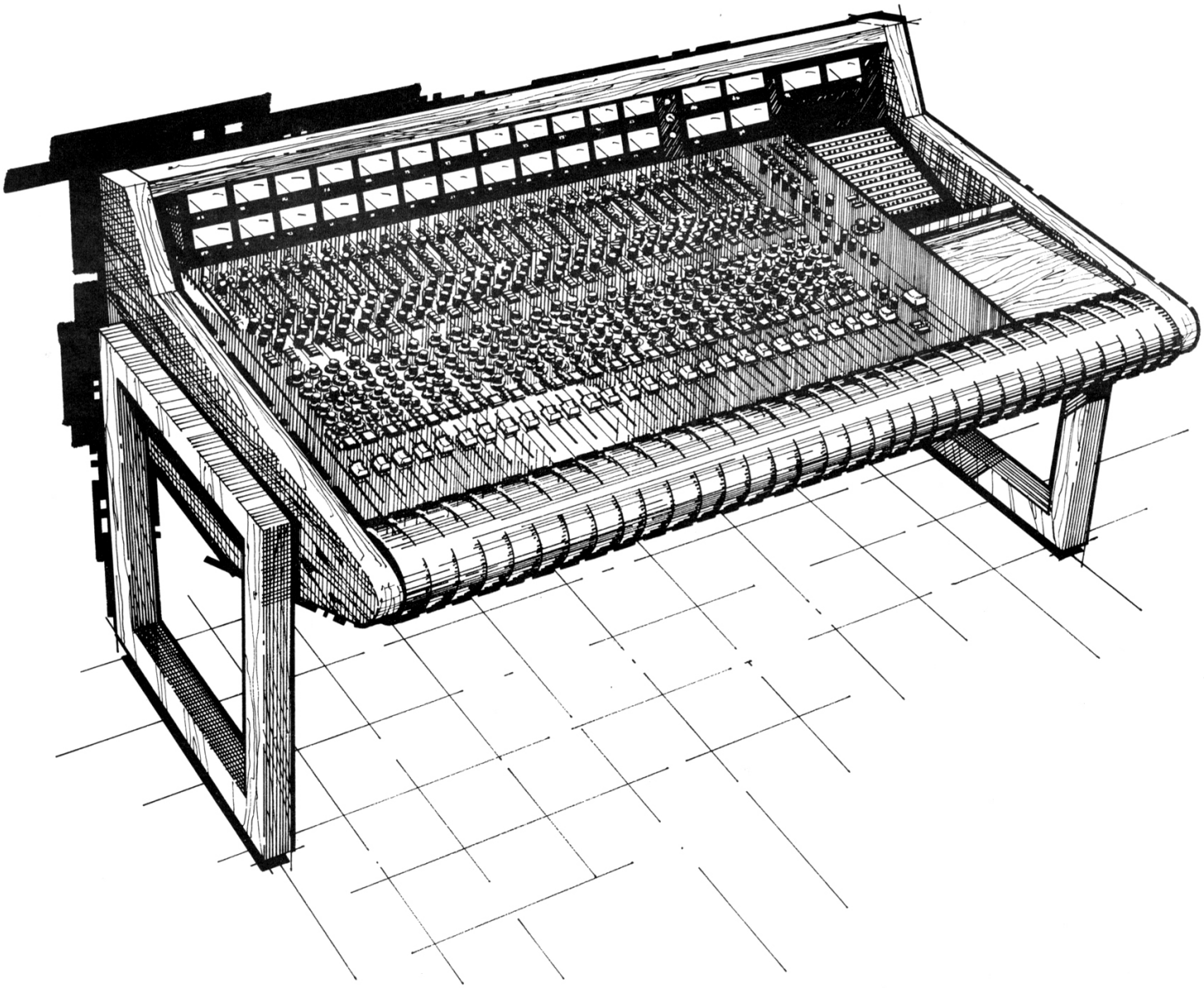
MCI

JH-428/440

SERIES



PROFESSIONAL RECORDING CONSOLE

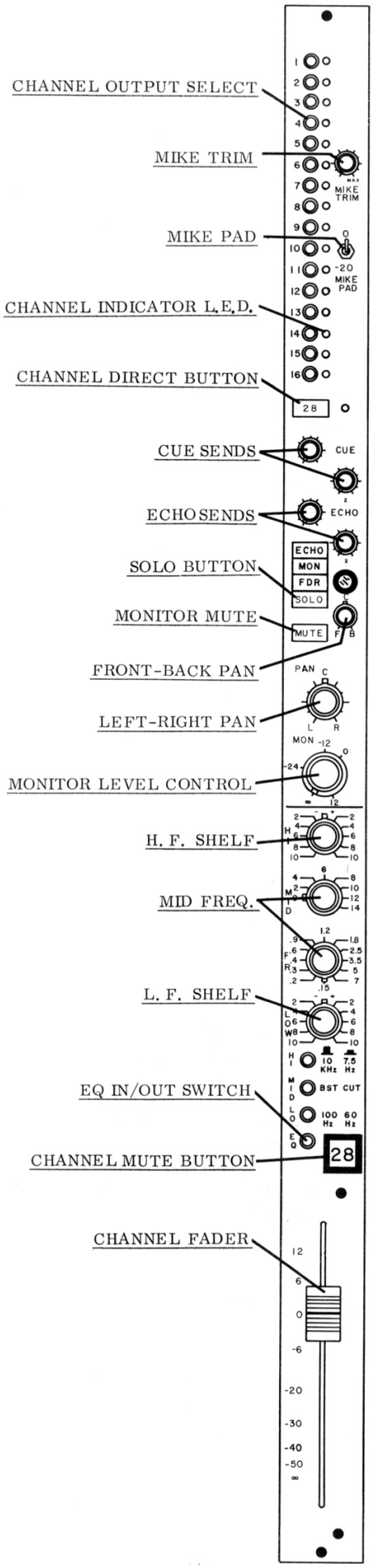
The JH-428 is a comprehensive, cost effective recording console meeting all professional standards and offering the electrical and musical capabilities of consoles twice its price. There are no frills in this console, only functional, complete musical control of the mix.

The entire console has been built small enough so that the average person can reach most of the controls without moving. Yet, the profile is low creating minimum control room acoustic problems and permitting a clear view into the studio.

The JH-428 is styled in a durable synthetic walnut finish with control panels in a natural sugar maple color. The armrest is large and well padded. These natural colors and comfort features minimize the tiring effect of late night mixing sessions.

For the small studio just getting started, every model of the JH-428 from 8 channels up comes fully wired and tested for 28 channels so the console can grow with the studio by simply plugging in additional modules. For the large studio, the JH-428's modular construction will permit full utilization of the recording facility by minimizing service "down time".

Read thru the following pages and compare our features to the competition's, then study our users lists. The rest it up to you.



Each input/output module is a plug-in board containing all circuitry for a mike and line input, a channel send with equalization, and full monitor capability.

16 channel output assignment buttons on each input/output module permit the assignment of each mike input to any track of the master tape machine. A channel "direct assignment" button with the channel number is provided seperately for the operators convenience. It is important to realize that any given mike can be assigned to any or all tracks of the master machine and any or all mikes can be assigned to any track of the master machine. When any channel assignment is made a channel L. E. D. lights indicating the selection.

The mike input is a balanced transformer with a 20 db switchable pad in front. Circuitry is provided for phantom powering. Maximum gain of the mike preamp is 60 db and headroom exceeds 28 dbm.

The channel fader controls mike level or line level into the input/output module depending on the operating mode. The fader is a Penny and Giles conductive plastic unit manufactured to MCI specifications. Following the fader, an illuminated mute switch with channel number permits "killing" of the channel. When "killed" the channel mute switch illumination is dim.

Complete equalization is provided by the MCI equalizer. Low and high frequency boost/cut shelving is provided at 4 frequencies while 14 db of boost/cut mid range peaking is provided at musical half octaves from 150 Hz to 7 KHz.

The channel monitor includes full quad panning with mute. Note the seperate controls, not dual concentrics! In remix, the 428 monitor permits four echo sends by using the two cue sends and the two echo sends. These four sends are interchangeable in remix. A pre/post switch permits echo send 1 to go before the fader in remix.

The input/output module has three states, MIKE, TAPE, and REMIX, which are programmed by a selector on the status module.

MIKE

Brings the mike through the fader, equalizer, and out the channel bussing. The monitor is monitoring the channel line out of its respective module.

TAPE

The same as MIKE except the monitor is monitoring the line return from tape.

REMIX

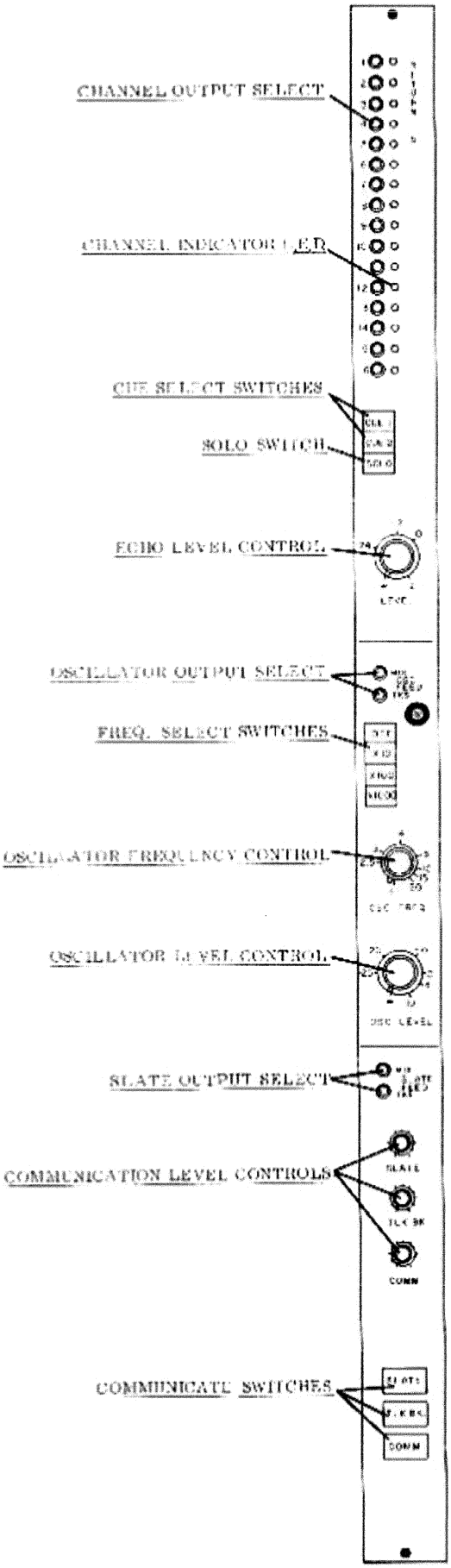
The channel line return from tape feeds the channel fader, the equalizer, and then the pan and echo sends.

"FDR" BUTTON

When the console is in remix mode, the "FDR" button on each channel permits reverting the individual channel to tape mode.

"MON" BUTTON

When any module is in tape mode, either by master console selection or use of the "FDR" button, the "MON" button reverts the module to mike mode.



The auxillary module is a plug-in board and has three seperate functions incorporated on it. An echo return, an AGC controlled Wienbridge oscillator, and the communication functions.

Echo return five is a mono echo return assignable to channel outputs 1-16. A return level control is provided with up to 12 db of gain and full attenuation. Assignment buttons permit feeding echo into the two cue send busses. A solo button provides solo capability.

