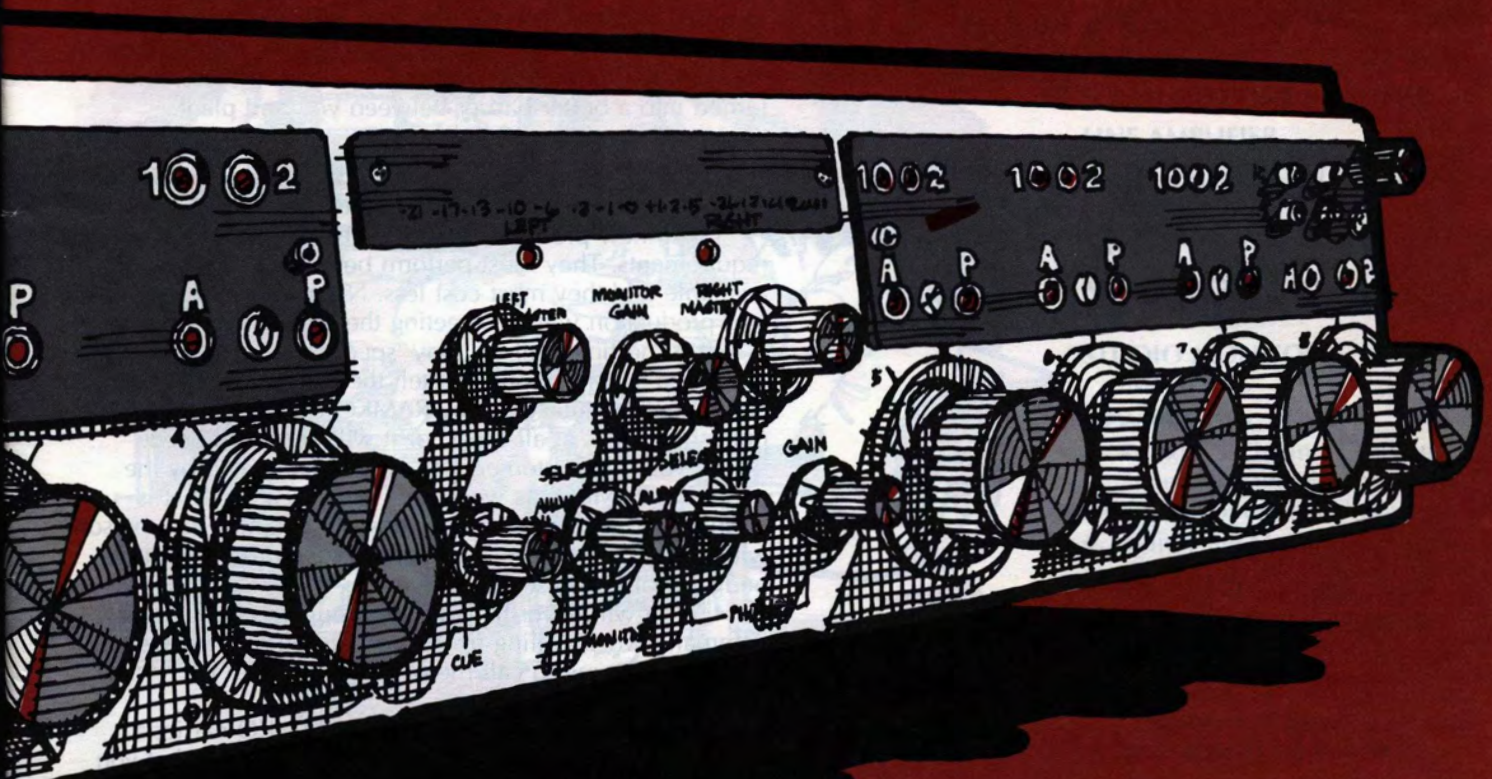


PROFESSIONAL AUDIO EQUIPMENT



1978/1979 CATALOG

If You Didn't Get This From My Site,
Then It Was Stolen From...

www.SteamPoweredRadio.Com



FOREWORD



We formed RAMKO RESEARCH in the late '60's with the firm belief that manufacturers of broadcast audio equipment were not doing all they could to advance the state of the art.

Even though dramatic strides were being made in the field of solid-state components, too many manufacturers were content to retain the same designs year-in and year-out. Even today, you can supposedly see 'state of the art' equipment that contains amplifiers and circuitry originally designed over ten years ago. The equipment has only been repackaged, relaid and presented in a different manner. Consequently, performance cannot begin to approach what is possible with today's design.

We also created RAMKO RESEARCH with the belief that industry practices in the general areas of advertising, communications and customer service left a lot to be desired. Prices were rarely published in ads, as one example. Another was the frequent back-and-forth hassle with the manufacturer to gain the necessary technical or cost information. Customer Service, in some cases, had turned into a buffer-barrier between you and plant managers.

Accordingly, in planning corporate philosophy, we set forth the following five irrevocable policies:

1. All new products must meet two, very stringent requirements. They must perform better than what is available and they must cost less. No new product will go into production without meeting these tests.
2. At no time will we play 'specsmanship'. All published specifications will tell the whole story. All equipment manufactured by RAMKO must exceed published specs at all times, or it will not be shipped.
3. You, the customer, will always be treated by the people at RAMKO, as we expect to be treated. That is courteously, with respect and most importantly, as a person with a special problem or need, not just someone with a budget for broadcast equipment.
4. You will never have to go through a chain of command when calling us. Before, during or after the sale. You are welcome to call me or anyone else in the organization.
5. Everything you purchase from RAMKO carries a two-week, free trial period. This insures you get what you need and keeps us honest.

Admittedly, adhering to these policies hasn't always been the easiest thing to do. But doing so probably explains why our sales have increased over 100 times in the last 7 years.

Take a few moments to look through our new catalog. I think you'll be pleasantly surprised at the new products we've developed to make your job a little easier.

Very sincerely,

Ray Kohfeld
President/Director of Engineering

GUIDE



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BROADCAST CONSOLES



DC 5M DC-5MS



DC-8M DC-8MS



SC-5M



SC-5R (rack mount)

- DC-5M (Dual Channel Mono)
- DC-5MS (Dual Channel Stereo)
- DC-8M (Dual Channel Mono)
- DC-8MS (Dual Channel Stereo)
- SC-5M (Single Channel Mono)
- SC-5R (Single Channel Mono)

The Best Cost/Performance Ratio In The Industry

RAMKO'S entire console series contains design and operating features that you won't find in consoles costing 5 to 10 times more. Some features are RAMKO exclusives you won't find in any console — Anywhere!

Noiseless input select switches; noiseless audition / off / program select switches; noiseless audio mixers and noiseless cue switching are only part of the reason that we say RAMKO Consoles represent the greatest advance in audio control in the last 15 years.

This series of RAMKO Consoles — whether single or dual channel; table models or rackmount; 5 or 8 mixers — feature Illuminated Touch Pad Audio Select switching; Solid State (better than VU) light emitting meters; SIMUL-Q monitoring capability; Full-Range Gain Selects on each input; Cue and Monitor Mute Select Patch Panel on every channel except the last; Plug-In Amplifier Cards and RF Suppression. (See *photographic closeups facing page.*)

RAMKO Consoles are not only years-ahead in audio control design, they are rugged, handsome and easy to service.

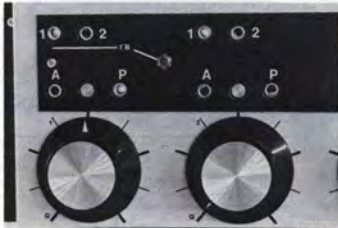
The complete cabinet is constructed of heavy 14 gauge aluminum and finished in a rich dark brown and light sand combination. The finish is lightly textured, tough polyurethane which is unaffected by alcohol, soap and water, solvents — or even coffee. The knobs by Rogan, are probably the sturdiest, most attractive on the market. Internally, you'll find the same outstanding quality. COS / MOS IC's by RCA, 1 million rotational life pots, LED's by Monsanto, G-10 glass PC boards.

RAMKO Consoles are the best buy in the business. Particularly, when you start matching cost to performance. We are generally 30% to 50% less expensive than our nearest competitor.

On top of all this, you may enjoy a 2-week, free trial period on any RAMKO Console. And after you sell yourself, you receive a warranty of from 2 to 4 years — depending on console model, to insure your total satisfaction.

Study the next few pages carefully and give us a call. You'll be years ahead!

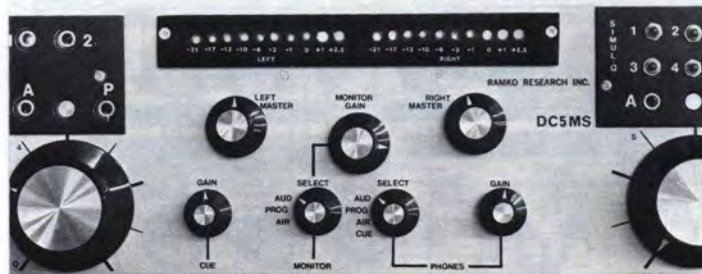
BROADCAST CONSOLES



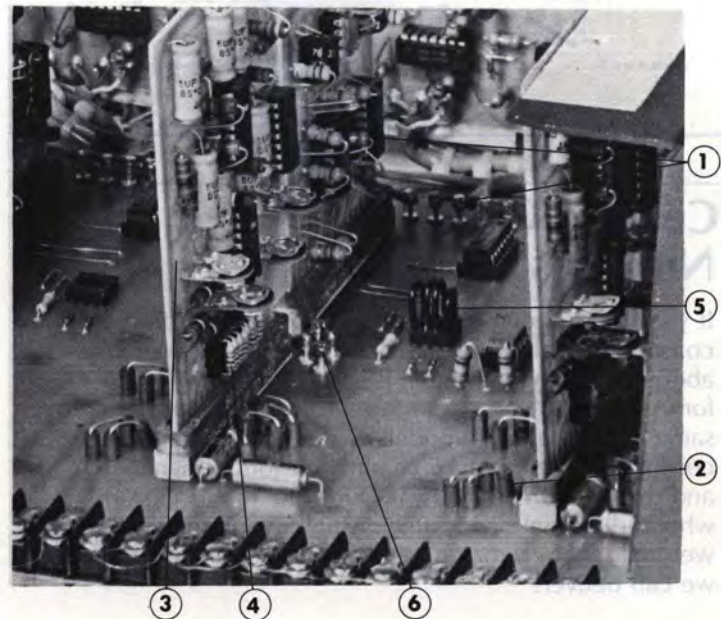
1.



2.



3.



Quality, Flexibility, Easy to Service

1. Talkback and Illuminated Touch Pad Audio Switching. A momentary contact push button switch is easily connected to any of the input preamps for your talkback function.

Light emitting diodes tell you which audio function is on. Your finger tells the audio where to go. The Touch Pad utilizes the capacitance and resistance of your skin to positively command our COS/MOS audio switchers to act. Select Input 1 or 2, Audition, Program or Off merely by touching the sense ring. Not susceptible to static electricity, hum or heavy handed operators.

2. DC Control of All Audio and Simul-Q. No audio on front panel permits hum-free, noiseless audio processing. Mixers control the audio remotely. Thus the elimination of dual ganged pots for stereo and their inherent tracking problems. Cue switching is also electronic — no mechanical switches on the rear of mixers. Since only solid state devices are used for switching and attenuation, long term stability is assured. (no light bulbs)

SIMUL-Q permits the operator to simultaneously cue any input on this channel, on-the-air or not.

3. Master Control Panel and Solid State "VU" Meters. The Master Control panel allows the operator to know where he's at, at all times; makes console operation a pleasure. Solid State "VU" Meters are guaranteed to indicate the fastest transient you'll ever be concerned with and still let the operator see it. Eight red LED's indicate from -21 through 0VU and 2 yellow LED's indicate over modulation (+1 VU and +2.5 VU). And you can read them 20 feet away. This may be the first time you have actually known what's coming out of your console.

1. Plug-In I.C.'s make troubleshooting easy. Just pop out the old and pop in the new.

2. RF Suppression is more than just suppression. Individual tuned circuits to eliminate RF in both AM, FM and TV.

3. Plug-In Amplifier Modules. IC's plug into the plug-in modules which plug into mother boards. No simpler method of maintenance.

4. Patch Panel Input Gain Select is better than High/Low Select. Simply plug in the appropriate resistors for whatever gain desired. Each and every input (left/or right, one and/or two) accomodates input level -65 dbm to +21 dbm.

5. Patch Panel Monitor and Cue Mute Select. Selectable patch panels on every channel (except the last) allows you to select muting for Input #1 and/or #2 and/or Audition and/or Program. Its as easy as plugging in jumpers.

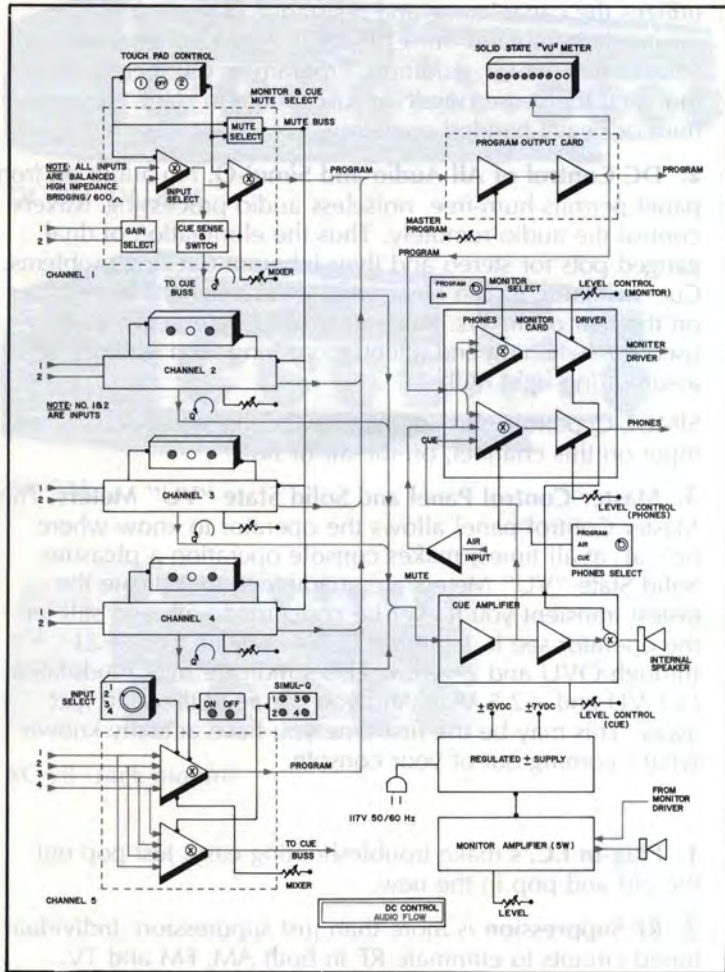
6. Equalizer and Special Effects Interconnects. Removable jumpers allow you the flexibility of inserting external EQ or reverb (preferably our new add-on EQ-4) or whatever else you'd like to do to modify your sound.

