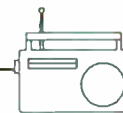


Radio Guide



Radio's Technology Forum

July 1996

New Internet Web Pages

We've got a few new pages on our website, and they're ready to go — RADIO ADS, PRODUCT PAGE, and NEWTECH PAGE.

All of these pages can be accessed through the home page at: <http://www.radioshopper.com>

The RADIO ADS page is an on-line classified ad system, where you can post your ads at no charge.

The PRODUCT PAGE is an on-line product listing of selected Radio Guide and Shopper advertisers, where you can request detailed product information right on line.

The NEWTECH PAGE is a special page for new, just released, products and services for the radio industry. If you see something that interests you here, you can request detailed information, right on the page.

INFO-FAX Card and HELP-FAX Sheet

In this month's Radio Guide envelope, you'll find the INFO-FAX card and the HELP-FAX sheet.

The INFO-FAX card was developed to help you obtain detailed information on any, or all, of our supporting advertisers' products. Just fill out the postage-paid, INFO-FAX reply card, and either mail or fax it back to us. Our reply system will contact our advertisers electronically, with your requests, and your information will be on its way to you, in no time at all.

The HELP-FAX sheet was developed to help you find equipment, parts, schematics, technical information — whatever. Just fill out the sheet and fax it back to us. We'll place your request on our Internet RADIO-ADS, on-line classified ad service, at no charge. Hundreds of people check out this site each week, so you'll be certain of receiving an answer to your request.

Ray Topp

Here's How to Reach Us . . .

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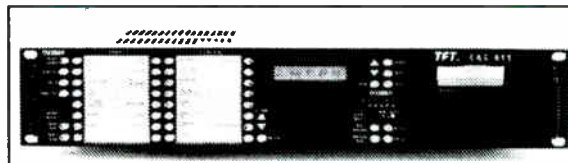
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July 1996

Volume 8, Number 7

Radio Guide Publication

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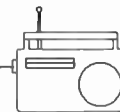
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The SBE Forum

From the SBE National Office



SBE Conference Heads "Toward the Digital Century"

The Society of Broadcast Engineers will present its eleventh annual national SBE Engineering Conference & World Media Expo, October 9-12, 1996 at the Los Angeles Convention Center. Headquarter hotel accommodations will be at the Universal City Hilton & Towers, in Universal City. The Conference and Expo will offer educational workshops, technical paper presentations and equipment exhibits vital to your career as we head "Toward the Digital Century."

SBE Offers Professional Liability Insurance

SBE is pleased to announce a new member benefit. Group rates on professional liability (errors and omissions) insurance. Contract engineers, and others who do not always work as an employee when providing broadcast engineering services, should find this coverage extremely valuable. The program is called "PROinsure," and is administered by MIMS International, Ltd. of Towson, Maryland. The coverage is underwritten by Employers Reinsurance Corporation and is tailored specifically for broadcast engineers.

Prior to now, professional liability insurance was either not available, or too expensive, for most broadcast engineers to consider. For more information and a no-obligation quote, call Debbie Zarzecki at (800) 899-1399.

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With the addition of professional liability coverage, SBE now offers nine types of insurance coverage benefits for you: Professional Liability, Commercial Liability, Term Life Plan, Comprehensive HealthCare Plan, Excess Major Medical Plan, In-Hospital Plan, High-Limit Accident Plan, Disability Income Plan, Medicare Supplement Insurance.

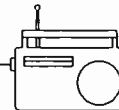
For more SBE information, check out the SBE Internet website at: <http://www.sbe.org>

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Automated Computer Time Service (ACTS)

From NIST, Boulder Colorado



NIST's Automated Computer Time Service (ACTS) has been provided since 1988, to those users who need to synchronize computer clocks to the correct time. The telephone number for ACTS is (303) 494-4774. Using ACTS requires only a computer, a modem, and some simple software. When a computer connects to ACTS by telephone, it receives an ASCII time code. The information in the time code is then used to set the computer's clock.

ACTS works at speeds up to 9600 baud, with 8 data bits, 1 stop bit, and no parity. To receive the full time code, you must connect at a speed of at least 1200 baud. The full time code is transmitted every second and contains more information than the 300 baud time code, which is transmitted every 2 seconds. The full time code looks like this:

JJJJ YRMODA HH:MM:SS TT L DUT1 msADV UTC(NIST) OTM

Where: JJJJ is the Modified Julian Date (MJD).

The MJD is the last five digits of the Julian Date, which is the number of days since January 1, 4713 B.C.

To get the Julian Date, add 2.4 million to the MJD.

YRMODA is the date. It shows the last two digits of the year, the month, and the current day of month.

HH:MM:SS is the time in hours, minutes, seconds.

The time is always sent as Coordinated Universal Time (UTC). An offset needs to be applied to UTC to obtain local time. For example, Mountain Time in the U. S. is 7 hours behind UTC during Standard Time, and 6 hours behind UTC during Daylight Saving Time.

TT is a two digit code (00 to 99) that indicates whether the United States is on Standard Time (ST) or Daylight Saving Time (DST). It also indicates when ST or DST is approaching. This code is set to 00 when ST is in effect, or to 50 when DST is in effect. During the month in which the time change actually occurs, this number de-increments every day until the change occurs.