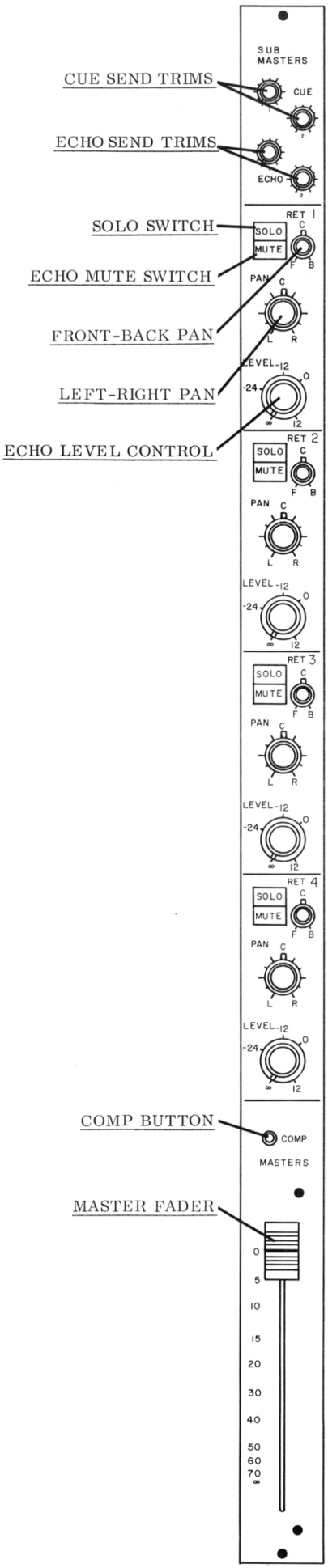
The oscillator is a self leveling Wienbridge oscillator with a frequency range continuously variable from 20 Hz to 20 KHz and an output level continuously variable from -50 to +10 dbm. The oscillator output is available at the patch bay OSC OUT or may be bussed to the channel outputs via the TKS switch or the mix outputs via the MIX switch to facilitate ease of alignment for all tape machines. An external sweep generator or oscillator signal may be injected into the console when the built-in oscillator is turned off by using the patch bay OSC OUT jack and the MIX and TKS switches on the oscillator.

The slate button activates the oscillator at 20 Hz, -18 dbm level and will inject this along with the built-in talk back microphone output into the channel line outputs if the slate feed TKS switch is depressed or the mix outputs if the slate feed MIX switch is depressed. A slate level control is provided to control the audio level from the built-in microphone.

The talkback button feeds audio from the built-in microphone into the studio monitors. A talkback level control is provided to control the audio level.

The communicate button feeds audio from the built-in microphone into the cue busses. A communicate level control is provided to control the audio level.

When either the slate or talkback switch is depressed the control room monitors are automatically muted.

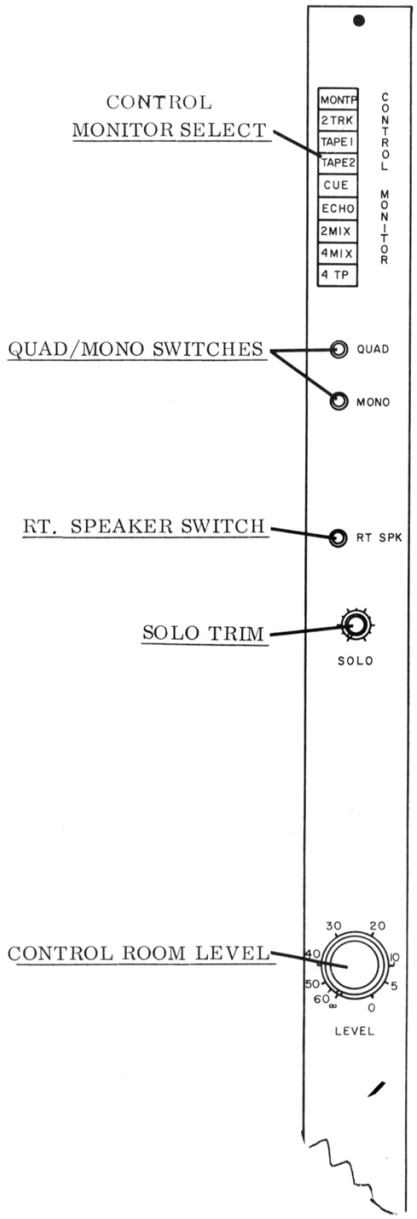


The master module is a plug-in board containing the cue and echo send master controls, four echo returns and the master level fader.

The cue sub masters and echo sub masters provide a 20 db level trim for the two cue sends and two echo sends. The individual channel cue and echo sends are summed at this point.

Each of the four echo returns have full quad panning with seperate front back pan and left-right pan controls. A monitor level control is provided for each echo return with up to +12 db of gain and full attenuation. Each return also has a monitor mute switch to mute the pan output and a solo switch for soloing the output on the control room monitors without affecting program material.

The master fader is a four element conductive plastic P & G fader which provides attenuation from 0 to ∞ . All channel quad monitors and echo return quad monitor outputs are summed at the master fader. Electronic networks automatically mix down the 4 channel mix to 2TK and mono giving simultaneous quad, 2TK and mono outputs. A "COMP" switch activates cross feed logic to reduce channel seperations to 18 db if desired for mono/ stereo compatibility. Four VU meters constantly monitor the quad outputs while two additional meters are switchable for 2TK and mono monitoring.

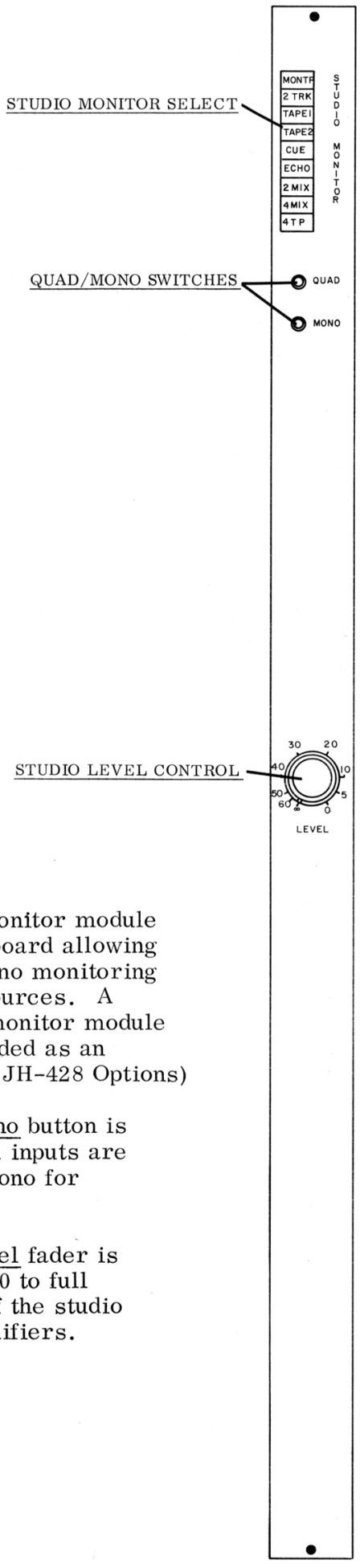


The control room monitor module is a plug-in board allowing quad, stereo, or mono monitoring of 9 signal sources.

When any stereo input or mono input is selected the two rear monitors are automatically muted. When the mono button is depressed any input is monitored in mono thru the L & R speakers. The right speaker switch allows muting of the right speaker.

A solo trim level is also provided. When any one or more solo buttons on the console is depressed, the control room monitor automatically monitors only the selected solo sources.

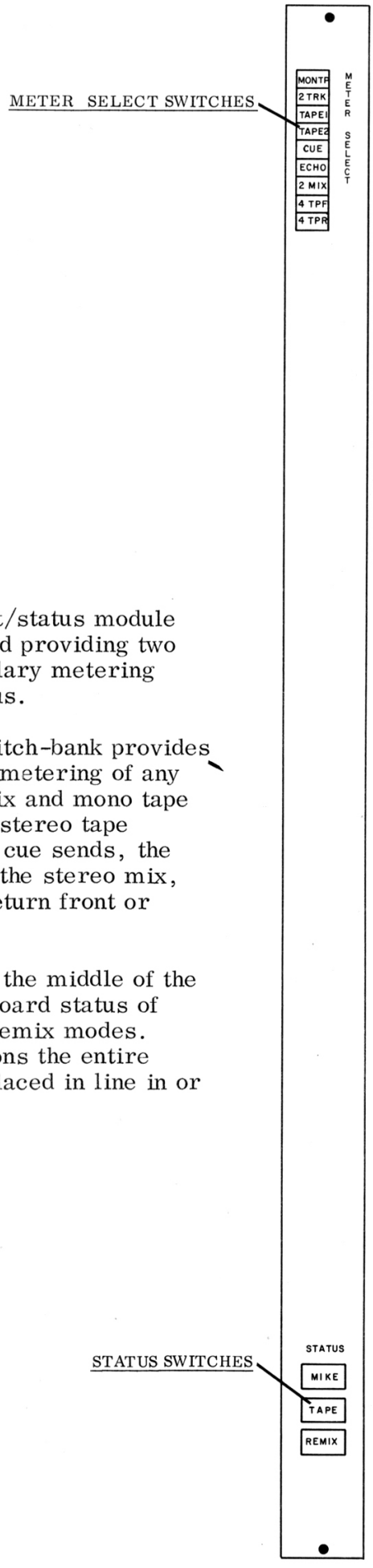
The master level fader is a conductive plastic rotary fader providing 0 to full attentuation of the control room monitor amplifiers.



The studio monitor module is a plug-in board allowing stereo or mono monitoring of 9 signal sources. A quad studio monitor module may be provided as an option. (See JH-428 Options)

When the mono button is depressed all inputs are reduced to mono for monitoring.

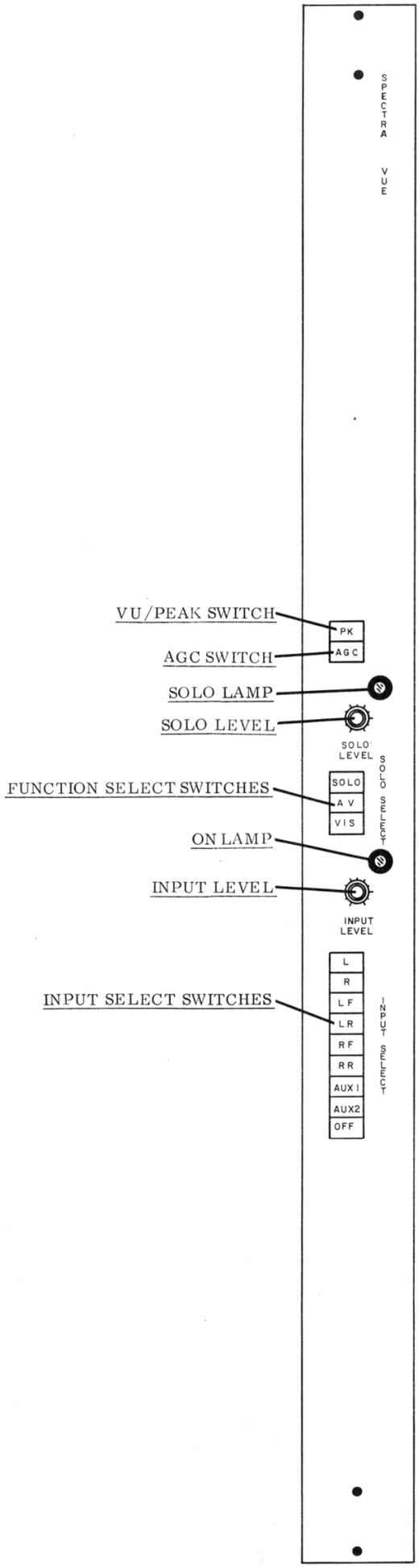
A master level fader is provided for 0 to full attenuation of the studio monitor amplifiers.



The meter select/status module is a plug-in board providing two functions: Auxillary metering and console status.

A nine button switch-bank provides auxillary stereo metering of any source, mono mix and mono tape return, any of 3 stereo tape returns, the two cue sends, the two echo sends, the stereo mix, or a quad tape return front or back.

Three buttons in the middle of the module initiate board status of mike, tape, or remix modes. Using these buttons the entire console can be placed in line in or mike in quickly.