BROADCAST CONSOLES

SPECIFICATIONS FOR ALL RAMKO CONSOLES.

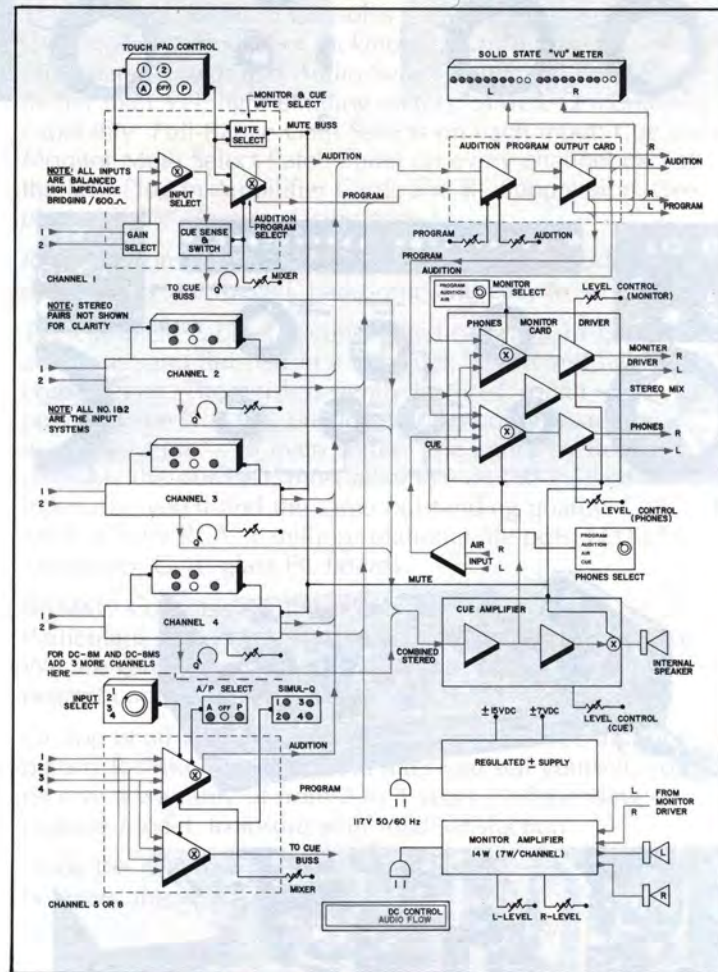
INPUTS: 18 inputs into 8 mixers (DC-8). 12 inputs into 5 mixers (DC-5 and SC-5). All inputs (except last channel) gain selectable from low thru high. **LOW LEVEL** - 150/250 ohms balanced; As shipped -55 dbm nominal, -25 dbm max. **HIGH LEVEL** - Balanced bridging (100K each side to ground); As shipped -10 dbm nominal, +10 dbm max. Input impedance may be changed to any lower impedance by placing appropriate resistor across input terminals. **OUTPUTS:** PROGRAM - 600 ohm, differential balanced, +8 dbm nominal, +20 dbm max. AUDITION - same as program. MONITOR - 7 watts RMS per channel into 8 ohms. CUE - 0.5 watts to internal speaker. **HEADPHONES** - 8 ohms thru high impedance. Rear panel jack. **FREQ. RESPONSE:** PROGRAM AND AUDITION - +0, -2 db 20 KHz referenced to 1 KHz at +8 dbm out. MONITOR - +0, -2 db 30 Hz to 15 KHz referenced to 1 KHz @ 1 watt

BLOCK DIAGRAM FOR SC-5R; SC-5M



out. **DISTORTION:** PROGRAM, AUDITION, COMBINED STEREO AND MONITOR DRIVER - 0.3% or less. MONITOR - 0.5% THD or less at rated load and output. **SIGNAL-TO-NOISE:** PROGRAM, AUDITION, COMBINED STEREO - Noise 65 db (unweighted) below +8 dbm out, referenced to -50 dbm in. **MUTING:** Patch panel concept allows selection of any of 28 combinations (DC-8), 16 combinations (DC-5) and 8 combinations on the SC-5. Cue mute follows monitor mute. Headphone cue unmuted. **POWER:** 10 to 30 watts, 117 VAC, 50/60 Hz. **SIZE:** DC-8's - 8" H x 36 3/4" W x 14 1/2" D. SC-5M and DC-5's - 8" H x 27 3/8" W x 14 1/2" D. **OPTIONS:** 230 VAC, 50/60 Hz, LC-4 accessory remote control, IX-34 input expander, EQ-3 three channel equalizer, and slide attenuators. Contact factory for more information.

BLOCK DIAGRAM FOR DC-5M; DC-5MS ; DC-8M; DC-8MS



CUSTOM CONSOLES



16 CHANNEL CUSTOM

Custom Consoles at Non-Customary Cost

If you have special broadcasting requirements for your console, don't be hesitant to ask us for a bid. We know all about the stigma that inhibits many from checking out costs for customized needs. Our customs usually cost about the same as the standard models of our competitors. The console pictured is a 16 channel custom designed and manufactured by RAMKO for one of our customers who had special needs. Its unusual layout design illustrates we think, that no matter what your requirements may be, we can deliver!

CONSOLE ACCESSORIES



DC - 4CE



DC - 8CE



LC - 2



SQ - 4L

Console Extenders. RAMKO Console Extenders increase your console's mixing capabilities without rewiring or modifications. Two different models allow you to add either 4 or 8 additional mixers (2 inputs per mixer) to your DC - 8 or DC - 5 console. Whether mono or stereo, simply plug the extender into the socket on the rear lip of your RAMKO console.

All channels contain the same features as the console itself. (Before ordering, be sure to check your console for extender socket. Earliest models did not have socket.)

Remote Control. The LC-4 and LC-2 provide remote control capability for on-the-air lights, equipment turn on/turn off, audio muting and other operations.

The LC-4 is designed to handle up to 4 channels of switching information (from the RAMKO consoles) while the LC-2 is designed for two.

Utilizing the switching voltages present in our consoles, the LC units may be programmed (via their internal patch panels) to provide individual relay contact closure or opening for each input of up to four channels on the console. Thus on *each channel* you have the capability of programming a relay to actuate on any selected combination of input #1 and/or Audition and/or Program AND a different relay to actuate on any selected combination of input #2 and/or Audition and/or Program.

Besides their versatility the LC units are easy to connect (no rewiring of the console itself), rugged and reliable. Relay contacts that handle 3.5 amps resistive and 2.5 amps inductive @ 120 VAC insure reliable actuation of any equipment found in the average studio.

Latching Option. This modular plug-in accessory converts the standard momentary contact SIMUL-Q push buttons to latching push on/push off.

The SQ-4L is an invaluable accessory for hands-free monitoring of networks or other sources, while attending to other duties.

Installation is simple requiring only the unplugging of one IC in your console, inserting the SQ-4L plug in its place and bolting the module in place.

Input Expander. The IX-34 (not pictured) will convert any 2 input-per-channel console up to 5 inputs per channel. The input expander is completely self-contained with solid-state switching and routing and is balanced in and out. It contains 3 groups of 4 additional inputs each. Each group of 4 is designed to feed into mixer input (s) in any combination desired.

For example: with 2 inputs per mixer you might like to have one particular mixer with 4 inputs on Input A and one input on B. Or you might prefer 2 inputs on A and 2 on B. Since the IX-34 is programmable, any combination per mixer input may be selected. As there are 3 separate groups of 4, you could realize up to 15 additional inputs to 3 of your mixer sections. If you need a few more inputs and not a new console, the IX-34 may be the answer.

THE MOST ADVANCED TROUBLE-FREE BROADCAST CONSOLES IN HISTORY!



DC-12

FEATURES OF NEW DC-12 SERIES CONSOLES

- Remote controlled rack mount audio electronics. All solid state audio routing and attenuation. Completely DC controlled.
- Dual channel.
- Plug in mixer/switching modules allow up to 12 channels on standard models.
- Up to 20 channels with extender electronics.
- 2 inputs per mixer.
- Quiet, lighted push buttons.
- Tone generator built in.
- Duo-Q. Two points of cue initiation. The standard full off mixer position and the lighted push on/push off switch located just below each mixer. Thus the mixing pot may be left in the mixing position and still cue via the switch below.
- Minimum 5 million operations on mixer controls.
- Minimum 5 million operations on input and output select switches.
- Talk back thru cue system.
- Solid state balanced in and balanced out.
- Zero tracking error on stereo consoles via Ramko's exclusive time shared attenuators.
- All plug in electronics.
- Patch panel programmable cue and monitor mute.
- AC line filtering built in.
- Lightning fast interior access.
- Patch panel gain select on all inputs. All inputs may be made to accept anything from mic thru high level.
- Interchangeable, colored push button caps.
- 4 year warranty on all consoles.
- 2 week free trial on all standard models.
- Simulcast output and metering on all stereo models.



DC-38

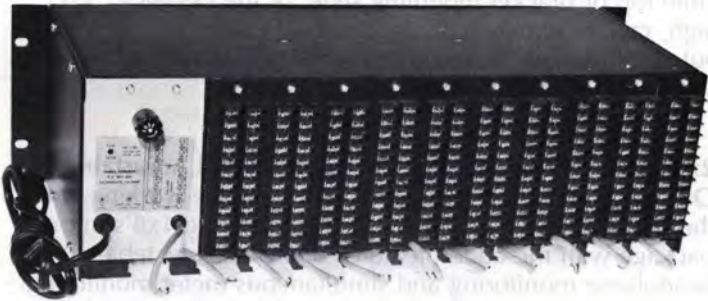
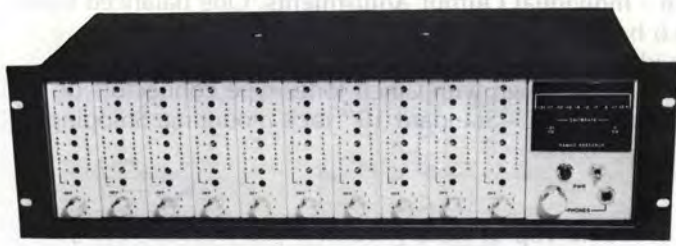
FEATURES OF NEW DC-38 SERIES CONSOLES

- Dual Channel.
- 5, 8, & 10 mixer versions.
- 4 inputs per mixer.
- Alpha numeric readouts above each mixer.
- Solid state meters.
 - (a) 3 meters for stereo. Left, right and mono mix (simulcast). The left & right meters are switchable to Audition or Program. The mono mix meter is switchable to a special circuit for phase checks.
- Duo-Q.
 - (a) 2 points of cue initiation are provided. The standard full counter clockwise position on the channel mixer & right above on the output switching group. Thus the mixing pot may be left in the mixing position and still cue via the switch above.
- Up to 20 million operation mixer controls.
- Up to 20 million operation push button switches.
- Talk back thru cue system.
- Completely DC controlled. All solid state audio routing and attenuation.
- Exclusive time shared attenuators provide ZERO tracking error on stereo consoles.
- Solid state balanced in and balanced out.
- Plug in electronics.
- Patch panel programmable cue and mute.
- Patch panel programmable cue and live mic flashing indicators on each channel.
- AC line filtering built in. Suppresses both line transients and RF.
- Lightning fast interior access. Total access in less than 15 seconds.
- Patch panel gain select on all inputs. Each input may be made to accept any input from mic thru high level.
- Interchangeable snap in legends on input and output select switches.
- Interchangeable back lighted alpha/numeric status indicators.
- Optional digital clock and production timer.
- Front panel, Prog. & Aud. balanced controls (stereo only).
- 4 year warranty on parts and labor.
- 2 week free trial.

An Unconditional 4 Year Warranty

Our exciting new DC - 12 and DC - 38 Console Series were developed simultaneously with catalog production. For complete details, call collect or write for individual brochures.

AUDIO DISTRIBUTION AMPLIFIERS



DA-2080

An Audio DA For Every Need

New developments in integrated circuitry and the innovative application of these circuits make RAMKO DA's exceptionally high performance tools. For example: although the input is designed for bridging or matching balanced or unbalanced audio lines, it does so without the usual input transformer. In its place is a high performance, differential operational amplifier circuit. Thus we have eliminated one very expensive component and its attendant drawbacks.

Input stages are followed by the gain control stages which control the signal level only without affecting input or output characteristics of the system. Our output stages are unique. All output transformers have been replaced with the balanced differential line driver concept.

The specs and diagrams found on this and the next 2 pages will further describe our 12 distribution amp models. There's a DA for you, whatever your needs.

Up To 20 In And 160 Out. More inputs and outputs, for the size and price, than any other ADA on the market!

Highly versatile modular concept allows you to buy only what you need now and expand later on. The DA-2080 Main Frame comes complete with all wiring for 10 slide in modules. Power supply and metering module included.

The DA-2080 amplifier modules each have 2 balanced inputs and 8 balanced outputs. Thus there are two separate 1x4's on each module. In addition each module has its own meter select switch and individual output level controls. These modules are completely self contained and only need be plugged into the main frame.

Versatile. Any or all inputs may be strapped together to form whatever combination desired. In addition any or all of the outputs may be used in the unbalanced mode to double the output capability. Thus each module would have a 2 in, 16 out capability. Eight outputs in phase and eight outputs out of phase.

The Solid State "VU" Meter is guaranteed to indicate the fastest transient you'll ever be concerned with and still let the operator see it. Eight red LED's indicate from — 21 through 0 VU and 2 yellow LED's indicate over modulation (+1 VU and +2.5 VU). And you can read them 20 feet away.

Compact. Only 5½" high and 19" wide. Price and performance? We know of no other unit on the market that compares with this unit at even twice the cost.

