



THE COMMUNICATOR



Volume 5, Issue 11

November 2005

SARC ELECTIONS

The SARC ELECTIONS will take place at the November 2005 meeting. All members in good standing will be able to cast ballots.

Nominations for office are still open and will be open until the vote takes place.

The following members are currently on the ballot.

President	Mike Swiader, KA9E
Vice President	Bob Burlison, KG7QJ Harold Newman, KD7VK
Secretary	Akiva Smith, KE7DAB
Treasurer	Dianne Hoffman, KD7DJE

Board Nominations

Terry Cross, NK7T
 Gene Wilson, WA8TSG
 Jonathan Simmonds, KD7VCF
 Jim Hoggard, K7MY
 Jo Wilson
 Shawn Shroyer, KE7BVI
 Larry Griffin, AD7GL
 Steve Gurley, KY7W
 Mary Simmonds, KD7ZBC

W7ASC ADAW Column

The No-Code Tech class at Mesa Community College is almost over. Testing will be at the Superstition ARC Hamfest Saturday December 3rd. So far two of our students took the test at Devry 11/5 and passed! Congratulations to Gena, KE7FJH, and Thomas, KE7FJJ. The next Tech License class will start Saturday February 25th 2006.

The W7ASC antennas are back up with the exception of the "South" Sloper where we will have to replace it. The antenna traps and insulators were thoroughly hosed when the roof work was done last Spring. The satellite antennas are now aligned. Next is to get the automatic computer tracking software set up. The CARL Board will replace the CCD camera in the shack with a new one. The old CCD camera could be fixed but would only work marginally (the color is way off). We also discussed possible changes in the shift hours for one shift 10AM to 2PM. Unfortunately this will not do much to help get volunteers for the weekends. If there are any changes in hours it will occur after Thanksgiving.

One additional item from the CARL meeting was a discussion on a possible W7ASC "Hamfest" for early 2006. More on that later.

The annual CARL meeting for all Volunteers will be held at the Science Center Saturday January 28th 2006. Door prize is a \$50 HRO gift certificate.

Even though the "Snow Birds" are coming back we continue to be VERY sort on volunteers for W7ASC! Spread the word at your Ham Club. Call Bob at 480-961-1109 and volunteer now. A Volunteer sign-up page is available at www.w7asc.org

-73 de KG7QJ Bob B.
kg7qj@cox.net 480-961-1109

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SUPERSTITUTION AMATEUR RADIO CLUB
Board Meeting Minutes
November 8, 2005

Opening

The regular meeting of the SARC Governing Board was called to order at 6:30 PM on November 8, 2005 in Village Inn at Power Road and Main Street in Mesa, Arizona by Mike Swiader.

Present

Mike Swiader, Terry and Myrna Cross, Art and Dianne Hoffman, Harold Newman, Ron McKee, Jim Hoggard, Shawn Shroyer, Akiva Smith, Gene and Jo Wilson, Jonathan and Mary Simmonds, Stu, Bob Burleson, Steve Gurley, Rodney Bevill

Open Issues

Dianne Hoffman
Provide the financial report in the absence of Ron Hedtke.

General Fund	\$1920.33
Repeater Fund	\$3849.17
HAM Fest	\$3355.44
Petty cash	\$ 100.00

Ron motioned to accept report and seconded by Akiva.

Old Business

None reported

New Business

Ron McKee
HAMFEST activities are progressing. The door prizes are on hand and under the control of Mike. All members are encouraged to talk up the event on all repeaters. The food committee still needs some help. Ticket sells and food sells are the biggest jobs and provide the cash flow need to keep event alive each year. Ron needs help to get equipment from the club trailer to the event. Permits are in the mail and should arrive shortly. Costs breakdown are as follows (currently):

MCC	498.48	(needed now)
Port A Potty	307.34	(needed Dec 2)
Roll of tickets		
AZ Rental	248.59	
Generators		
Tables		
Coffee pots		

Steve will check to see the club needs vendor tickets.
Marriott Courtyard has set a \$10 discount for up to 10 rooms.
Ron Hedtke will provide wash station.
Lastly, event is in need of hourly prizes.