For example, during the month of October, the U.S. changes from DST to ST. On October 1, the number changes from 50 to the actual number of days until the time change. It will de-increment by 1 every day, and reach 0 the day the change occurs.

L is a one-digit code that indicates whether a leap second will be added or subtracted at midnight on the last day of the current month. If the code is 0, no leap second

will occur this month. If the code is 1, a positive leap second will be added at the end of the month. This means that the last minute of the month will contain 61 seconds instead of 60. If the code is 2, a second will be deleted on the last day of the month. Leap seconds occur at a rate of about one per year. They are used to correct for irregularity in the earth's rotation.

DUT1 is a correction factor for converting UTC to an older form of universal time. It is always a number ranging from -0.8 to +0.8 seconds. This number is added to UTC to obtain UT1.

msADV is a five-digit code that displays the number of milliseconds that NIST advances the time code. It is originally set to 45.0 milliseconds. If you return the on-time marker (OTM) three consecutive times, it will change to reflect the actual one way line delay.

The label UTC(NIST) indicates that you are receiving Coordinated Universal Time (UTC) from the National Institute of Standards and Technology (NIST).

OTM (on-time marker) is an asterisk (*). The time values sent by the time code refer to the arrival time of the OTM. In other words, if the time code says it is 12:45:45, this means it is 12:45:45 when the OTM arrives.

Since the OTM is delayed as it travels from NIST to your computer, ACTS sends it out 45 milliseconds early. This always removes some of the delay. Better results are possible if the user's software returns the OTM to ACTS after it is received. Each time the OTM is returned, ACTS measures the amount of time it took for the OTM to go from ACTS to the user and back to ACTS. This quantity (the round-trip path delay) is divided by 2 to get the one-way path delay. ACTS then advances the OTM by the one-way path delay and the OTM changes from an asterisk to a pound sign (#). When the # sign appears, the time code is synchronized within a few milliseconds of UTC(NIST).

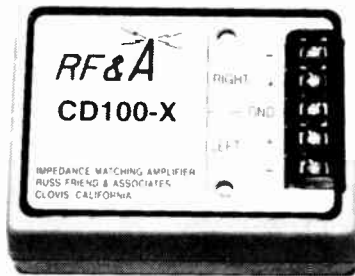
ACTS is a very popular source of time. The service currently has 12 phone lines and receives about 10,000 telephone calls per day.

To download PC-TIME, a simple ACTS program for MS-DOS, go to:

<http://www.bldrdoc.gov/timefreq/service/pctime.zip>

For questions, or more information about the Automated Computer Time Service, contact: Michael Lombardi, email: lombardi@bldrdoc.gov

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FCC Rules for Kahn POWER-side™

Motorola tried to deny broadcasters the right to increase coverage by using SSB — Kahn POWER-side™ equipment. But the FCC specifically ruled that the "Kahn POWER-side system ... may continue to be operated ..." as a mono improvement system. So you can now use POWER-side with Kahn independent sideband exciters to immediately increase coverage to listeners using any and all type of AM receivers.

Federal Communications Commission FCC '93-485:

21. Kahn "POWER-side" Operation. Several parties express concern over the continued acceptability under our rules of operating using the Kahn POWER-side AM single-sideband system. POWER-side operation, as distinct from Kahn stereo operation, involves an AM transmitter with two independent sidebands, containing identical program material, but with intentional level and frequency response differences. This system is implemented with a Kahn independent sideband stereo exciter and is claimed to have certain advantages for reception with monophonic receivers, particularly in adjacent-channel interference situations. CTI and Furr argue that adoption of the proposed standard would prohibit such an implementation. Motorola maintains that the Kahn POWER-side mode of operation is not stereophonic and questions its legality under the present rules.

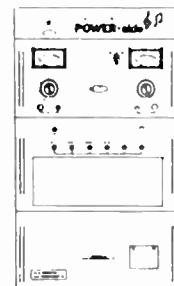
22. Our AM rules do not include a definition of the term "stereophonic." However, generally accepted definitions of stereo service infer two or more channels of audio information designed to produce an audio "image" when demodulated by an appropriate receiver. On this basis, we find that stations employing the Kahn POWER-side system are not subject to the provisions of the stereophonic transmitting standard adopted herein and may continue to be operated, provided that the program material fed to both channels of the exciter is identical in content.