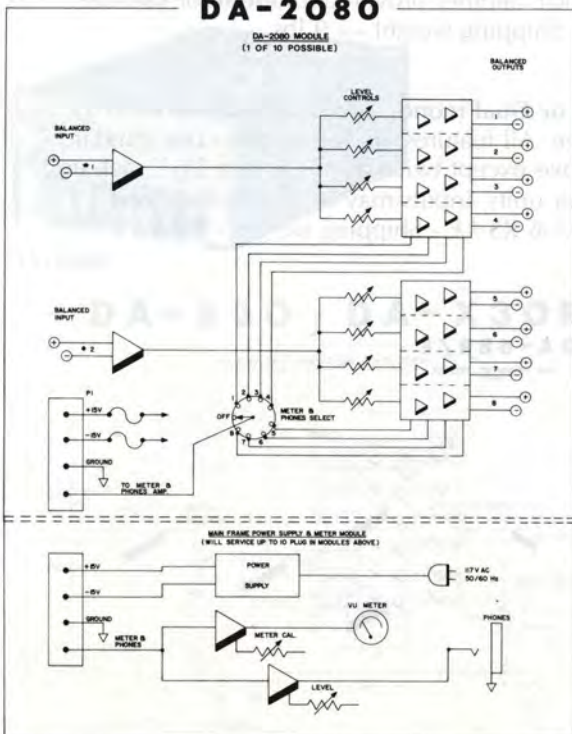
SPECIFICATIONS

DA-2080; DA-6B/RE and DA-16 BR/E; DA-6/E; DA-6R/E and DA-6 RS/E

RESPONSE: 10 Hz - 20KHz, ±0.5db **DISTORTION:** 0.1% or less (typically 0.05%) **INPUT IMPEDANCE:** 200K ohms, balanced bridging. May be changed to any lower impedance by placing an appropriate resistor across the input terminals. **OUTPUT IMPEDANCE:** 125 / 600 ohms balanced. Unique output stage allows the outputs to work into any impedance over 125 ohms without affecting response or distortion. **OUTPUT LEVEL:** +20 dbm max. **GAIN:** Variable from full off to +26db. **HUM & NOISE:** 90db down referenced to +20 dbm out. **CHANNEL SEPARATION:** 75db **SOLID STATE:** Plug-in Integrated circuits **POWER:** 115VAC, 50 / 60Hz (220 VAC, 50Hz optional) **COLOR:** Sand and charcoal brown. **CONNECTORS:** Cinch Jones type barrier strips.

DA-2080

DA-2080 MODULE
(1 OF 10 POSSIBLE)



AUDIO DISTRIBUTION AMPLIFIERS



DA-6BR/E



DA-6R/E



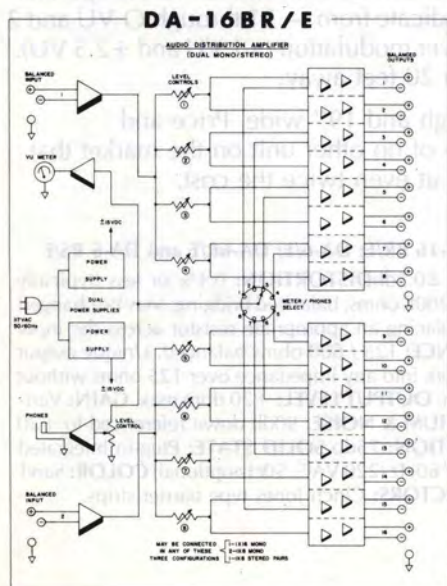
DA-6E



DA-16 BR/E



DA-6 RS/E



1 x 6 - Individual Output Adjustments. One balanced input and 6 balanced outputs. Each output level may be individually adjusted via recessed front panel controls. Compact 3½" high with Cinch Jones type connectors on rear. DA-6BR / E - Standard 19" rack mounting. Shipping weight — 6 lbs.

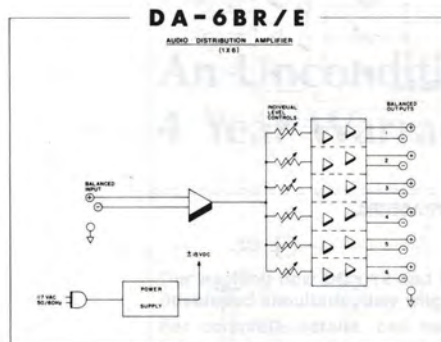
1 x 6 - Table Top or Rack Mount. If you need to feed your audio to only a few places you can't beat our DA-6 for both performance and economy. Available in either the DA-6/E table top or bracket mounting style, or the DA-6R/E, 3½" high, rack mount version. Single level control adjusts all outputs simultaneously. Shipping weight, DA-6/E — 4 lbs. Shipping weight, DA-6R/E — 6 lbs.

2x16 Metering, Headphone Monitoring and Adjustable Outputs. Whether it's stereo or mono you're working with, the DA-16BR/E will fill the bill. Two separate 1x8's in one package with the added features of switch selectable headphone monitoring and simultaneous meter monitoring. Like all of our other distribution amplifiers the inputs may be strapped for 1 in capability. In addition the 16 balanced outputs may be used unbalanced for a total of 32 out. As shown in the block diagram all outputs are adjustable via recessed front panel controls and cover the full range from off to +26db gain.

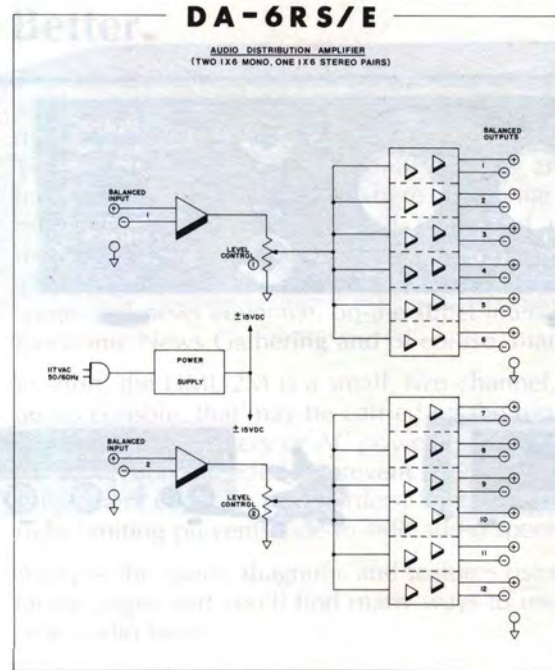
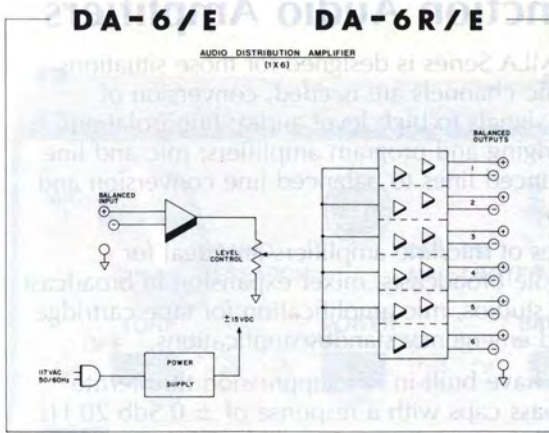
The Solid State "VU" Meter is guaranteed to indicate the fastest transient you'll ever be concerned with and still let the operator see it. Eight red LED's indicate from — 21 through 0 VU and 2 yellow LED's indicate over modulation (+1 VU and +2.5 VU). And you can read them 20 feet away.

The DA-16BR/E another proven audio tool for you the professional. Shipping weight — 9 lbs.

2x12 Stereo or Dual mono. Two 1x6 audio DA's in the same package. All features are the same as our standard DA-6R/E above except twice as much in a 3½" rack unit. Like our other units, inputs may be strapped for one operation. DA-6 RS / E - Shipping weight - 9 lbs.



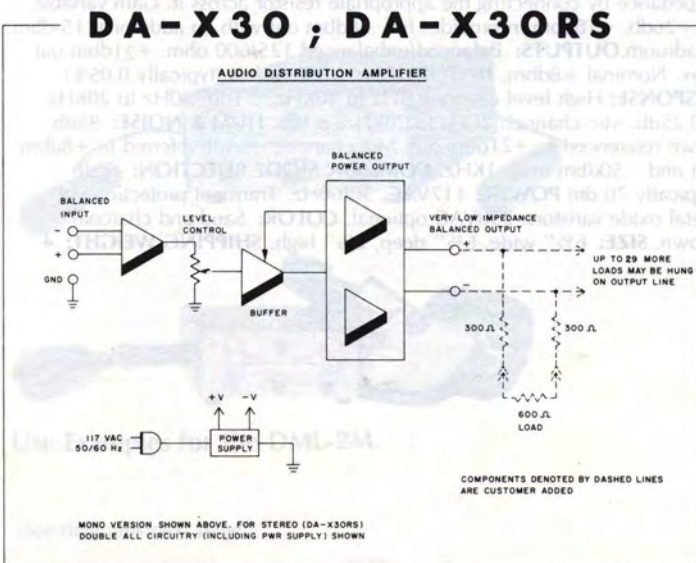
AUDIO DISTRIBUTION AMPLIFIERS



DA-X30RSE; DA-X30RE



DA-X30E



Low Impedance; Mass Feed

If you have to feed a large number of loads simultaneously, but dread all the wiring that normally goes with it, our new DA-X30 Series is the answer to your problem. Simply run the single balanced output of the DA-X30 around the area(s) to be serviced. Tap off this line any place desired. Up to thirty 600 ohm loads (sixty in the stereo version) may be serviced simultaneously with complete isolation between loads.

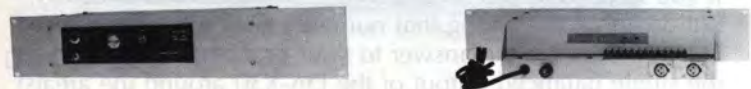
The output impedance of the DA-X30 is so low - approximately 0.01 ohms, that no one load will affect the others. RAMKO'S new DA-X30 Series offers ease of installation with a great cost/performance ratio.

SPECIFICATIONS

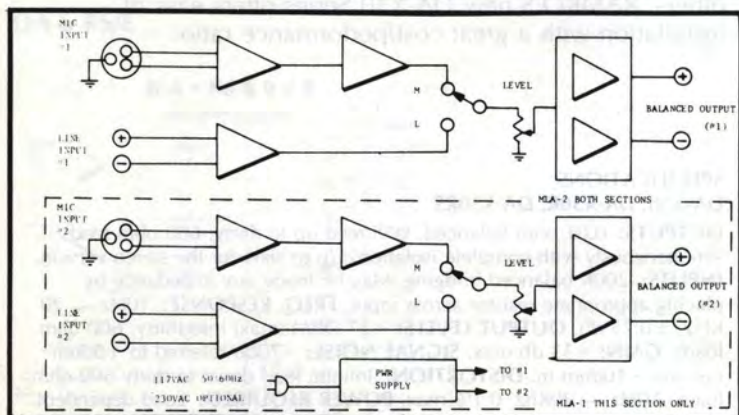
DA-X30, DA-X30R, DA-X30RS

OUTPUTS: 0.01 ohm balanced. Will feed up to thirty, 600 ohm loads simultaneously with complete isolation. Up to sixty for the stereo version.
INPUTS: 200K balanced bridging. May be made any impedance by placing appropriate resistor across input. **FREQ. RESPONSE:** 10Hz — 20 KHz, ± 0.75 db. **OUTPUT LEVELS:** +27 DBM (max) into thirty, 600 ohm loads. **GAIN:** +33 db max. **SIGNAL NOISE:** -70db referred to +8dbm out and -10dbm in. **DISTORTION:** Infinite load down to thirty 600 ohm loads. 10Hz — 20KHz, 0.1% max. **POWER REQUIRED:** Load dependent. Up to 20 watts, 117VAC, 50/60Hz. **LEFT/RIGHT PHASING:** Stereo only. 5° @ 100KHz. **POWER:** 117VAC, 50/60Hz (220VAC optional)
COLOR: Charcoal brown and sand **SIZE:** DA-X30 (table top/bracket mount) - 2½" H. X 4" W. X 7½" D. DA-X30R, DA-X30RS - 3½" H x 19" W x 10" D.

MICROPHONE LINE AMPLIFIERS



MLA-1R/E



Dual Function Audio Amplifiers

The RAMKO MLA Series is designed for those situations where extra mic channels are needed, conversion of medium level signals to high level audio; line isolation amplifiers; bridging and program amplifiers; mic and line mixers; unbalanced lines to balanced line conversion and so on.

The MLA Series of mic/line amplifiers are ideal for churches, remote broadcasts, mixer expansion in broadcast and recording studios, mic amplification for tape cartridge equipment and emergency standby applications.

The amplifiers have built-in RFI suppression thru ferrite beads and bypass caps with a response of $\pm 0.5\text{db}$ 20 Hz 20KHz. Distortion measures an inaudible 0.1%. Noise measures at line level, -80db (typically -90db). Quick-release PC boards and socket-mounted IC's permit extremely fast field service. These dual function, audio utility amplifiers offer greater flexibility and performance than any others on the market of comparable size and price.

MIC/LINE AMPLIFIERS • FEATURES

- Solid state — plug-in integrated circuitry.
- Table top and/or bracket mount. Mounting brackets supplied with unit. Rack mount optional.
- MLA-2/E may be used for dual mono or stereo since channels are isolated by 70db or better.
- Individual level controls for each channel.
- RFI suppression via RF beads and bypass caps on inputs and throughout the power supply.
- XLR type mic connectors and barrier strip terminals.
- Individual front panel mic or line switches.
- Inputs and outputs may be used balanced or unbalanced.
- Outputs will work into any load from 120 ohms to open circuit without affecting performance in any way.

SPECIFICATIONS

INPUTS: Mic channel(s) - Balanced 150/250 ohm. -60db in for $+4\text{dbm}$ out. High level - 100K balanced bridging. This input may be made any impedance by connecting the appropriate resistor across it. Gain variable to $+26\text{db}$. -18dbm in provides full $+8\text{dbm}$ out with an additional 15-dbm headroom. **OUTPUTS:** Balanced/unbalanced 125/600 ohm. $+21\text{dbm}$ out max. Nominal $+8\text{dbm}$. **DISTORTION:** 0.1% or less (typically 0.05%) **RESPONSE:** High level channel: 5Hz to 40KHz, $\pm 1\text{db}$; 20Hz to 20KHz $\pm 0.25\text{db}$. Mic channel: 20Hz to 20KHz, $\pm 1\text{db}$. **HUM & NOISE:** 95db down referenced to $+21\text{dbm}$ out. Mic channel, -64db referred to $+8\text{dbm}$ out and -50dbm in @ 1KHz. **COMMON MODE REJECTION:** 60db (typically 70 db) **POWER:** 117VAC, 50/60Hz. Transient protection via metal oxide varistors. 230VAC optional. **COLOR:** Sand and charcoal brown. **SIZE:** 6½" wide, 6½" deep, 2½" high. **SHIPPING WEIGHT:** 4 lbs.