The optional MCI Spectra-Vue utilizes the existing VU or light meters to provide a large, readable display of the audio spectrum in eighteen 1/2 octave bands from 45 Hz to 16.5 KHz. The Spectra-Vue can be ordered in a new console or installed by any MCI dealer in the field.

FEATURES:

* Instantly gives you a spectrum display of your mix, for accurate and repeatable checks on tonal balance.
* Helps identify problems in the studio you used to find out about in the cutting room. Instantly shows you too much bottom in low octaves and excessive sibilance, to help you get a better mix.
* Sees things you can't always identify by listening; why certain bass guitars sound better because of their harmonic content, why certain records sound so "gutsy" when others do not.
* Helps check and tune control room and studio monitors. (Compatable with standard equalizer sets.)
* Provides a quick check of equalizers and filters.
* Helps find malfunctions in microphones and speaker systems.
* AGC circuit permits full spectrum display with input levels from -30 db to +20 db automatically.

SPECIFICATIONS:

Inputs

8 Switch selectable inputs, normally connected to the four quad busses, the two stereo busses, and to two auxillary sources routed through patch points. Two or more input selections can be operated simultaneously.

Solo Interface

Console solo system is connected to allow normal monitor solo through the control room speakers, display of the solo signal, as well as monitor solo, or display solo alone.

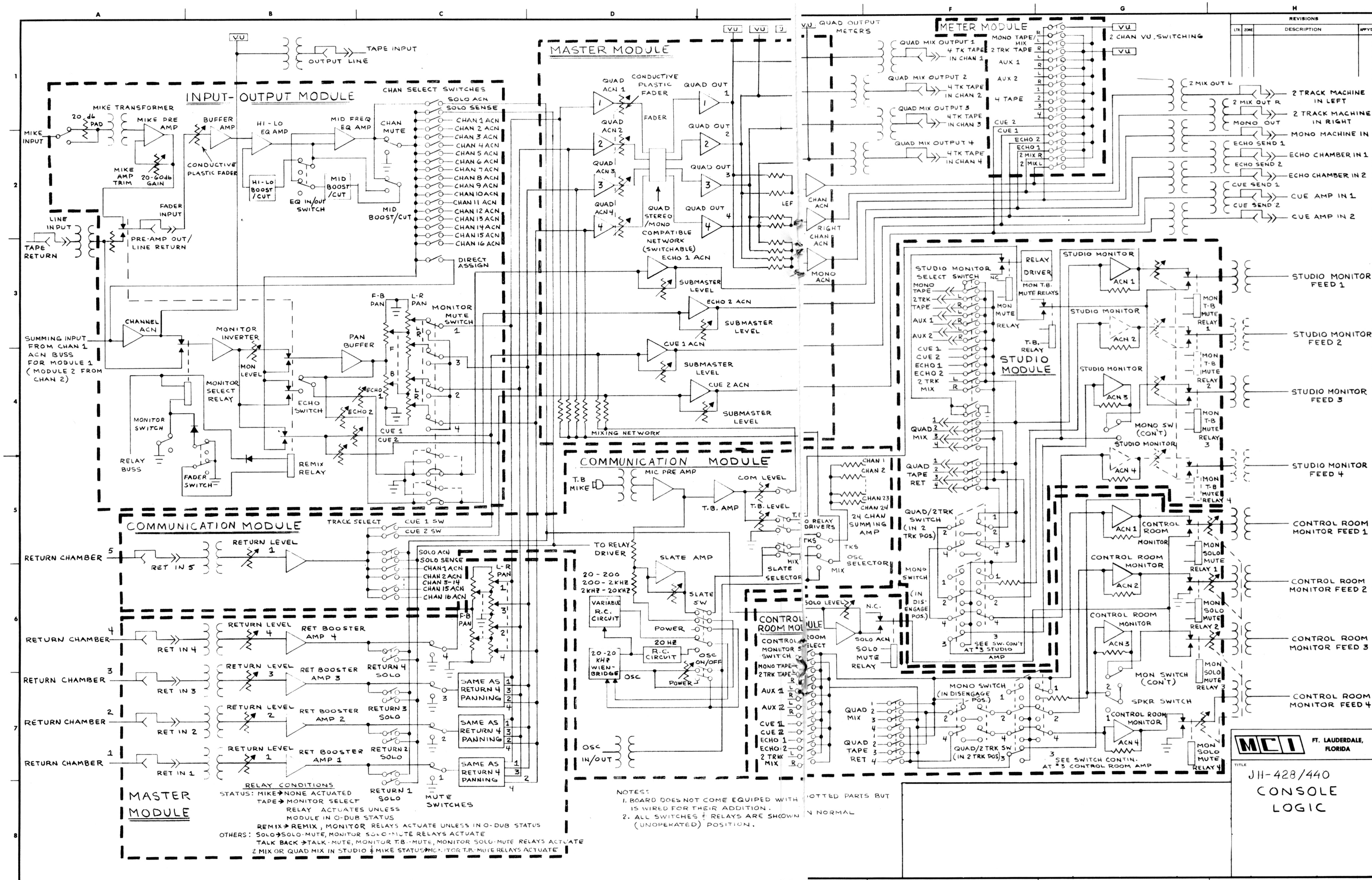
Input Impedance

10K Ohms unbalanced, each input.

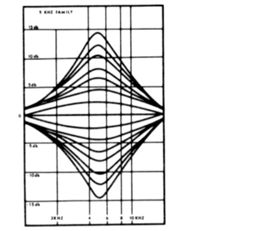
Centerband Frequencies

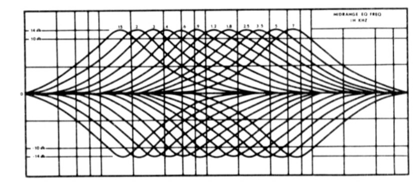
Frequencies of the Spectra-Vue are keyed to the MCI console and to standard monitor-tuning equalizer sets.

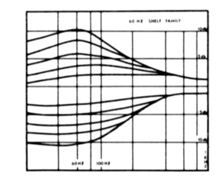
45 Hz	400 Hz	3.2 KHz
70 Hz	560 Hz	4.5 KHz
100 Hz	800 Hz	6.3 KHz
140 Hz	1.1 KHz	9.0 KHz
200 Hz	1.6 KHz	12.8 KHz
280 Hz	2.2 KHz	16.5 KHz

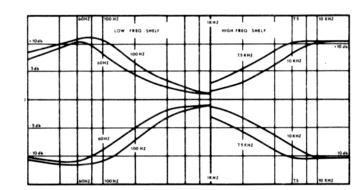


INPUT-OUTPUT MODULE
MIKE TRANSFORMER
MIKE PRE AMP
BUFFER AMP
HI - LO EQ AMP
MID FREQ EQ AMP
CHAN MUTE
CHAN SELECT SWITCHES
SOLO ACN
SOLO SENSE
CHAN 1 ACN
CHAN 16 ACN
DIRECT ASSIGN
MIKE INPUT
LINE INPUT
TAPE RETURN
FADER INPUT
PRE-AMP OUT/ LINE RETURN
CONDUCTIVE PLASTIC FADER
HI-LO BOOST /CUT
EQ IN/OUT SWITCH
MID BOOST /CUT
SUMMING INPUT FROM CHAN 1 ACN BUSS FOR MODULE 1 (MODULE 2 FROM CHAN 2)
CHANNEL ACN
MONITOR INVERTER
MON LEVEL
MONITOR SELECT RELAY
MONITOR SWITCH
RELAY BUSS
FADER SWITCH
REMIX RELAY
ECHO SWITCH
PAN BUFFER
F-B PAN
L-R PAN
MONITOR MUTE SWITCH
CUE 1
CUE 2
TAPE INPUT
OUTPUT LINE
MASTER MODULE
QUAD ACN 1
QUAD ACN 2
QUAD ACN 3
QUAD ACN 4
CONDUCTIVE PLASTIC FADER
QUAD OUT
QUAD STEREO /MONO COMPATIBLE NETWORK (SWITCHABLE)
ECHO 1 ACN
ECHO 2 ACN
CUE 1 ACN
CUE 2 ACN
SUBMASTER LEVEL
MIXING NETWORK
COMMUNICATION MODULE
T.B MIKE
MIC PRE AMP
COM LEVEL
T.B. AMP
T.B. LEVEL
TO RELAY DRIVER
SLATE AMP
SLATE SW
20-200 200-2KHZ 2KHZ-20KHZ
VARIABLE R.C. CIRCUIT
20-20 KHZ WIEN-BRIDGE
20 HZ R.C. CIRCUIT
POWER
OSC ON/OFF
OSC IN/OUT
SLATE SELECTOR
RETURN CHAMBER
RET IN 5
RETURN LEVEL
TRACK SELECT
CUE 1 SW
CUE 2 SW
RET BOOSTER AMP 4
RET BOOSTER AMP 3
RET BOOSTER AMP 2
RET BOOSTER AMP 1
RETURN 4 SOLO
RETURN 3 SOLO
RETURN 2 SOLO
RETURN 1 SOLO
SAME AS RETURN 4 PANNING
MUTE SWITCHES
MASTER MODULE
RELAY CONDITIONS
STATUS: MIKE→NONE ACTUATED
TAPE→MONITOR SELECT RELAY ACTUATES UNLESS MODULE IN O-DUB STATUS
REMIX→REMIX, MONITOR RELAYS ACTUATE UNLESS IN O-DUB STATUS
OTHERS: SOLO→SOLO-MUTE, MONITOR SOLO-MUTE RELAYS ACTUATE
TALK BACK→TALK-MUTE, MONITOR T.B.-MUTE, MONITOR SOLO-MUTE RELAYS ACTUATE
2 MIX OR QUAD MIX IN STUDIO & MIKE STATUS→MONITOR T.B.-MUTE RELAYS ACTUATE
NOTES:
1. BOARD DOES NOT COME EQUIPED WITH DOTTED PARTS BUT IS WIRED FOR THEIR ADDITION.
2. ALL SWITCHES & RELAYS ARE SHOWN IN NORMAL (UNOPERATED) POSITION.
VU
QUAD OUTPUT METERS
METER MODULE
2 CHAN VU SWITCHING
QUAD MIX OUTPUT 1
QUAD MIX OUTPUT 2
QUAD MIX OUTPUT 3
QUAD MIX OUTPUT 4
4 TK TAPE IN CHAN 1
MONO TAPE/ MIX
2 TRK TAPE
AUX 1
AUX 2
4 TAPE
CUE 2
CUE 1
ECHO 2
ECHO 1
2 MIX R
2 MIX L
CHAN ACN
LEFT
RIGHT
MONO ACN
2 MIX OUT L
2 MIX OUT R
MONO OUT
ECHO SEND 1
ECHO SEND 2
CUE SEND 1
CUE SEND 2
2 TRACK MACHINE IN LEFT
2 TRACK MACHINE IN RIGHT
MONO MACHINE IN
ECHO CHAMBER IN 1
ECHO CHAMBER IN 2
CUE AMP IN 1
CUE AMP IN 2
STUDIO MONITOR SELECT SWITCH
RELAY DRIVER
MON T.B. MUTE RELAYS
MON MUTE RELAY
T.B. RELAY
STUDIO MODULE
STUDIO MONITOR
MON T-B MUTE RELAY
MONO SW (CON'T)
STUDIO MONITOR FEED 1
STUDIO MONITOR FEED 2
STUDIO MONITOR FEED 3
STUDIO MONITOR FEED 4
QUAD MIX
QUAD TAPE RET
CHAN 1
CHAN 2
CHAN 23
CHAN 24
24 CHAN SUMMING AMP
TO RELAY DRIVERS
OSC SELECTOR
QUAD/2TRK SWITCH (IN 2 TRK POS)
MONO SWITCH (IN DISENGAGE POS.)
SEE SW. CON'T AT #3 STUDIO AMP
CONTROL ROOM MODULE
SOLO LEVEL
SOLO ACN
SOLO MUTE RELAY
CONTROL ROOM MONITOR SELECT SWITCH
CONTROL ROOM MONITOR
MON SOLO MUTE RELAY
MON SWITCH (CON'T)
SPKR SWITCH
QUAD/2 TRK SW (IN 2 TRK POS)
SEE SWITCH CONTIN. AT #3 CONTROL ROOM AMP
CONTROL ROOM MONITOR FEED 1
CONTROL ROOM MONITOR FEED 2
CONTROL ROOM MONITOR FEED 3
CONTROL ROOM MONITOR FEED 4
REVISIONS
LTR
ZONE
DESCRIPTION
APPVD
MCI
FT. LAUDERDALE, FLORIDA
TITLE
JH-428/440
CONSOLE LOGIC









Over the years the many owners of the JH-416 and JH-428 recording consoles have suggested a large number of "personalized" but functional modifications to the standard modules. We have selected the best of these and offer them to the new user. Modifications come fully installed by the factory with properly silk screened panels and lettered buttons where applicable.

