

**1829-20D**  
**AM/FM Digital Receiver**  
**Owner's Manual**



**University**  
**Sound** <sup>®</sup> a MARK IV  
 company

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## 1 DESCRIPTION

The Model 1829-20D is a solid state monaural receiver consisting of an AM/FM digital tuner and a 20 Watt RMS audio amplifier. In addition to the front panel tuner controls, there are four controls on the front panel identified as VOLUME, TONE, POWER, and SELECT. The VOLUME control adjusts the output level of the unit and the TONE control adjusts the treble response. The POWER switch turns the unit on and off, and is linked to the accessory outlet on the rear panel. The SELECT switch permits a choice of either the built-in tuner or an external music source as the program material.

All input and output connections are made on the rear panel of the unit. Screw terminals are provided for antenna connections as well as power output connections. Power outputs are provided for 4 Ohm and 8 Ohm direct speaker coil connections, as well as 25 Volt and 70.7 Volt constant voltage distribution lines. 500/600 Ohm and 8 Ohm/1 Watt music-on-hold (MOH) outputs with level adjust are provided. The PRE AMP IN/OUT Jack can be used as an output to drive an external amplifier, or as an input to accept the signal from a tone generator. The AUX input allows for connection of an alternate program material source. The PRE AMP IN/OUT and AUX connections are all made on standard RCA phono jacks.

The receiver is housed in a sturdy steel cabinet which may be rack mounted using the Model RPK-2 rack mounting kit. The unit operates from a standard 120 VAC 60 Hz power source and is protected by a push-to-reset circuit breaker.

## 2 UNPACKING

The unit should be removed carefully from the carton and inspected for any possible damage in transit. If there is any evidence of damage which might have occurred in shipment, immediately notify your supplier or the transportation company which delivered it. Claims for damage sustained in transit must be made upon the carrier. Save all packing material for the claim agent who will supply you with the proper forms and give you the necessary instructions for filling out a claim.

## 3 INSTALLATION

The 1829-20D has ample vents for adequate ventilation; however, the unit must be installed with sufficient clearance around the cabinet to permit free air flow. Do not install the unit in a sealed box or cabinet without adequate ventilation. DO NOT PLACE ANY OBJECT ON TOP OF THE COVER OR IN ANY WAY BLOCK THE AIR FLOW OF THE VENTS. DO NOT STORE OR OPERATE THE AMPLIFIER IN AREAS WHERE THE AMBIENT TEMPERATURE EXCEEDS 140 °F.

The amplifier has an AC power cord with a 3 prong plug. This unit should be used with a 120 Volt 60 Hz grounded outlet. DO NOT REMOVE THE GROUNDING PIN FROM THIS PLUG as it is the safety ground for the metal cabinet. An AC receptacle is provided on the rear panel of the receiver for powering accessory equipment. This receptacle is linked to the POWER on-off switch so that the accessory equipment is turned on and off with the receiver.

## 4 CONNECTIONS

All connections are made on the rear panel of the unit. Connections to the AUX INPUT and PREAMP IN/OUT are made by means of a standard RCA phono Jack. These circuits require the use of a shielded audio patch cord to prevent RF/EMI noise pickup. All other connections are made on screw terminals, using simple two conductor cable. The back panel of the 1829-20D is shown in Figure 1.

### 4.1 Aux Input

This input is a high impedance unbalanced input and has a sensitivity of 0.28 Volts, suitable for matching the output from most tape players or other audio equipment with line level output. To use this input as the source of the program material instead of the unit's tuner, slide the SELECT switch on the front panel to the AUX position.

### 4.2 Antenna Inputs

Separate connection terminals for external AM and FM antennas are provided on the rear panel of the unit. For most reception areas, the antennas provided with the unit should be adequate.

### 4.3 Preamp In/Out

This jack provides access to the mix buss, which is the circuit in the receiver that connects the output of the preamplifier to the input of the power amplifier. Anything connected to this access point must be high impedance to prevent shorting out the music. This jack may be used as an output to drive the input of another amplifier or monitor the output of the 1829-20D. When used as an input, the source could be a Model TGSP-4A tone generator to provide a chime tone or alarm signal. Any input signal connected in this way is unaffected by the front panel controls.

