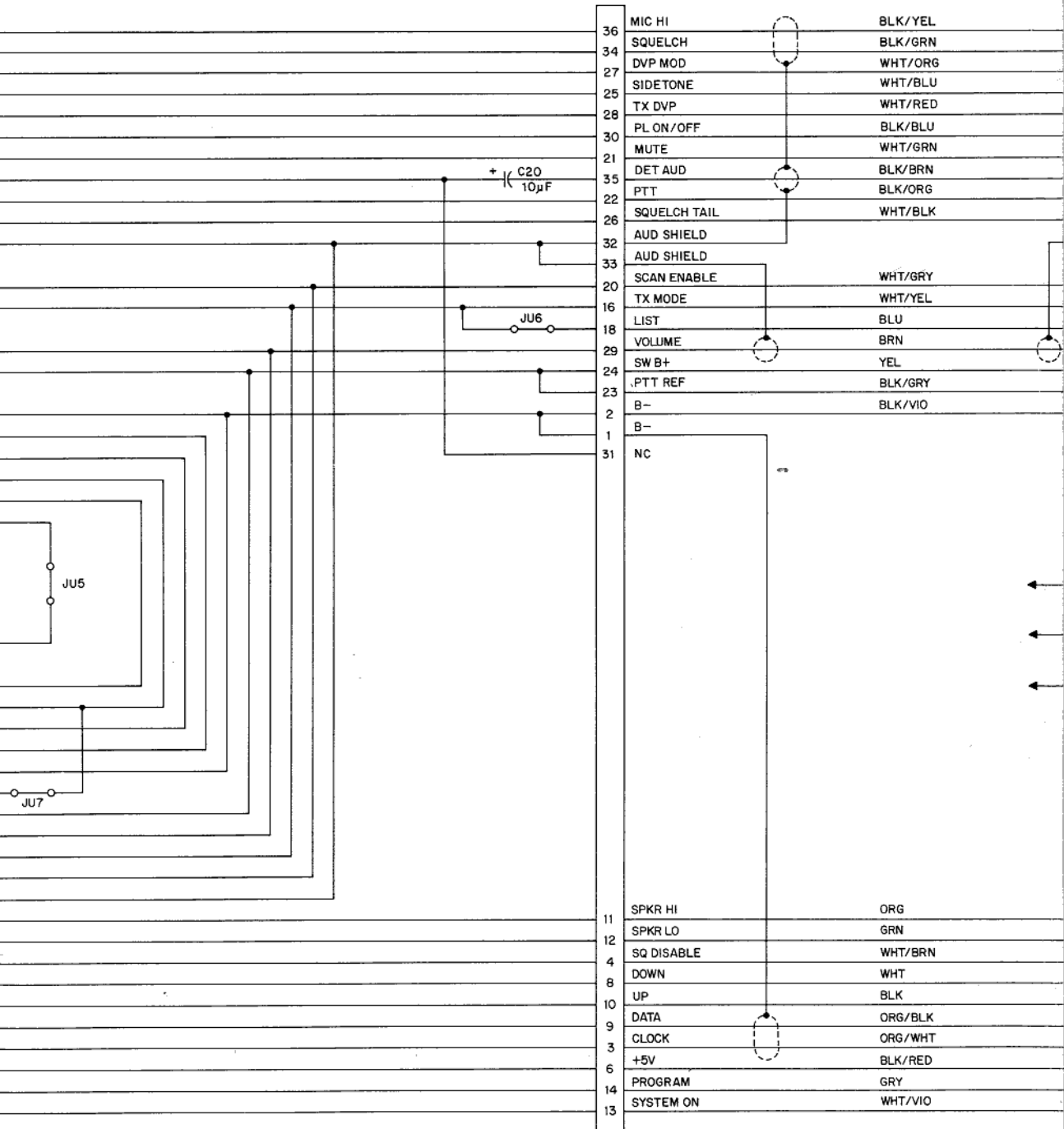
DVP UNIT



CONTROL HEAD MICROPHONE



P1
TO RADIO



HLN4849A
CABLE JUNCTION BOX

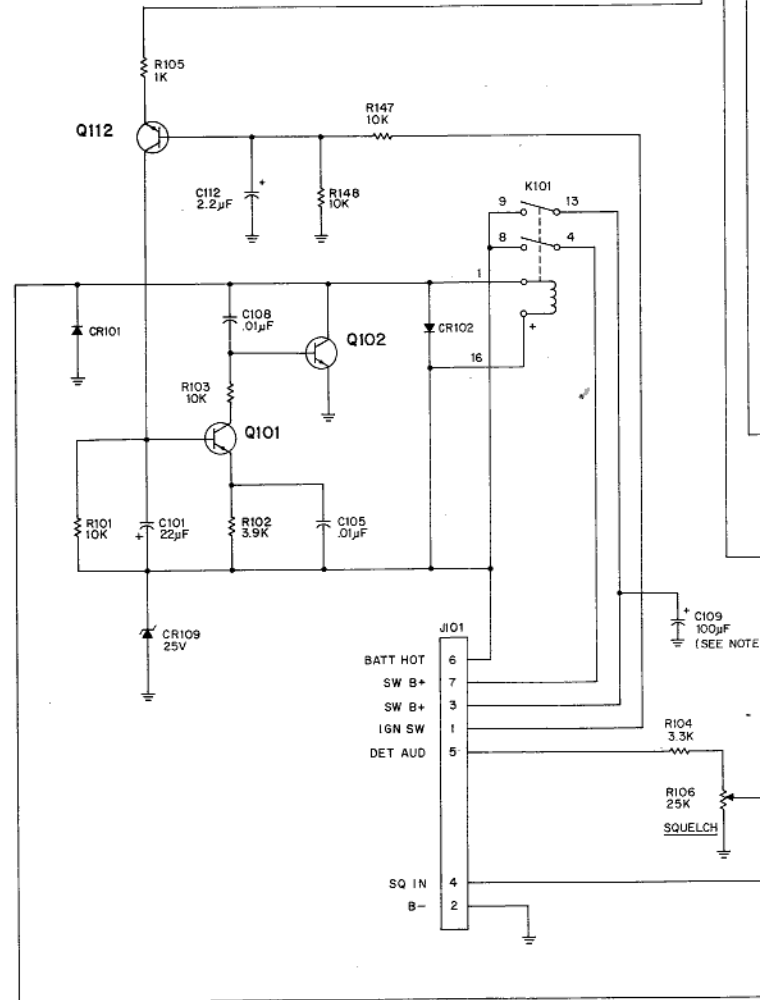
HKN4187A

parts list

HLN4728A/B Controller Board

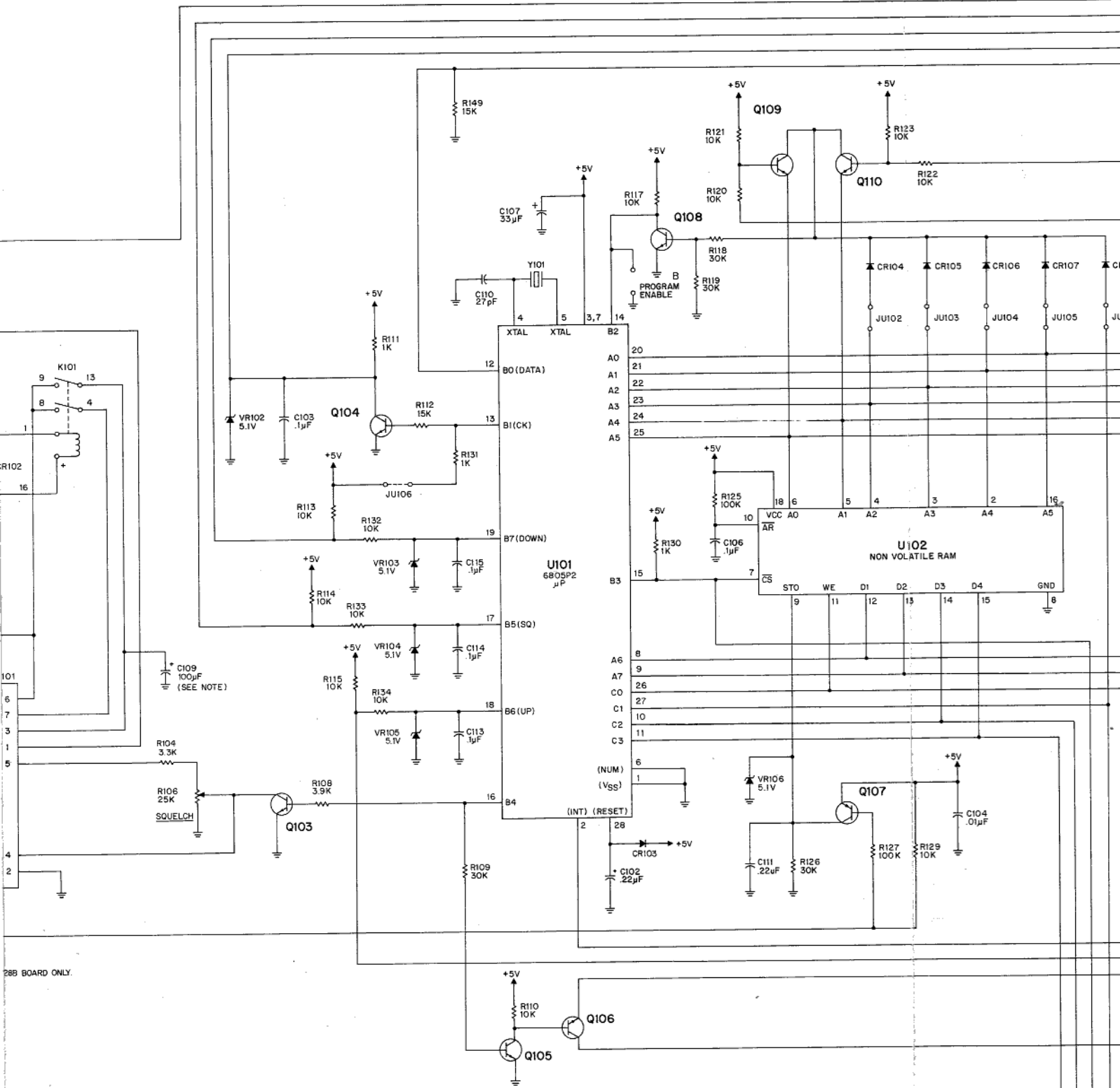
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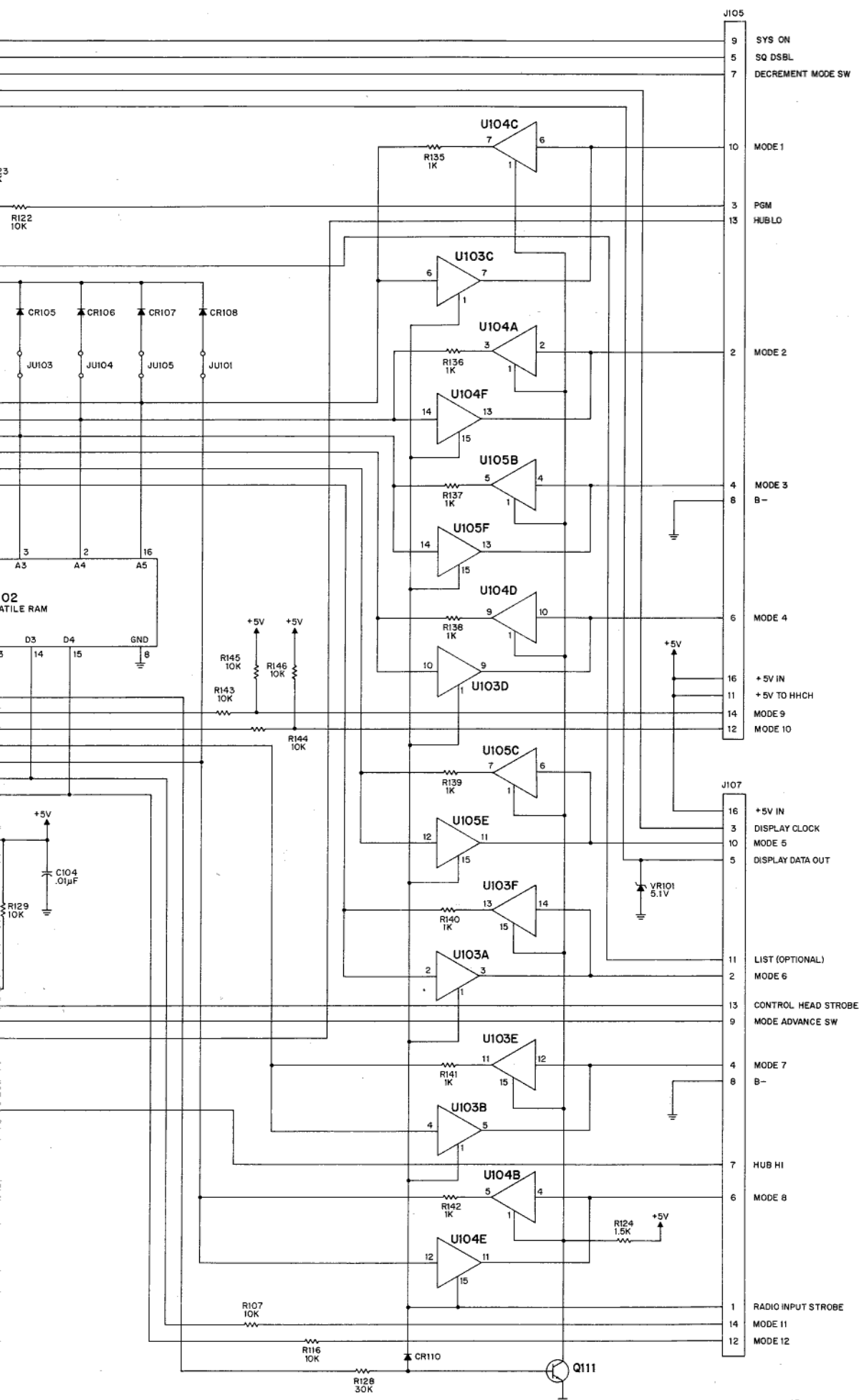
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
capacitor, fixed, pF ± 10% 100V unless otherwise stated		
C101	23-84762H16	22, 20V
C102	21-11032B15	.22 +80, -20%, 50V
C103	21-11032B13	.10 +80, -20%, 50V
C104, 105	21-11032B07	.01 +80, -20%, 50V
C106	21-11032B13	.10 +80, -20%, 50V
C107	23-11013B56	33 ± 20%, 10V
C108	21-11032B07	.01 +80, -20%, 50V
C109	23-84665F03	100 μF (see note 1)
C110	21-11031A25	27 ± 5%, 50V
C111	21-11032B15	.22 +80, -20%, 50V
C112	23-11013D05	2.2, 20V
C113-115	21-11032B13	.10, +80, -20%, 50V
diode (see note 2)		
CR101	48-80005E01	silicon
CR102	48-82466H18	silicon rectifier
CR103-108	48-80005E01	silicon
CR109	48-80236E07	silicon
CR110	48-80004E01	germanium
connector receptacle		
J101	28-80061H01	
connector		
JU101-106	06-11009B23	resistor jumper
relay		
K101	80-80075G03	dpdt
transistor (see note 2)		
Q101	48-82233P14	PNP, type MMBT3906
Q102-106	48-82233P13	NPN, type MMBT3904
Q107	48-82233P14	PNP, type MMBT3906
Q108	48-82233P13	NPN, type MMBT3904
Q109, 110	48-82233P14	PNP, type MMBT3906
Q111, 112	48-82233P13	NPN, type MMBT3904
resistor, fixed, Ω ± 5%, 1/8 watt unless otherwise stated		
R101	06-11024A73	10k
R102	06-11024A63	3900
R103	06-11024A73	10k
R104	06-11024A61	3.3k
R105	06-11024A49	1000
R106	18-80087E01	potentiometer, 25k
R107	06-11024A73	10k
R108	06-11024A63	3900
R109	06-11024A84	30k
R110	06-11024A73	10k
R111	06-11024A49	1000
R112	06-11024A77	15k
R113-117	06-11024A73	10k
R118, 119	06-11024A84	30k
R120-123	06-11024A73	10k
R124	06-11024A53	1500
R125	06-11024A97	100k
R126	06-11024A84	30k
R127	06-11024A97	100k
R128	06-11024A84	30k
R129	06-11024A73	10k
R130, 131	06-11024A49	1000
R132-134	06-11024A73	10k
R135-142	06-11024A49	1000
R143-148	06-11024A73	10k
R149	06-11024A77	15k
integrated circuit (see note 2)		
U101	51-97010C02	microprocessor firmware
U102	51-80070C19	nonvolatile RAM, 64 X 4
U103-105	51-82884L74	hex buffer
voltage regulator (see note 2)		
VR101-106	48-80007E01	zener 5.1V ± 10%
crystal (see note 2)		
Y1	48-82611M10	quartz oscillator, 3.6 mHz
non-referenced item		
	75-05295B01	crystal insulator