Modification 1 Channel Bussing Modification

This modification permits channels 17-28 to select console line outputs 9-24 instead of 1-16. This modification is extremely useful if a 24 track tape machine is interfaced to the console.

Modification 2 Phase Reverse Switch on Input/Output Modules

This modification adds a switch to each input/output module to permit phase reversal of the input signal. The switch is immediately after the input fader and will reverse mike input in MIKE and TAPE mode or line input in REMIX mode. This modification includes a properly silk screened top panel.

Modification 3 Tape Solo on Input/Output Modules

This modification alters the solo source on the input/output module. The following logic is established:

CONSOLE MODE	SOLO SOURCE
Mike	Equalized Mike
Tape	Line In From Tape
Remix	Equalized Line In

Modification 4 Auxillary Module COMM Selection

This modification permits access to the Cue 1, Cue 2, Echo 1, and Echo 2 summing busses individually, rather than the current one button access to both cue busses. Seperate level controls permit full control of level in all six talkback functions. An appropriately silk screened top panel denotes all functions.

Modification 5 Control Room Monitor Trim and Mute Controls

Four trim pots and four mini toggle switches are added to an appropriately silk screened top panel to permit trimming and muting of each control room speaker individually.

Modification 6 — Quad Studio Monitor

Additional circuitry and a conductive plastic rotary attenuator are added to the studio monitor to permit full quad monitoring in the studio.

Modification 7 — 2 Channel Studio Monitor Trim and Mute Controls

Two trim pots and two mini toggle switches are added to an appropriately silk screened top panel to permit trimming and muting of each studio monitor speaker individually.

Modification 8 — 4 Channel Studio Monitor Trim and Mute Controls

Four trim pots and four mini toggle switches are added to an appropriately silk screened top panel to permit trimming and muting of each studio monitor speaker individually.

Modification 9 — Alternate Speaker Switch on Control Room Monitor

A switch is added to the control room monitor to permit selection between two sets of quad speakers. This switch activates a remote set of relays mounted in the rear of the console.

Modification 10 — Echo Send V. U. Meters

Two additional V. U. meters can be added to monitor the echo send busses continuously. This modification cannot be used conncurrent with Modification 13.

Modification 11 — Equalized Peak Reading Light Meters

This modification generates a peak reading curve which indicates tape saturation using Scotch 206 tape with NAB tape equalization. It permits recording each track of the master tape at maximum unsaturated level.

Modification 12 — 56 Additional Tie Lines

While 56 tie lines are adequate for many installations, we have found some larger studios require the added capacity of 56 additional lines.

Modification 13 — Built-In Phase Meter

This modification provides your studio with the ability to compare phase between any two patchable signals. A built-in phase meter not only helps when mixing but also for checking mike phasing before laying tracks.

Modification 14 — Additional V. U. Meters

This modification provides extra V. U. meters of the channel type for the JH-440 series V. U. consoles. Up to 16 meters can be provided wired and labeled per request.

Modification 15 — Additional Light Meters

This modification provides extra light meters for the JH-440 series light meter consoles. Up to a total of 16 additional light meters can be installed in a JH-440LM and wired per request.

JH-428/440 CONSOLE SPECIFICATIONS

PATCH BAY FACILITIES—WIRED INTO CONSOLE:

These are Normalized Pairs Where Applicable:
- Preamp Out/Line Return, Fader Input
- Channel Line Output, Tape Machine Input
- Tape Machine Return, Channel Line Input
- 56 Tie Lines on JH-428, 80 Tie Lines on JH-440
- 2 Mults
- Quad Mix Out, Quad Tape In
- 2 Track Mix Out, 2 Track Tape In
- Mono Mix Out, Mono Tape In
- Quad Return
- 2 Track Return
- Mono Output, Mono Return
- Auxillary Tape 1, 2 Send and Return
- Cue In, Cue Send
- Chamber In, Echo Send

PROGRAM OUTPUT SPECIFICATIONS:

FREQUENCY RESPONSE
20-20KHz: ±1DB, 35-18KHz: Flat

HEAD ROOM
Minimum Head Room, Mike Preamp +28DBM, Console in Remix +24DBM

OVERALL GAIN
In Mike Mode: 80DB

CROSS TALK
Measured Channel to Channel with +4DBM in and +4DBM Out. Console in Remix Mode. 1KC-Below Noise, 10KC-Less Than -70DBM, 20KC-Less Than -65DBM.

DISTORTION
Mike Preamp Output +24DBM Above Normal Level of -6DBM. IM-Less Than .1%, THD-Less Than .1%. Console in Remix +4DBM In, +20DBM Out. IM-Less Than .1% THD-30Hz Less Than .1%, 1KHz Less Than .03%, 15 KHz Less Than .05%.

NOISE
Mike Preamp: -50DBM In, Normal Level Out. Noise: Less Than -74DBM. Console in Remix. Mode: +4DBM Out. Noise: Less Than -75DBM.

CONSOLE DIMENSIONS:

	JH-428	JH-440
Maximum Channels:	28	40
Overall Width:	74.45"	93.07"
Overall Depth:	39.65"	39.65"
Height to Arm Rest:	29.75"	29.75"
Overall Height: (above floor)	38.45"	38.45"
Net Weight: (approximately)	397 Lbs.	450 Lbs.
Shipping Weight: (with power supplies)	672 Lbs.	780 Lbs.

CONSOLE POWER REQUIREMENTS

	JH-428	JH-440
Lamps:	21V DC Bipolar @ 2.5 Amps	3.0 Amps
Relays:	24V DC Bipolar @ 2.0 Amps	2.8 Amps
Audio:	24V DC Bipolar @ 1.4 Amps	2.0 Amps

LIGHT METER SPECIFICATIONS

8 Segments:	Indicating +2, 0, -1.5, -3, -6, -10, -15, -20DB.
V.U. Ballistics:	Matched to A.S.A. V.U. Specifications.
Peak Ballistics:	10 M.S. Integration Time: 2 Seconds Fall Time.
Tracking Error Between Meters:	±.1DB Accomplished by Use of a Single Reference for All Meters.
Frequency Response:	5Hz to 18.5KHz.
Power Supply:	Seperate Logic Supply of +5V DC and ±15V DC.

Front Panel Height: 3.5" Front Panel Width: 19"
Total Depth: 7.40"

POWER SUPPLY SPECIFICATIONS

ELECTRICAL:

Three Interchangeable Power Supplies are Used. Voltage Outputs are Determined by Connecting Appropriate Power Cable from Console.

VOLTAGE: ±21V DC or ±24V DC Bipolar Regulated to Less than ±1% for Inputs of 95-135V AC and Outputs up to 3 Amps Less than 1 mv Ripple.

CURRENT: 3 Amps Normal Output. Current Limited to 3.4 Amps or 5 Amps—at this Point the Output Voltage goes to Zero.

COOLING: Forced Air

MECHANICAL:

Width of Front Panel:	19.00"
Height of Front Panel:	5.20"
Depth Behind Front Panel:	7.40"
Width Behind Front Panel:	17.00"

6-12-75 Rev. 4

MCI

4007 N. E. 6th Avenue, Ft. Lauderdale, Florida 33308
Phone: (305) 566-2853 Telex: 51-4362

MCI JH-428/440 CONSOLE PRICES

List Prices

CONSOLES

All console mainframes come fully wired for 28 or 40 channels as applicable. All consoles in the 440 series come with 24 channel metering. The 440 housing is pre-punched for up to 40 channel meters. The extra metering holes are covered with a blank panel.

28 CHANNEL FRAMES

JH-428-8 VU—Wired for 28 Channels, 24 Channel Meters, 8 I/O Modules	$ 16,785.00
JH-428-16 VU—Wired for 28 Channels, 24 Channel Meters, 16 I/O Modules	22,945.00
JH-428-24 VU—Wired for 28 Channels, 24 Channel Meters, 24 I/O Modules	29,105.00
JH-428-28 VU—Wired for 28 Channels, 24 Channel Meters, 28 I/O Modules	32,185.00
JH-428-8 LM—Wired for 28 Channels, 8 Channel Meters, 8 I/O Modules	18,325.00
JH-428-16 LM—Wired for 28 Channels, 16 Channel Meters, 16 I/O Modules	25,365.00
JH-428-24 LM—Wired for 28 Channels, 24 Channel Meters, 24 I/O Modules	32,405.00
JH-428-28 LM—Wired for 28 Channels, 28 Channel Meters, 28 I/O Modules	35,925.00

40 CHANNEL FRAMES

JH-440-28 VU—Wired for 40 Channels, 24 Channel Meters, 28 I/O Modules	35,961.00
JH-440-36 VU—Wired for 40 Channels, 24 Channel Meters, 36 I/O Modules	42,121.00
JH-440-40 VU—Wired for 40 Channels, 24 Channel Meters, 40 I/O Modules	45,201.00
JH-440-28 LM—Wired for 40 Channels, 24 Channel Meters, 28 I/O Modules	39,701.00
JH-440-36 LM—Wired for 40 Channels, 24 Channel Meters, 36 I/O Modules	45,861.00
JH-440-40 LM—Wired for 40 Channels, 24 Channel Meters, 40 I/O Modules	48,941.00

MODIFICATIONS

Mod. 1—Channel Bussing	150.00
Mod. 2—Phase Reverse Switch (16 or more boards)	25.00/I.O.
Mod. 3—Tape Solo (16 or more boards)	20.00/I.O.
Mod. 4—Auxillary Module COMM Select	350.00
Mod. 5—Control Room Trim and Mute	100.00
Mod. 6—Quad Studio Monitor	254.00
Mod. 7—2 Channel Studio Trim and Mute	75.00
Mod. 8—Quad Studio Trim and Mute	100.00
Mod. 9—Alternate Speaker Switch on Control Room Monitor	175.00
Mod. 10—Echo Send VU Meters	75.00
Mod. 11—Equalized Peak LM's	5.00 Ea.
Mod. 12—56 Extra Tie Lines (Only on 428 Frames	250.00
Mod. 13—Built-In Phase Meter	250.00
Mod. 14—Built-In Spectra-Vue Real Time Analyzer	1,250.00
Mod. 15—Extra Channel VU Meters Connected and Labeled Per Instructions for JH-440 VU Consoles	42.50 Ea.
Mod. 16—Extra Channel Light Meters Connected and Labeled Per Instructions for JH-440 LM Consoles	110.00 Ea. 500.00 Base
Mod. 17—Joy Stick Panners in Writing Surface (Up to 8 Pots)	302.00 Ea. 83.00 Base
Mod. 18—Extra Tie Lines (Only on 440 Frames)	300.00
Mod. 19—Extra Length Power Supply Cables (Per Foot of Cable Over 30 Feet Per Power Supply	1.50/Foot

10/75

ACCESSORIES AND PARTS

Additional Input/Output Modules (4E204) or (43E95)	$ 770.00
Additional Light Meter Modules	110.00
Auxillary Module	550.00
Master Module	1,800.00
Control Monitor	750.00
Studio Monitor 2 Track	490.00
Relay Module	190.00
JH-35 Spectra-Vue Real Time Analyzer	1,350.00
Light Meter Master Module	175.00
Power Supply $\pm$24 V or $\pm$21 V	425.00
Regulator Board +24 V or +21 V	110.00
Light Meter Power Supply	375.00
Mono MCI/P & G Fader	85.00
Four Gang MCI/P & G Fader	300.00
MCI 2001 Op-Amp	9.00
Jack Strip (Two Rows of 28 Jacks with 25' of Cable)	200.00
Jack Strip (Two Rows of 40 Jacks with 25' of Cable)	250.00
1' Patch Cords	9.00
2' Patch Cords	9.00
MCI JH-428 Spare Parts Kit	250.00
MCI JH-428 Touch-Up and Lubrication Kit	10.00
JH-400 Producer's Desk	550.00
Option 1—Panel 1-No Speaker Punch Outs	N.C.
Option 2—Panel 2-(2) 4X6 Speakers Mounted on Meter Panel	40.00
Option 3—Punch-Outs Per Drawing	50.00
Option 4—Rack Mounting Cut-Out in Writing Surface	50.00

TABLE 3-9 GLOSSARY OF INTERFACE TERMINOLOGY (See Prologue page 42)

USAGE

Underlining of terms denotes that the term underlined is also defined within this lexicon. Quotation marks denote that the term specifies a patch bay connection and is defined in table 3-8.