### 4.4 MOH Output

500/600 Ohm balanced and 8W/1Watt outputs are provided that may be used as the music-on-hold source for most phone systems. The maximum output level available is 1 Volt, and is adjustable from the control on the rear panel marked "MOH LEVEL"

### 4.5 Output Connections

20 Watts RMS power output is provided for 4 or 8 Ohm speaker lines or for distribution on 25 Volt or 70.7 Volt lines. Output connections are made by means of screw terminals on the back of the unit.

Long speaker lines have an appreciable resistance, resulting in output power loss between the amplifier and the speakers. This power loss can be avoided to a large degree by using 25 Volt or 70.7 Volt constant-voltage lines. The 25V and 70.7V outputs are used in speaker distribution systems in which each speaker has a line matching transformer connected to it. This allows for the connection of speakers having different wattage ratings, and greatly simplifies the calculation of the total system wattage demand. When using either of these outputs, connect one wire of the speaker system to the appropriate 25V/70.7V terminal and the other wire to the COM terminal. To avoid inducing hum into the speaker lines do not run speaker cables parallel to power lines. In some areas, 70.7 Volt distribution lines must be run in conduit. Check the local city electrical codes before installing a 70.7 Volt speaker system to determine the requirements.

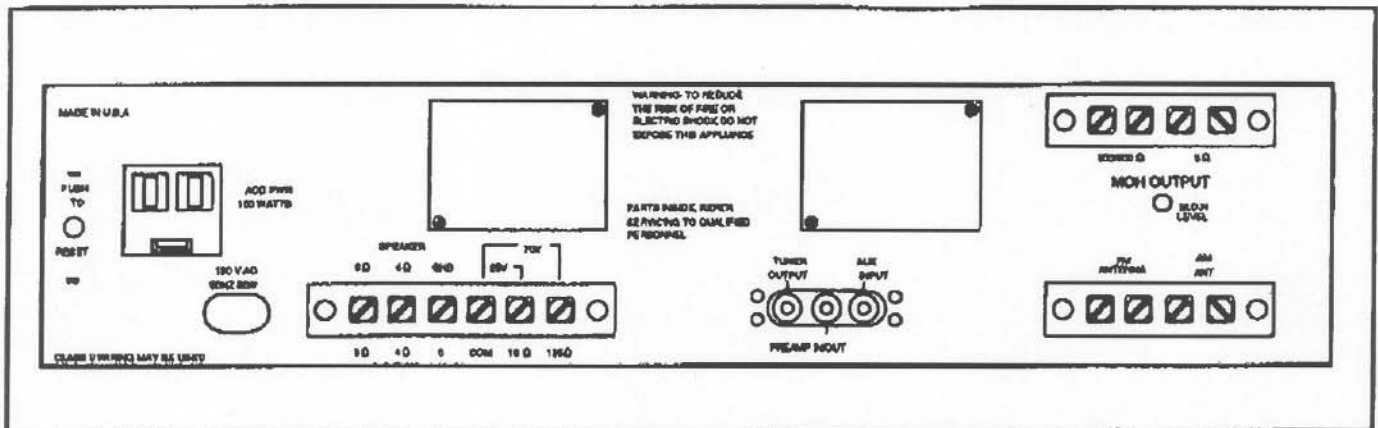


Figure 1: Back Panel of 1829-20D

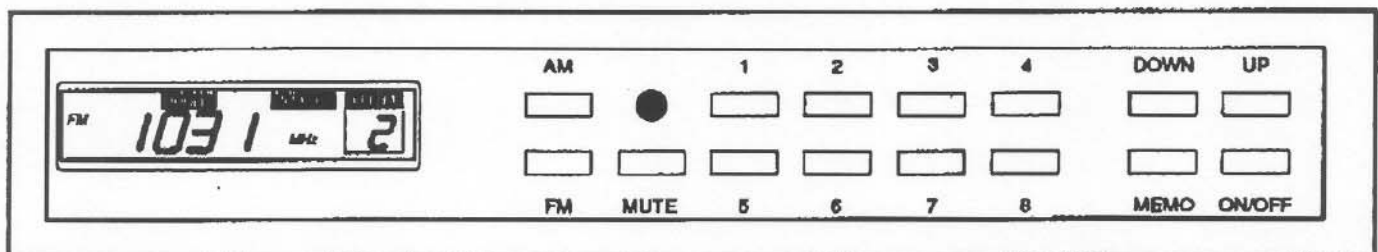


Figure 2: Tuner Section Layout

The 4W and 8W outputs are used when connecting directly to speaker voice coils. When using these outputs, connect one speaker wire to the appropriate 4W or 8W terminal, and the other wire to the terminal marked "GND". Do not load both outputs at their rated impedance simultaneously, as this will act as a demand for twice the rated output and overload the amplifier. Similarly, do not load both a speaker coil output and a 25/70.7 Volt output at full power demand. A combination of speaker loads is permissible using the various outputs from the amplifier; however, the sum of these demands should not exceed the rated output of 20 Watts of the 1829-20D.