Terry Cross

Presented a list of individuals currently running for office.

Officer Nominations:

President	Mike Swiader, KA9E
Vice President	Bob Burleson, KG7QJ
	Harold Newman, KD7VK
Secretary	Akiva Smith, KE7DAB
Treasurer	Dianne Hoffman, KD7DJE

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Larry Griffin, AD7GL
Steve Gurley, KY7W
Mary Simmonds, KD7ZBC

Mike Swiader

By-laws need to be changed/updated, activity may start in January.
Next meeting will be annual junque auction.
Dues for all members will be due in January and will be delinquent the 1st of February.

Harold Newman

Lost Dutchman Days event is progressing. A sample of the QSL card was circulated for everyone to see. Updated information for the card is need; i.e., current mail address, etc. Steve volunteered to help with updating the cards. Operators will be provided with information to give the contacts about the Lost Dutchman. The total expenses should be close to zero. Ron McKee stated he would look into getting the scouts antenna trailer for use at the event. It was brought up that log sheets will be needed to record all the contacts. Currently 10, 15, and 20 meters are planned but will probably be expanded. Also additional location may operate under the event call sign on other bands.

Jo Wilson

Christmas party is progressing. Jo stated she needs the 501c3 number in order to get donations for gifts and prizes. Event will be a Bishop's Family Restaurant on December 10 at 6:00PM.

Art Hoffman

Picnic is set. Event will be a potluck and will be located at Red Mountain Park on February 11. A radio station is planned for the event.

Adjournment

Meeting was adjourned at 7:15 PM by Steve.

Learn how to program your calculator

Editor's Note: In this second installment of a three-part series, Ted KC7ZEO follows up on his beginner's guide to calculators and explains programming.

Ted Roubal / KC7ZEO
Relay Correspondent

Providing your TI with a set of instructions (TI refers to instructions as command lines) that guide its operation through a series of steps or events in order to solve problems of mathematics and electronics is called programming.

Programs are very useful because they make it unnecessary to re-enter a long list of instructions each time you want to perform a series of often laborious mathematical operations on data. Programs can be saved in calculator memory (the TI 83s have lots of memory) and you can call up a program for use at any time. You can also delete programs from memory.

Inherent in programming is the ability to input numerical values (data) that the program uses for obtaining answers. With most programs, once all the data is input into the calculator, the program is automatically executed and returns an answer (or answers). Then it is ready to accept new data and go through the problem-solving process again.

Because the emphasis here is on programming calculators, minimal discussion of circuit operation will be presented.

If the reader would like to brush up on analog electronics, the 3rd and 6th editions of Electronic Principles by Albert P. Malvino, used in Electronics Technology at NSCC, are a good place to start.

The 6th edition is available at the NSCC bookstore.

The Programming Process

We'll write two programs, both of which can prove of value in any homebrew small-signal amplifier work. Because Voltage Divider Bias is widely used in transistorized linear voltage

circuits (it's often called Universal Bias), writing a program that analyzes VDB is a good place to start our programming adventure.

The key to a well-designed VDB is the "stiffness" of the voltage divider. A stiff divider characterizes a system where the Q-point of an amplifier is fixed and immune to variations in transistor Beta (β). The reader is referred to Malvino 3rd ed., pgs. 154-156 (or pgs. 260-266 in the 6th ed.) for a rigorous treatment of VDB.

The second program is for a swamped CE amplifier, a smallsignal amplifier that uses VDB.

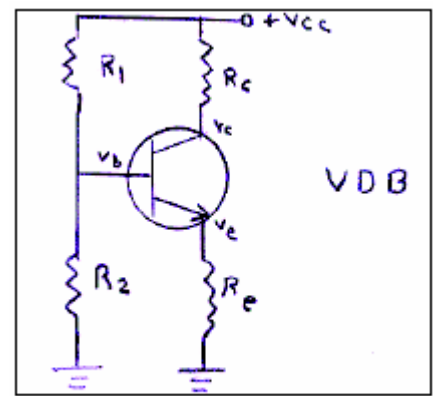


Figure 1: The VDB.