Channel	Channel is synonomous with input-output module. The number of channels in a console is equivalent to the number of input-output modules.
Channel Cue Feeds	Two cue feeds from each channel. In the standard configuration these outputs consist of equalizer output in REMIX mode; channel summing input (amplified with no manual gain control) in MIKE modes; or channel line input (amplified with no manual gain control) in TAPE mode. These channel outputs feed the cue summing busses. (Channel cue feeds may be interchanged with channel echo feeds in a non-standard configuration.)
Channel Echo Feeds	Two echo feeds from each channel. In the standard configuration channel echo feed #2 consists of equalizer output in REMIX mode; channel summing input (amplified with manual gain control) in MIKE mode; or channel line input (amplified with manual gain control) in TAPE mode. In the standard configuration channel echo feed #1 is identical to channel echo feed #2, if ECHO switch is OFF. If ECHO switch is ON channel echo feed #1 is identical to channel cue feeds. (Channel echo feeds may be interchanged with channel cue feeds in non-standard configuration).
Channel Line Input	One hi-level channel line input to each channel. Channel line input feeds through a 600 ohm transformer on mother board to "status relay input" connection on patch bay.

Channel Line Output	One channel line output from each channel. Channel line output from each channel feeds one of 24 "tape input" patches on patch bay via one of 24 output transformers on mother board. Consists of amplified channel summing input. Channel line output also feeds one of 16 VU meters on console meter panel. NOTE Channels 17 through 24 feed VU meters 9 through 16 only if METER change switch on meter module is in down position.
Channel Mike Input	One lo-level channel mike input to each channel. Channel mike input feeds directly from one of first 24 connections on connector block #1 to an input transformer on input-output module.
Channel Quad Feeds	Four quad feeds from each channel (either two front or two rear channel quad feeds are connected at any one time dependent on Quad Mix switch position). Channel quad feeds are connected to the quad mix busses.
Channel Solo Feed	Equalizer output from channel after feeding through channel solo switch. Solo switch assigns equalizer output to solo summing buss.
Channel Summing Feed	Equalizer Output from channel after feeding through channel select switches. Channel select switches assign equalizer output to a summing buss.
Channel Summing Input	ACN input to input-output module from summing buss. Each of first 16 channel summing inputs is individually connected to one of 16 summing busses (e.g. channel summing input 1 to summing bus #1;

channel 2 to buss #2 etc.). Channel summing inputs for channels 17 through 24 are not connected to summing busses.

Cue Send Outputs

Two cue outputs to "cue amp in" patches on patch bay, via a 600 ohm transformer on mother board. Consist of summed and amplified channel cue feeds from cue summing busses through an amplifier on master module. The cue send outputs also feed monitor select switches on control room monitor and studio monitor module and meter monitor module.

Cue Summing Busses

Two individual ACN summing buss lines located on mother board. Output from each cue summing buss feeds through a cue summing amplifier on master module. The outputs of cue summing amplifiers are named cue send outputs. The cue send outputs feed the control room monitor select switches, studio monitor select switches, and meter monitor select switches. Cue send outputs also feed "cue amp in" connections on patch bay. The input to each cue summing buss is fed by channel cue feeds from 24 channels (maximum).

Device

Any peripheral unit connected to console (e.g. tape machine, echo chamber, etc.).

Echo Returns

Five return signals to console from device connected through "echo return input" connections on patch bay. Echo returns 1 through 4 feed through a 600 ohm transformer to input amplifiers and echo quad mix circuits on master module. The echo quad mix circuits feed echo returns onto the four quad mix busses.

Echo return 5 feeds through a 600 ohm transformer on mother board to an input amplifier on echo return module. The amplifier output feeds echo return 5 to channel solo and cue select switches.

Echo Send Outputs

Two echo outputs to "chamber in" patches on patch bay via a 600 ohm output transformer on mother board. Consist of the summed and amplified channel echo feeds from the echo summing busses through an amplifier on master module. The echo send outputs also feed monitor select switches on control room monitor module, studio monitor module, and meter monitor module

Echo Summing Busses

Two individual ACN summing buss lines located on mother board. Output from each echo summing buss feeds through a echo summing amplifier on master module. The outputs of echo summing amplifiers are named echo send outputs. The echo send outputs also feed control room monitor select switches, studio monitor select switches, and meter monitor select switches. Echo send outputs also feed "chamber in" connections on patch bay. The input to each echo summing buss is fed by channel echo feeds from 24 channels (maximum).

Equalizer Output

Signal existing at output of equalizer within an input-output module. The equalizer output feeds channel select switches, solo switch, direct assign switch; and channel echo, cue and quad feeds if console is in remix mode. After feeding through a channel select switch this signal is referred to as channel summing feed.

Mix (in relation to a buss)

The term "mix" shall apply to those busses used for quad mix, stereo mix and mono mix (see summing).

Mono Mix Output

Console output signal fed through a 600 ohm transformer to device connected to "mono in" connections on patch bay. This signal consists of a mix of all four quad mix busses.

Mono Return

Return signal to console from device connected through "mono-ret" connections on patch bay. The "mono ret" patch feeds monitor select switches on control room, studio, and meter monitor modules.

Normal External Device

Any peripheral device (tape, echo chamber, etc.) that is connected to console without the aid of a patch cord.

Oscillator Feed	External oscillator input to console via "osc" patch bay connection.
Other External Device	Any peripheral device (tape, echo chamber, etc.) that is connected to console only when a patch cord is inserted into patch bay.
Primary Stereo	The stereo device connected to the console via pins 33 through 36 of connector block #1.
Program	The quad mix outputs, stereo mix outputs, or mono mix output from console.
Program Circuits	Those console circuits providing control and interface between input devices and output devices during live recording or off-line mix sessions.
Quad Mix Busses	Four individual mix buss lines located on mother board. Output from each quad mix buss feeds through a summing amplifier, fader, compatibility network and quad mix output amplifier on master module. The compatibility network output also feeds stereo mix output amplifiers and the mono mix output amplifier. These busses also feed control room monitor select switches, studio monitor select switches, and quad VU meters on console meter panel. The input to each quad mix buss is fed by individually selected left front and right front or left rear and right rear channel quad feeds from 24 channels (maximum). Selection of channel quad feeds is made through Quad Mix switch. Echo returns 1 through 4 also feed the quad mix busses.
Quad Mix Outputs	Four console output signals connected through a 600 ohm transformer to device connected to "quad tape input" connections on patch bay. These signals consist of the quad mix produced on the quad mix busses. Quad mix outputs also feed 4 MIX monitor select switch on control room monitor module and studio monitor module.

Quad Returns

Four return signals to console from device connected through "quad tape return" connections on patch bay. The quad tape return patches feed monitor select switches on control room, studio, and meter monitor modules.

Solo Summing Buss

One buss line located on mother board. Output from solo summing buss feeds to a summing amplifier on control room monitor module. The input to solo summing buss is fed by channel solo feeds from all channels that have SOLO switch depressed.

Status Relay Output

Pertains to the channel fader input signal that is fed through a relay that is energized in the Remix mode and de-energized in Tape or Mike mode. In remix mode, status relay output consists of channel line input. In tape or mike mode, the status relay output consists of channel mike input.

Stereo Mix Outputs

Two console output signals fed through a 600 ohm transformer to device connected to "2 trk in" connections on patch bay. The stereo signal connected to "2 trk in" #1 consists of a mix of quad mix busses 1 and 2. The stereo signal connected to "2 trk in" #2 consists of a mix of quad mix busses 3 and 4. Stereo mix outputs also feed 2 mix monitor select switch on control room monitor module, studio monitor module, and meter monitor module.

Stereo Returns

Two return signals to console from device connected through "2 trk ret" connections on patch bay. The "2 trk ret" patch feeds monitor select switches on control room, studio, and meter monitor modules.

Summing (in relation to a buss)

The term "summing" shall apply to those busses used for channel summing, cue summing, and echo summing (see mix).

Summing Buss

Sixteen individual ACN summing buss lines located on mother board. Output from each summing buss separately feeds a channel summing input on one of first 16 input-output modules. The input to each summing buss is fed by channel summing feed assigned through channel select switches on 24 input-output modules (e.g. summing buss #1 is connected to 24 channel select switches #1; #2 to 24 channel select switches #2, etc.).

Additions to Glossary

Mother Board

One mother board per console. This printed circuit board is located at the bottom of console and serves as the master interfacing network for console inner electronics. All buss lines and all 600 ohm line transformers are located on this board.