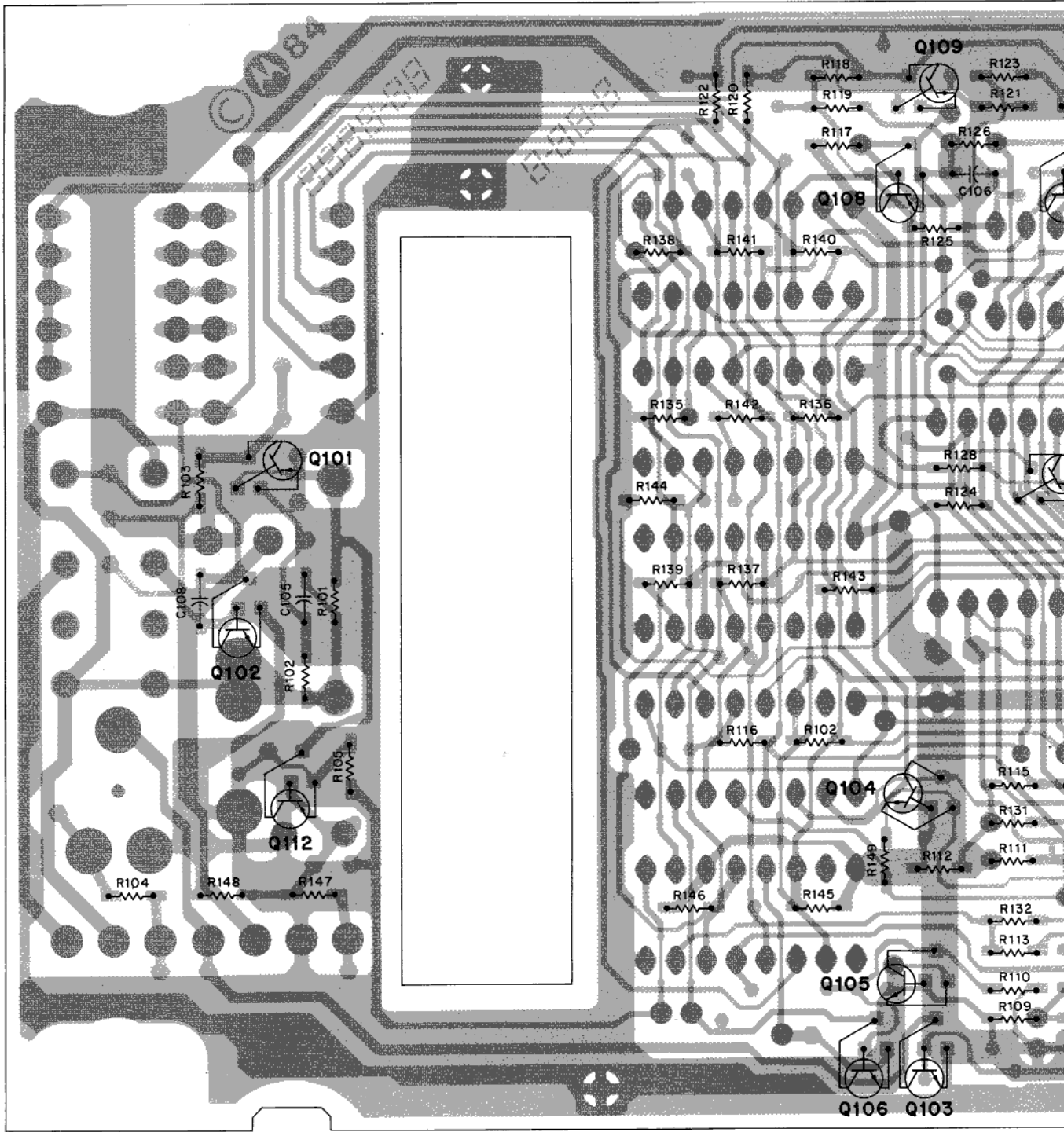
NOTE: COMPONENT USED IN HLN4728B BOARD ONLY.

- notes:
1. C109 is used in the B-version boards only.
 2. For best performance, order diodes, transistors, and integrated circuits by Motorola part number.



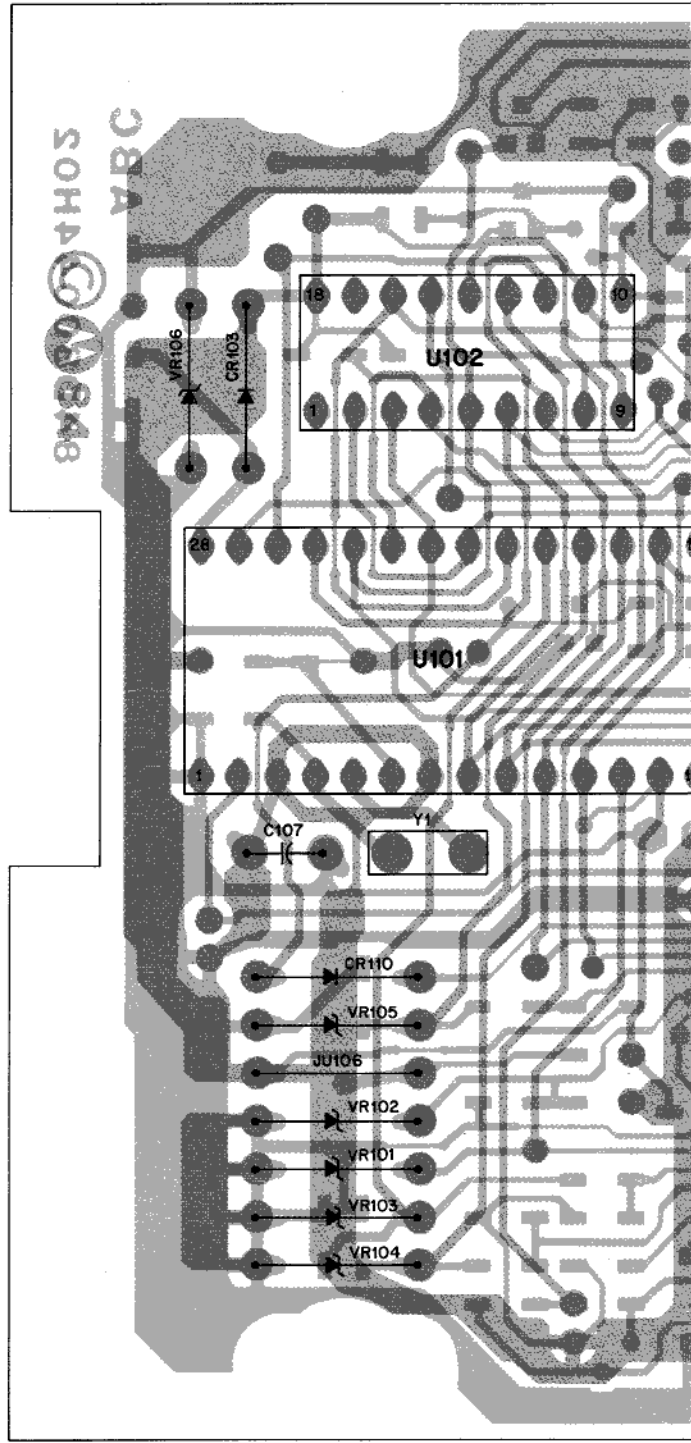
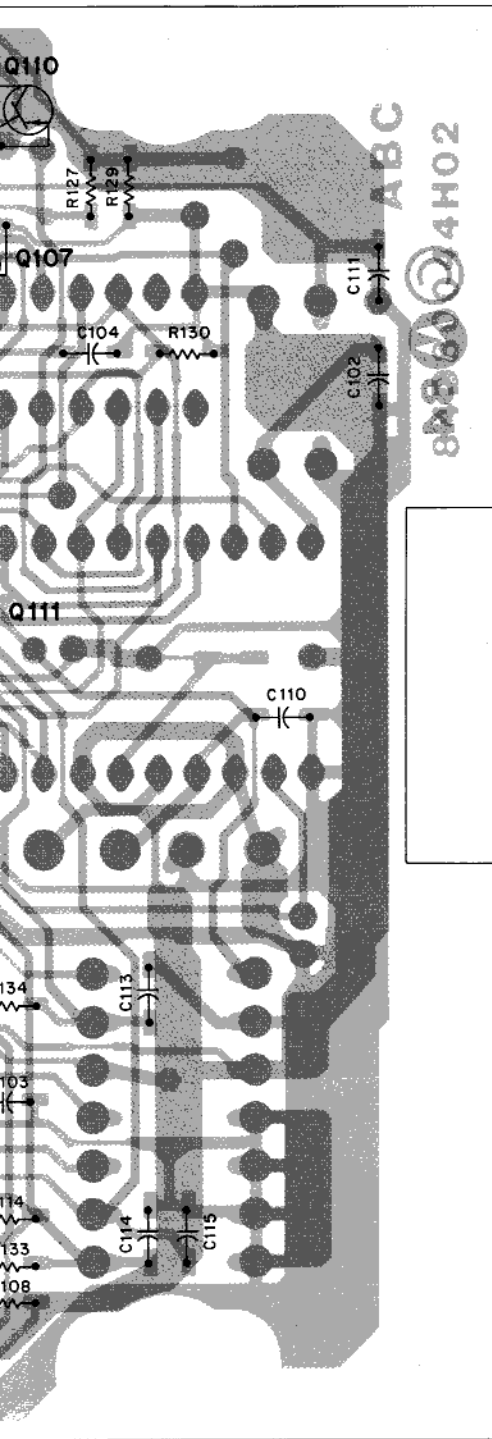