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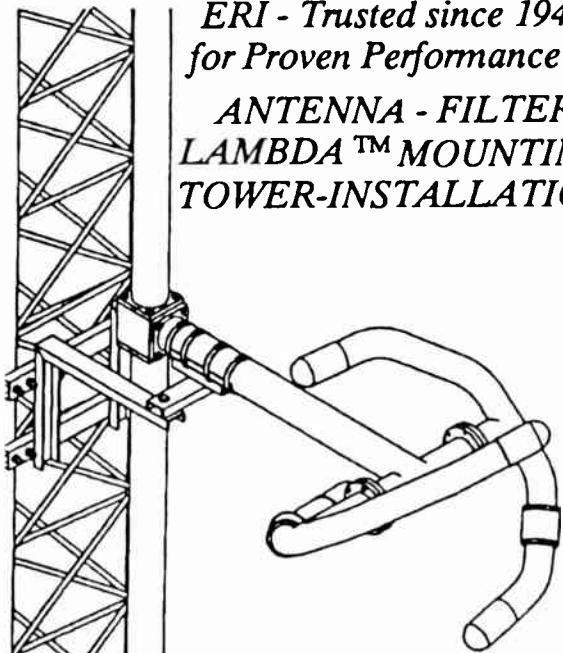
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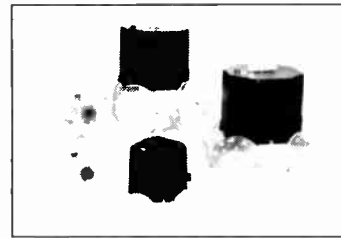
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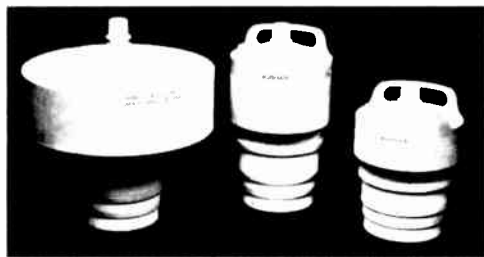
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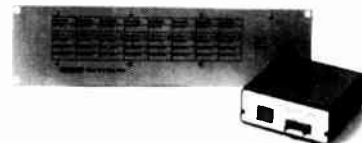
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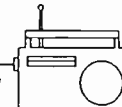
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Radio ENG: Use the Right Tool for the Job

Paul Kaminski — News Director, Motor Sports Radio Network [103725.2301@compuserve.com]



The news and sports business is not “one size fits all.” Anything can, and does happen; those of us who cover news and sports have to be prepared.

It may surprise you when I tell you that quality radio ENG can be done on a budget. You don’t need a Nagra or Neumann condenser mike to bring back quality sound.

Microphones are one tool that will help with quality. I use a Shure SM-63 short omni for two reasons: it’s small enough that it can travel easily, and, it has better sound quality than the EV-635A. It’s what you use when you don’t have time to mike a podium properly or have to grab sound on the run.

I also use a Shure SM-77 (smaller version of the SM-57) in my kit. This comes in very handy when I’m interviewing a race driver in a garage and another car is revving up a few stalls down. Close miking will allow the driver’s voice to come through clear and still hear enough of the ambient sound to place the interview on location. The SM-57 will travel well (if you can’t find a 77).

As far as a tape recorder goes, the Marantz PMD-221 or 222 will outperform all but a portable DAT or mini-disc field unit, if you use chromium dioxide (CrO₂) tape. I use the PMD-222 because it has an XLR mike input. Remember, the better the sound, the better your actualities will sound.

I still use the venerable, dependable Voice-Act (from SoundAmerica Corp.) to couple my tape recorder to the phone, in some cases. I use it with a Western Electric handset, into which I plug the handset cord from the telephone I’m using. This may become an issue, because some telephone systems (digital PBXs for example) may not like it when you try to hook up an RJ-11 device. It plays hob with computer modems, so companies are now marketing boxes to interface to handsets. However, in a press pool situation, most phones are still analog, single lines. So if you can use the handset and Voice-Act with the phone, it’ll simplify your feeding of tape and voicers.

Some reporters may ask the question, OK, but what happens when you get to a place where you can’t use a phone, and all you can use is a pay phone?

Yes, you can hold the pay phone handset over the speaker, if necessary, if that’s the only way you can get the story back. (If you do a lot of street reporting, you may wish to use a cell-phone ... that’s the subject of another article.)

We’ve used a Shure 50-AC acoustic coupler, with some success. This device plugs into the earphone jack of your recorder, and straps over the mouthpiece of the pay phone. Again, the better the recording, the better the sound.

However, the strap wears out, and needs replacing, if you use it often enough.

If you buy reconditioned, look for mikes at the flea markets or music stores, buy the CrO₂ tape on sale, and look in your parts bin for a Western Electric handset. You can assemble a pro-quality news gathering kit for well under \$400.

I’ve discussed quality on a budget and using the right tools for the job. Sometimes, those tools are a bit more expensive. But the added capability may justify the expense.

Handset Replacements

I have (and use) a Microtel from Gentner. You can set the Microtel up to feed tape, mix a mike (it has an XLR mike jack) and listen for cues off air — a very sophisticated piece for under \$300. It also allows you to record telephone audio, and feed a 600 ohm line. So you could use a Microtel to feed the line input of a codec or Marti, simultaneously feed a dial up telephone (if you need hot backup) and hear cues down the phone or from the audio output of an IFB receiver or off-air radio. If you have a bureau in a remote location, or a need to set up a temporary news operation, a Microtel, headphones, microphone, tape recorder, power strip, AC adapters, and connecting cords will put you in business for a lot less money than you think.

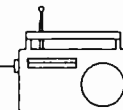
I wouldn’t feed music through this system, but for voice programming and news work, the audio quality should suffice.