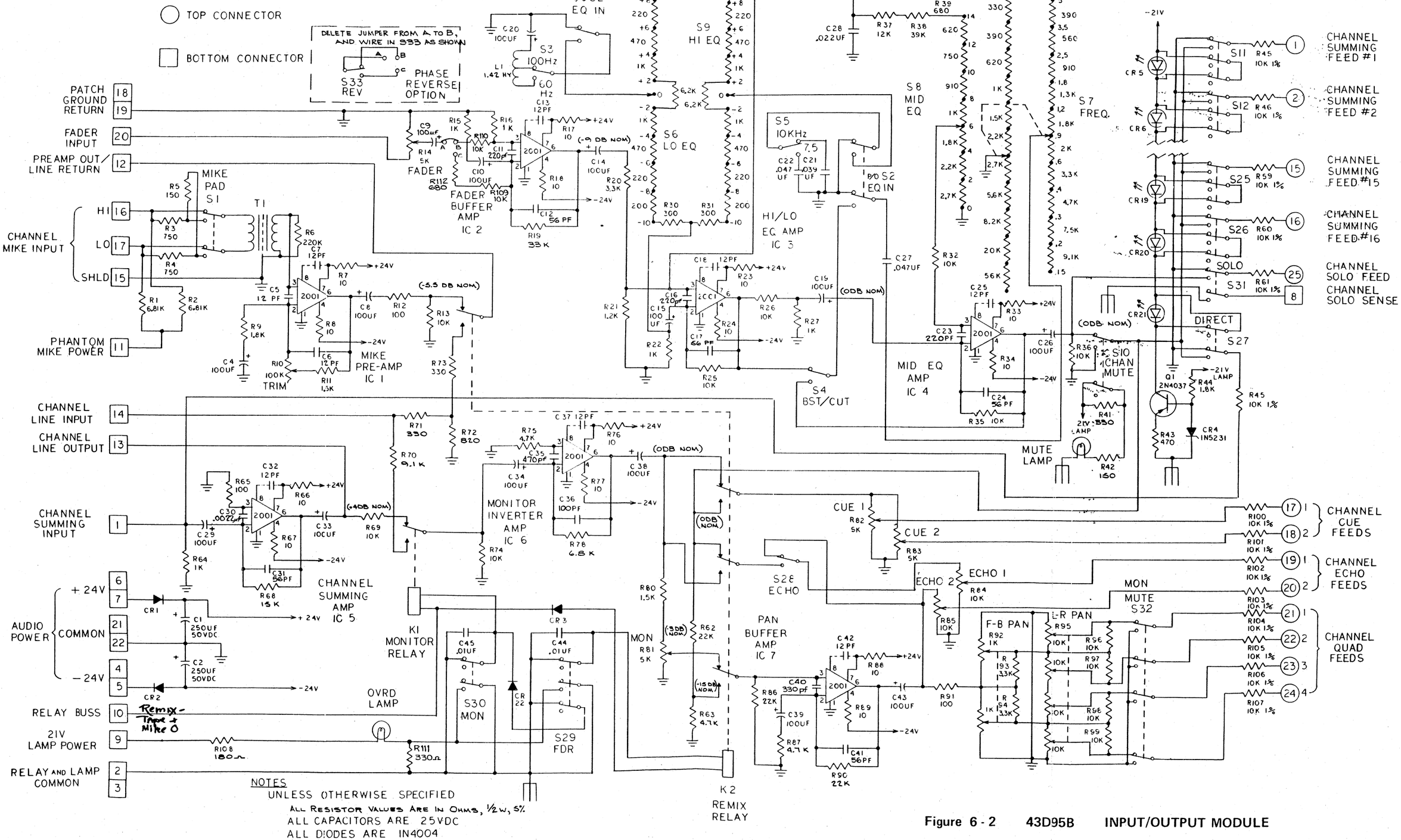


Figure 6 - 2 43D95B INPUT/OUTPUT MODULE

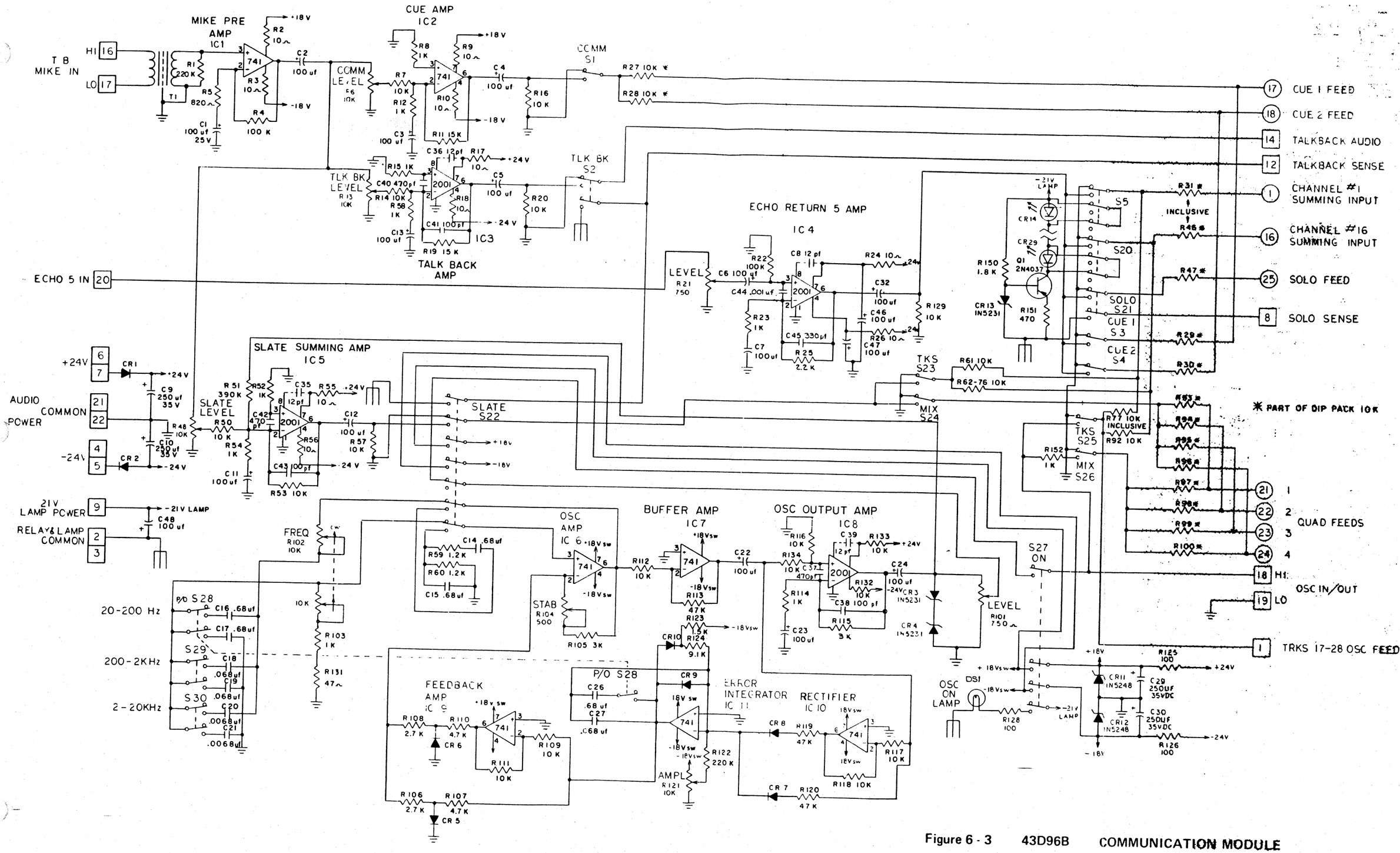


Figure 6 - 3 43D96B COMMUNICATION MODULE

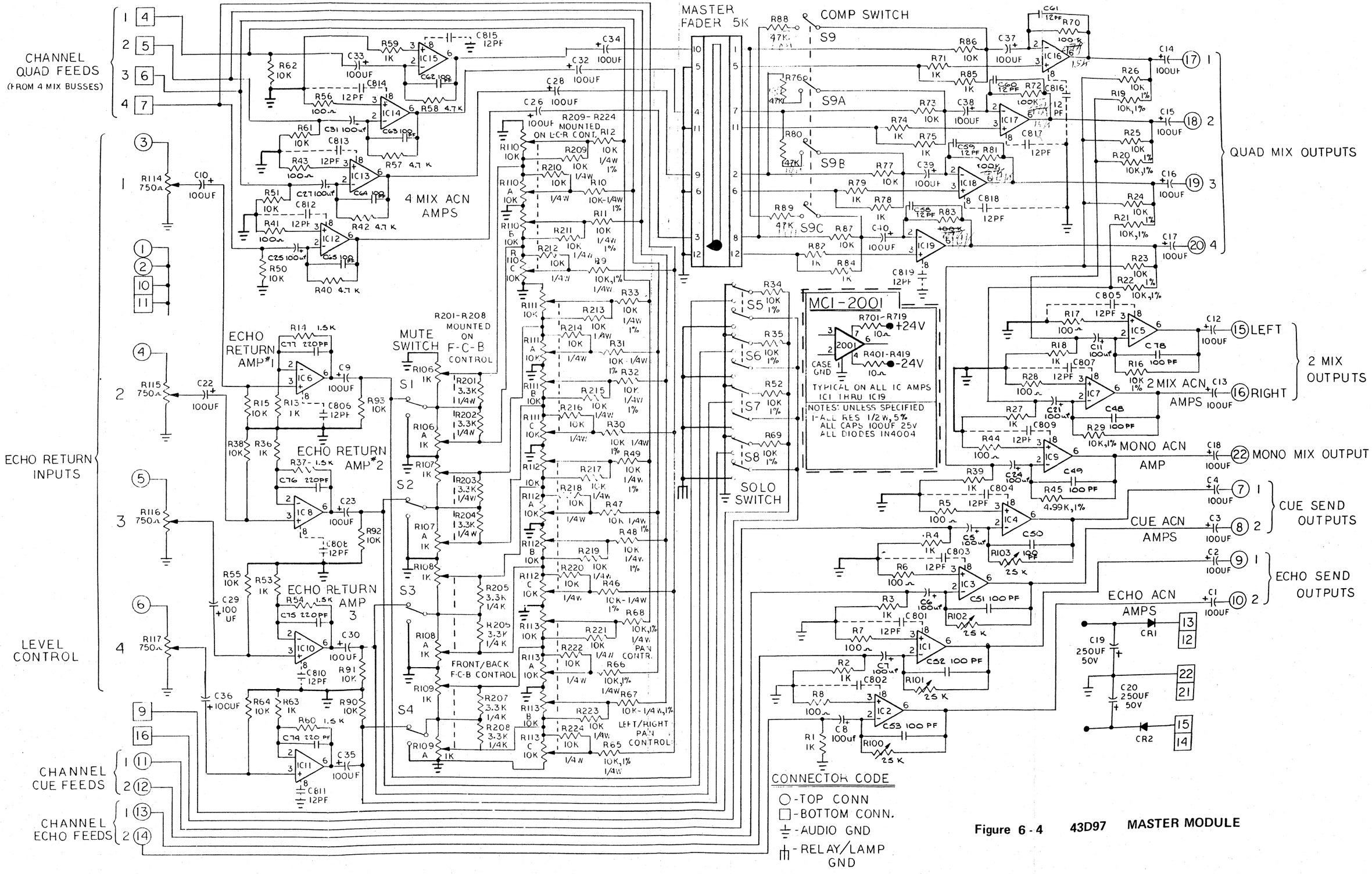
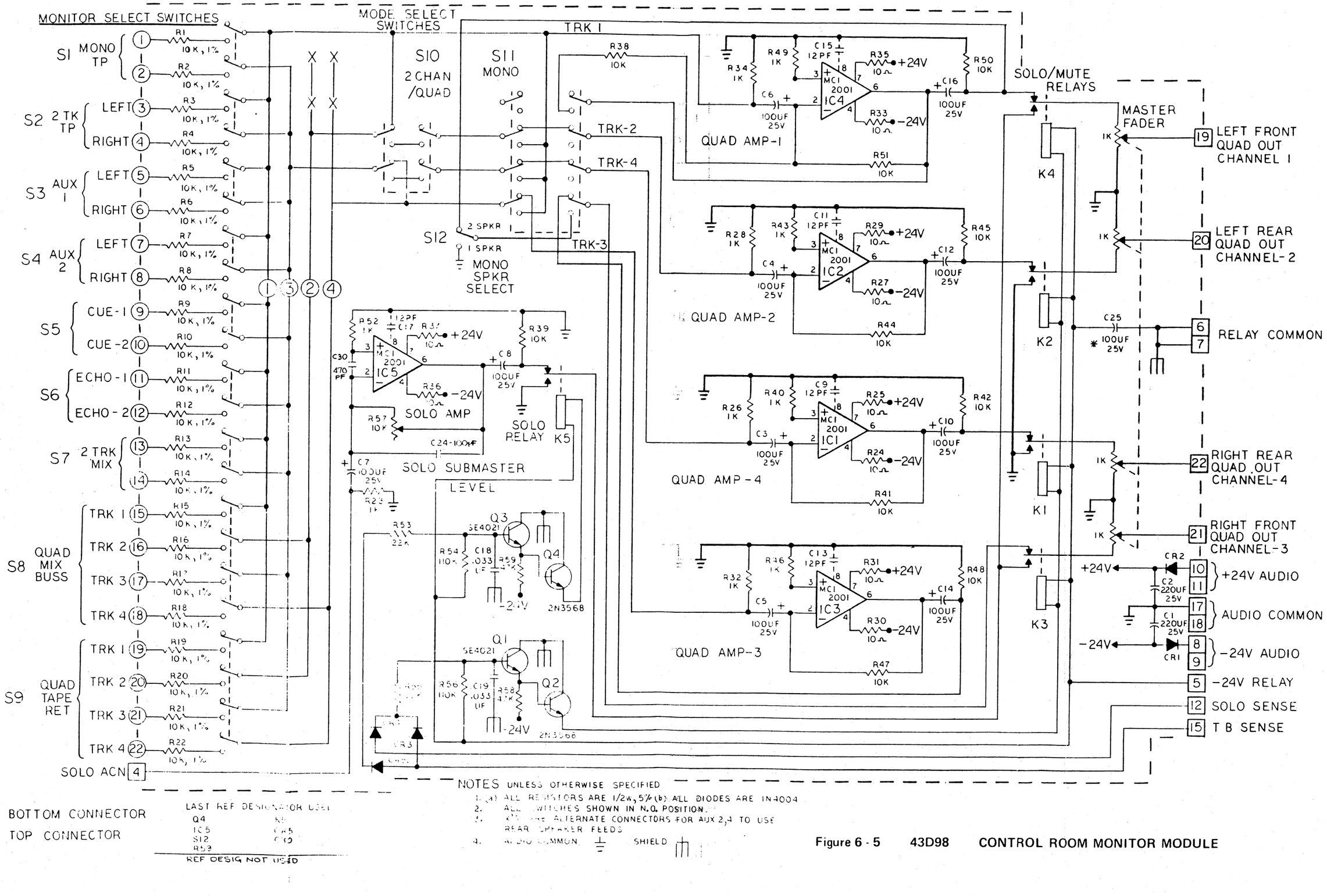