MICROPHONE LIMITERS



DML-2M



DML-1S



DML-1S (rear)



DML-2M Optional AC Supply



Use Examples for the DML-2M

(See diagrams next page)

Powerful New Audio Tools Make Your Job Easier and You Sound Better.

The RAMKO DML Series offers you Mic Limiters that amplify, mix, limit and control gain with response and distortion specs that are almost unbelievable at these prices. The DML-2M dual mic preamplifier, limiter and mixer is intended for those situations where 2 separate microphones must be independently amplified, controlled and then mixed into a common, balanced 600 ohm output. Think of all the applications . . . ! Conferences, remote broadcasts, sports and news coverage, on-the-street interviews, or Electronic News Gathering and of course, many more.

In short, the DML-2M is a small, two-channel, hands-free audio console, that may be carried on the hip or set on table tops. It is battery or AC powered. The DML-1S is our stereo version intended to prevent over-driving of subsequent consoles or recorders. Synchronized left and right limiting prevents side-to-side audio spectrum shift.

Analyze the specs, diagrams and features listed on this and facing pages and you'll find many ways to use these fine new audio tools.

DML-2M Features

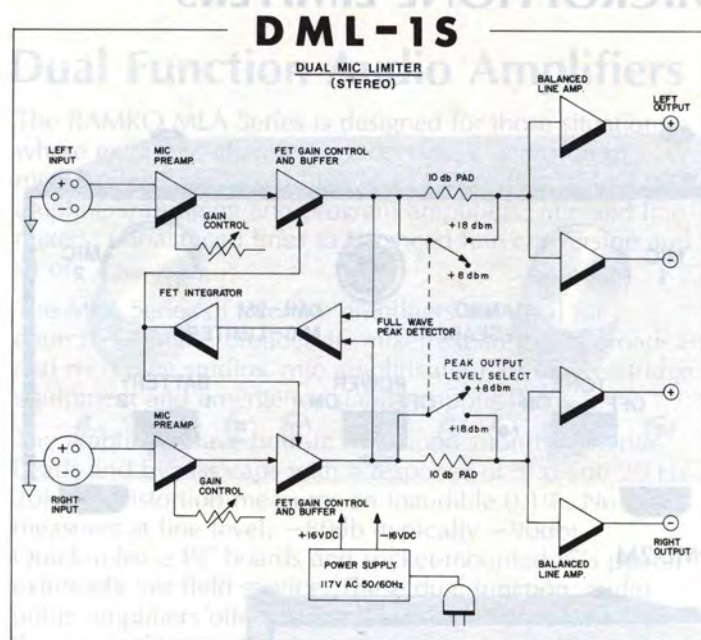
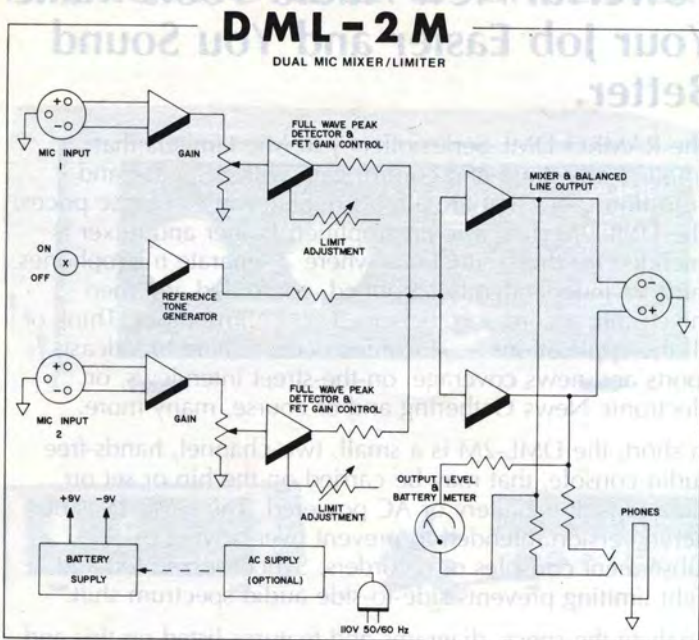
- Inaudible distortion
- Balanced inputs
- Balanced 600 ohm output
- Headphone monitor and talk back capability
- Built in tone generator for initial setup or remotes
- Output metering
- Switchable, dual battery pack (no dead airtime if main battery supply goes out)
- Flat response
- AC supply option
- Compact, 2½" H x 5¼" W x 8½" D
- XLR type connectors
- 2 microsecond attack time
- Readily available 9V transistor batteries
- Output level and battery metering.

DML-1S Features

- Inaudible distortion
- Balanced inputs
- Balanced 600 ohm outputs
- Switch selectable output limit level
- Flat response
- Internal AC supply
- Left and Right limiters synced to prevent side to side audio shifting
- XLR type connectors
- Compact 2½" H x 5¼" W x 8½" D
- 2 microsecond attack time
- Front panel gain controls

MIC LIMITER SPECIFICATIONS

INPUTS: -60 db, 50-250 ohm balanced. -18 db max. **GAIN:** 90 db max. **OUTPUT LEVEL @ LIMITING:** DML-2M, +10 dbm — DML-1S, +18 dbm or +8 dbm. **OUTPUT IMPEDANCE:** Balanced 600 ohms. **RESPONSE:** +0,-2db 20 Hz to 20 KHz. **LIMITER RANGE:** More than 35 db. **DISTORTION:** 0.25% max. 0.1% typical. **ATTACK TIME:** 2 microseconds. **RELEASE TIME:** Variable depending on limiting depth. Nominally 600 millisc. **SLOPE:** 50:1. **NOISE:** 60 db below max. output. **SEPARATION:** More than 60 db. **CMR:** 70 db typical. **CONNECTORS:** Standard XLR type. **CONSTRUCTION:** Plug in I.C.'s and FETS. **SIZE:** 2½" H x 5¼" W x 8½" D. **WEIGHT:** less than 2 lbs.



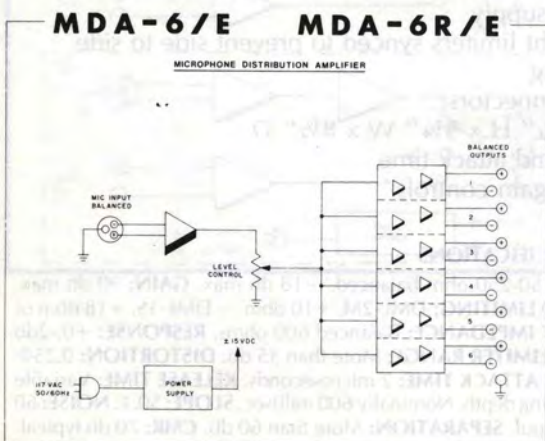
MICROPHONE DISTRIBUTION AMPLIFIERS



MDA-6R/E; MDA-6BR/E



MDA-6/E



From One Low-Level, To Six High-Level Outputs

How many times have you wished to amplify a microphone and then simultaneously, feed it to several places at once? Here's the answer: The MDA Series of combined mic amplifier and 6 balanced outputs, line level audio distribution system.

RAMKO MDA's allow you to route that signal around the area — to 6 different points — without worrying about hum pickup and additional amplifiers at the other end. There are 3 MDA versions to choose from: A tabletop, or a 3½" rack package each with one common level control or the 3½" rack unit with 6 individual output level controls.

SPECIFICATIONS

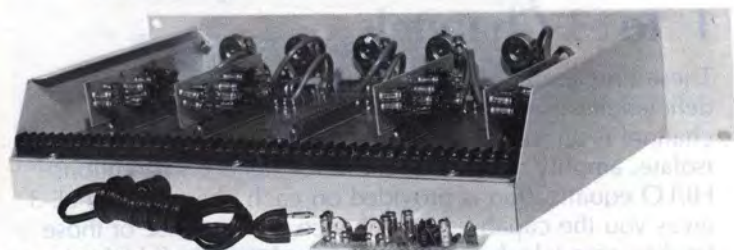
MDA-6/E, MDA-6R/E, MDA-6BR/E

GAIN: Full off to +65 db gain. Front panel controllable. -60 dbm in for +8 dbm out. **INPUT:** Balanced 150/250 ohm mic level. XLR type connector. **OUTPUTS:** Six, balanced, 600 ohm. **INPUT LEVEL:** -30 dbm max. 30 db headroom referred to -60 dbm in. **OUTPUT LEVELS:** +21 dbm max. **RESPONSE:** 10 Hz to 20 KHz — +0, -2 db; 10 Hz to 15 KHz — +0, -1 db **DISTORTION:** 0.03% max **NOISE & HUM:** -62 db below +8 dbm out with -50 dbm in. **OUTPUT ISOLATION:** 90 db or better isolation. **POWER:** 117 VAC, 50/60 Hz (220 VAC optional) **COLOR:** Charcoal brown and sand. **SIZE:** MDA-6/E (table top/bracket mount) — 2½" H x 6½" W x 7" D. MDA-6R/E, MDA-6BR/E — 3½" H x 19" W x 8" D.

LINE AMPLIFIERS



LA-5S/LA-10M



LA-5S REAR



LA-2/E

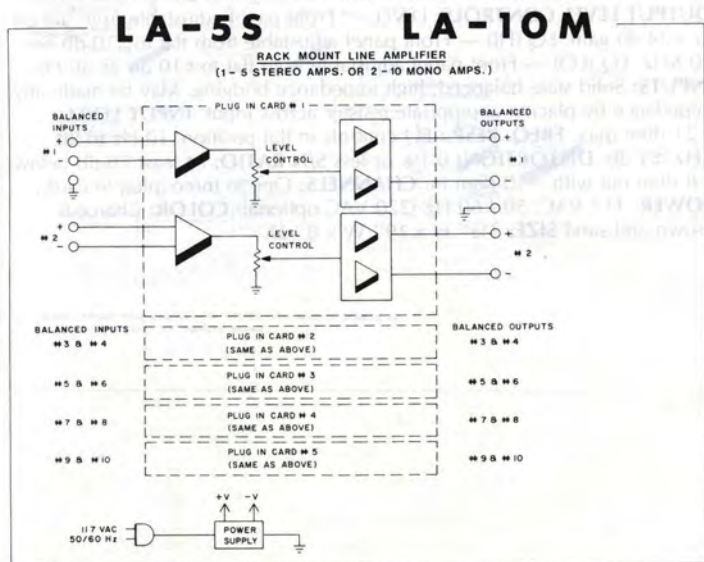
Ideal Solution For Line Level Problems

RAMKO Line Amplifiers can serve up to 10 mono or 5 stereo channels of line level amplification with isolation and buffering in one small rack package. This is the ideal solution for your line level problems.

Plug-in modules allow you to buy only the capabilities you need today, with expansion capabilities for later on. Each plug-in card contains 2, separate line level amplifiers; balanced in and balanced out. Up to 5 cards may be plugged into the 3 1/2" rack frame. Since the inputs are high impedance bridging and may be used in the balanced or unbalanced mode, you can use these amplifiers for a myriad of chores. Turning unbalanced sources into balanced 600 ohm lines; tapping off existing sources to generate multiple feeds; and, increasing insufficient signals to a maximum of +21 dbm out.

The LA-2 / E is for those limited applications where only one or two channels are needed. All performance specifications are the same as those listed for the LA-5S / LA-10M. The design is also the same as the LA-5S / LA-10M and can be seen in the upper dashed box of the accompanying block diagram. Size is compact, 2 1/2" H X 4" W X 7 1/2" D.

Performance? The best in the industry! We know of no other unit on the market that can touch these specs. At any price!

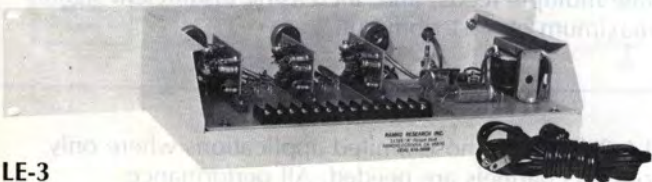
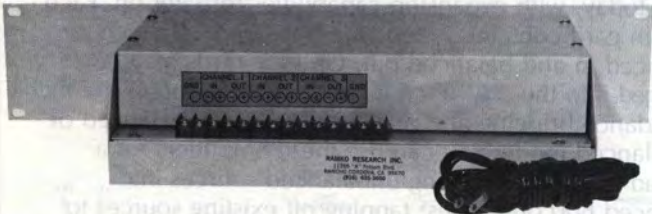


SPECIFICATIONS

LA-5S; LA-10M; LA-2/E

GAIN: Variable from full off to +26 db. **OUTPUT LEVEL:** +21 dbm max. **OUTPUTS:** Solid state balanced, 600 ohms. Plug in cards. Up to 5 stereo channels. Up to 10 mono channels. **INPUTS:** Balanced, high impedance, bridging (200K). May be made any lower impedance by placing appropriate resistor across input terminals. **INPUT LEVEL:** +21 dbm max. **HUM AND NOISE:** 85 db, or better, below +8 dbm out and 0 dbm in. **RESPONSE:** 20 Hz to 20 KHz, +0, -0.1 db 10 Hz to 50 KHz, +0, -1 db **DISTORTION:** 0.008% @ +8 dbm out. **CHANNEL SEPARATION:** 80 db or better @ 1 KHz, 70 db @ 15 KHz **PHASE TRACKING:** Stereo only. Not to exceed 5° at 100KHz. **POWER:** 117 VAC, 50 / 60 Hz. 220 VAC optional. **COLOR:** Charcoal brown and sand. **SIZE:** 3 1/2" H x 19" W x 10" D.