- 9 SYS ON
- 5 SQ DSBL
- 7 DECREMENT MODE SW
- 10 MODE 1
- 3 PGM HUBLO
- 13 HUBLO
- 2 MODE 2
- 4 MODE 3
- 8 B-
- 6 MODE 4
- 16 +5V IN
- 11 +5V TO HHCH
- 14 MODE 9
- 12 MODE 10
- 16 +5V IN
- 3 DISPLAY CLOCK
- 10 MODE 5
- 5 DISPLAY DATA OUT
- 11 LIST (OPTIONAL)
- 2 MODE 6
- 13 CONTROL HEAD STROBE
- 9 MODE ADVANCE SW
- 4 MODE 7
- 8 B-
- 7 HUB HI
- 6 MODE 8
- 1 RADIO INPUT STROBE
- 14 MODE 11
- 12 MODE 12

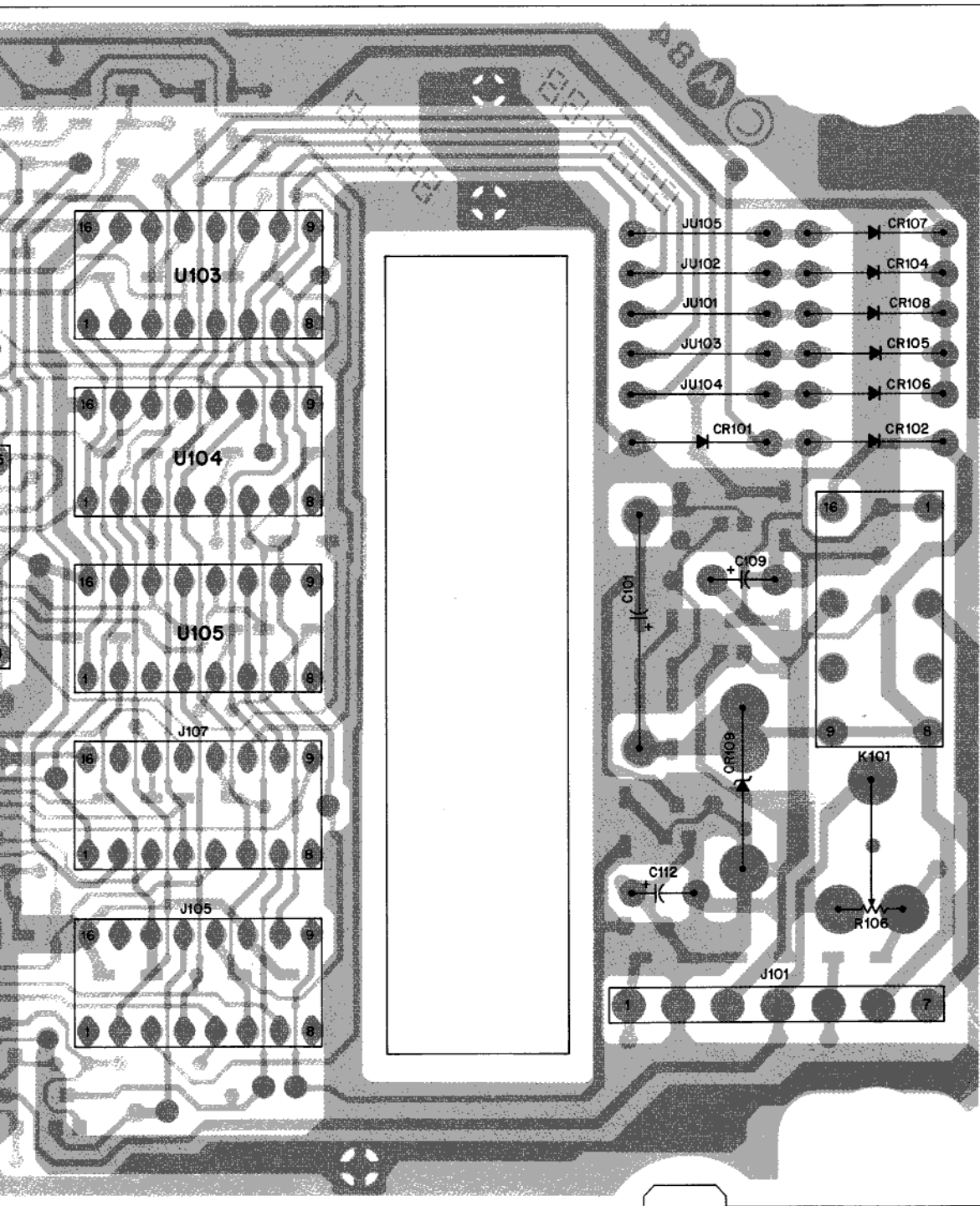


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 COMPONENT SIDE ● GDW-1340-0
 SOLDER SIDE OVERLAY — GDW-1342-0

HLN4728B CONTROLLER BOARD



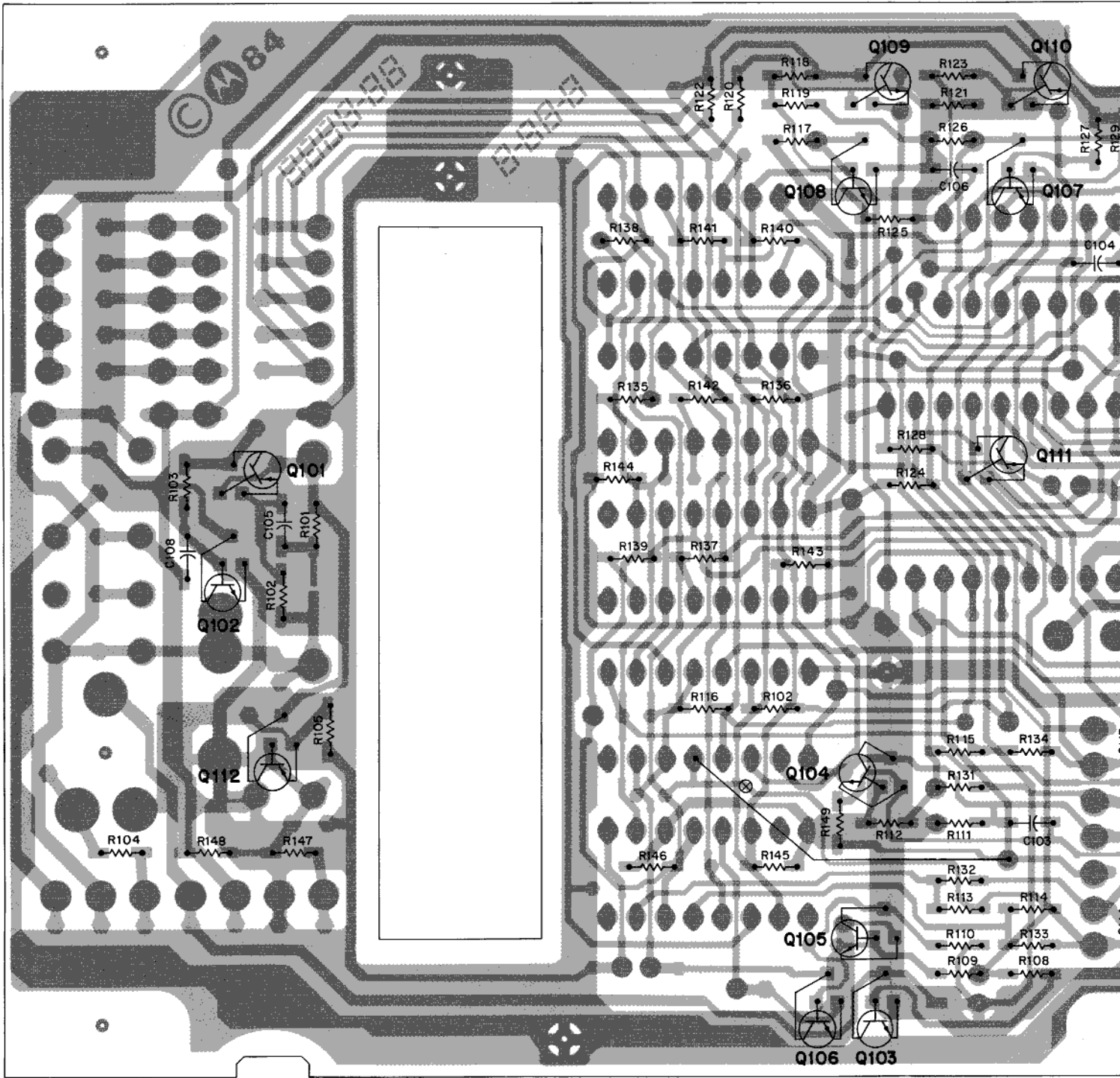
SOLDER SIDE VIEW



SOLDER SIDE GDW-1339-0
 COMPONENT SIDE GDW-1340-0
 COMPONENT SIDE OVERLAY GDW-1341-0

COMPONENT SIDE VIEW

Schematic, Circuit Board Diagrams, and
 Parts List for HLN4728A/B Controller Board
 (Sheet 2 of 3)
PCW-0970-A
 2/7/85