Optimum performance of any amplifier depends upon proper impedance match between the output and the load. Connecting a load of mismatched impedance to an amplifier will deteriorate the overall performance of the system. To accurately measure the impedance of a speaker line, the Model LWT should be used. This test instrument permits direct reading of the wattage demand or impedance of a speaker line and is a valuable aid in determining opens, shorts, and mismatch conditions.

### 5 AM/FM DIGITAL TUNER OPERATION

The 1829-20D has been equipped with a digital AM/FM tuner similar to the one shown in Figure 2. In addition to digital readout, this tuner offers high sensitivity, FM muting, and 24 (8 AM and 16 FM) station preset memories. To use the tuner, press the ON/OFF button (the tuner power may already be "on" when the unit is shipped to you) to power up the tuner. The tuner's ON/OFF switch is independent of the main unit's POWER switch.

Using the UP and DOWN buttons, stations can be selected either manually or by causing the tuner to automatically search "UP" or "DOWN" the band until a station is found. To manually select a station, press the UP or DOWN button momentarily. To automatically search for a station, press and hold either button. The buttons numbered from 1 to 8 select one of the 24 (8 AM and 16 FM) station presets. When one of these buttons is pressed momentarily, the tuner will jump to the station stored in that preset memory. To access FM presets 9 - 16, hold the desired button down until the preset changes. For example, if FM preset button #1 is held down, preset #9 is accessed. The AM presets and the FM presets use the same eight buttons; to access a preset on a different band, first press the AM or FM button to set the desired radio band. To store a station in a preset, use the MEMO button. First, set the tuner to the desired station and AM or FM band. Then press and release the MEMO button. The "MEMORY" box will light in the digital readout. While this box is lit, press the desired preset number button. If no preset is pushed within a certain amount of time, the MEMORY light will go out, preventing accidental erasure of a preset.

When the tuner is set to the FM band, the MUTE button toggles a circuit which narrows the sensitivity of the tuner circuit. This is useful when two stations are close enough on the FM band to cause the tuner to receive both stations simultaneously. When the MUTE circuit is active, the tuner can be fine-tuned so that only one station is received. An LED light directly above the MUTE button lights when the circuit is active.

## 6 SPECIFICATIONS

|                                     |                              |
|-------------------------------------|------------------------------|
| <b>Power Output:</b>                | 20 Watts.                    |
| <b>THD at Rated Output:</b>         | <1% at 1 kHz.                |
| <b>Signal-to-Noise Ratio:</b>       | 70 dB.                       |
| <b>Frequency Response:</b>          | 50 Hz to 15 kHz, $\pm 2$ dB. |
| <b>Tone Control:</b>                | 0/-20 dB at 10 kHz.          |
| <b>Input Sensitivity/Impedance:</b> |                              |
| Aux:                                | 280 mV/50 kW (unbal).        |
| Preamp In/Out:                      | 200 mV/50 kW (unbal).        |
| <b>Line Output Level/Impedance:</b> |                              |
| MOH Output:                         | 1V @ 500/600 W (balanced).   |
| or                                  | 1 Watt @ 8 W (unbal).        |
| Tuner Output:                       | 0.3V / 3 kW.                 |
| <b>Speaker Outputs:</b>             | 4 W, 8 W, 25V, 70.7V.        |
| <b>Dimensions:</b>                  |                              |
| Height                              | 3.63 inches (9.2 cm).        |
| Width                               | 13.5 inches (34.3 cm).       |
| Depth                               | 11.9 inches (30.2 cm).       |
| <b>Weight:</b>                      |                              |
| Net:                                | 9.1 lbs (4.1 kg).            |
| Shipping:                           | 10.0 lbs (4.5 kg).           |
| <b>Rack Mount Kit:</b>              | Model RPK-2.                 |

## SERVICE INSTRUCTIONS

### \*\*\*CAUTION\*\*\*

No user serviceable parts inside. Hazardous voltage and currents may be encountered within the chassis. The service information contained within this document is for use only by UNIVERSITY SOUND'S authorized warranty stations and qualified service personnel. To avoid electric shock, DO NOT perform any servicing other than that contained in the Operating Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

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**NOTE:** Modifications to UNIVERSITY SOUND products are not recommended. Such modifications shall be

at the sole expense of the person(s) or company responsible, and any damage resulting therefrom shall not be covered under warranty or otherwise.