EQUALIZED LINE AMPLIFIERS



LE-3

Line Amplifiers That Equalize 1 to 3 Channels

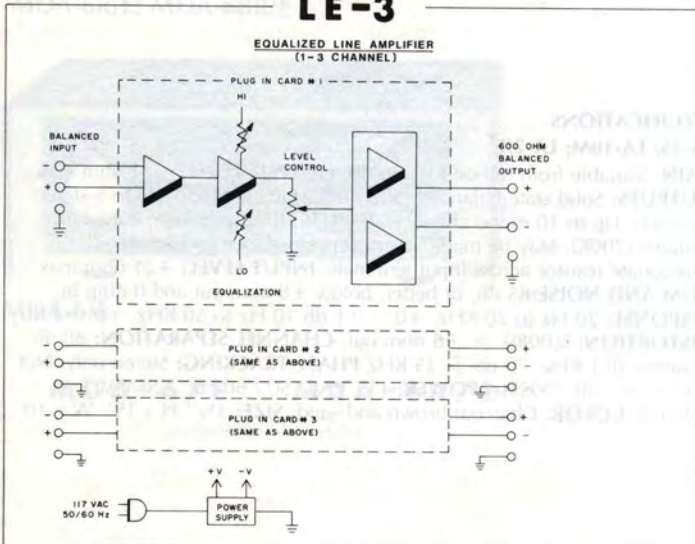
These line amplifiers allow you to compensate for deficiencies in your signal — coming or going. Each channel is an independent line amplifier that allows you to isolate, amplify and buffer line-level signals. In addition, HI/LO equalization is provided on each channel. The LE-3 gives you the capability to enhance the response of those troublesome telephone lines that tend to roll off high frequencies. Or maybe you just want to make your sound a little brighter, a little richer — or both.

Flexibility is built in — up to 3 complete channels in 1 rack mount. Order the number of channels you need now and add on later.

Performance? All circuitry is active solid state, so you experience the same, clean bright sound that RAMKO is famous for. Check the specs below, then give us a call. We're out to make your job a little easier.

LE-3

EQUALIZED LINE AMPLIFIER
(1-3 CHANNEL)



SPECIFICATIONS

LE-3 (formerly MDL-3CTE)

OUTPUTS: Solid state balanced, 600 ohm **OUTPUT LEVELS:** +21 max. An additional 3 db out will be realized when feeding into 2K ohms or higher. **OUTPUT LEVEL CONTROLS:** LEVEL — Front panel adjustable from full off to +24 db gain. EQ (HI) — Front panel adjustable from flat to ± 10 db @ 10 KHz. EQ (LO) — Front panel adjustable from flat to ± 10 db @ 30 Hz. **INPUTS:** Solid state balanced, high impedance bridging. May be made any impedance by placing appropriate resistor across input. **INPUT LEVEL:** +21 dbm max. **FREQ. RESP.:** EQ controls in flat position, 10 Hz to 20 KHz, ± 1 db. **DISTORTION:** 0.1% or less **S/N RATIO:** At least 70 db below +8 dbm out with -10 dbm in. **CHANNELS:** One to three (plug in cards) **POWER:** 117 VAC, 50 / 60 Hz (220 VAC optional) **COLOR:** Charcoal brown and sand **SIZE:** 3½" H x 19" W x 8" D.

STUDIO MONITOR AMPLIFIERS



SMA-50/E



SMA-500/E MONO



SMA-1000/E STEREO

Versatile, High Performance

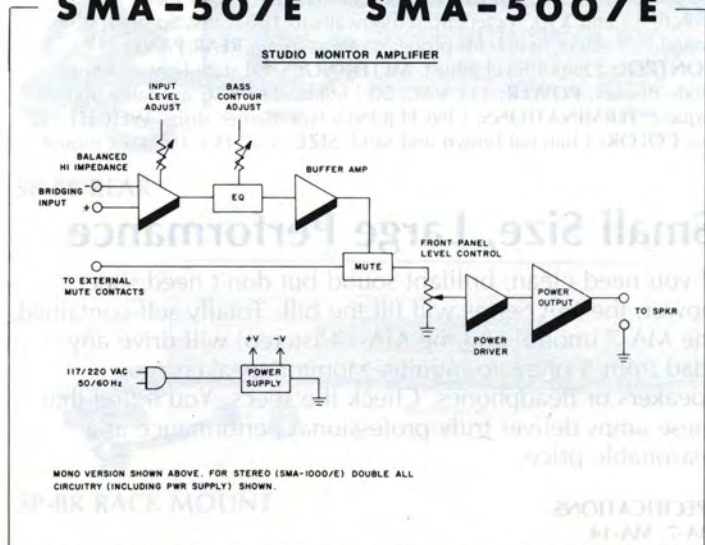
Our SMA Series is designed specifically for studios requiring medium power, with versatility and high performance.

Exceptional reproduction, internal muting and bass contour adjusts make the SMA's the best value in the industry.

Balanced, high impedance and bridging inputs. The silent muting provision requires only an external contact closure. You won't hear thumps, pops or clicks in these monitor amps. Rear panel input level adjusts allow the front panel level controls to be operated at their normal settings regardless of input level.

Front panel bass contour controls allow you to tailor the sound to your taste. Combine these features with the superb reproduction capabilities of our SMA's and you're buying a professional studio amp at HI-FI prices.

SMA-50/E SMA-500/E



SPECIFICATIONS

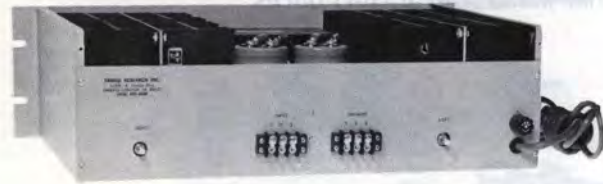
SMA-50/E SMA-500/E SMA-1000/E

GAIN: Apw = 70db, Av = 29db **INPUT(s):** High impedance balanced bridging. 200K nominal but may be made any value by adding the appropriate resistor across the input. **OUTPUT:** 25 watts RMS into 8 ohms per channel. Outputs will work into any load from 4 ohms to infinity. **CONTROLS:** Input level adjust (rear panel). Output level adjust (front panel). Bass contour adjust — ± 12 db @ 30 Hz. Adjustable from flat. **RESPONSE:** 15 Hz to 90 KHz, ± 1 db @ 25-W. 15 Hz to 100 KHz, ± 1 db @ 0.1 W. **NOISE AND HUM:** 70 db below rated out with 0.5 V in. **DISTORTION:** 0.6% @ 25 W, 0.3% @ 0.1 Watts **MUTING:** Internal before power stage. Silent! Requires only an external contact closure. **POWER:** 117 / 220 VAC, 50 / 60 Hz **COLOR:** Charcoal Brown and sand. **SIZE:** SMA-50/E (table top) — 3½" H x 8½" W x 7½" D. SMA-500/E, SMA-1000/E — 3½" H x 19" W x 8" D.

STUDIO MONITOR AMPLIFIERS



SPA-400



SPA-REAR



SPA PLUG-IN MODULE



MA-14

Super Power, Sweetest Sound

Our Super Power Monitor Amplifiers deliver 180 watts per channel of the purest, sweetest sound you've ever experienced.

The SPA 200 and 400 feature plug-in power and preamp modules, high impedance, balanced bridging inputs, solid state power meters, meter range and speaker impedance select switch.

Our SPA Amps, as with all other RAMKO Amps, were designed for the professional — not the HI-FI market. Balanced high impedance inputs, plug-in power and preamp modules permit fast, easy maintenance or expansion from mono to stereo at a later date. Output overload and thermal sensing circuitry provide amplifier protection. Computer grade capacitors have been designed into the power supply section. The SPA's also have massive heat sinking and overrated power transformers. 19" rack mounts are standard.

SPA performance is as impressive as the engineering. Excellent frequency and transient response and inaudible THD and IM distortion. If you truly appreciate unadulterated sound you owe yourself an SPA.

SPECIFICATIONS

SPA-200 (mono), SPA-400 (stereo)

POWER OUTPUT: 4 ohm load — 180 watts RMS; 8 ohm load — 120 watts RMS; 16 ohm load — 80 watts RMS (per channel); **DISTORTION:** IM not to exceed 0.2% THD not to exceed 0.02% @ 1 KHz and 5 db below clipping level. THD not to exceed 0.1%. **HUM AND NOISE:** 100 db below rated output. **INPUT LEVEL:** 0.5 V for full output. **INPUT IMPEDANCE:** High impedance, balanced bridging. Approx. 200K. May be made any lower impedance by placing appropriate resistor across input. **FRONT PANEL CONTROLS:** Power meter select switch, X1 and X10. Meters from milliwatts to 180 watts. Speaker impedance select switch for proper meter reading. **REAR PANEL CONTROL:** Output level adjust. **METERING:** Solid state light emitting diode display. **POWER:** 117 VAC, 50 / 60Hz. 220 VAC available upon request. **TERMINATIONS:** CINCH JONES type barrier strips. **WEIGHT:** 32 lbs. **COLOR:** Charcoal brown and sand. **SIZE:** 5 1/4" H x 19" rack mount.

Small Size, Large Performance

If you need clean, brilliant sound but don't need super power, the MA Series will fill the bill. Totally self-contained, the MA-7 (mono) and the MA-14 (stereo) will drive any load from 4 ohms to infinity. Monitor speakers, cue speakers or headphones. Check the specs. You'll find that these amps deliver truly professional performance at a reasonable price.

SPECIFICATIONS

MA-7, MA-14

OUTPUTS: MA-7, 10 watts RMS into 8 ohms. MA-14, 14 watts RMS (7 watts/Channel). **RESPONSE:** 20 Hz to 19 KHz — +0, -2db @ rated output. 10 Hz to 50 KHz — +0, -2 db @ 1 watt out. **DISTORTION:** At rated output and 1 KHz, 0.4% max. At 0.1 watts and 1 KHz, 0.25% max **NOISE AND HUM:** -75 db below rated output with 0 dbm (approx. 0.7V) in. **INPUTS:** 5K single ended **INPUT LEVEL:** 0.7V in for max output. Max be made more or less sensitive by changing one resistor. **POWER:** 117 VAC, 50/60 Hz (220 VAC optional) **COLOR:** Charcoal brown and sand. **SIZE:** 2 1/2" H x 4" W x 7 1/2" D.

Inaudible Distortion and Low Noise



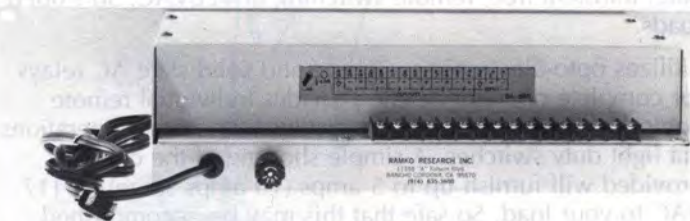
MP-8E



SP-8E



SP-8E REAR



SP-8R RACK MOUNT

High-performance, balanced output drivers combined with the latest in integrated circuitry make RAMKO's turntable preamplifiers the best buy on the market. High sensitivity. As little as 500 micro-volts @ 1KHz will drive them to a full +4dbm out. There's plenty of headroom. Internally adjustable sensitivity controls allow you to use practically any cartridge on the market. Will accept over 100 mv in @ 1KHz before distorting. Built-in RFI Suppression via ferrite beads and bypass caps is another design feature. Response is ± 1 db RIAA/NAB curve. In addition external contacts are provided for brilliance and scratch filter effects. These TT preamps are a pleasure to service. If a problem should occur, you won't rip up the board replacing parts. All active circuits are socket mounted. Pop out the old and pop in the new.

Compare these with other turntable preamplifiers costing hundreds of dollars more.

FEATURES

- Solid state — plug in integrated circuitry.
- Table top and / or bracket mount. Mounting brackets supplied with each unit. Rack mount available.
- Sensitivity adjustments. May be adjusted to any cartridge output requirement.
- Stereo unit (SP-8) may be used for dual mono since channels are isolated by 70db or better.
- RFI suppression via RF beads and bypass caps on inputs and throughout the power supply.
- Standard RCA type phono jack inputs.
- Sturdy Cinch Jones type barrier strips used for outputs and brilliance / scratch filter terminals.
- Individual front panel gain controls.
- Provisions for remote control switching of response curve. Simply connect any 3 position switch to unit for RIAA, brilliance or scratch filter effects.
- Outputs may be used balanced or single ended.
- Outputs will work into any load from 120 ohms to open circuit without affecting performance of the amplifiers in any way.

SPECIFICATIONS

INPUT IMPEDANCE: 47K ohms **FREQUENCY RESPONSE:** RIAA ± 1 db. Provisions for externally switching of response curve (RIAA, scratch filter and brilliance). **DISTORTION:** 0.05% **SENSITIVITY:** Adjustable. 500 uV @ 1 KHz for +4dbm out. **HEADROOM:** Will accept over 100 MV @ 1 KHz in before distorting. **CHANNEL SEPARATION (STEREO):** 70db min. **OUTPUT LEVEL:** +21dbm max., +8dbm nominal into 600 ohms. **OUTPUT IMPEDANCE:** 125 / 600 ohms. balanced / unbalanced. **HUM & NOISE:** Minus 77db below nominal output with 12MV @ 1KHz in. **POWER:** 117 VAC, 50 / 60 Hz. **MOUNTING:** Table top and bracket mount. Rack mount optional. **SIZE:** 6½" W X 6½" D X 2½" H. **SHIPPING WEIGHT:** 4 lbs. **COLOR:** Sand and charcoal brown.

TURNTABLES

Direct Drive — Quartz Control

In 1969, Technics by Panasonic introduced the world's first direct drive turntable. Today Technics sets the standards by which professional turntables are judged. Ramko Research is proud to offer 2 different Technics turntables for your consideration.



SL-1500MK2

SL-1500MK2

This new professional turntable and tone arm combination defies comparison with anything else on the market. Two speed, quartz controlled — direct drive with digital readout. Front panel controls include power switch, start/stop, 33/45 RPM select, and speed control. Quartz-phase locked speed control maintains speed within $\pm 0.002\%$. Actual speed can be raised or lowered in exact 0.1% increments, by as much as $\pm 9.9\%$. LED digital readouts indicate both speed selected and percent of change from that speed. Wow and flutter, 0.025% WRMS.; Rumble, -73db or below (DIN B). Turntable reaches $33\frac{1}{3}$ RPM within 0.7 seconds. The gimbal suspension tone arm (20 miniature, high tolerance ball bearings) responds to an incredible 7 mg. Last, but not least, is the double isolated suspension system that makes this unit practically feedback proof. Comes complete with tone arm, base, and dust cover.