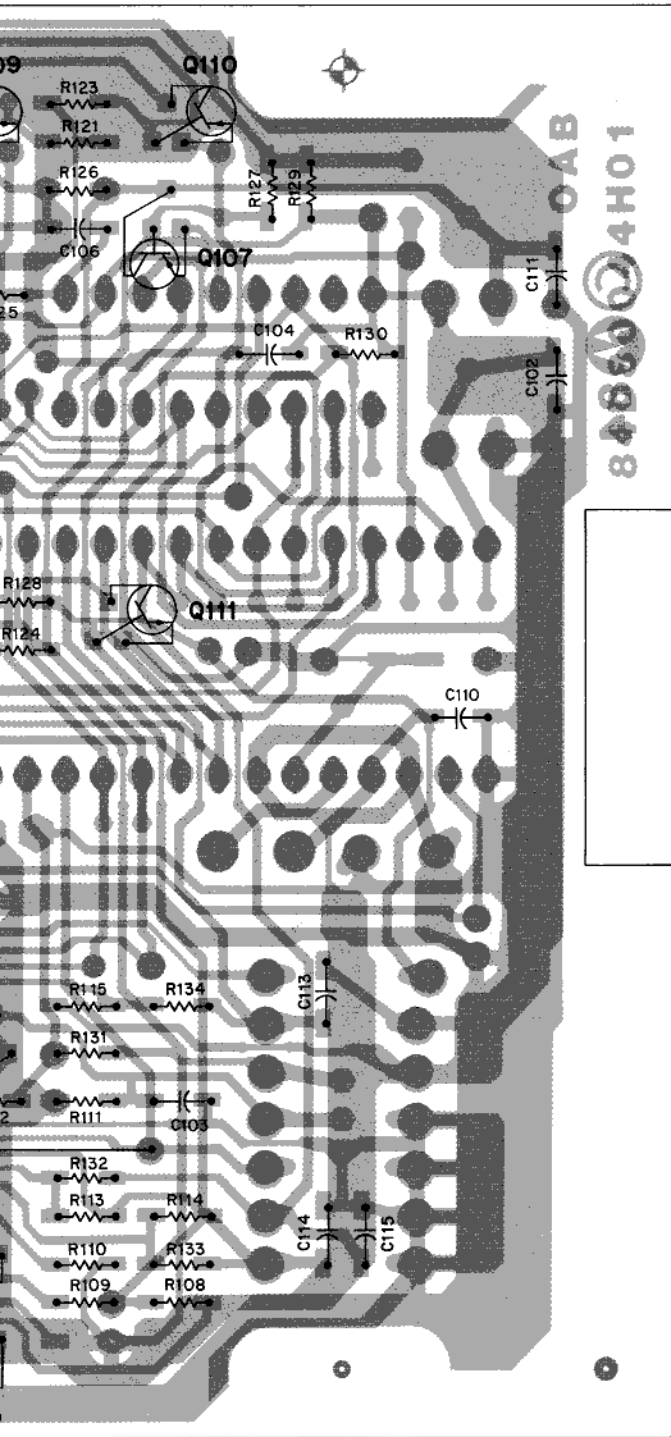


SOLDER SIDE VIEW

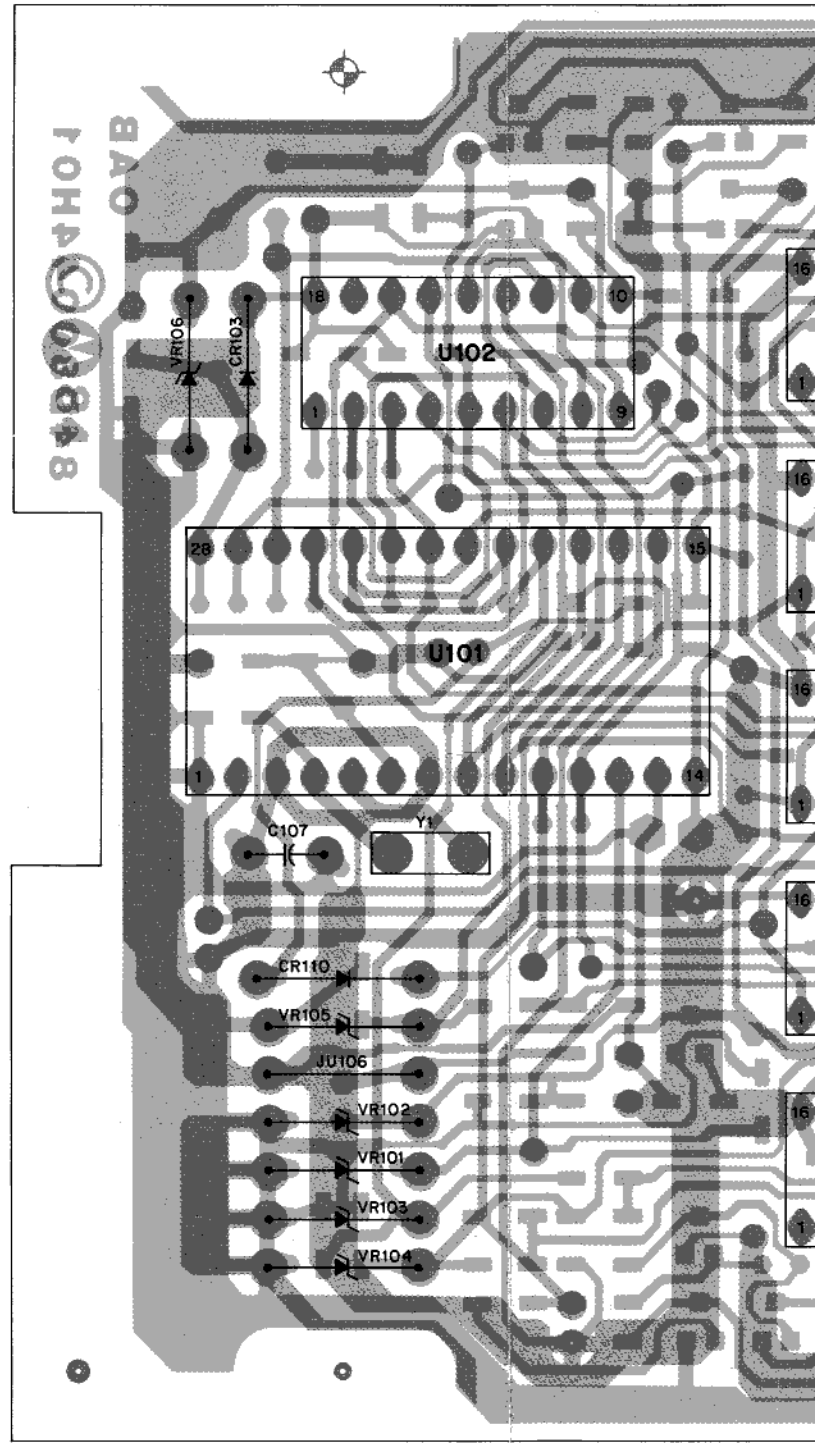
⊗ PLATING CUT ON SOLDER SIDE

SOLD
COMPONE
SOLDER SIDE

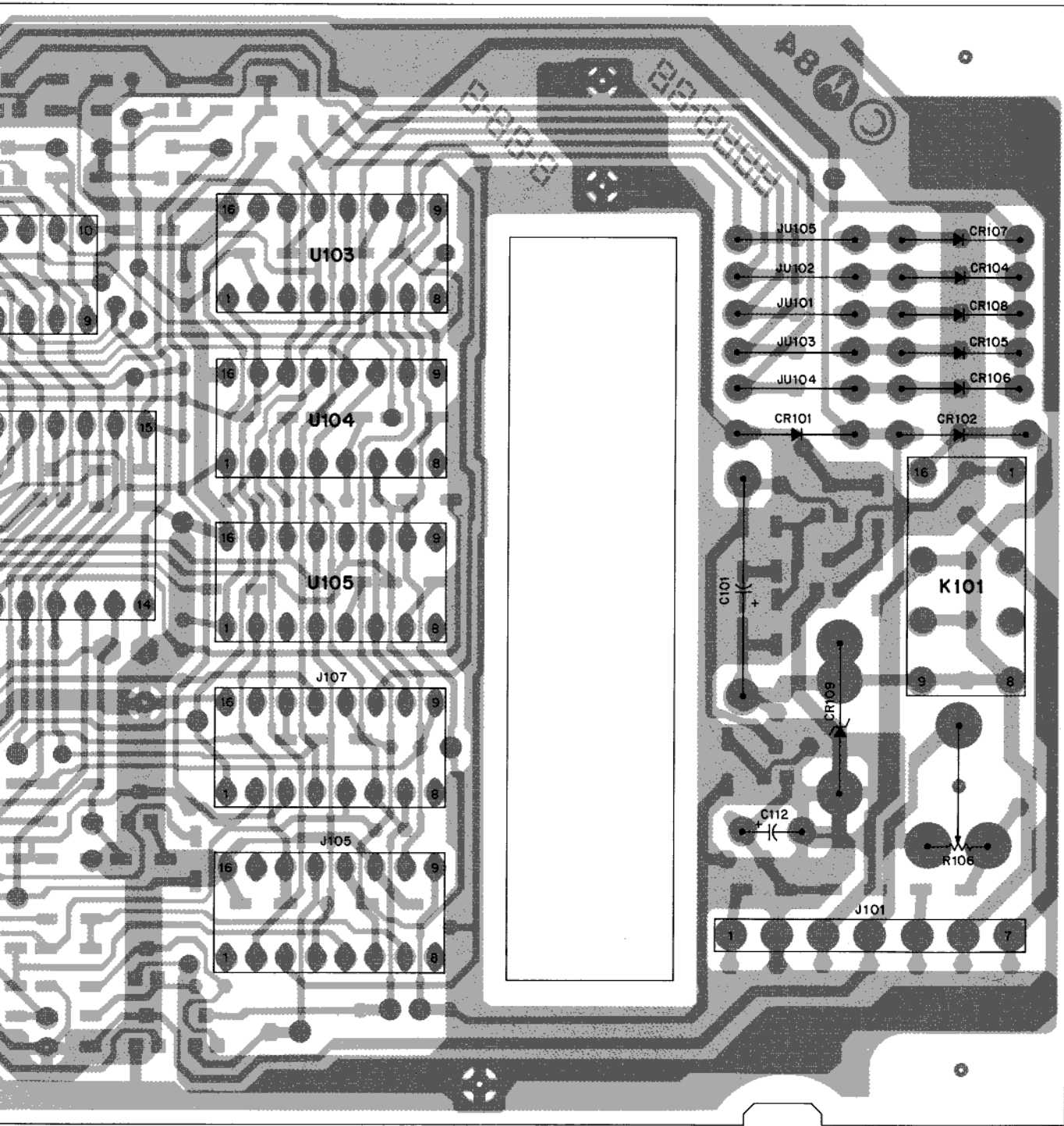
HLN4728A CONTROLLER BOARD



SOLDER SIDE ● GDW-0972-0
 COMPONENT SIDE ● GDW-0973-0
 SOLDER SIDE OVERLAY — GDW-0974-A

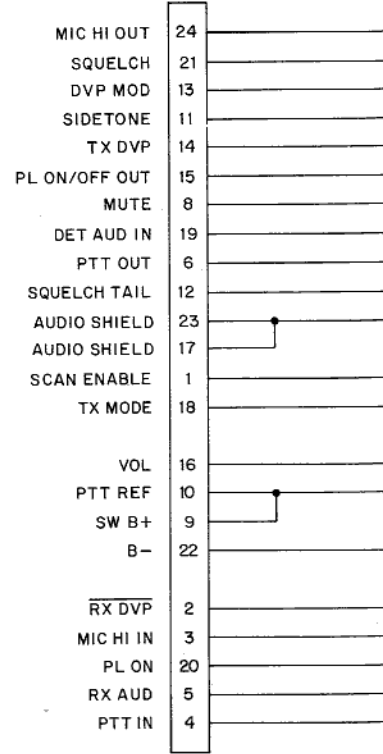


SOLDER SIDE ● GDW-0972-0
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 COMPONENT SIDE OVERLAY — GDW-1044-A

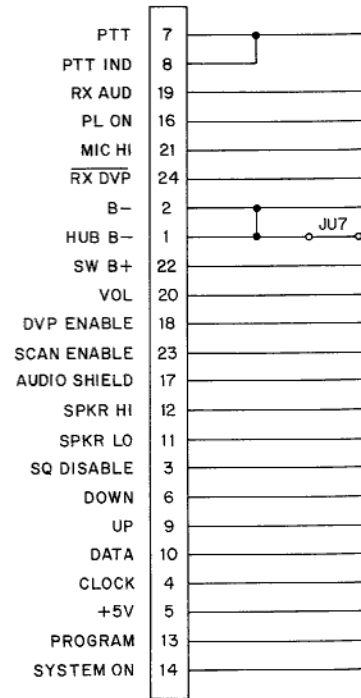