Single-line frequency extender

I have and travel with a Comrex PLX micro. I tend to use it when I freelance for the AP, USA and CBC Radio Networks, because the built in hybrid gives me better sound. I can plug in a mike and tape, and the PLX’s circuitry will ride gain and still give me enough volume in my earpiece or headphones to hear cues. I use it in the bypass mode much of the time, but when I use it in the extend mode, the audio does really sound better when it is decoded and processed properly at the studio end. (An aside: I believe the reason most operations won’t use a frequency extender is because they can’t take time to set it up right. There are easy-to-use bidirectional extenders available, although they cost more than the standard interfaces most news operations use.) I use the PLX, when the press pool phones won’t let me use my Voice-Act and handset combination. I’ve used the PLX in the Persian Gulf

(continued on page 7)

Radio ENG



Continued from page 6

and in press rooms around the United States. I've had but one problem with it; Comrex fixed it with no sweat, while loaning me another.

Cell phones

The USA Radio network does take in some material via the single-line Comrex. I did one report for them using the PLX micro and cell phone combination. How easy was it to set up and do? You plug a RJ-11 line cord from the PLX's line in jack into a modem jack adapter hooked to the cell phone. In the case of a Nokia bag phone, the adapter allowed on-hook dialing through the handset. When you seize the line, you shift the audio to the PLX (receive and transmit). Then you do your report in the usual way.

Is it like a Marti? It still doesn't have the high end over 3 kHz, but the low end, coupled with the inherent cellular separation of receive and transmit frequencies gives quality audio. I also used this system in bypass mode to feed golf reports to the AP Network.

The PLX and cell phone system are pricey. However, if quality is your first concern, your budget won't allow a Marti or ISDN, and you need mobility, you should look into such a system. It's also a good system for program backup transmission, using half-speed frequency extension (many

uplink facilities have them in their racks, and will probably keep them for just such cases).

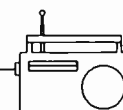
I'd consider myself an expert user/operator of Radio ENG systems, since I've used them in sports and news applications, and in the Persian Gulf in the clean-up phase of Operation Desert Storm with the Armed Forces Radio and Television Service's Desert Network. But I don't profess to know everything about Radio ENG — I'm still learning (as we all should). If I can help you solve a problem, please feel free to E-mail me at "103725.2301@compuserve.com".

We hope to test the Mini-Disc technology in our operation sometime soon. We've seen broadcasters from Brazil use them at races already. Once we bring that on-line, I'll share what I find.

Paul Kaminski is the News Director for the Motor Sports Radio Network, producers of the weekly syndicated "Race-Talk" and "Radio-Road-Test" programs.

He's reported news and sports for the ABC, NBC, USA, AP and Canadian Broadcasting Corporation Radio Networks, the BBC World Service and the Armed Forces Radio and Television Service. He is a Army veteran of Operation Desert Storm's clean-up phase and a graduate of Ithaca College's School of Communications ... Editor.

FCC: Rules Regarding Silent Stations



From the Federal Communications Commission

Report No. MM 96-21

Mass Media Action May 17, 1996

Commission Implements Rules Regarding Silent Broadcast Stations Pursuant to the Telecommunications Act of 1996

The Commission, in accordance with Section 403(l) of the Telecommunications Act of 1996, has adopted rules specifying that the license of any broadcast station that remains off-the-air for any consecutive 12-month period, will expire as a matter of law, notwithstanding any provision, term, or condition of the license to the contrary. The first such licenses will expire on February 9, 1997. These rules will apply to all classes of broadcast stations, commercial and non-commercial, as well as to the remote pick-up and auxiliary stations licensed to the silent station.

License expiration pursuant to these rules will not be affected by a silent station's other FCC applications on file.

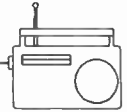
Thus, the Commission warned that "parties seeking to assign a license or to modify the facilities of a silent station should make sure that sufficient time exists, before automatic expiration of the license, to return the station to the air." The Commission's Mass Media Bureau expects to issue a separate public notice addressing such matters further.

The new rules establish a process that is simpler than the revocation proceedings previously used to terminate broadcast licenses. The Commission indicated, however, that it may continue to use those revocation proceedings in the cases of silent stations that do not meet the automatic expiration requirement of 12 consecutive months of silence postdating enactment of the Telecom Act. There is no change in the requirement that broadcasters must notify the Commission and obtain its consent for shorter periods of discontinued operation.

MMB contact: Irene Bleiweiss at (202) 418-2780.

Surface Mount Technology (SMT)

Jim Somich — Radio Engineering Services, Broadview Heights, Ohio [216-546-0967]



The transition from point-to-point wiring, to printed circuits (actually printed wiring) took place during the late 1950's, first in the military and then in consumer electronics. The ease-of-manufacture, consistency and friendliness to automation, made point-to-point wiring obsolete almost overnight.

Printed wiring with leaded components has served the electronics industry well for over 30 years. It has matured from a single layer of wiring to as many as six or more layers! In the late 1980's, a variation on printed wiring called SMT (for surface mount technology) was introduced. A printed wiring board was still used, but there were no holes for component mounting. Special lead-less components (called chip components) were tack-soldered directly to the printed wiring board. SMT was even more automation-friendly than leaded components and printed wiring, but it's main advantage was miniaturization. PW had gone about as far as it could go — boards were becoming packed with sub-miniature leaded components. SMT would increase board density by a factor of ten or more!