Figure 6-4 43D97 MASTER MODULE



NOTES UNLESS OTHERWISE SPECIFIED

1. (a) ALL RESISTORS ARE 1/2w, 5% (b) ALL DIODES ARE IN4004
2. ALL SWITCHES SHOWN IN N.O. POSITION.
3. [illegible] ARE ALTERNATE CONNECTORS FOR AUX 2,4 TO USE REAR SPEAKER FEEDS
4. AUDIO COMMON ⏚ SHIELD

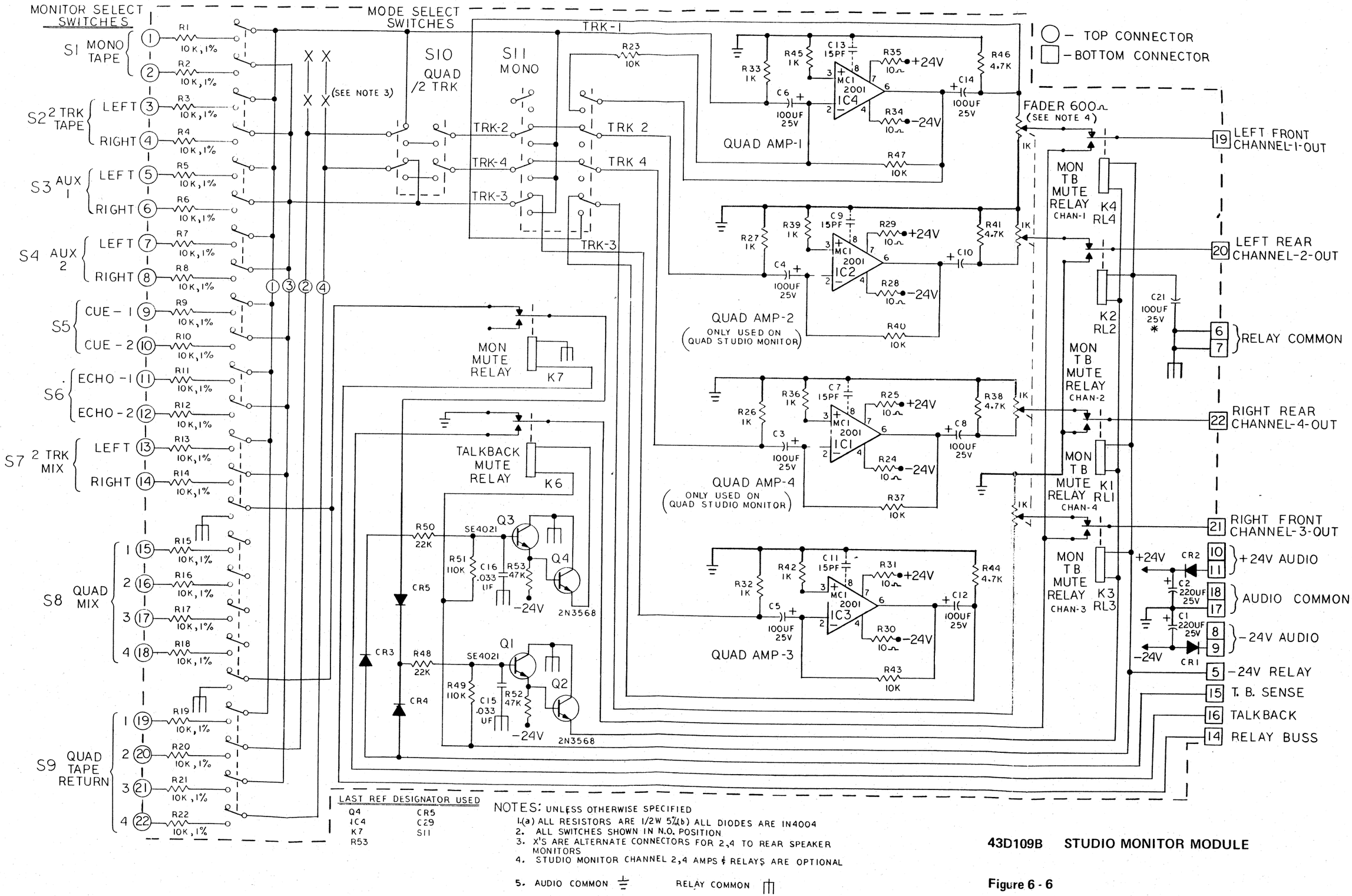
BOTTOM CONNECTOR

TOP CONNECTOR

LAST REF DESIGNATOR USED	
Q4	R5
IC5	C45
S12	C43
R59	

REF DESIG NOT USED

Figure 6 - 5 43D98 CONTROL ROOM MONITOR MODULE



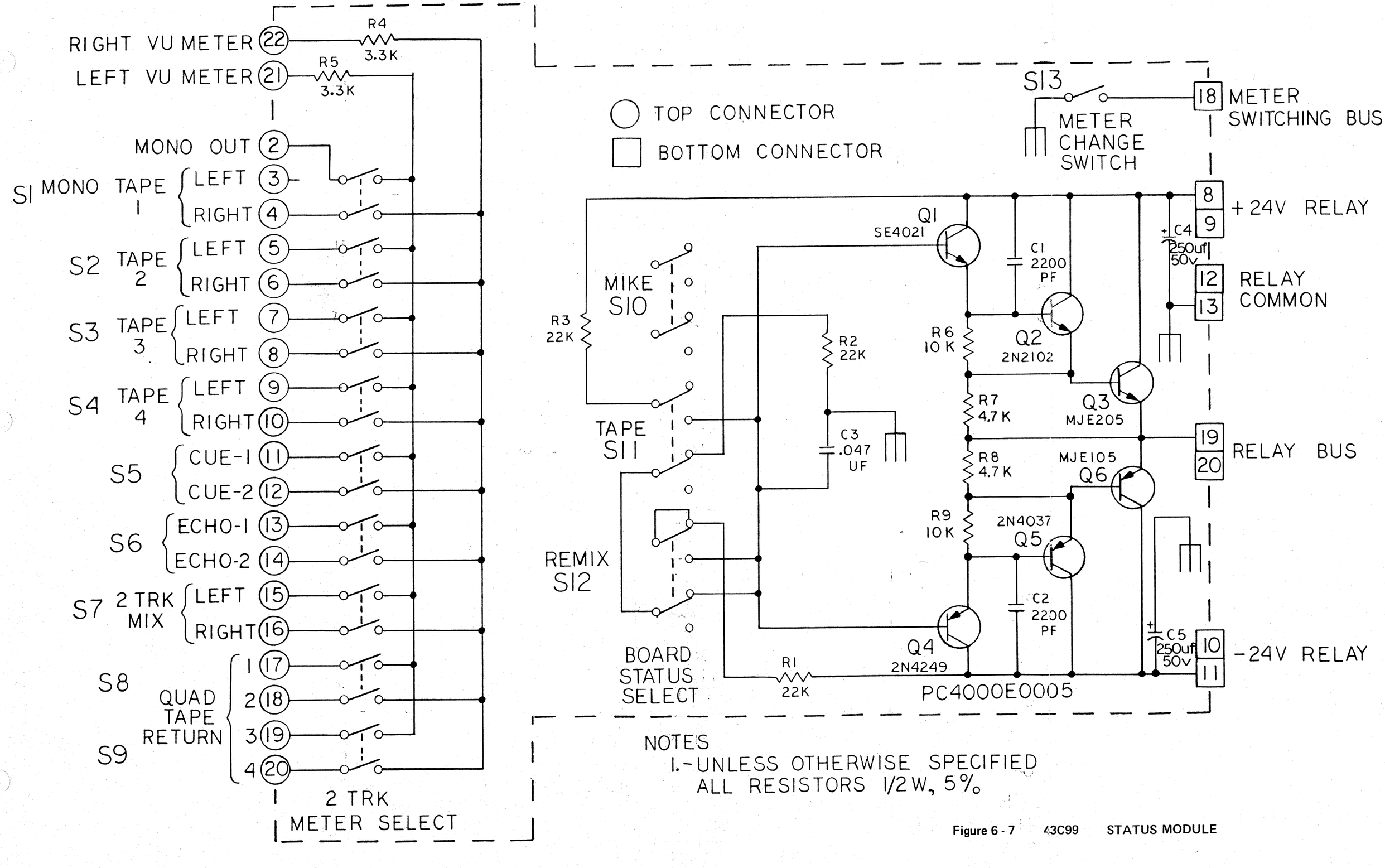
LAST REF DESIGNATOR USED	
Q4	CR5
IC4	C29
K7	S11
R53	

NOTES: UNLESS OTHERWISE SPECIFIED

1.(a) ALL RESISTORS ARE 1/2W 5%(b) ALL DIODES ARE IN4004
2. ALL SWITCHES SHOWN IN N.O. POSITION
3. X'S ARE ALTERNATE CONNECTORS FOR 2,4 TO REAR SPEAKER MONITORS
4. STUDIO MONITOR CHANNEL 2,4 AMPS & RELAYS ARE OPTIONAL
5. AUDIO COMMON ⏚ RELAY COMMON ⏚

43D109B STUDIO MONITOR MODULE

Figure 6 - 6



NOTES

1.-UNLESS OTHERWISE SPECIFIED ALL RESISTORS 1/2W, 5%

Figure 6 - 7 43C99 STATUS MODULE

CR3 IN5231 5.1V
R7 1K
CURRENT SOURCE
Q3 2N4354
R8 10K
C1 47UF 63V
CR2
R16 2.7K
C5 47 UF/6V
ERROR AMP
Z1 U8741
R4 1K
CR5
R5 22K
Q2 2N3568
CURRENT LIMIT
R3 100Ω
Q1 2N3053
R2 .39Ω 2W
R1 .39Ω 2W
CR1
C2 47UF 63V
R9 1K
R16 2.2K
R10 470Ω 1W
Q4 2N3868
R13 1K
BI-POLAR OVERVOLTAGE SENSE
R14 1K
Q5 2N4354
R15 2.2K
R12 1K 2W
CR6
C3 47 UF 63V
R20 1K
CR4
K1 OVERVOLT CUTOFF
R28 680Ω
R29 680Ω
R27 100Ω
CR9 IN5231 5.1V
R25 1K
CURRENT SOURCE
Q8
R26 10K
R31 1K
ERROR AMP
Z2 U8741
R23 1K
-26VDC 40MV P-P
-24VDC
C4 47UF 63V
CR8
R24 2.7K
C6 47UF/6V
TP -24VDC 100UV P-P
CR7
C7 47UF 35V
R22 22K
Q7 2N4354
CURRENT LIMIT
R19 100Ω
Q6 2N4037
CR10
R30 470Ω
R18 .39Ω 2W
R17 .39Ω 2W
PC BOARD PC4000C0010

21 +35 V IN YEL/WHT
20 WHT/ORN
18
19 ORN
PASS TRANSISTOR 2N3055 HEAT SINK
+ 24 V REG
22 + AUTO VOLT. TRIM ORN
14 + REMOTE SENSE
12
13 + REG OUTPUT RED
15 GRA
10
11 BLK
8 GRA
2 GROUND SENSE
3 GROUND GRA
9 - REMOTE SENSE
1 -35 V IN BLK/BRN
5 WHT/BLU
6
7 -24 V REG
4 - AUTO VOLT. TRIM BLK

PILOT LITE
B
150Ω
OVERVOLT LITE
R
IN4721 IN4721 IN4721 IN4721
.01 UF
2800 UF 50V
2800 UF 50V
T1
S1 MDL
F1 2 AMP
BLK
GRN
WHT
117 VAC

O6 O7 + AUTO VOLT TRIM
O13 O14 EARTH GND
O4 O5 O9 O3 O1 O2 +24 V REG
O15 O16 -24 V REG
O17 O12 O10 O11 GND ZERO VOLT
O18 O8 - AUTO VOLT TRIM
POWER OUTPUT CONNECTOR

NOTE: OFF BOARD WIRING DOESN'T CORRESPOND TO INFO. ON ECO #1 JH-416 TRW 3-9-73

NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS 1/2W 5%
2. ALL CAPACITORS IN UF
3. REF. PC.BOARD PC4000C0010.
4. ALL DIODES IN4004
4. TO CONNECT ZERO VOLTS BUS TO EARTH GND, JUMPER PIN 10 TO PIN 13 ON POWER OUTPUT CONNECTOR.
5. TO TRIM VOLTAGE TO ±22V, JUMPER PINS 7,8, & 10,11 ON POWER OUTPUT CONNECTOR.