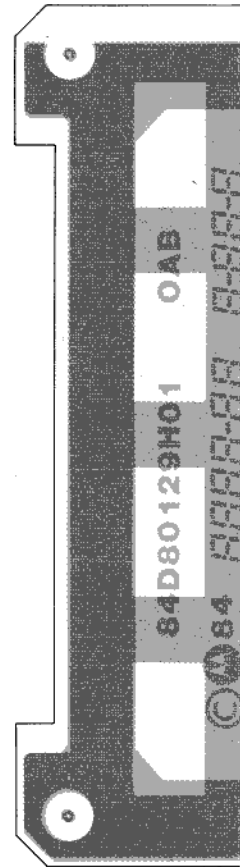
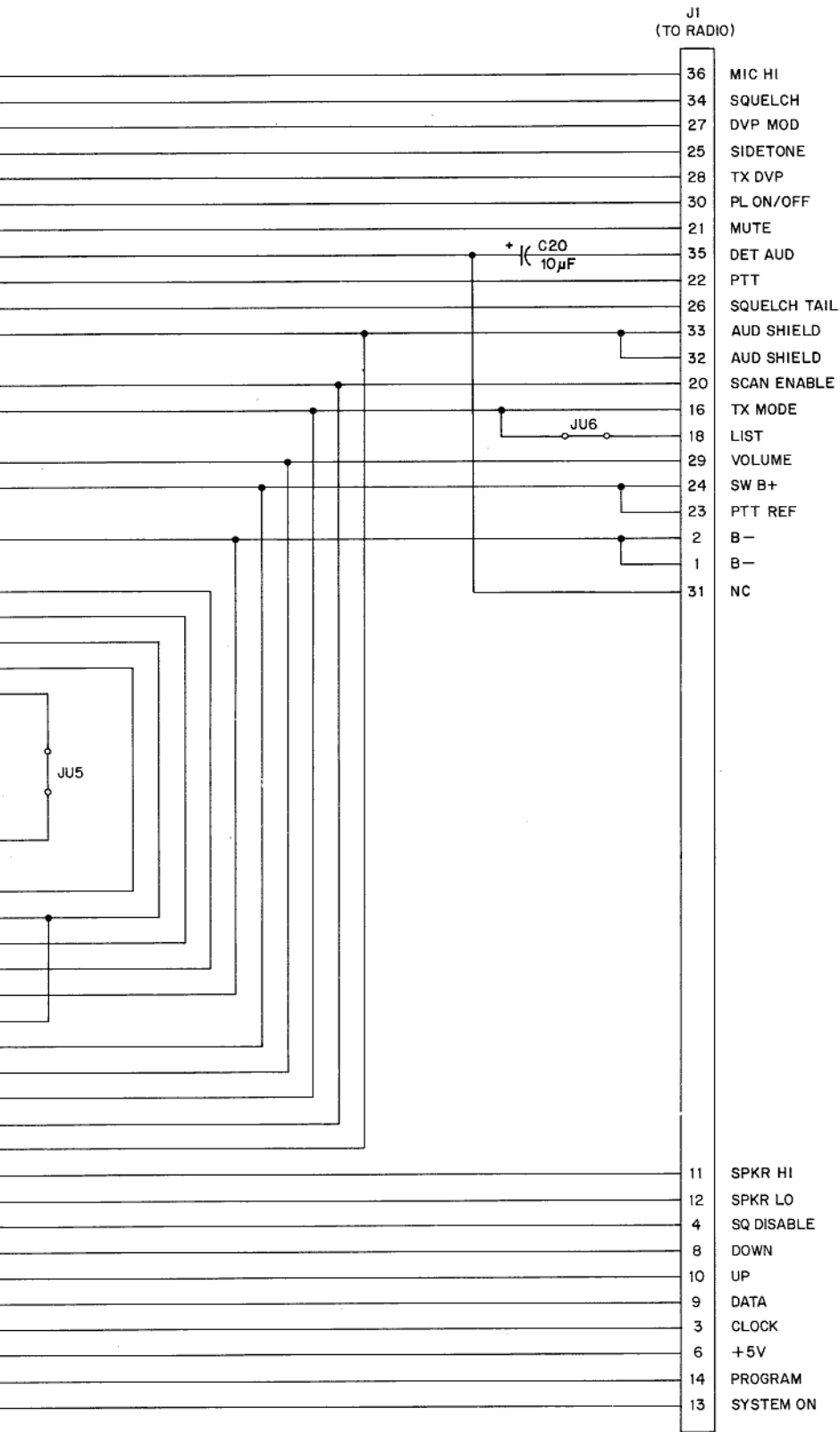
COMPONENT SIDE VIEW

J3
(TO DVP)



J2
(TO CONTROL HEAD)





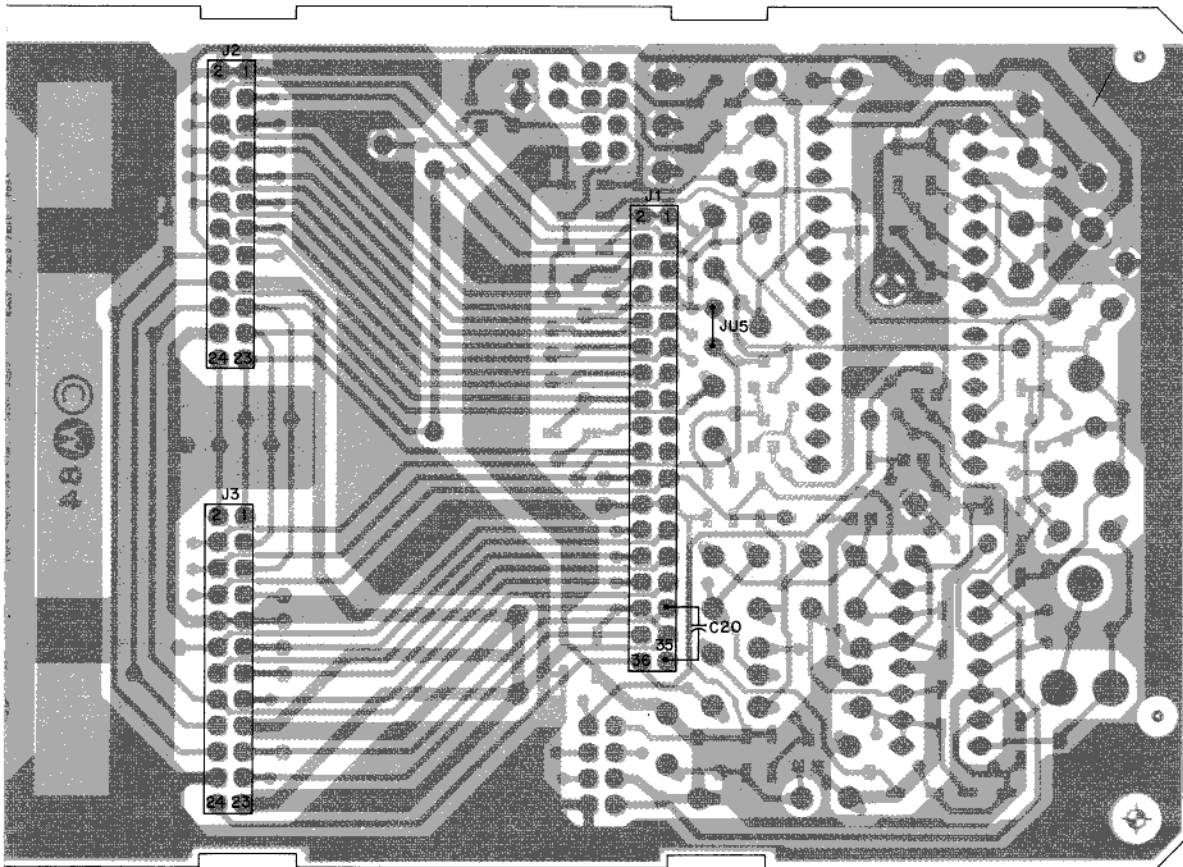
SHOWN FROM S

parts list

HLN4849A Junction Box

REFERENCE SYMBOL	MOTOROLA PART NO.
C20	23-11013C5- 28-80052D0- 28-80052D0-

HLN4849A JUNCTION BOARD



OLDER SIDE

SOLDER SIDE ● GDW-0989-0
 COMPONENT SIDE ● GDW-0990-0
 OVERLAY — GDW-1337-0

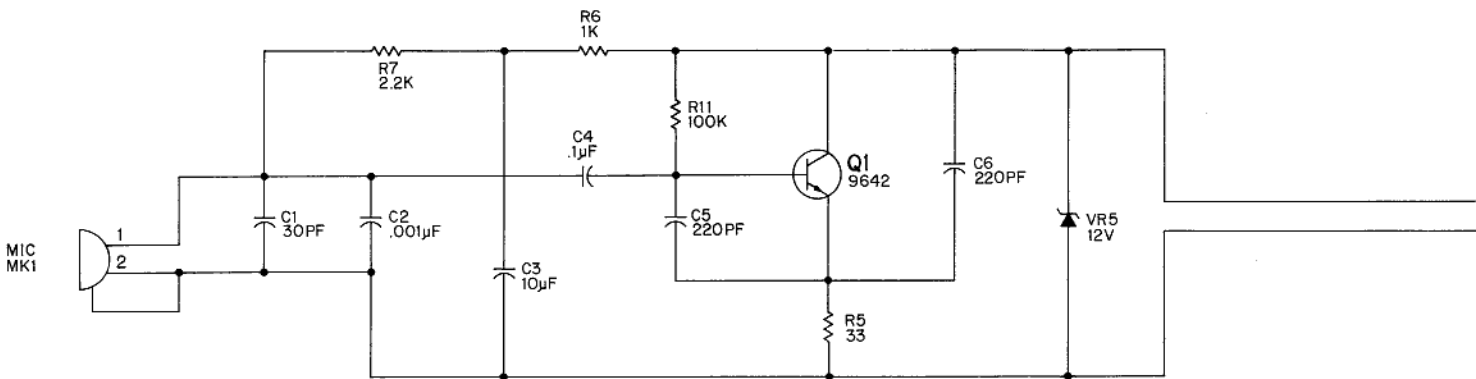
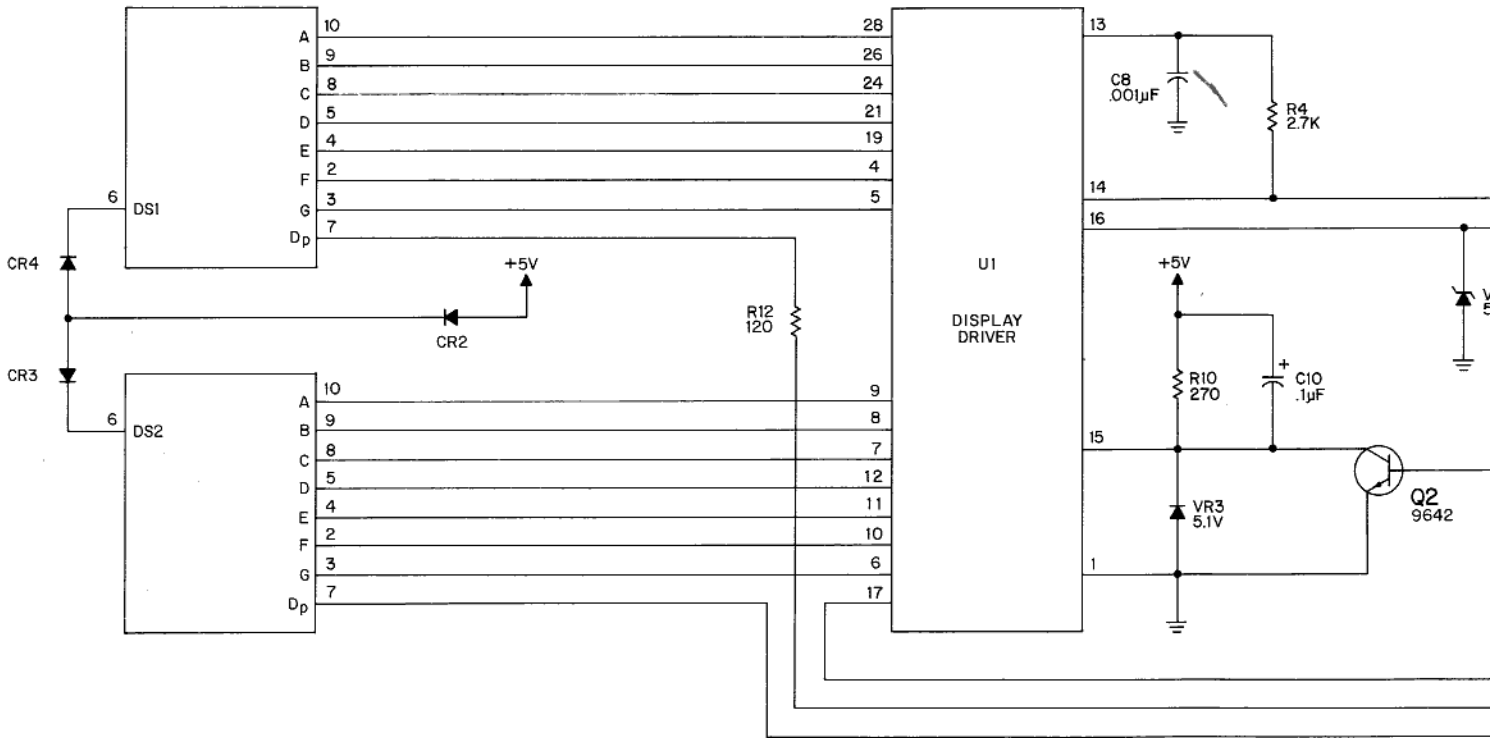
MXW-1336-O