An entirely new line of passive and active sub-miniature components were developed for SMT. These chip components could be fed on a tape-reel for automated assembly just like leaded components, but that is where the similarity ended.

Super Automation

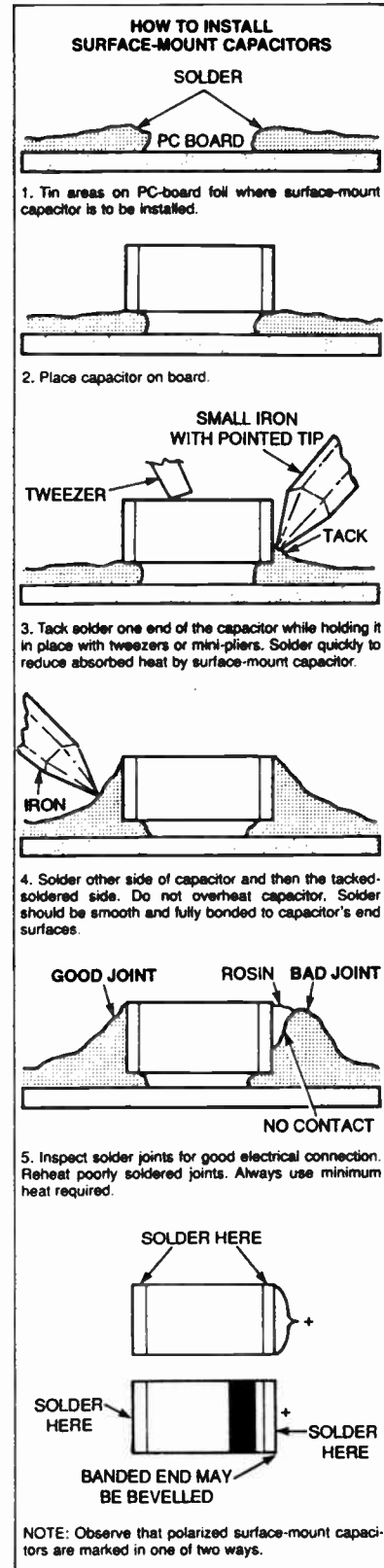
SMT uses a special solder paste made up of a flux and tiny balls of solder. This paste is applied as dots to the printed wiring board by an automatic process in just those areas where solder connections are desired. A mechanical robot then applies the chip components from a tape reel so that they are placed in exactly the right place on the board for soldering. The board is then placed in an oven where the solder in the flux paste liquifies, making the connection.

Broadcast Applications

SMT is an automation-friendly process and is seldom used where small production quantities are desired. It is a very awkward process to perform manually, and programming a robot for SMT requires a high production output to be financially viable. Most radio equipment is still constructed using standard printed wiring techniques and leaded components, but video equipment is already full of SMT. This miniaturization has resulted in smaller handheld cameras with printed wiring boards of incredible density.

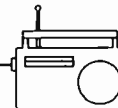
(continued on page 9)

Installing Surface Mount Caps



Surface Mount Technology

Continued from page 8



If you do not get involved with video equipment, your introduction to SMT will probably be through your computer. If you examine the typical computer board you will find SMT to be the dominant construction technique.

SMT Bench Techniques

Most technicians, unfamiliar with service techniques, shun performing any work on SMT boards. The techniques are different from leaded component PWB's, but are not hard to learn. The illustration on page 8 shows how to install a surface mount capacitor chip. Resistors and ICs are installed in exactly the same manner. The chips are tiny, and a strong magnifier lamp is a tremendous help when working with SMT devices.

To remove a defective chip, use solder-wick, along with a low-wattage soldering iron with a tiny tip. Suck the solder from the tack-points and lift the component from the board with a needle nose pliers. Clean off any excess solder with the wick, and clean the pad with an alcohol swab.

As you encounter more SMT, it will be worthwhile to acquire some tools specifically designed for the process. DC Electronics [800- 467-7736] offers a dot maker which is an easy to use hand dispenser that applies exact deposits of solder creams and paste flux from pre-filled caplettes.

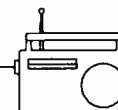
Their VAC Tweezer ensures safe handling and placement of SMT parts without danger to leads or board scratching. Just squeeze the bulb, put the pad on the SMT component and release. Powerful suction holds the part for accurate placement. They have a dot maker kit [Cat No 587-0100] for \$86.90, that includes all of the above along with caplettes of solder creams and fluxes.

Soldering can be performed by using a subminiature iron or a hot air soldering iron designed specifically for SMT work.

Surface Mount Technology is an exciting new construction technique that you will encounter sooner or later. Why not learn something about it now? Tackle that next SMT job with confidence.

FCC: Revised Expanded AM Band Plan

From the Federal Communications Commission



**Public Notice DA 96-408
Released: March 22, 1996
Mass Media Bureau Announces Revised
Expanded AM Broadcast Band
Improvement Factors and Allotment Plan**

As part of the Commission's plan for the overall improvement and revitalization of the AM broadcast band, by this Public Notice we announce the revised Allotment Plan providing for eighty-seven AM radio stations in the AM expanded band. The expanded band is that spectrum between 1605 and 1705 kHz. This Public Notice also announces the revised improvement factors which were used to generate the Allotment Plan.