Figure 6 - 8 SC40D21 CONSOLE POWER SUPPLY

PC 4000C0139

SIGNAL INPUT 15 / 14 ②

C3 22 25V

R1 5K (CW / CCW)

CALIBRATE CONTROL

C4 20PF

PRECISION RECTIFIER

IC1 748C

CR7

CR6

R4 10K

R5 10K

C5 20PF

IC2 748C

CR5 IN34

R7 100Ω

C7 15 25V

R9 PEAK CURVE 82K

R10 22K

S1

PEAK RMS

R8 10K

RMS CURVE

C6 15 25V

CR4 IN5231A

R11 1K

IC3 748C COMPARITOR

9 RAMP INPUT

12 / 13 LOGIC AND LAMP GND.

R3 10K

R6 20K SYMMETRY CONTROL (CCW / CW)

R2 4.7K

② (common)

+15VDC

-15VDC

① (logic & lamp gnd)

CR1

1 +15VDC

C1 25 25V

3 0V

C2 25 25V

2 -15VDC

CR2

(SEE NOTE #3)

DS1 DS2 DS3 DS4 DS5 DS6 DS7 DS8

R14 2.2K R15 2.2K R16 2.2K R17 2.2K R18 2.2K R19 2.2K R20 2.2K R21 12.2K

R12 1K

+5VDC LOGIC POWER 8

R13 1K

C8 .01 50V

IN5231A

CR3

C9 .01 50V

DIGITAL INFO INPUT A 4 / B 5 / C 6 / D 7

IC4 74175 QUAD LATCH

IC5 7445 BCD TO DECIMAL

+21V LAMP 10 / 11

+21V FROM POWER SUPPLY

K1 (ON SECONDARY MOTHER BD)

+5V LOGIC POWER

LAST REF. DES. USED

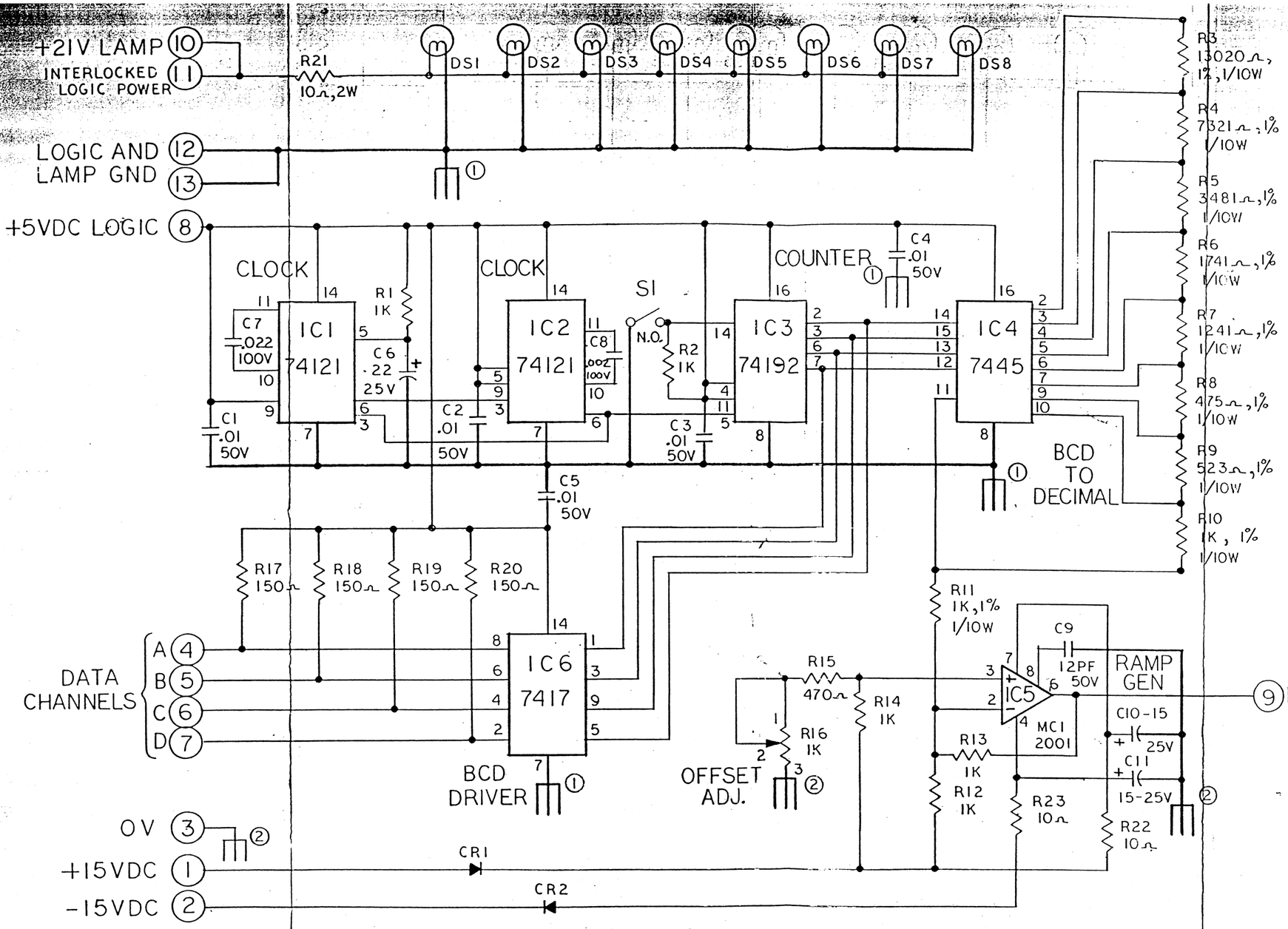
S1	C9
CR7	R21
IC5	
DS8	

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   1. RESISTORS ARE 1 2W 5
   2. DIODE ARE IN4004
   3. CAPACITORS ARE SPECIFIED IN MICROFARADS
2. ① LOGIC & LAMP GND. ② OP. AMP. GND.
3. ALL LAMPS ARE 28V 40MA OSHINTO OL387BP OR EQUIV.

Figure 6-9

4C139C Light Meter Voltage Display Board



3. ALL LAMPS ARE 28V, 40MA OSHINTO OL38BP OR EQUIV.

LAST REF. DES. USED

SI	DS8
CR2	C11
IC6	R23

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   1. RESISTORS ARE 1 2W 5
   2. DIODES ARE IN4004
   3. CAPACITORS ARE IN MICROFARADS
2. ① +5V LOGIC AND +24 LAMP GND ② 15V-BI-POLAR COMMON

Figure 6-10

4C128B Light Meter Master Control Board

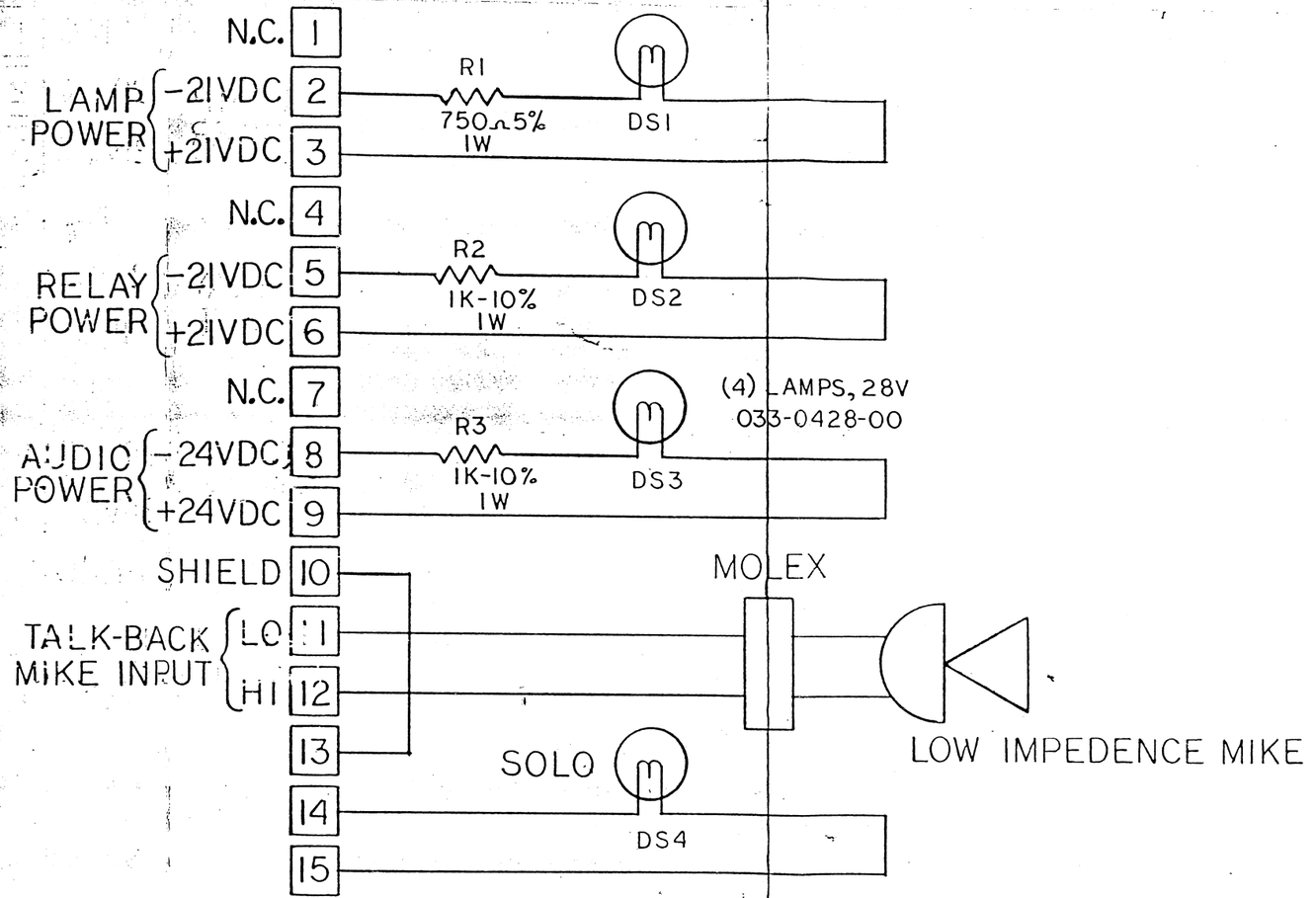


Figure 6-11

4C126 Light Meter Power Display Board

A