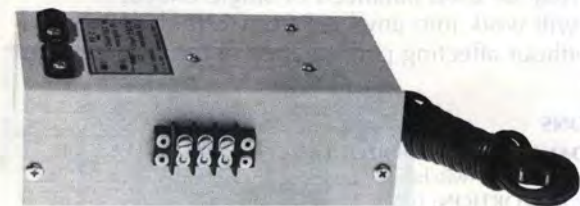


Technics
SP-10 MK II

SP-10MKII

Unmatched precision and abundant torque. The SP-10MKII will reach playing speed of $33\frac{1}{3}$ r.p.m. within 0.25 of a second. Less than $\frac{1}{12}$ of a turn. Comes to a dead stop in only 0.3 of a second. The SP-10MKII, thru its direct drive system, provides exceptionally low wow and flutter (0.025% WRMS) and inaudible rumble (-70 db DINB). The internal quartz-locked frequency generator keeps the speed at exactly $33\frac{1}{3}$, 45, or 78 RPM no matter the line frequency or voltage. The speed drift is within $\pm 0.002\%$. Includes separately housed power supply. Available as an option is a base and dust cover Model SH10B3.

REMOTE POWER CONTROLLERS (DUAL)



Safe, transient free, remote switching of 120VAC, 50 / 60Hz loads.

Utilizes opto-electronic switching and solid state AC relays for complete operator safety. Provides individual remote control of 2 turntables, on the air lights and other operations via light duty switches. A simple shorting of the contacts provided will furnish up to 5 amps (10 amps surge) @ 117 VAC to your load. So safe that this may be accomplished with merely a bare paper clip between your fingers.

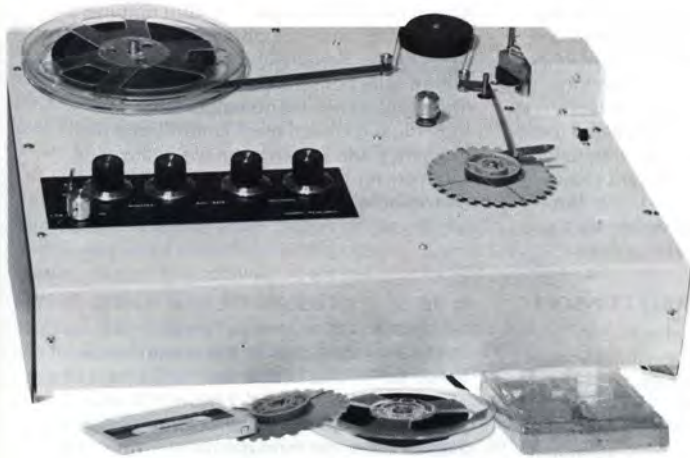
The PR-2 operates via on / off toggle switches and will power 2 separate loads (5 amps ea.). The PR-2B incorporates special logic that allows each load to be actuated by a momentary push button switch. Pushing this switch once actuates a flip / flop that turns one of the loads on and pushing it again turns the load off. In addition the PR-2B furnishes switched 6VAC (20 ma) to drive remote status indicators.

SPECIFICATIONS

MOUNTING: Table top or bracket; **COLOR:** Sand; **SIZE:** $2\frac{1}{2}$ " H X 4" W X $7\frac{1}{2}$ " D

AUTOMATIC CART AND CASSETTE LOADERS

Save Up to 40% on Reloading Costs



Now that RAMKO has made automatic tape winding affordable, you can load your own carts and cassettes with savings in cost of up to 40%, not to mention the savings in time.

If you are interested in a more efficient, self-dependent operation, this ACL is for you. Solid state tape tension control insures proper tape pack on all sizes of hubs, cassettes and reels. Enjoy attention-free operation. Dial in the time desired, hit the run button and busy yourself with other things. This ACL stops automatically, precisely to -0 , $+1$ second of playback time.

The exclusive playback speed selector ends mental gymnastics figuring tape length versus playback speed. Simply set the selector to $1\frac{1}{8}$, $3\frac{3}{4}$ or $7\frac{1}{2}$ i.p.s. and the ACL does the rest. An optional cassette adapter enables you to wind both carts and cassettes on the same machine. Takes only a minute to change over.

RAMKO's ACL-25/E has a nominal winding speed of 30 i.p.s. Compare RAMKO prices and versatility. We unconditionally guarantee our ACL's to have more design advantages permitting greater ease in operation than any comparably priced unit on the market.

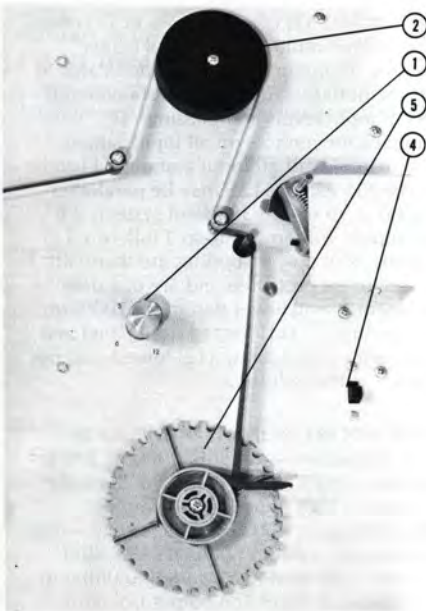


OPERATING FEATURES

- Easy to load. — Takes only seconds to set up and start.
- Automatic tape length determination. Playback speed selector eliminates guesswork. No need to divide or multiply for carts and cassettes to be played back at different speeds. Simply set selector to $1\frac{1}{8}$, $3\frac{3}{4}$ or $7\frac{1}{2}$ i.p.s.
- Exclusive torsion control. Insures proper tape pack on all size hubs, cassettes and reels.
- Accurate. Precise braking stops tape within one second of playback time.
- Easy reset. Reset/run switch resets circuitry, for next tape to be wound, without erasing previously entered settings.
- Able to wind all tapes cartridge, cassette and reel.
- Loads from any tape source. — All machines are capable of winding off of the smallest reels and/or up to 14" pancakes.

DESIGN FEATURES

- 1 — Tape take up tension control.
- 2 — Light beam chopping tachometer.
- 3 — AC on/off switch.
- 4 — Tape take-up spindle.
- 5 — Loads all sizes of tape cartridges.
- 6 — Loads up to 7" reels from pancake supply.
- 7 — Optional cassette adapter for ACL. 25/E only.
- 8 — Digital time select panel (select from 1 second to 99 minutes, 59 seconds).
- 9 — Playback speed select switch, $1\frac{1}{8}$, $3\frac{3}{4}$, $7\frac{1}{2}$ i.p.s.
- 10 — RUN/RESET switch.
- 11 — Pancake adapter (optional accessory for ACL-25E only).



NEW PRODUCTS



The ultimate in turntable preamps.

THE ULTIMATE IN TURNTABLE PREAMPS

ESP-38 — Super low distortion and an unparalleled signal-to-noise ratio make this new turntable preamp the unquestioned leader in its field. Features include push button activated scratch, brilliance, and rumble filters and a mono output push button. These push buttons are located on a front panel plate that may be removed by two screws and mounted remotely from the unit. A blank cover plate is supplied with the ESP-38 for use when this feature is utilized. Recessed, screw driver adjustable, front panel controls allow the user to adjust the level and Hi and Low frequency equalization of both the left and right channels $\pm 6\text{dB}$ @15kHz and 30Hz respectively. We even have a built in remote turntable start/stop

relay. In addition the input features a socket allowing insertion of user selected resistor and capacitor for exact input impedance tailoring to your cartridge.

SPECIFICATIONS: S/N, -90dB down referred to 12 MV in @1 kHz and $+8\text{ dBm}$ out (A weighted) and -85 dB down wide band. Balanced 600 ohm out. $+8\text{ dBm}$ nominal out (adjustable) and $+21\text{ dBm}$ max. $\pm 0.5\text{ dB}$ of RIAA curve. Remote and/or front panel push button select of scratch, brilliance and rumble filters and stereo/mono output select. Individual recessed level controls and high frequency and low frequency equalization trimmers for both left and right channels. Distortion of 0.03% max. (typically 0.015%). 60 dB gain.



Miniature 5 mixer portable console.

MINIATURE, 5 MIXER PORTABLE CONSOLE

P5M — Now! A feature packed portable console in a small package. Everything you could ever want in a portable console — just check these operating features: 5 mixers with 8 inputs. The first 2 mixers are mic inputs only with built-in compressor/limiters for each and muting. The muting controls a P.A./monitor output which is located on the rear panel with its own level control. Mixers 3 thru 5 have 2 high impedance line level inputs each with input "A" being switch selectable for either mic or line. These last three potentiometers are also equipped with a cue switch. The headphone output is switch selectable between the program output and cue with separate gain controls for phones and cue. The P5M has a built-in tone generator that makes set-up or testing a snap. Throw the front panel tone switch to on and an 800 Hz tone at 0 VU is fed

to the program output. The tone level is adjustable with an internal control. Also on the front panel are a master gain control with on/off switch, an LED power indicator, and a VU meter. Mixers 1 and 2 have XLR mic connectors with the remaining inputs and outputs on screw terminal barrier strips. All inputs and outputs are balanced. A folding stand is an integral part of the unit and may be removed for rack mounting.

SPECIFICATIONS: $+8\text{dBm}$ out nominally ($+18\text{dBm}$ max.); $\pm 2\text{dB}$, 20Hz to 20kHz; S/N -75dB high level and -62dB mic level; 0.3% max. distortion; balanced/bridging high impedance inputs and balanced 600 ohm output; compression and limiting range of 35dB and a slope of 50:1. Weight is less than 7 lbs. Size — $9\frac{3}{4}''$ W x $9\frac{1}{2}''$ D x $3\frac{1}{2}''$ H. Check the features, then the price — you can't buy better!



Audio router/ amplifier with lighted status display

AUDIO ROUTER/AMPLIFIER

ARA-1612 — Mono/Stereo audio router (switcher) and amplifier with lighted status displays and BCD encoding. Plug in modules allow up to 16 inputs to be routed to up to 12 different places simultaneously. All in one small 10", rack mount package. Designed specifically for the radio broadcaster to eliminate patch panels and all their attendant drawbacks. The patch panel system for example does not allow multiple feeds without either impedance mismatches or resistor branching. Both methods deteriorate the source signal. The first affects response and the second affects the system noise figure. The patch panel also negates the possibility of remote switching. The ARA-1612 on the other hand eliminates all of these problems via CMOS switching and isolation buffer amplifiers. Whether you are up-dating your installation, building new facilities or considering AM stereo, the ARA-1612 offers more features at a better cost/performance ratio than anything else on the market. For example: (1) front panel lighted status displays show at a glance which inputs are being fed to which outputs; (2) each output card (16 in by 1 out) has dual outputs for simul-feeds; (3) each output card (up to 12, 16 x 1's in each rack) may be changed to 8 x 1

stereo simply by throwing an on board switch; (4) front panel, push button, input/output select switches; (5) common buss BCD control concept allows multi-slave control center operation; (6) optional metering (dedicated to one of the output cards) allows instantaneous checks of input levels and phasing; (7) individual gain controls on all inputs allow precise matching of all input and output levels; (8) up to 333 ARA-1612's may be paralleled for a total of 16 in and 3996 out system; (9) power supply will power up to 3 full 16 x 12 rack units; (10) power supplies are thermally and overcurrent protected and are of a dual instantaneous switchover design for 100% on the air reliability; (11) hinged front panel and plug-in card construction; (12) lowest cost per crosspoint in the industry.

SPECIFICATIONS for the ARA-1612 are as follows: Response — $\pm 0.5\text{dB}$, 20Hz to 20kHz. Distortion — 0.3% max. @ 1kHz and $+8\text{dBm}$ out. Inputs — high impedance balanced/bridging and up to $+21\text{dBm}$ in. Outputs — 600 ohm balanced, $+8\text{dBm}$ nominal ($+21\text{ dBm}$ max.). S/N — 85dB down referred to 0dBm in and $+8\text{dBm}$ out. Input and output isolation, 75dB. Switching time less than 1 us. Gain — variable to $+17\text{dB}$.

SOLID STATE "VU" AND PHASE METERS

SSM-2C and SSM-3R — The now famous RAMKO solid state "VU" meters featured in both stand alone table top and rack mount packages. In addition the SSM-3R rack unit contains our solid state phase check meter for continual monitoring of left and right audio phasing. The full range display may be user

adjusted for any part of the range from IN PHASE to 180 degrees out of phase. The "VU" meters were designed to take advantage of both the PEAK reading and "VU" ballistics concept. The end result is exceptionally fast response on the way up and "VU" ballistics on the way down. Thus you end up with a cleaner, brighter sound than ever before.



Solid state "VU" and phase meters

ORDERING AND SERVICE INFORMATION

BY MAIL

Ramko Research, Inc.
11355 "A" Folsom Blvd.
Rancho Cordova, CA 95670

PLANT

Our plant is open from 7:45 A.M. to 4:30 P.M. Monday through Friday. Please feel free to visit us any time you are in the area.

BY PHONE

Our order department number is (916) 635-3600. Feel free to call collect for technical assistance or to place an order.

DISTRIBUTORS

RAMKO RESEARCH maintains a world-wide network of quality distributors. You may order factory direct or through one of the many distributors listed elsewhere in this catalog. If your favorite distributor is not shown, contact him anyway as we are continually adding to this list.

2 YEAR AND 4 YEAR WARRANTY

RAMKO guarantees to replace, free of charge (parts and labor) any electronic component(s) which should fail within the first 2 years of original ownership. Any equipment with a published longer warranty period (4 years on some items) is naturally covered for that time. All equipment distributed by and not manufactured by RAMKO RESEARCH carries only the original equipment manufacturers guarantee. RAMKO RESEARCH will not be responsible for customer negligence or abuse. Under no circumstances will RAMKO assume responsibility for any shipping charge, to or from our plant. All shipping charges to be borne by the customer. All guarantees and warranty policies will be extended to original owners only and are non transferrable.

2 WEEK FREE TRIAL PERIOD

All items manufactured by RAMKO RESEARCH are offered for your evaluation on a free 2 week trial basis. Only orders approved by our credit department will be cleared for shipment. It is understood that the 2 week trial period is to begin upon your receipt of the item and not upon our shipping date. Any extended use (over the 2 week trial period) can be subject to a restocking charge. No equipment will be accepted after 21 days without prior permission from RAMKO RESEARCH.

PRICES

All prices shown in the accompanying pricing guide are effective as of date shown. RAMKO RESEARCH reserves the right to change prices, without notice, as economic conditions dictate. Pricing on all products is F.O.B. Rancho Cordova, California.