DESCRIPTION

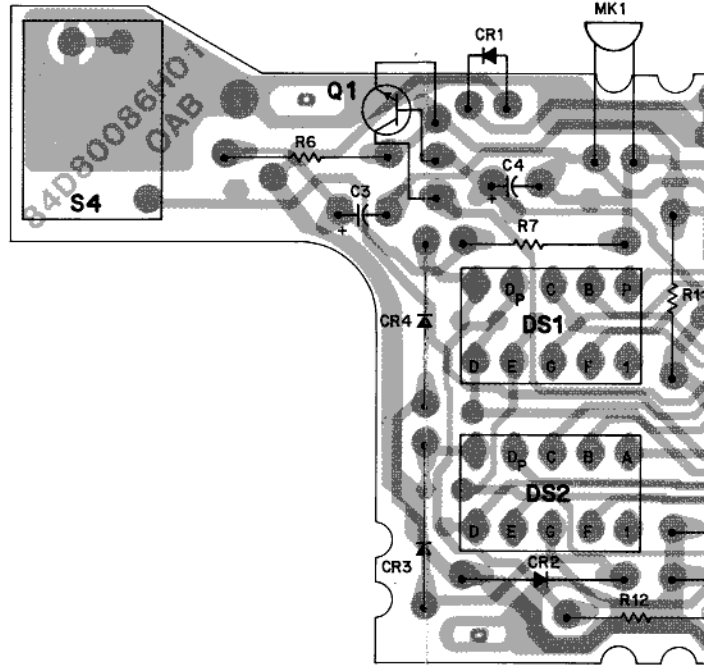
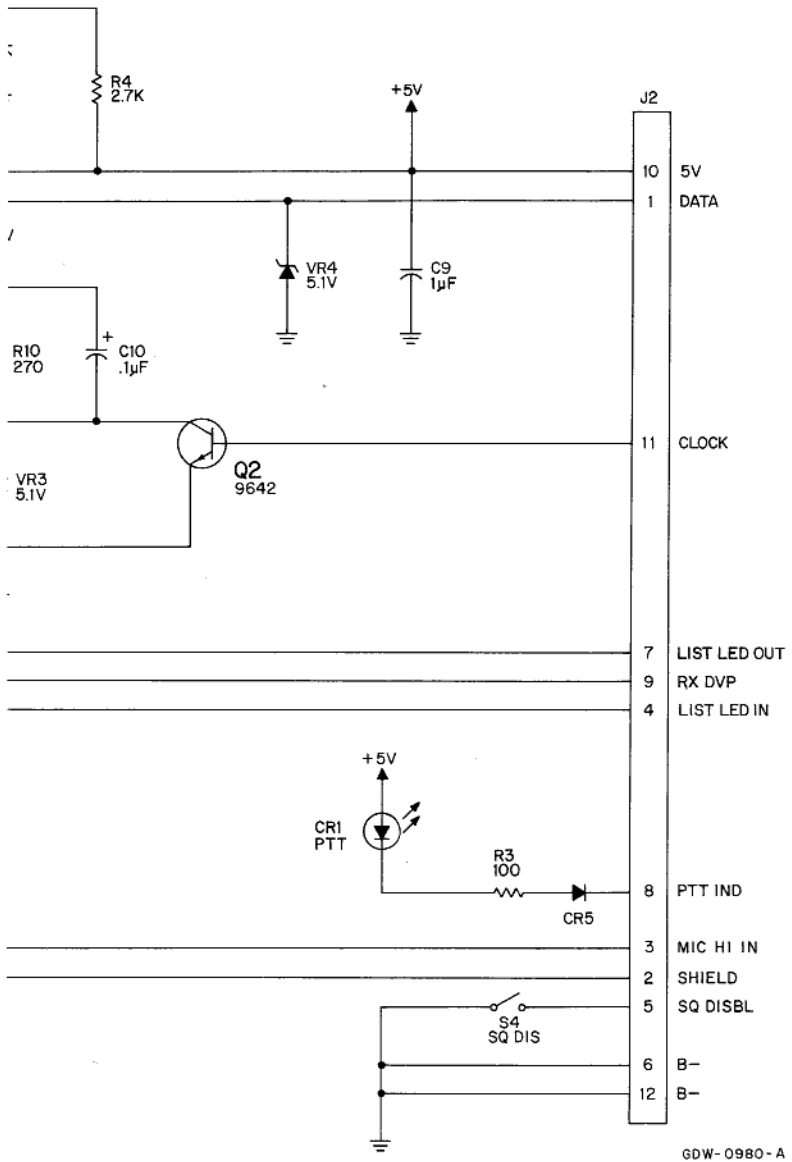
- 1 10 μ F \pm 20%, 15 V, tantalum
- 3 male housing connector, 2 used
- 4 male housing connector

Interconnect Diagram, Circuit Board Diagram,
 and Parts List for HLN4849A Junction Box
PCW-1338-O

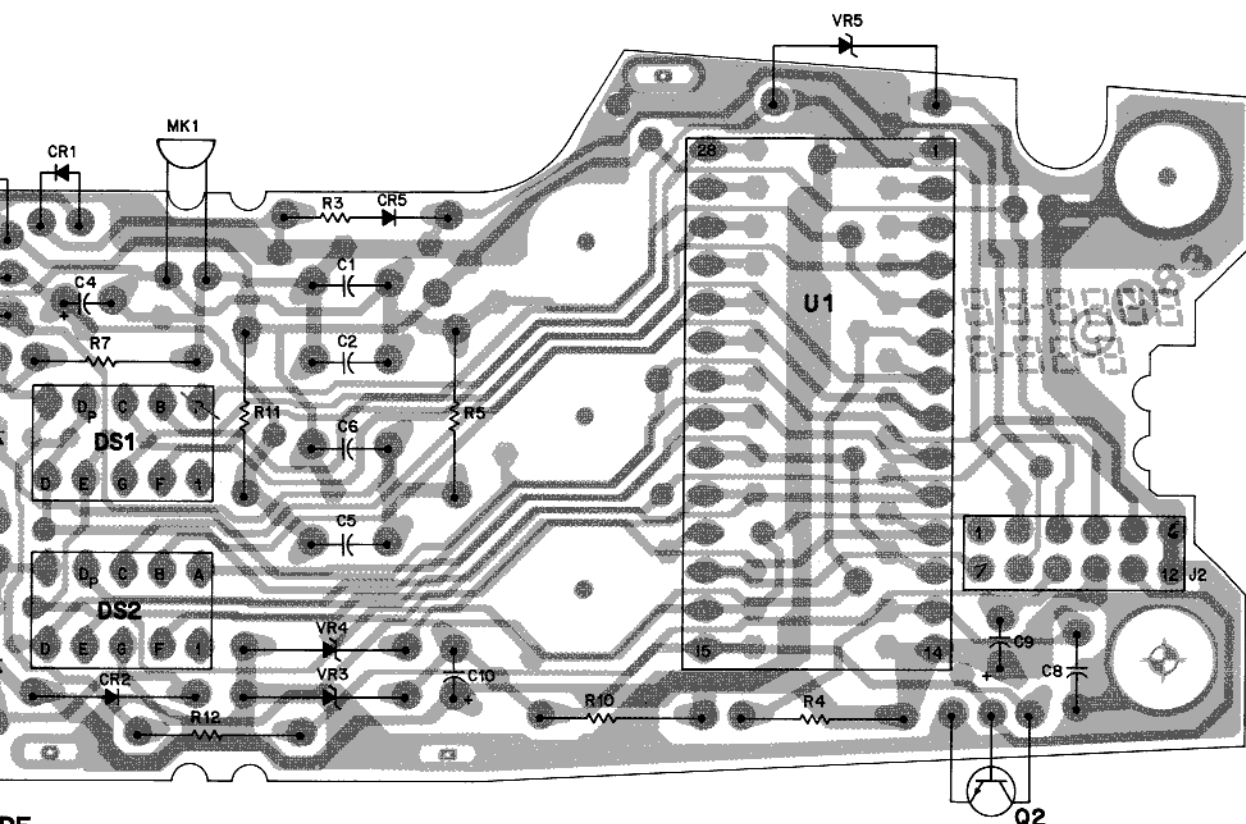
2/7/85



UPPER BOARD



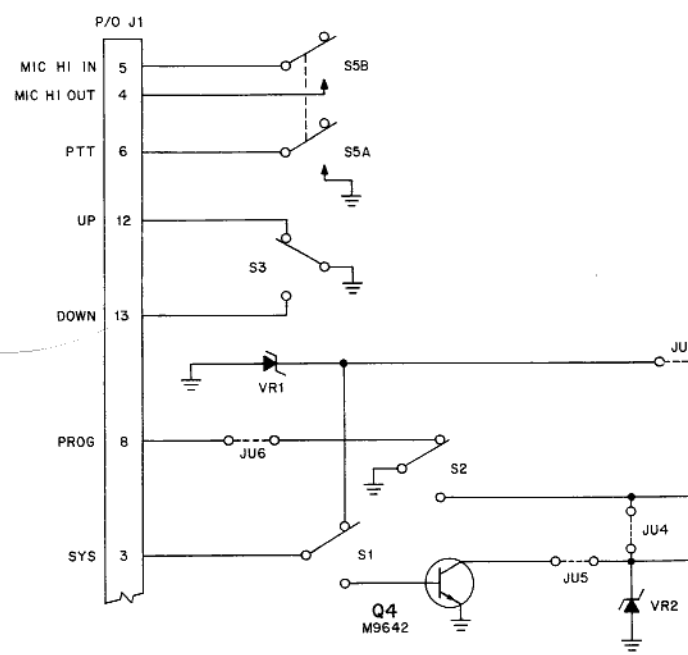
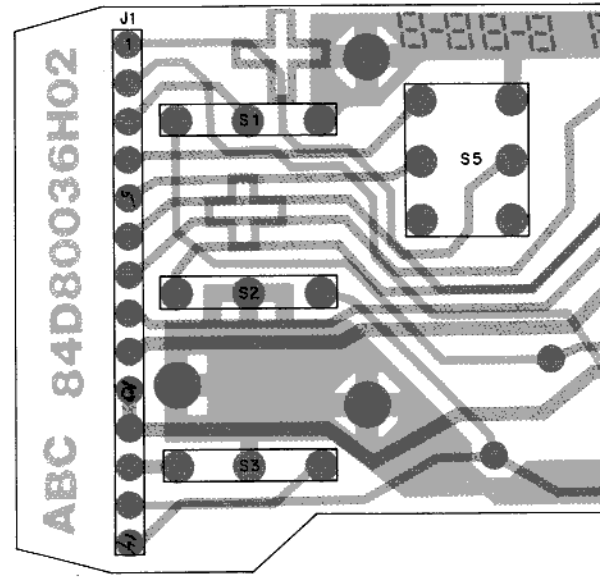
SHOWN FROM SOLDER SIDE