On September 1, 1995 the Commission rescinded the October 14, 1994 Public Notice (DA 94-1154) listing stations which were potentially eligible to apply for authorizations associated with specific allotments in the expanded AM band. See Memorandum Opinion and Order, 10 FCC Rcd 12143 (1995). The Commission also rescinded a December 3, 1993 Public Notice which set forth interference improvement factor rankings of existing AM licensees who had petitioned to migrate to the expanded band. That Order set forth the

technical procedures that would be used to generate new improvement ranking factors and a revised allotment plan. Interested parties were afforded a thirty day period to comment on the procedures. The Commission is today releasing a Memorandum Opinion and Order, FCC 96-113, "In re Comments in Response to Reconsideration of Implementation of the AM Expanded Band and Allotment Plan" which denies the requests raised in the comments filed in response to the September 6, 1995 Order.

After the Allotment Plan becomes a final Commission action, we will issue a further public notice announcing that each licensee that was allotted a frequency, and thus selected for migration to the expanded band, will be afforded a sixty (60) day period in which to file an application for construction permit authority on the allotted channel. Such licensees will also be notified individually by letter. Applications will be subject to petitions to deny but not to competing applications. Application procedures will be set forth in the further public notice. Licensees selected for migration to the expanded band are reminded that construction of the new facilities cannot commence until issuance by the Commission of a construction permit for the allotted frequency.

For more info, contact Jim Burtle at (202) 418-2660.

Improve the Sensitivity of Your Simpson 260

Jim Somich — Radio Engineering Services, Broadview Heights, Ohio [216-546-0967]



Even in this digital era, I would not be without my trusty old Simpson 260 meter. If you have ever tried to peak a voltage or adjust for a dip with a modern digital multimeter, you know what I mean. Sometimes analog really is better!

The only shortcoming of the classic 260 (which is still made today) is its sensitivity. The most sensitive DC voltage scale on the 260 is the special 1 volt scale. You activate this scale by plugging the positive probe into the +1 volt jack on the meter. With modern digital multimeters, we have begun to take extreme sensitivity for granted. A one volt scale on a 20,000 ohms per volt meter is often not sufficient for seeing very small voltages.

What I needed was a compact probe amplifier that would increase the Simpson's sensitivity to around 30 millivolts full scale. RCA manufactures a CMOS operational amplifier designated as CA3130. The 3130 has an extremely high input impedance, a 15 MHz, unity-gain bandwidth, and a 10-volt-per microsecond slew rate. Low frequency open loop gain is 100,000. The available output current is 20ma in either direction. The optimum input reference is one-half the supply voltage.

Total power-supply voltage can range from 5 to 15 volts (+/-2.5 to +/-7.5). A current of 10ma. is typical with a 15volt supply.

The schematic drawing (Figure 1) below, illustrates the 3130 amplifier I built for the Simpson 260. This circuit increases the input impedance of the 260 from 20,000 ohms per volt (Only 20k on the one volt scale) to 10 megohms. The amplifier can be switched to the X10 or X100 gain configuration. When you connect the amplifier to your 260 on the 1 volt scale, it is converted to a 100mv (X10) or 10mv (X100) full scale meter.

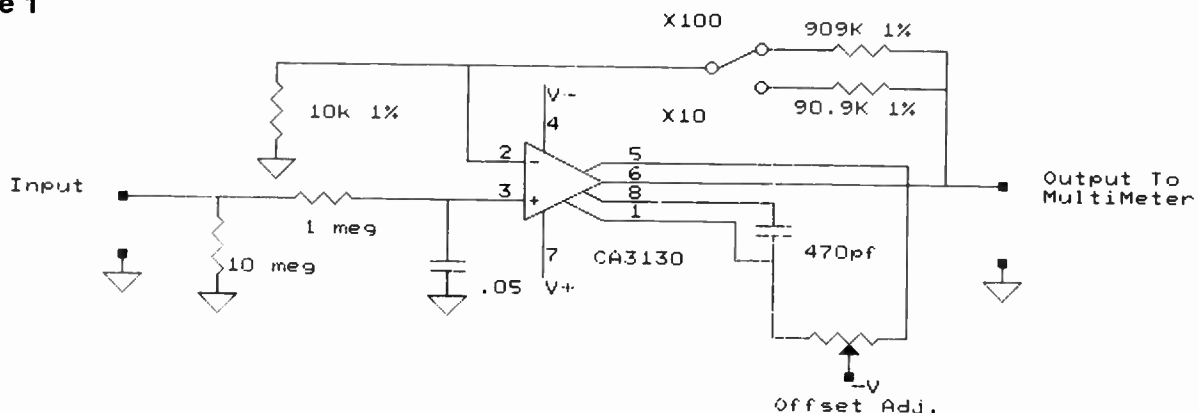
On the 2.5 volt scale, you would have a 250mv full scale meter (X10) or a 25mv full scale meter (X100). That's a big increase and sufficient for measuring the tiniest voltages. The input impedance stays at 10 megohms on either scale.