CREDIT TERMS

Open account shipments will be made to all firms approved by RAMKO. A minimum of 3 business references and your bank will be required before

an open account may be established. All other orders will be shipped only with payment in advance or C.O.D. C.O.D. orders require 20% payment in advance unless customer is well known to us. Payment terms are net 20 days on open accounts. A finance charge of 1½% per month (annual 18%) may be levied on past due accounts. All sales on open account are subject to approval by RAMKO RESEARCH.

TAXES

California residents please add 6% to your order. We reserve the right to add any taxes required by local law or ordinances. Firms operating under tax-free conditions must state applicable license or contract numbers and be prepared to furnish necessary certifications.

CLAIMS AND RETURNS

Inspect all shipments immediately upon receipt. Missing cartons or obvious damage to cartons (shipped by common carrier) should be noted on the delivery receipt before signing. Concealed damage or loss should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within 5 days after receipt of shipment. Claims for lost shipments should be made within 2 weeks of receipt of invoice or other notification of shipment. Please save damaged or pilfered carton until claim is settled. Do not return any goods to us without obtaining prior authorization from our sales department. Goods returned (unauthorized) by collect freight may be refused. See 2 week free trial section for any exceptions to this section.

REPAIRS

Contact our customer service department for instructions on the repair of equipment. Do not return items for repair without contacting our factory. You may call collect.

PRODUCT IMPROVEMENT

RAMKO RESEARCH reserves the right to make any design or manufacturing changes, at any time, without prior notice, to improve our product.

CUSTOM PRODUCTS

RAMKO has an extensive custom product facility through which many new and unique products have been designed and developed to meet your needs. We are prepared to quote on any unusual requirements that you may have. It is understood that upon acceptance of the order and before proceeding with the actual construction, RAMKO will require a 30% deposit. Our standard 2 week free trial does not apply to any customs furnished by us. All standard warranties apply to custom work unless other agreements have been reached by you and RAMKO RESEARCH.

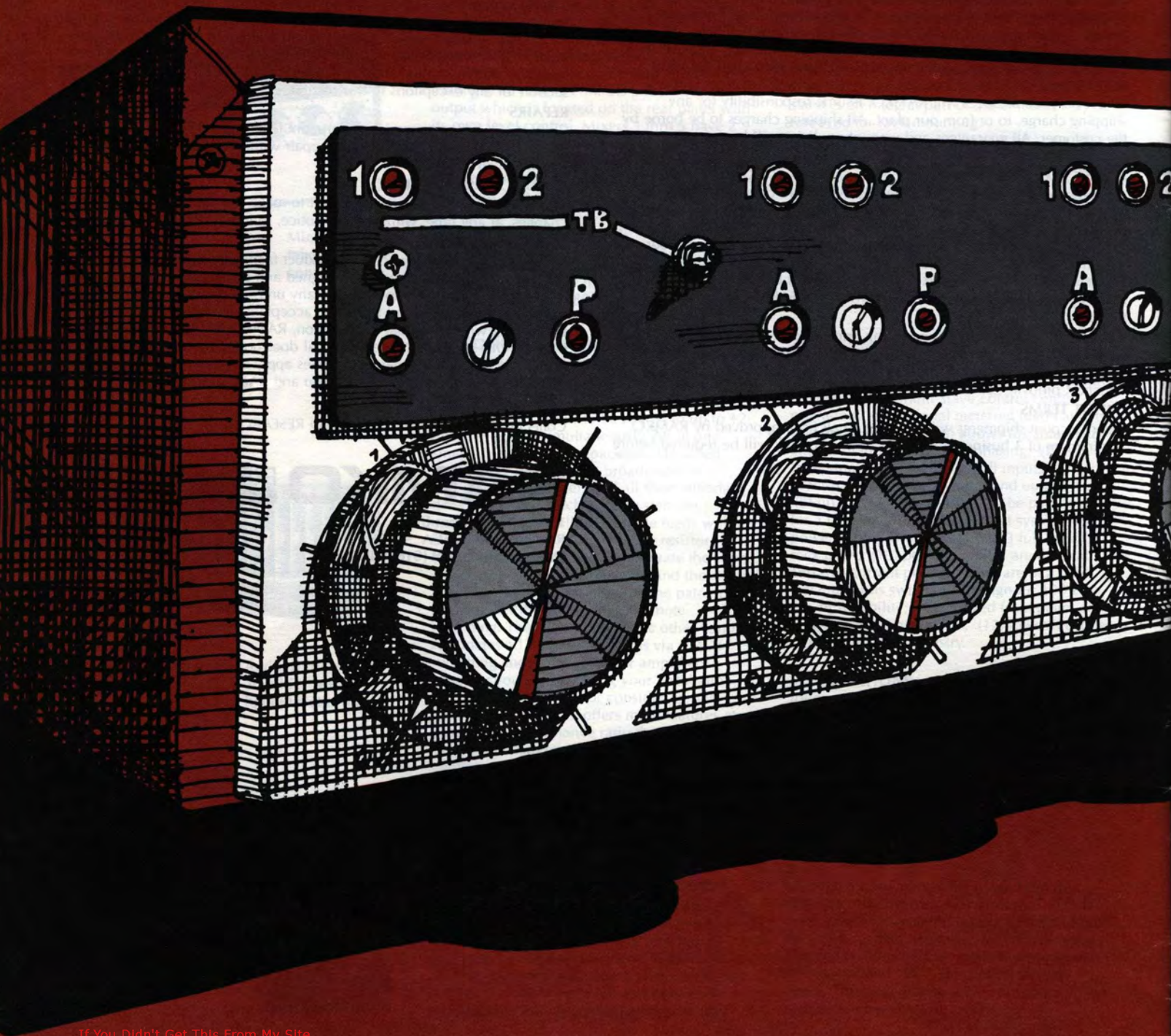
TELEPHONE SERVICE

Collect calls are accepted by RAMKO RESEARCH.

RAMKO RESEARCH

11355 "A" Folsom Blvd.
Rancho Cordova, CA 95670
Please call collect (916) 635-3600

Catalog #978-3
September 1, 1978



RAMKO RESEARCH

11355-A Folsom Blvd. / Rancho Cordova, California / 95670
(916) 635-3600

Dear Broadcaster:

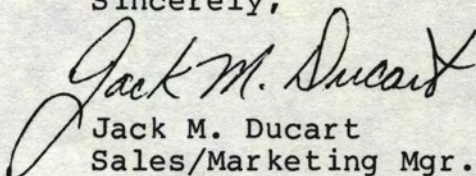
Thank you for requesting information on the RAMKO RESEARCH line of professional audio equipment.

Please take a few moments to read the "Forward" in our catalog. It explains our design philosophy and is the basic concept on which RAMKO was founded. We feature today's technology at prices to fit any budget.

If you need more information or wish to place an order, please call us collect at (916) 635-3600.

RAMKO understands your needs. After all, we're Broadcast Engineers too!

Sincerely,


Jack M. Ducart
Sales/Marketing Mgr.

PROFESSIONAL AUDIO PRODUCTS



DC-5 & DC-8 SERIES AUDIO CONSOLE UPDATE

Ramko Research is constantly striving to bring you the very best in Professional Broadcast and Audio Products that employ the latest technological advances.

We, therefore, proudly announce new versions of the popular DC-5 and DC-8 series audio consoles. The changes we have made are the result of suggestions made to us by our customers and our own experience with over 700 of these units in the field since their introduction.

The specifications and features shown in our current catalog remain unchanged, except for the following:

1. Hinged front panel with thumb operated "Quick release" latches for lightening fast interior access.
2. Front panel mounted headphone jack and console power on/off switch.
3. REAR panel installed "Molex" plug for quick connection of LC-2 or LC-4 remote control accessory.
4. New mixer attenuators for longer life and greater mechanical strength. A mechanical shock absorber provides a smooth and quiet zero stop on each attenuator.
5. Standard in all consoles is a corcom RFI filter on the AC line which is designed to provide effective control of line-to-line as well as line-to-ground RFI interference. This filter is particularly suited where pulsed, continuous and/or intermittent RFI is present.
6. Two internally selectable relays have been added. 1. an "On'The-Air" light relay (dry contacts) capable of 1A @ 240VAC. 2. An auxiliary relay for remote speaker muting.
7. Plug in power supply with seperate supplies for Monitor and Cue amps.
8. Plug in, internal Monitor amplifier.
9. NEW RCA (DARLINGTON) chips used in both the Monitor and Cue amplifiers for cooler operation and less output distortion.
10. All consoles have only one Mother Board with barrier connections and components identified by silk screened legends. Mother Board is hinged for easy access to bottom of board.

11. All components are mounted on plug in boards with voltages and pin numbers etched into circuit side of board.
12. Touch pad boards and "VU" meters are plug in.
13. LED's in "VU" meter are now 50% brighter.
14. New console lid covers input/output barrier strip.
15. Lid, front and end panels are made of 45% thicker metal.
16. Simul-Q latching option is on a plug in card.
17. We added a switch on stereo models so you can switch the "VU" meters to Monitor either Audition or Program.
18. Exclusive shared attenuators provide ZERO tracking error on stereo consoles.
19. The Program and Audition outputs may be simultaneously selected from any mixer.
20. The standard Stereo Mix (mono) output on stereo consoles is now a balanced output at +8dBm.
21. The Cue amplifier maximum output has been increased to 2.5 watts.
22. All inputs (including the last mixer) are now gain selectable from Mic thru high level.

AT RAMKO RESEARCH WE LISTEN TO OUR CUSTOMERS!!!

WRITE OR CALL COLLECT FOR DETAILS ON WHY RAMKO PRODUCTS PROVIDE THE BEST COST/PERFORMANCE RATIO IN THE INDUSTRY,

4/78

RAMKO RESEARCH

11355-A Folsom Blvd. / Rancho Cordova, California / 95670
(916) 635-3600

PRICE LIST

PROFESSIONAL AUDIO PRODUCTS

February 1, 1979

CATALOG PAGE	MODEL #	PRICE	DESCRIPTION
CONSOLES AND CONSOLE ACCESSORIES			
4	SC-5M	\$995	Audio console, single channel, 5 mixer, 12 inputs (mono)
4	SC-5R	\$995	Same as above only rack mount
4	DC-5M	\$1399	Audio console, dual channel, 5 mixer, 12 inputs (mono)
4	DC-5MS	\$1695	Same as above but stereo with mono output
4	DC-8M	\$1887	Audio console, dual channel, 8 mixer, 18 inputs (mono)
4	DC-8MS	\$2375	Same as above but stereo with mono output
7	LC-2	\$155	2 channel remote control accessory for RAMKO audio consoles
7	LC-4	\$230	Same as above but 4 channel
7	DC-4CE/M	\$639	4 channel console extender (mono) for DC-5 & DC-8 consoles
7	DC-4CE/S	\$715	Same as above but stereo
7	DC-8CE/M	\$1100	8 channel console extender (mono) for DC-5 & DC-8 consoles
7	DC-8CE/S	\$1230	Same as above but stereo
7	SQ-4L	\$74	Simul-Q latching option for push on/off operation
8	DC-12MR	\$4200	Audio console, dual channel, 12 mixer, slide attenuators, mono, 2 inputs per mixer. Remote control electronics. Complete
8	DC-12SR	\$5200	Same as above but stereo with mono output
-	DC-12MOD	\$125	Mixing & switching module for DC-12 series consoles & extenders. Use for mono or stereo consoles.
-	DC-12CE/MF	\$235	Console extender main frame for DC-12 series consoles. Holds up to 8 DC-12 MODS.
-	DC-12FP	\$15	Filler panel for DC-12 extender when using less than 8 DC-12MODS's. (Same size as DC-12MOD)
-	DC-12RE/M	\$410	Rack electronics for DC-12 series console extender with power supply (mono). Less channel input cards.
-	DC-12RE/S	\$510	Same as above only stereo.
-	DC-12CIC/M	\$58	Channel input card for DC-12RE/M (mono).
-	DC-12CIC/S	\$97	Channel input card for DC-12RE/S (stereo).
-	CABLE	\$7/ft.	Extra cable to interconnect console/extender to rack electronics. 6 foot of cable is supplied standard.
8	DC38-5M	\$2447	Audio console, dual channel, 5 mixer, 4 inputs per mixer, (mono), 20 inputs total. Lighted status indicators, up to 5 million operations on mixers and switches.
8	DC38-5S	\$3235	Same as above but stereo with mono output. 3 meters; left, right and mono/phase.
8	DC38-8M	\$3290	Same as DC38-5M but 3 more mixers. 32 inputs (mono)
8	DC38-8S	\$4390	Same as DC38-5S but 3 more mixers. 32 inputs (stereo)
8	DC38-10M	\$3930	Same as DC38-5M but 5 more mixers. 40 inputs (mono)
8	DC38-10S	\$4980	Same as DC38-5S but 5 more mixers. 40 inputs (stereo)

SOLID STATE METERS

22	SSM-2C	\$135	Solid state LED "VU" meter, stereo, 8 ohm headphone, output, and 150 K ohm unbalanced bridging input. Instantaneous reading on the way up and VU ballistics on the way down. Table top.
22	SSM-3R	\$295	Solid state LED "VU" meter, rack mount. 3 meters; left channel, right channel and phase meter. 150 K ohm balanced bridging input. Instantaneous reading on the way up and VU ballistics on the way down. 19" W X 1 3/4" H X 6 1/2" D.

CLOCK/TIMERS

-	DC-38CT	\$150	Optional built-in digital clock/timer (6 digit) for DC38 series consoles. Clock runs continuously, display switched between clock & timer functions. Line frequency accuracy.
-	DC-38CT/C	\$275	Same as above mounted in case w/power supply. 115VAC. Controls may be remoted thru rear mounted connector.
-	XTAL	\$60	Crystal time base option for DC38CT and DC38CT/C, 0.0005% accuracy, includes trimmer for exact set.

Represented by:

AUDIO DISTRIBUTION AMPLIFIERS

9	DA-2080MF	\$326	Distribution amp. Main frame with meter, power supply and extender card. For up to 10 DA-2080MOD's.
9	DA-2080MOD	\$195	Distribution amp. plug in module, 2 in 8 out, individual controls.
10	DA-6/E	\$160	Distribution amp. 1 in 6 out, table top/bracket mount.
10	DA-6R/E	\$181	Distribution amp. 1 in 6 out, rack mount.
10	DA-6BR/E	\$197	Distribution amp. 1 in 6 out, rack mount, individual controls.
10	DA-6RS/E	\$263	Distribution amp. 2 in 12 out, rack mount, stereo/dual mono.
10	DA-16BR/E	\$405	Distribution amp. 2 in 16 out, rack mount, individual controls, with LED VU meter.
11	DA-X30	\$145	Audio distribution amp. Low impedance out. Balanced in & out. Up to 30 balanced or unbalanced 600 ohm loads may be used. Table top.
11	DA-X30R	\$170	Same as above only rack mounted.
11	DA-X30R/S	\$240	Same as above only stereo.