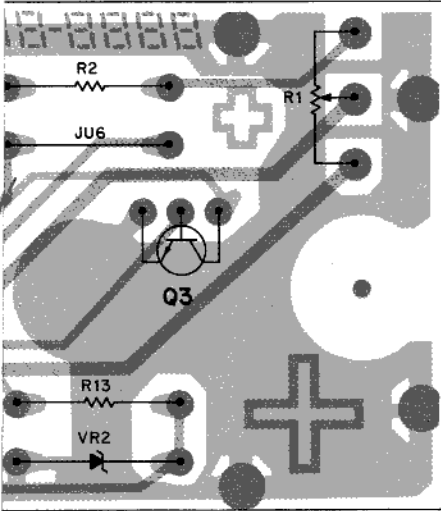
DE

- SOLDER SIDE ● GCW-0981-0
- COMPONENT SIDE ● GCW-0982-0
- OVERLAY — GCW-1033-0

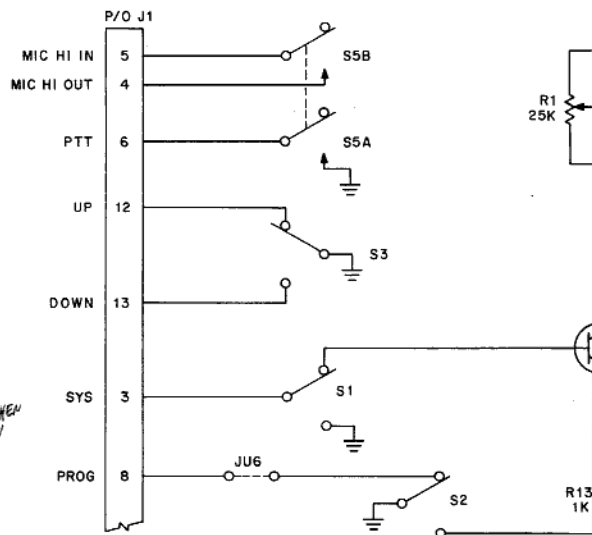
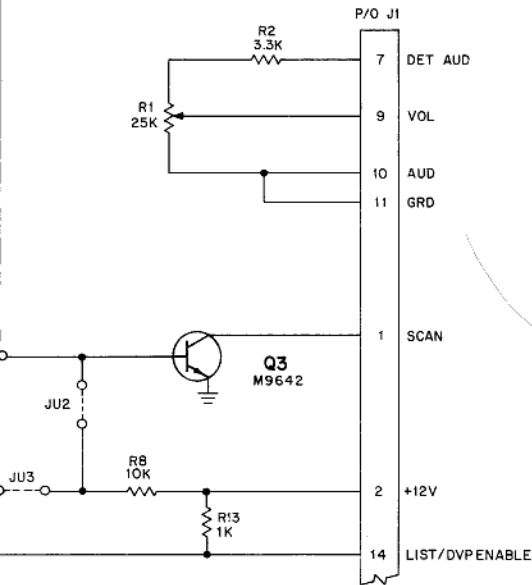
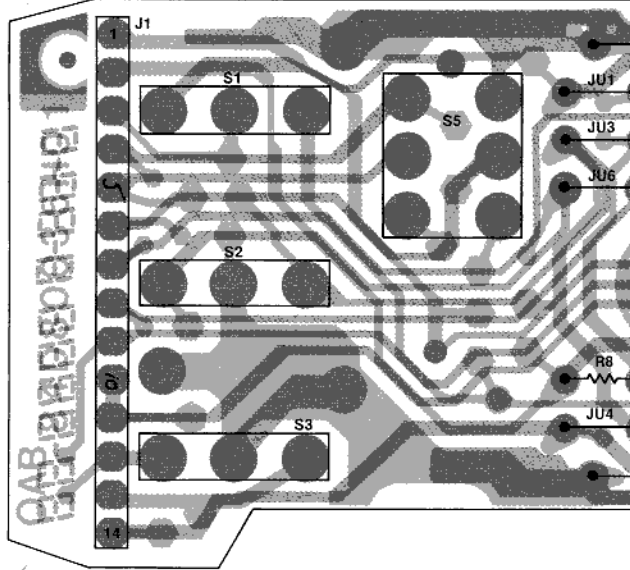
HCN4026
HCN4027
HCN4028



HCN4026A
 HCN4027A
 HCN4028A



SOLDER SIDE ● GCW-1344-0
 COMPONENT SIDE ● GCW-1345-0
 OVERLAY — GCW-1346-0



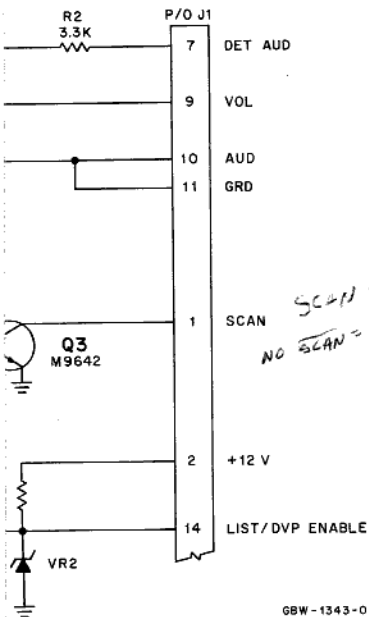
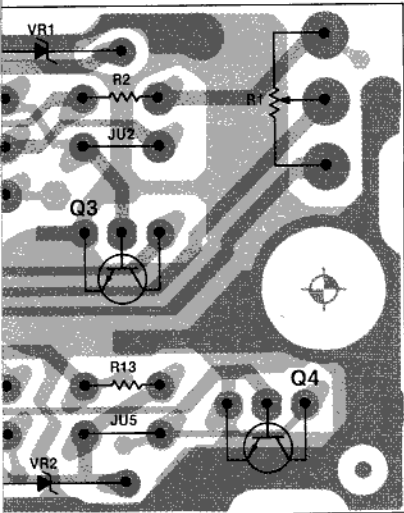
LD WHEN RANGE OV

parts list

HCN4026A/B, HCN4027A/B, and
HCN4028A/B Handheld Control Head with DVP

MXW-0983-A

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		capacitor, fixed, pF ± 10% 100V unless otherwise stated
C1	21-11014H36	30 ± 5 NPO
C2	21-11015A01	1000 + 80, -20%
C3	23-11013E57	10 ± 20%, 25V, electrolytic tantalum
C4	23-83441B20	.1 ± 20%, 35V
C5, 6	21-11015B05	220
C8	21-11015A01	1000 + 80, -20%
C9	23-11013F57	1 ± 20%, 35V, electrolytic tantalum
C10	23-83441B20	.1 ± 20%, 35V
		diode (see note)
CR1	48-05504C01	LED
CR2-4	48-82466H18	silicon rectifier
CR5	48-83654H01	silicon
		indicator
DS1, 2	48-80187G02	common anode RHDP <i>TRY 48-51800 8 J02</i>
		socket
J1	28-80085E13	15-position male connector header
J2	28-80085E12	15-position male connector header
J3-6	09-80070H02	5-position IC socket
		connector
JU1-6	06-11009D23	resistor jumper (JU1-5 A models only)
		microphone
MK1	50-80258E04	electret cartridge
		transistor (see note)
Q1-4	48-00869642	NPN, type M9642 (Q4 A models only)
		resistor, fixed, Ω ± 5%, ¼ watt unless otherwise stated
R1	18-80095D07	25k variable
R2	06-11009C61	3300
R3	06-11009C25	100
R4	06-11009C59	2700
R5	06-11009C13	33
R6	06-11009C49	1000
R7	06-11009C57	2200
R8	06-11009C73	10k (A models only)
R10	06-11009C35	270
R11	06-11009C97	100k
R12	06-11009C27	120
R13	06-11009C49	1000
		switch
S1	40-80123H02	toggle
S2	40-80123H03	toggle (HCN4026A/B)
	40-80123H06	toggle (HCN4027A/B)
	40-80123H01	toggle (HCN4028A/B)
S3	40-80123H01	toggle
S4	40-80067H01	momentary
S5	40-80065E01	momentary
		integrated circuit (see note)
U1	51-80135C08	display driver
		voltage regulator (see note)
VR1	48-82256C33	zener (A models only)
VR2	48-82256C08	zener
VR3, 4	48-82256C15	zener
VR5	48-80007E02	zener, 12V, ± 5%, 400 mW



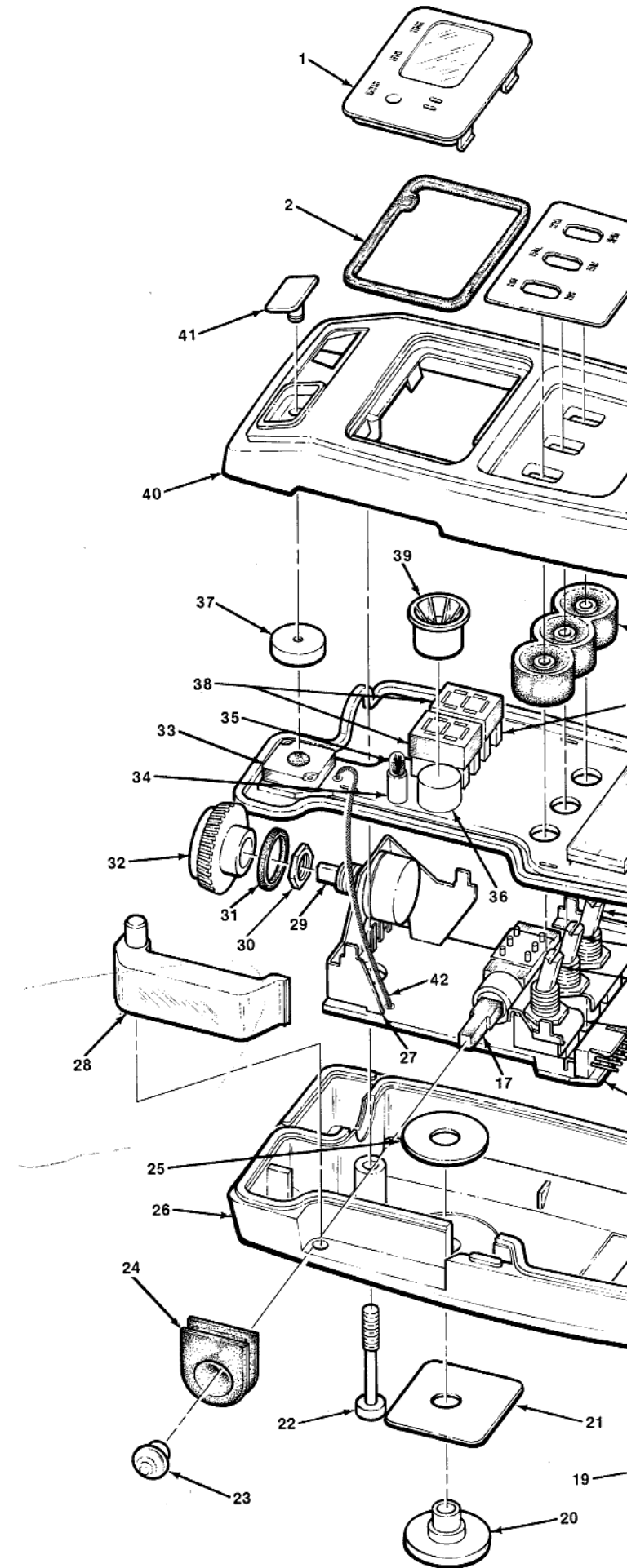
note: For best performance, order diodes, transistors, and integrated circuits by Motorola part number.