### 7.1 Factory Service

If factory service is required, ship the unit prepaid to:

UNIVERSITY SOUND, Inc.  
Service/Repair  
10500 W. Reno Ave.  
Oklahoma City, OK 73128 U.S.A.

or

UNIVERSITY SOUND, Inc.  
Service/Repair  
9130 Glenoaks Blvd.  
Sun Valley, CA 91352 U.S.A.

Enclose a note describing the problem in detail. Include other helpful information such as test conditions, where used, how used, etc.

### 7.2 Technical Assistance

For applications assistance/technical information, write or call:

UNIVERSITY SOUND Technical Assistance  
P.O. Box 24031  
Oklahoma City, OK 73124-4031 U.S.A.  
Phone: (405) 324-5311 FAX: (405) 324-8981

### 7.3 Replacement Parts

To order replacement parts, look up the ordering number from the parts list and write or call:

UNIVERSITY SOUND Parts Sales  
P.O. Box 24031  
Oklahoma City, OK 73124-4031 U.S.A.  
Phone: (405) 324-5311 FAX: (405) 324-8981

## SPECIAL INSTRUCTIONS

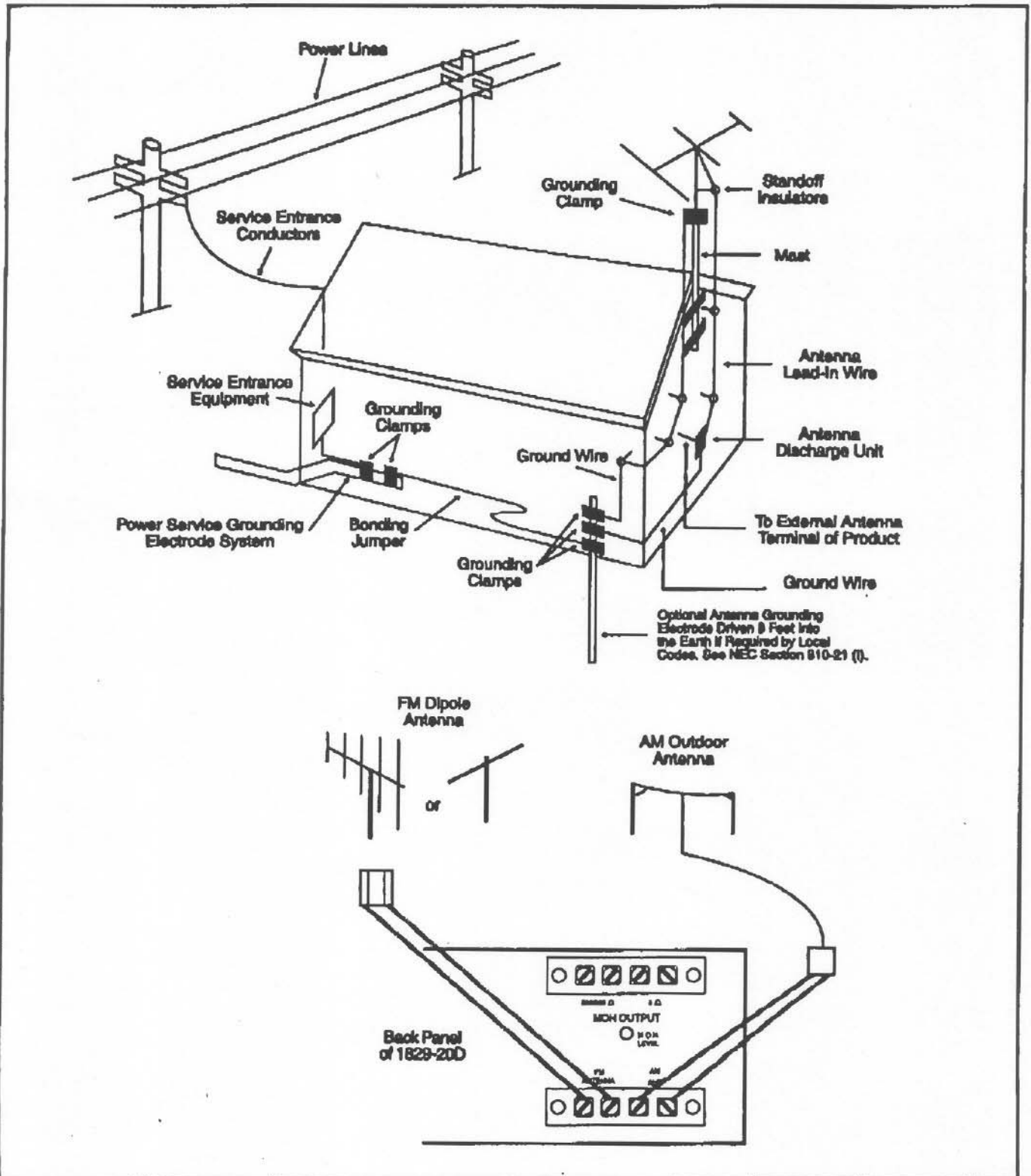
This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# WARNING:

*Do not install antennas near power lines or service entrances.*

The following instructions are for external antenna installation:



## 1829-20D Parts List

## PCB ASSY, 1W, MOH DRIVER (U800 7061 00)

| PART NUMBER  | DESCRIPTION                                |
|--------------|--|
| 47-01-102030 | RESISTOR, 10 OHM, 5%, .25W,                |
| U070 6008 00 | RESISTOR, VARIABLE, PC MOUNT,<br>TRIM, 10K |
| U080 6005 00 | SHAFT, WHITE, 10mm, PT10                   |
| U020 0908 00 | CAP, 220 UF, 16V, RAD                      |
| U020 6005 00 | CAP, 100 UF, 25V                           |
| U181 1MOP 00 | CAP, .1UF, DISC                            |
| U182 1MOP 00 | CAP, .1UF, MINI MYLAR BOX                  |
| U182 33KP 00 | CAP, .033UF, MYLAR                         |
| U100 7059 00 | IC, LM386, OP AMP                          |
| U050 0262 00 | OUTPUT TRANSFORMER, 1W, 600<br>OHM         |
| U040 7019 00 | PCB, RAW, MOH DRIVER                       |

## 20W OUTPUT PCB ASSEMBLY (U800 0272 00)

| PART NUMBER  | DESCRIPTION                 |
|--------------|-----------------------------|
| U191 0220 00 | RESISTOR, 220 OHM, 5%, .5W  |
| U195 K330 00 | RESISTOR, .33 OHM, 2W       |
| 47-01-027397 | RESISTOR, 150 OHM, 5%, .5W  |
| 47-01-027498 | RESISTOR, 100 KOHM, 5%, .5W |
| 47-01-028404 | RESISTOR, 47 KOHM, 5%, .5W  |
| 47-01-028427 | RESISTOR, 1.5 KOHM, 5%, .5W |
| 47-01-028534 | RESISTOR, 1 KOHM, 5%, .5W   |
| 47-01-039170 | RESISTOR, 880 OHM, 5%, .5W  |
| 47-01-102272 | RESISTOR, 2.2 KOHM, 5%, .5W |
| 47-01-102280 | RESISTOR, 4.7 KOHM, 5%, .5W |
| 47-01-102284 | RESISTOR, 6.8 KOHM, 5%, .5W |
| 47-01-102288 | RESISTOR, 10 KOHM, 5%, .5W  |
| U020 0092 00 | CAP, 10 UF, 25V, AXIAL      |
| U020 0102 00 | CAP, 100 UF, 25V, ELEC      |
| U181 050P 00 | CAP, 50 pF DISC             |
| U181 100P 00 | CAP, 100 pF DISC            |
| U181 50KP 00 | CAP, .05 UF DISC            |
| U182 3K3P 00 | CAP, .0033 UF MYLAR         |
| U182 4M7P 01 | CAP, .47 UF MYLAR BOX       |
| 15-01-028691 | CAP, 10 UF, 50V, RAD        |
| U040 0485 00 | RAW PCB, POWER OUTPUT       |
| U100 0408 00 | DIODE, 1N4148               |
| U100 0735 00 | DIODE, 1 AMP, 200 PIV       |
| U100 0756 00 | TRANSISTOR, MPS U06         |
| U100 6025 00 | TRANSISTOR, 2N5881          |
| U100 0491 02 | IC MC1747CP2 OP AMP DUAL    |
| U110 0925 00 | 14 PIN DIP SOCKET           |
| U120 0469 00 | TRANSISTOR SOCKET, TO3      |
| U160 0675 00 | INSUL FOR TL-3              |
| 14-05-039161 | HEATSINK                    |