MICROPHONE/LINE AMPLIFIERS

12	MLA-1/E	\$128	Mic/line amp. (mono) table top/bracket mount
12	MLA-1R/E	\$139	Same as above only rack mount
12	MLA-2/E	\$175	Mic/line amp. (stereo/dual mono) table top/bracket mount.
12	MLA-2R/E	\$185	Same as above only rack mount.

PORTABLE REMOTE MIXERS WITH LIMITING

13	DML-1S	\$274	Mic/limiter (stereo) internal AC supply
13	DML-2M/B	\$239	Light weight 2 channel portable audio console featuring 2 mic inputs with independent limiting, built in tone generator, dual battery supply, metering, and headphone amplifier with talk-back capability. Weight; less than 2 lbs.
13	DML-2M/AB	\$281	Same as above but includes DML-PS for battery & AC operation.
13	DML-PS	\$42	General purpose power supply. Plus & minus 9VDC @ 200 ma.
22	P5M	\$545	Miniature, 5 mixer portable console with dual compressor/limiters. 7 lbs.

MICROPHONE DISTRIBUTION AMPLIFIER

14	MDA-6BR/E	\$206	Mic distribution amp. 1 balanced mic in & 6 balanced line levels out. Rack mount with individual output level controls.
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LINE AMPLIFIERS

15	LA-2/E	\$135	Line amp (stereo/dual mono) table top/bracket mount.
-	LA-2R/E	\$151	Same as above only rack mount.
15	LA-5S/10M	\$209	Line amp main frame, rack mount with one module installed. Each module may be used for 1 stereo or 2 mono input(s)/output(s). Main frame will hold a total of 5 modules. Individual controls for each module.
15	LA-5S/10MMOD	\$61	Plug in module for above. Module has 1 stereo/2 mono, input/output.

EQUALIZED LINE AMPLIFIER

16	LE-3	\$198	Equalized line amp. main frame WITH one plug in module, one channel. May be expanded to 3 channels using LE-3MOD's.
16	LE-3MOD	\$35	Plug in module for above

MONITOR AMPLIFIERS

17	SMA-50/E	\$186	Studio monitor amp. (mono) 25 watts RMS, table top
17	SMA-500/E	\$194	Same as above only rack mount
17	SMA-1000/E	\$325	Studio monitor amp. (stereo) 25 watts RMS per channel, rack mount.
18	MA-12	\$121	Monitor amp. (mono) 12 watts RMS
18	MA-12R	\$139	Same as above only rack mount
18	MA-20	\$153	Monitor amp. (stereo) 10 watts RMS per channel
18	MA-20R	\$171	Same as above only rack mount

TURNTABLE PREAMPLIFIERS

19	MP-8/E	\$98	Turntable preamp (mono) table top/bracket mount.
19	SP-8/E	\$144	Turntable preamp (stereo) table top/bracket mount
19	SP-8R/E	\$162	Same as above only rack mount
22	ESP-38	\$325	The ultimate. Super low distortion & S/N ratio. Push button filters & adjustable equalization.

TURNTABLES

20	SP-10MKII	\$712	3 speed, direct drive, quartz-controlled turntable
20	SL-1500MK2	\$346	Quartz-phase-locked control, direct drive 2 speed turntable with quartz synthesizer pitch control, with tone arm, cart-ridge shell, base and dust cover.

REMOTE POWER CONTROLLERS

20	PR-2	\$63	Remote power controller for turntables, etc. Dual
20	PR-2B	\$79	Same as above but actuated by momentary push buttons.

AUTOMATIC TAPE WINDER

21	ACL-25/E	\$375	Automatic tape winder, 30 IPS
21	ACL-C	\$20	Cassette attachment for ACL-25/E
21	ACL-P	\$25	Pancake adapter with flange for ACL-25/E

AUDIO ROUTER/AMPLIFIERS

ARA-1612 - Mono/Stereo audio router (switcher) and amplifier with lighted status displays and BCD encoding. Plug in modules allow up to 16 inputs to be routed to up to 12 different places simultaneously. All in one small 7" rack mount package. Designed specifically for the radio broadcaster to eliminate patch panels & all their attendant drawbacks. The patch panel system for example does not allow multiple feeds without either impedance mismatches or resistor branching. Both methods deteriorate the source signal. The first affects response & the second affects the system noise figure. The patch panel also negates the possibility of remote switching. The ARA-1612 on the other hand eliminates all of these problems via CMOS switching and isolation buffer amplifiers. Features: (1) front panel lighted status displays show at a glance which inputs are being fed to which outputs; (2) each output card (16 in by 1 out) has dual outputs for simul-feeds; (3) each output card (up to 12, 16 X 1's in each rack) may be changed to 8 X 1 stereo simply by throwing an on board switch; (4) front panel, push button, input/output select switches; (5) common buss BCD control concept allows multi-slave control center operation; (6) optional metering (dedicated to one of the output cards) allows instantaneous checks of input levels & phasing; (7) individual gain controls on all inputs allow precise matching of all input & output levels; (8) expandable to 45 inputs and 12 outputs; (9) power supply will power up to 3 full 16 X 12 rack units; (10) power supplies are thermally & overcurrent protected & are of a dual instantaneous switchover design for 100% on the air reliability; (11) hinged front panel & plug-in card construction; (12) lowest cost per crosspoint in the industry.

22	ARA-1612MF	\$571	Audio Routing Amplifier main frame. Will accomodate 2 ARIM-8. (Audio Routing input modules) & 12 ASOM-1612 (Audio switching & output modules). Fully equipped main frame will provide switching facilities for 16 mono or 8 stereo inputs & 12 mono/stereo outputs. Size 19" rack mount X 7" H X 11" D. Requires ARA-1612PS power supply.
22	ARIM-8	\$64	Audio Router Input Module for 8 mono inputs. Input is 200K ohms balanced bridging with a nominal input level of minus 10dB. May be changed to any lower input impedance by placing appropriate resistor across input terminals. When using router in stereo configuration 2 ARIM-8 modules are required.
22	ASOM-162	\$103	Audio Switching & Output Module. May be used stereo or mono. Output is 125/600 ohms balanced w/gain variable to +15dB. One ASOM-162 required for each output. With LED status display.
22	ARA-1612PS	\$361	Power supply for ARA-1612MF. 19" rack mount X 3 1/2" H. Unit will supply power for up to 3 main frames. Dual automatic switch over.
-	ARA-1612OM	\$320	Output mixer for expanding ARA-1612 system. This unit is used with up to 3 main frames to expand the system to 45 inputs and 12 outputs.
-	ARA-1612CP-1	\$275	Remote control panel for ARA-1612. Enables user to remotely control one output feed. Rack mounted unit has 16 illuminated push button switches & 3 enter push buttons for use with up to 3 ARA-1612 main frames.
-	ARA-1612CP-2	\$120	Remote control panel for ARA-1612. Enables user to remotely control one output feed. Rack mounted unit has 2 thumb wheel select switches, and an enter push button
-	ARA-1612CP-1T	\$275	Same as ARA-1612CP-1 only table top.
-	ARA-1612CP-2T	\$120	Same as ARA-1612CP-2 only table top
22	SSM-3R	\$295	Solid State LED "VU" meter, rack mount. 3 meters; left channel right channel and phase meter. May be used in conjunction with ARA-1612 by dedicating one output card to feed this meter. User then can check all 12 output levels and if used as a stereo system the stereo phasing.

LINE TRANSIENT FILTER

-	LTF-1	\$35	Line transient filter. Designed to suppress AC line voltage transients being generated or received. Also provides RF suppression. Will handle loads up to 1A @ 115/230VAC, 50Hz to 400Hz.
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TECHNICS "PROFESSIONAL SERIES" BY PANASONIC

-	SE-9060	\$364	Stereo/mono DC power amplifier, 90 watts RMS @ 4 ohms per channel stereo, 160 watts RMS @ 8 ohms mono.
-	SU-8080	\$376	Stereo integrated DC preamp & amplifier, 90 watts RMS per channel.
-	SU-9070	\$364	Stereo DC preamplifier
-	ST-9030	\$364	FM stereo tuner
-	ST-9038	\$475	Quartz Synthesizer FM stereo tuner w/digital readout.
-	SH-9038	\$475	Micom Programmable unit, optional for use with ST-9038. Microprocessor with digital clock allows 7 day a week programming of stations selected, time of day on/off, & start/stop of other units.
-	SH-9010	\$427	Stereo Universal frequency equalizer, 5 elements per channel
-	SH-9020	\$285	Peak/average meter unit.
20	SL-1500MK2	\$346	Quartz-phase-locked control, direct drive 2 speed turntable with quartz synthesizer pitch control, with tone arm cart-ridge shell, base & dust cover.

20	SP-10MKII	\$712	Quartz-controlled direct drive 3 speed turntable
-	SL-1000MK2	\$1108	SP-10MKII with obsidian lava base, titanium tone arm with variable damping, ruby ball bearing anti-shock pivot suspension.
-	RS-M85	\$554	Quartz-locked direct drive stereo cassette deck. Fluorescent bar graph meter with full IC logic tape motion control. 19" rack mount X 3 7/8" high.
-	RS-646DS	\$270	Portable cassette deck
-	RS-686DS	\$514	Ultra compact 3 head, portable stereo cassette deck
-	RS-9900US	\$1583	Rack mounted stereo cassette deck with closed loop, double-capstan, 3 motor drive system. Separate amplifier & tape transport deck.
-	RS-1500US	\$1425	Stereo, isolated loop, 3 motor, direct-drive reel to reel tape deck. 3 speed w/quartz control.
-	RS-1506US	\$1425	Same as above only 4 track 2-channel Record/Play.
-	RS-1520	\$1820	Same as RS-1500US only has front panel fine adjustment control for Bias & Equalization, built in test-tone oscillator, and 600 ohm balanced input & output with cannon connectors.
-	RS-1700	\$1820	Same as RS-1506US only plays & records in both directions & has auto-reverse.
-	SB-4500A	\$218/pr	Linear phase, 2 way speaker system, 75 watts peak.
-	SB-5000A	\$131	Linear phase, 2 way speaker system, 75 watts.
-	SB-6000A	\$247	Linear phase, 2 way speaker system, 100 watts.
-	SH10B3	\$277	Base & dust cover for SP-10MKII
-	RP-9100-P	\$276	Portable carrying case for RS-1500US
-	RP-9110-P	\$34	Dust cover for RS-1500US
-	RP-9130-P	\$28	19" rack mount kit for RS-1500US
-	RP-9690-P	\$84	Remote control unit for RS-1500US & RS-9900US
-	RP-10AP	\$15	10" empty reel for RS-1500US
-	RP-086	\$118	Battery adaptor for RS-1500US

Price and technical specifications are subject to change without notice

TERMS AND CONDITIONS OF SALE

CREDIT TERMS: Open account shipments will be made to all firms approved by RAMKO. A minimum of 3 business references and your bank will be required before an open account may be established. All other orders will be shipped only with payment in advance or C.O.D. C.O.D. orders require 20% payment in advance unless customer is well known to us. Payment terms are net 20 days on open accounts. A finance charge of 1 1/2% per month (annual=18%) may be levied on past due accounts. All sales on open account are subject to approval by RAMKO RESEARCH.

SHIPMENTS: All shipments are F.O.B. Rancho Cordova, Calif. Accessories and other items not manufactured by RAMKO may be drop shipped F.O.B. vendors plant. Unless specifically stated by the buyer, we will exercise our best judgment as to method of shipment. A full range of shipping services is available.

RETURN OF GOODS: Equipment in "like-new" condition of current manufacture may be accepted for return within 90 days of purchase subject to a 15% restocking and handling charge. (Exception - see 2 week free trial offer on page 23 of our catalog). Liability for a safe, insured, prepaid return rests with the shipper. Do not return any equipment without prior approval from the customer service dept.

LEASING: Leasing and time payment plans on request. Please contact us for details.

TELEPHONE SERVICE: Our order department number is (916) 635-3600. Feel free to call collect for technical assistance or to place an order.

WARRANTY: All equipment designed and manufactured by RAMKO RESEARCH INC is warrantied against defects in workmanship and material that develop under normal use within a period of 2 years (4 years on some items) from the date of original shipment, and is also warrantied to meet any specifications represented in writing by RAMKO so long as the purchaser is not in default under his contract of purchase and subject to the following additional conditions and limitations:

1. The sole responsibility of RAMKO RESEARCH INC for any equipment not conforming to this warranty shall be, at its option:
 - A. To repair or replace such equipment or otherwise cause it to meet the represented specifications either at the purchaser's installation or upon the return thereof f.o.b. Rancho Cordova, Calif., as directed by RAMKO; or
 - B. To accept the return thereof f.o.b. Rancho Cordova, Calif., credit the purchaser's account for the unpaid portion, if any, of the purchase price theretofore paid; or
 - C. To demonstrate that the equipment has no defect in workmanship or material and that it meets the represented specifications, in which event all expenses reasonably incurred by RAMKO, in so demonstrating, including but not limited to costs of travel to and from the purchaser's installation and subsistence, shall be paid by purchaser to RAMKO.
2. In case of any equipment thought to be defective, the purchaser shall promptly notify RAMKO giving full particulars as to the defects. RAMKO will give instructions respecting the shipment of the equipment, or such other manner as it elects to service this warranty as above provided.
3. This warranty extends only to the original purchaser and is not assignable or transferable, does not extend to any equipment which has been subjected to abuse, misuse, physical damage, alteration, operation under improper conditions or improper installation, use or maintenance, and does not extend to equipment not manufactured by RAMKO, and such equipment is subject to only such adjustments as are available from the manufacturer thereof.
4. No other warranties, express or implied, shall be applicable to any equipment sold by RAMKO and no representative or any other person is authorized to assume for it any liability or obligation with respect to the condition or performance of any equipment sold by it, except as provided in this warranty. This warranty provides for the sole right and remedy of the purchaser and RAMKO shall in no event have any liability for consequential damages or for loss, damage or expense directly or indirectly arising from the use of equipment purchased from RAMKO RESEARCH.

(For more information please refer to page 23 of our current catalog under "Ordering & Service Info.")

SALES REPRESENTATIVES

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Rev. 11/78

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