Opening the ground return on the 10k resistor will convert the opamp to a voltage follower with unity gain for less-sensitive ranging. Further attenuation can be obtained by tapping the 10 megohm input resistor at suitable attenuation values.

You can build this circuit into a small plastic project box and power it from two batteries. The addition of this amplifier to your Simpson 260, or any other analog multimeter, will inject new life into an old standby.

And you can learn something about CMOS opamps at the same time!

Figure 1



Radio Guide Web-Tip

<http://www.fcc.gov/mmb.html>

This is the FCC's Mass Media Bureau website. Here, you can find the latest Report and Orders, Public Notices, Notices of Proposed Rulemaking, and AM and FM engineering databases.

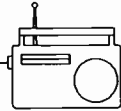
Radio Guide Web-Tip

<http://www.broadcast.net/events.html>

This is the Broadcast Net's world-wide calendar of events. This site will give you the dates for all the broadcast events in the U.S., and around the world. Check it out.

FCC: Amended Renewal

From the FCC



News Report No. MM 96-19

Action in Docket Case - April 12, 1996

FCC Implements Amended Renewal Procedures Under the Telecom Act

The Commission has adopted an Order implementing Section 204(a) of the Telecommunications Act of 1996 ("Telecom Act"). The Telecom Act adopts new Section 309(k) of the Communications Act, which eliminates comparative renewal hearings and directs the Commission to grant a broadcaster's renewal application if statutory renewal standards are met. This new procedure effects a major change in the way the Commission processes renewals. With respect to broadcast renewal applications filed after May 1, 1995, the statute eliminates comparative renewals and establishes, instead, a new two-step renewal procedure. It also codifies specific standards for the Commission to apply in considering broadcasters' renewal applications. Additionally, Section 204(a)(2) of the Telecom Act amends Section 309(d) of the Communications Act to make the standard for filing petitions to deny conform to the new statutory renewal standards. The Commission's rules will be modified to conform to the renewal procedures and standards adopted in the Telecom Act.

The Telecom Act does not define the terms contained in the renewal standards embodied in Section 309(k), and the Commission likewise does not define those terms in this Order. It is the Commission's present intent to continue to apply existing policy statements and case law, refining these as appropriate on a case-by-case basis in interpreting the statutory terms that govern the new renewal process. If the Commission determines at some future time that further clarification of the renewal standards is appropriate, it shall conduct such proceedings as may be warranted.

Pending comparative renewal proceedings and mutual exclusivities involving applications filed on or before May 1, 1995, will be concluded pursuant to the current rules, and accordingly, the Commission will leave intact procedural provisions of the current rules that refer to comparative renewal proceedings until those pending proceedings and exclusivities are finally resolved. The Commission also terminated BC Docket No. 81-742 in which the Commission had been considering reform of the comparative renewal process.

News Media contact: Audrey Spivack at (202) 418-0500. Mass Media Bureau contact: Mania K. Baghdadi at (202) 418-2130.

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For further information contact:

**Jim Somich at MicroCon Systems Ltd.
Phone 216-546-0967**

Satellite Radio Guide™

These listings are courtesy of Universal Electronic's Satellite Guide™ Subscriptions are \$25.00 — Call 614-866-4605.

The listings in this issue of Radio Guide are Part-2 of: AUDIO SUBCARRIERS ABOVE VIDEO (5-8 MHz)

	GALAXY 5	(G5)	C-Band	125°W
TR-02	*	KLON-FM, Long Beach, CA		5.58 / 5.76
TR-03		Religious, Trinity Broadcasting		5.58 / 5.76
		Trinity Radio Service (Spanish)		5.96
		Storyvision Computer Service		7.30
TR-03		Trinity Broadcasting, Network Control		8.00
TR-05		CNN Radio Network, News, Sports News		6.20
		CNN Radio Network, News, Sports News		7.58
TR-06	*	World Radio Network, 24 hours		6.20
		Unidentified Radio, Religious		6.45
		World Radio Network, Full World-Wide Programming, BBC		6.80
		BBC - Radio Canada		6.80
		Brother Staires Radio Network, Tone		7.40
TR-07		"Superguide," TVRO Guide Service		5.48
		KILA-FM, Sounds of the Spirit Radio Network		5.58 / 6.12
		WFMT-FM, Chicago, IL, Classical Music		6.30 / 6.48
		Yesterday USA / Old Time Radio		6.80
TR-08	*	World Radio Network, Multilingual, News		6.80
TR-09		ESPN, Secondary Audio, Sports		7.56
TR-11		Standard News Network, Talk Radio, SBN		5.94
		CBN, Christian Radio Network, Religious, Talk, Music		6.12
TR-18	*	WWTN-FM, Nashville, Country Music, Talk Radio		7.38 / 7.55
		WSM-AM Nashville, Country Music, (Changes to Single Mono Signal at Night)		7.55
TR-21		America's Country Music, Country Music (SuperAudio)		5.04 / 7.75
		Soft Hits, Soft Rock (SuperAudio), Big Bands		5.22 / 5.40
		Big Bands, Saturday 10-2 a.m. (SuperAudio)		5.58 / 5.75
		Light and Lively Rock, Contemporary Music (SuperAudio)		5.94 / 6.12
		Classic Collections, Classical Music (SuperAudio)		6.30 / 6.48
		New Age Jazz (SuperAudio)		7.38 / 7.56
		Classic Hits, Golden Oldies, 50s, etc. (SuperAudio), Jones Satellite Services		8.10 / 8.28
TR-22	*	CNN Headline News, Audio From CNN		7.60