## PCB ASSY, PWR SUPPLY (U800 7067 00)

| PART NUMBER  | DESCRIPTION                   |
|--------------|-------------------------------|
| U195 0058 00 | RESISTOR, 56 OHM, 5%, 5W      |
| 47-01-027397 | RESISTOR, 150 OHM, 5%, .5W,   |
| U020 6003 00 | CAP, 10 UF, 50V, RAD          |
| U020 7002 00 | CAP, 4700 UF, 50V, RAD        |
| 15-01-124814 | CAP, 470 UF, 63V              |
| 15-02-026884 | CAP, .01 UF, 250V, CERAMIC    |
| U100 0740 00 | DIODE, 1N5401, 3 AMP, 100 PIV |
| U100 6011 00 | 15V REGULATOR, 7815           |
| U040 7018 00 | PCB, RAW, POWER SUPPLY        |
| 14-05-037751 | HEATSINK,                     |

## CHASSIS ASSY.

| PART NUMBER  | DESCRIPTION                            |
|--------------|--|
| 47-01-100627 | RESISTOR, 3.3 MOHM, 5%, .5W            |
| U070 0300 00 | POTENTIOMETER, 200K, VAR. TAPER        |
| U181 4K7P 00 | CAP, .0047 UF, 1.4KV DISC              |
| U182 33KP 00 | CAP, .033 UF MYLAR                     |
| 15-02-050017 | CAP, 22 pF, 10%, 100V, CERAMIC         |
| U090 0304 00 | SWITCH, AUX/RADIO                      |
| U090 0309 00 | SWITCH, POWER ON/OFF                   |
| U090 0416 00 | SWITCH SOLDER GUARD                    |
| U090 0585 00 | CIRCUIT BREAKER, NW2S, 0.8 AMP<br>12mm |
| U100 0409 00 | LED, POWER                             |
| 56-01-050018 | RF BEAD, TWO APERTURE CORE             |
| U050 0323 00 | POWER TRANSFORMER, 31W                 |
| U050 0422 00 | OUTPUT TRANSFORMER, 20W                |
| U080 0818 01 | KNOB, BLACK WITH WHT. DOT, SMALL       |
| U110 0508 00 | PHONO JACK, 3 POSITION PANEL<br>MOUNT  |
| U110 0518 00 | 4 SCREW TERMINAL STRIP, PANEL<br>MOUNT |
| U110 0658 00 | 6 SCREW TERMINAL STRIP, PANEL<br>MOUNT |
| U120 0454 00 | OUTLET, 3 WIRE                         |
| U120 0548 00 | HEAVY LINE CORD, 3 WIRE                |
| U130 0069 00 | LED BEZEL, BLACK                       |
| 14-02-039158 | TRANSISTOR COVER                       |
| 14-02-039160 | TERMINAL BOARD COVER                   |
| U800 7062 00 | DIGITAL TUNER ASSEMBLY                 |

## ACCESSORIES

| PART NUMBER  | DESCRIPTION        |
|--------------|--------------------|
| U060 0782 00 | FM ANTENNA, IA-620 |
| 42-02-050099 | OWNER'S MANUAL     |
| U204 0000 00 | SAFETY INSTR.      |