parts list

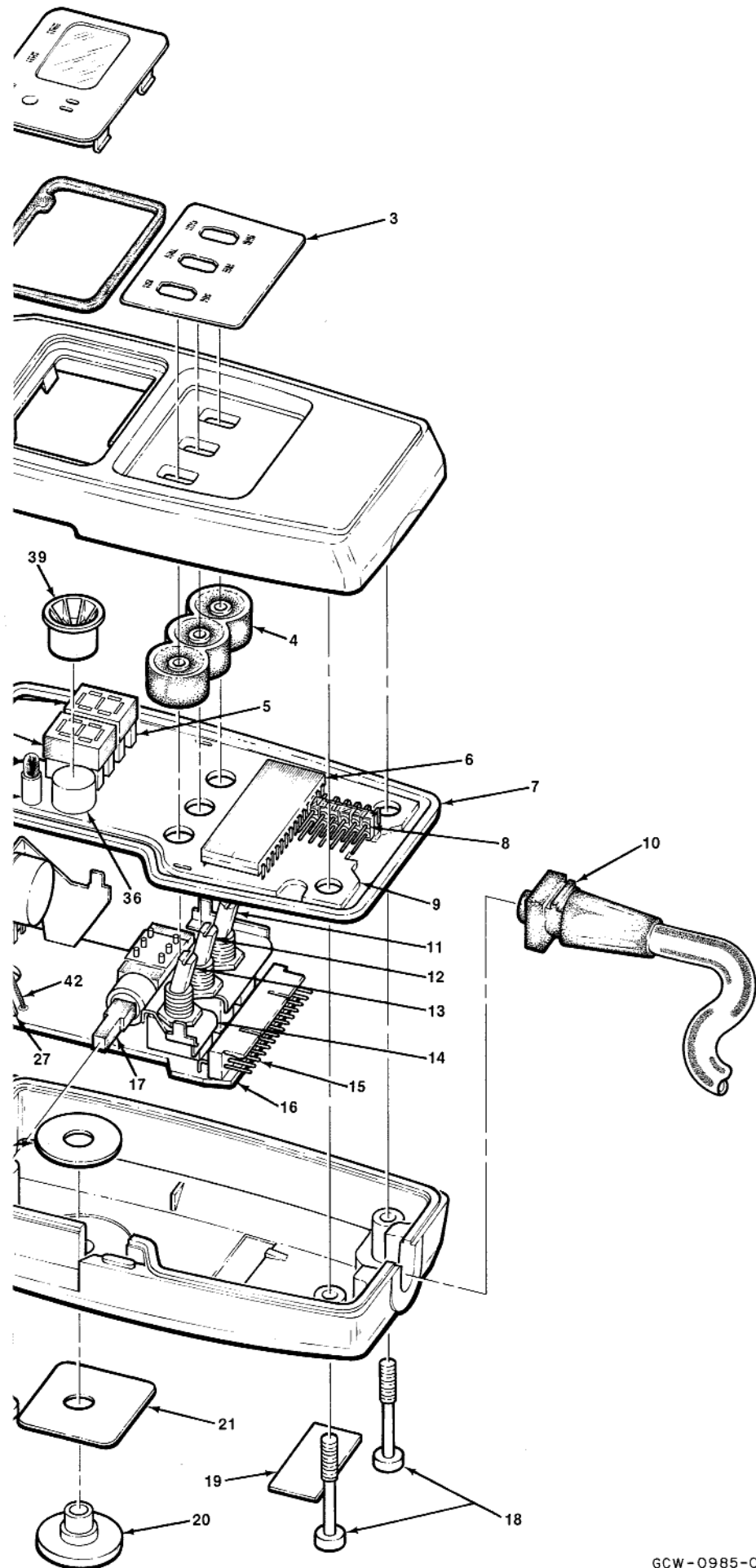
Handheld Control Head Mechanical Parts

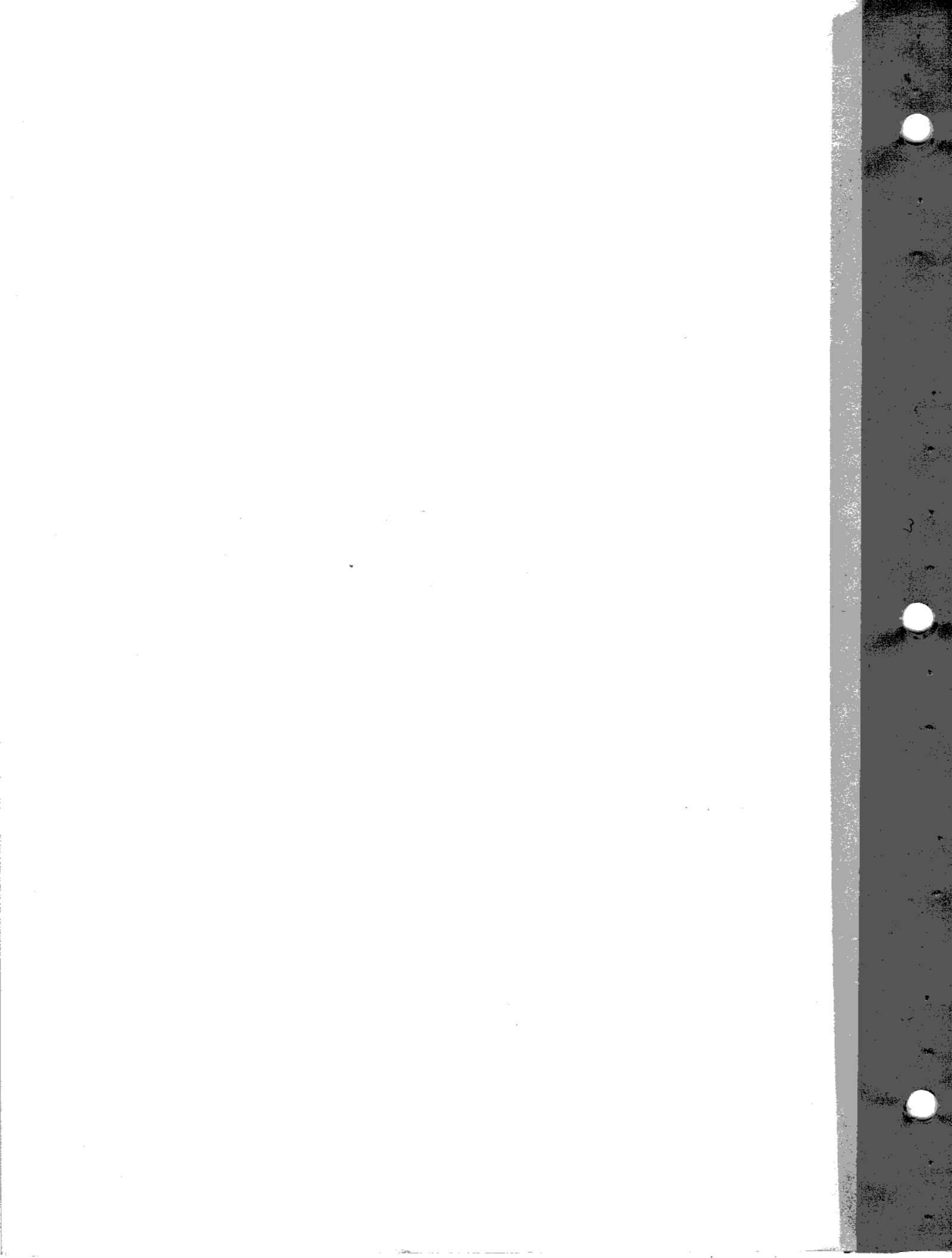
MXW-1347-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	61-80052H02 61-80052H01	lens (HCN4026A/B and HCN4027A/B) lens (HCN4028A/B)
2	32-80059H01	lens gasket
3	13-80020H01 13-80020H03 13-80020H04	escutcheon (HCN4026A/B) escutcheon (HCN4027A/B) escutcheon (HCN4028A/B)
4	32-8003H01	switch seal
5	09-80070H02	18-pin socket
6	51-80135C08	display driver
7	32-80058H01	housing gasket
8	28-80085E12	11-pin connector
10	30-80068H01	coil cord assembly
11	40-80123H02	3-position toggle switch
12	40-80123H03 40-80123H06 40-80123H01	2-position toggle switch (HCN4026A/B) toggle switch (HCN4027A/B) momentary toggle switch (HCN4028A/B)
13	40-80123H01	momentary toggle switch
14	07-80050H01	switch bracket
15	28-80085E13	14-pin connector
17	40-80065E01	PTT switch
18	03-80076E02	screw
19	33-80025H02 33-80025H03 33-80025H04	nameplate (HCN4026A/B) nameplate (HCN4027A/B) nameplate (HCN4028A/B)
20	05-00855939	hangup rivet
21	04-80072H01	outer washer
22	03-80076H06	screw
23	38-80066H01	PTT switch cap
24	32-80060H01	PTT seal
25	04-05139386	backup washer
26	15-80048H01	back housing
27	07-80049H01	potentiometer bracket
28	38-80055H01	PTT button
29	18-80095D07	potentiometer
30	02-80188H01	nut
31	42-84591A03	o-ring
32	36-80053H01	knob
33	40-80067H01	pushbutton switch
34	43-80064H01	LED spacer
35	48-84404E03	LED
36	50-80258E04	microphone cartridge
37	32-80062H01	button seal
38	48-80187G02	display
39	32-80061H01	microphone seal
40	15-80047H01	front housing
41	38-80054H01	squelch button
42	30-80197H01	grounding cable



Exploded View and Mechanical Parts List
for Handheld Control Head
PCW-0984-A
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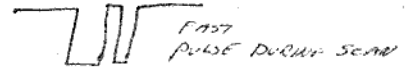


HHCH CONTROLLER BOARD HLN4728A

NO SCAN

SCAN ON = RADIO LOCKED TO RX.F1

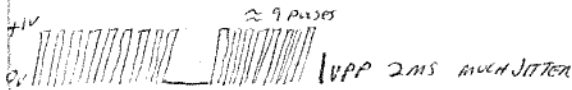
J107-1



J107-2, 4, 6, 10



J107-3



J107-5



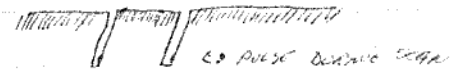
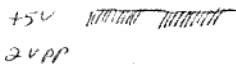
J107-7

+5V ALWAYS HI

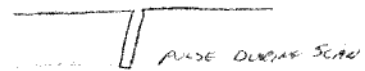
J107-9

+5V / Lo WHILE UP BUTTON DEPRESSED

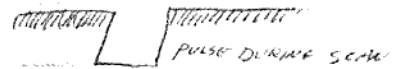
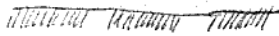
J107-12



J107-13

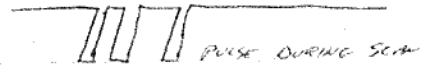


J107-14



J107-15

+5V HIGH



ADDRESS AND DATA INFORMATION ON P601, P602 IS THE SAME FOR A STANDARD CONTROL HEAD RADIO

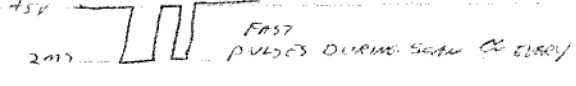
HHCH CONTROLLER BOARD

HLN4728A

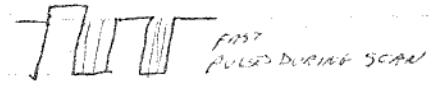
NO SCAN

SCAN ON = RADIO LOCKED ON RX

J105 - 1



J105 - 2, 4, 10



J105 - 3

+5V ALWAYS HI

J105 - 5

+5V / LO WHILE SR BUTTON DEPRESSED

J105 - 7

+5V / LO WHILE DOWN BUTTON DEPRESSED

J105 - 9

+1V RADIO ON / +5V RADIO OFF

J105 - 12, 14

+5V ~~TO MULTISITTING~~
 2VPP TO MULTISITTING CAPTURE PULSES

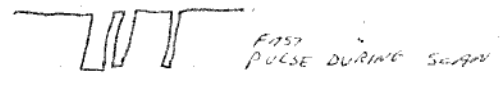


J105 - 13

+5V ALWAYS HI

J105 - 15

+5V NO SCAN



ADDRESS AND DATA INFORMATION ON PG01, PG02 IS THE SAME FOR A STANDARD CONTROL HEAD RADIO