	GSTAR 2	(GS2)	Ku-Band	125°W
TR-06		CNN Radio Network, News Feeds		6.30
TR-21		Muslim Audio Feeds, URDU - 6.50, English - 7.02, Arabic - 7.20, French - 7.92		

	SBS 5	(B5)	Ku-Band	123°W
TR-11		American Drug Stores - In-Store Service		5.50

(continued on page 13)

Satellite Radio Guide™

The listings in this issue of Radio Guide are Part-2 of:
AUDIO SUBCARRIERS ABOVE VIDEO (5-8 MHz)

Continued from page 12

	GALAXY 4	(G4)	C-Band	99°W
TR-06	KDVA-FM, Gravette, AK, Variety, Music, Oldies			5.58 / 5.76
	ARN, Arkansas Radio Network, Variety Music, Occasional Audio			6.20
	WCRP-FM, PR - Religious, Talk, Spanish			6.53
	* IAM Radio, Music			7.74
TR-12	CNN In-flight Radio Service (English)			6.20
	CNN In-flight Radio Service (Spanish)			6.80
TR-15	WHME-FM, South Bend, Sports			5.60 / 5.75
	For the People (PRN) 2 - 5 p.m., Chuck Harder			7.46
	World Harvest Radio, WHRI, Shortwave Station			7.46 / 7.55 / 7.64
	For the People (PRN) 10 - 12 p.m., Chuck Harder			7.55
	Occasional Audio Programming, WHRI - Relay			7.64
TR-16	Data Channel			5.80
TR-19	Data Channel			5.96

	GALAXY 4	(G4)	Ku-Band	99°W
TR-23	Mormon Tabernacle Church-Mormon Choir, Sunday 11:30 a.m. (No Video)			6.20 / 6.80

	TELSTAR 401	(T1)	C-Band	97°W
TR-03	"Hard Copy," Spanish Version			5.80
TR-04	Home Page Radio Computer Show - Saturday, 5:00 p.m.			5.80
TR-14	* "More" Radio			7.50

	TELSTAR 401	(B2)	Ku-Band	97°W
TR-10B	DMX, Music Services - Ku-Band, Special Receiver Required			
TR-14B	Georgia Public TV, Secondary Audio			5.04 / 5.22
	Peach State, Secondary Audio Channel			5.04 / 5.22
	Peach State Public Radio, Classical Music			5.40 / 5.58
	GP-TV, News and Reading Service			5.76
TR-28	Georgia Public Radio			5.46 / 5.58
	Georgia Talking Book			5.76

	GALAXY 3	(G3)	C-Band	93.5°W
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NOTE: Satellite Out of Service

(continued on page 14)

Satellite Radio Guide™

The listings in this issue of Radio Guide are Part-2 of:
AUDIO SUBCARRIERS ABOVE VIDEO (5-8 MHz)

Continued from page 13

	GALAXY 7	(G7)	C-Band	91°W
TR-02	Data Channel			5.80
	Audio for CBS, Scrambled Video Signal			6.20 / 6.80
TR-04	Audio for FX Service			5.80 / 6.80
	Occasional Audio			6.20
TR-05	Occasional Audio			6.20
TR-10	Radio Maria (Italian)			5.80
	Radio Dubai (Arabic)			7.40
TR-10	*	Occasional Audio with Music		8.00
TR-14	Occasional Audio			6.20
	Religious Programming, Music, Inspirational Audio, Music			7.74
TR-15	RAI, Italian Network			7.38
TR-16	Occasional Audio			5.80
TR-19	Data Channel			5.80
	WCBS-AM, New York - News, Talk			7.40

	TELSTAR 402R	(T4)	C-Band	89°W
TR-04	*	Tech Talk Radio Network, Omega		5.80
TR-11	*	Yesterday U.S.A.		5.80
TR-18	*	RDP, Portuguese Radio Network		8.00

	GALAXY 6	(G6)	C-Band	74°W
TR-09		MUCH Music, Contact Channel, Occasional Audio		7.70
TR-10		Arab Network Audio		5.80
TR-14	*	USA Patriot Network - Talk Show, 24 hours		5.80
	*	WCCO Radio, Various Backhauls, Viking International, Liberty News, Eagle Network		7.56
TR-15		Data Transmissions		5.80
	*	WCCO-AM, Minneapolis / St. Paul, Minnesota Twins, Sports, MLB, CBS News		6.20
	*	Tech-Talk, DB-1 Satellite Radio Show		6.20
TR-20	*	CNN Headline News Audio, Occasional Audio		6.80
TR-23		Worship Audio Services, Music		7.50
	*	Coyote Broadcasting		8.10



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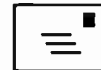
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