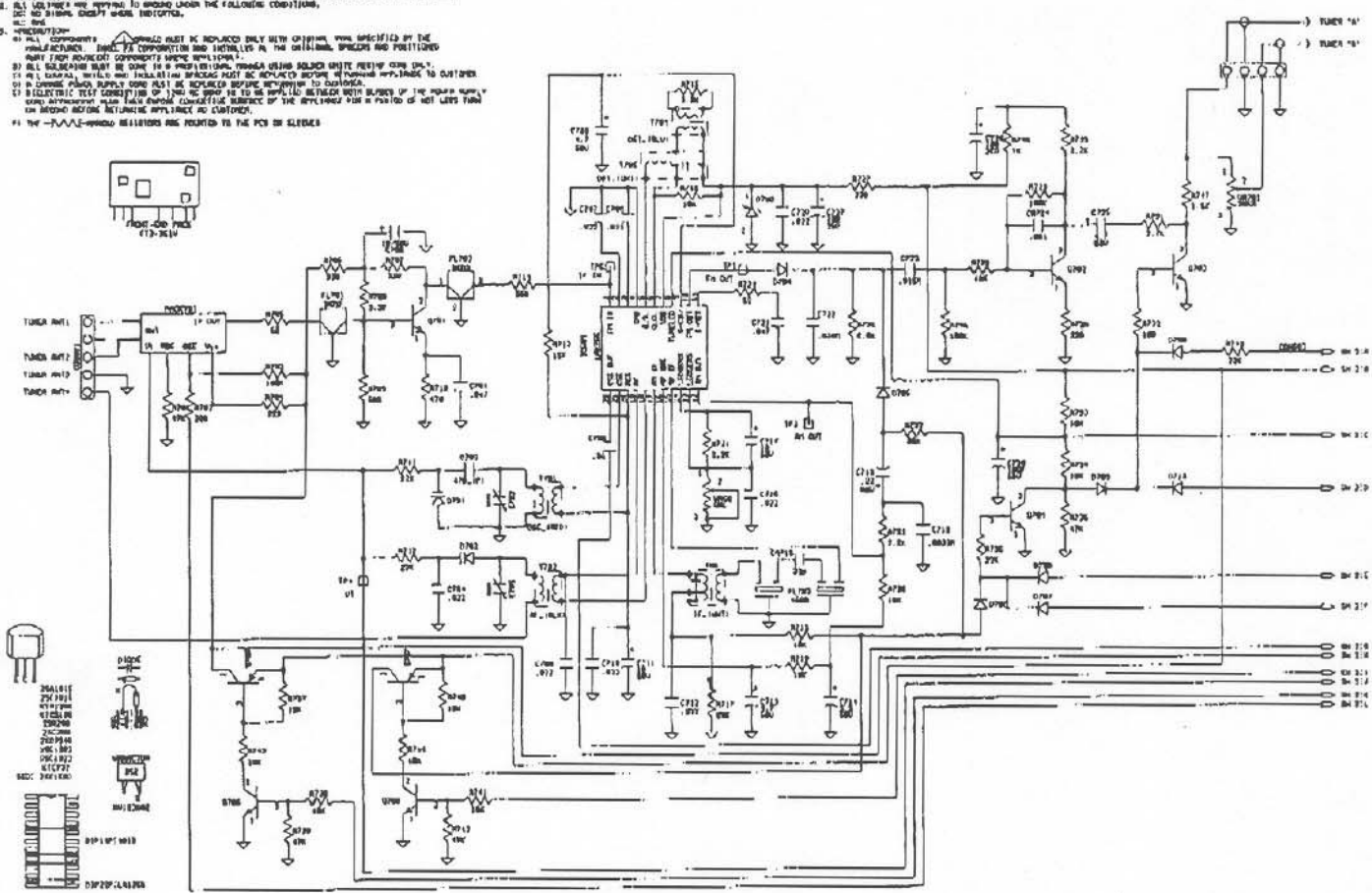
# 1829-20D AM/FM Digital Tuner Circuit Schematic

**MECHANICAL INFORMATION**  
 1. RESISTORS AND CAPACITORS ARE LISTED IN OHMS UNLESS OTHERWISE SPECIFIED.  
 2. ALL DIMENSIONS ARE GIVEN UNLESS OTHERWISE SPECIFIED.  
 3. NO DIMENSIONS ARE GIVEN FOR ELECTRICAL CONNECTIONS UNLESS OTHERWISE SPECIFIED.

**REVISIONS**

- 1) ALL COMPONENTS SHOWN MUST BE REPLACED ONLY WITH EQUIVALENTS SPECIFIED BY THE MANUFACTURER. ORIGINAL PART NUMBERS AND LOCATIONS IN THE ORIGINAL SPECIFICATIONS AND POSITIONS MUST BE MAINTAINED UNLESS OTHERWISE SPECIFIED.
- 2) ALL DIMENSIONS MUST BE IN ACCORDANCE WITH THE DIMENSIONS SHOWN ON THE DRAWING.
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†1 THE DIMENSIONS SHOWN ARE FOR THE PCB BY SLIDES





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