Referring to Figure 1, let's work on a program that uses as inputs Vcc, R1, R2, Re and Rc, and returns (or displays) Vbb, Ve, Ie=Ic, Vc and Vce. With these values we can plot the DC load line and locate the Q-point (illustrated on page 9). The math steps are shown below:

Step 1: $V_{bb} = (R_2 \times V_{cc}) \div (R_1 + R_2)$

Step 2: $V_e = V_{bb} - 0.7$

Step 3: $I_e = I_c = (V_{bb} - 0.7) \div R_e$

Step 4: $V_c = V_{cc} - (I_e \times R_c)$

Step 5: $V_{ce} = V_c - V_e$

In order to enable the calculator to perform mathematical operations, we must devise a means of inputting numerical data for the calculator to work with.

To accomplish this, use is made of the prompt instruction. When prompt is encountered in a program, it means "now go ahead and input the data." We can input all the data as a single group of numbers or we can use prompt more than once in a program, thus providing a means of inputting portions of the data at a time.

Which method to use depends on the nature of the program. But, for now, the simplest approach is to input all the numbers as a single group. Thus, by inserting the prompt instruction near the beginning of the program, we can input all the data and the calculator can fetch from this list the appropriate numbers when called for in a program. The actual mechanics of inputting data following a prompt instruction will be thoroughly explained later.

Programming your calculator

When the last piece of data is entered, the program will now run. But as our program now stands, no answers will be displayed by the calculator. Why? The program is incomplete; we must include a few more instructions to make it perform as it should.

In the first place, we forgot to tell the calculator to display the results and when. `display` is an instruction the calculator understands, and when the program encounters it, the answer to a just-completed step is displayed.

So let's modify the above series of steps to include prompt and display at the appropriate locations in the program.

We write: prompt (enter data, explained later)

1. $(R2 \times Vcc)/(R2+R1)$ display `Vbb`
2. $Vbb - 0.7$ display `Ve`
3. $(Vbb - 0.7) / Re$ display `Ie=Ic`
4. $Vcc - (Ie \times Rc)$ display `Vc`
5. $Vc - Ve$ display `Vce`

And when we run the program, we are disappointed because all we see is `vce` is (numerical value) done

None of the intermediate step answers (steps 1-4) are displayed. If you look closely at the screen as the program runs, you'll see a blur of numbers moving down the screen so fast you can't make them out.

Evidently, we are still lacking something! And what are we lacking?

We need to use yet another instruction that the calculator recognizes—the pause instruction. When pause is encountered in a program, it signals the program to stop, keeps displaying the answer to the just-completed step and doesn't proceed until instructed to do so.

And what gets the program up and

running again? Pressing enter. Then the program continues on to the next step, solves the step, displays the answer, encounters pause and stops with the answer maintained in view, awaiting another press of enter, and so forth until all the answers to all the steps have been presented.

Then the program stops, displays done and goes to sleep. It's easy to reawaken, however, and run the program again as often as desired.

We're almost ready for some actual programming, but there remains the matter of doing it in a way—using a format—that makes the program perfectly understandable by the calculator.

First is to consider that the steps in the problem solving build on one another. That is, the answer to the first step is used in the second step, and so we must devise a way to make this known to the calculator.

The way we do this is to use the store instruction. When the program encounters store (designated by the `sto` key), it stores temporarily in calculator memory the answer to the step just completed.

Thus, if we wrote $(2 \times Vcc)$ `sto A`, this instructs the calculator to store the numerical value answer of 2 times `Vcc` in a memory location we have designated as `A`. (Don't be concerned right now about memory locations; I will explain this shortly.)

Then, if the next step in the program (or any subsequent steps, for that matter), requires the value $2 \times Vcc$ in order to calculate a result, we simply designate 2 times `Vcc` as `A` when writing the program.

If we now wanted to divide the result of $2 \times Vcc$ by 600, we instruct the calculator to do this with the instruction $(A \div 600)$, and since we'll probably need this value further on, we complete the instruction with `sto b`. That is, $(A \div 600)$ `sto b` instructs the calculator to store the result of `A` divided by 600 in memory slot `B`.

Now for some real programming. I suggest you read the following thoroughly before you put calculator in hand and try to follow along. Later, I'll show you some programming aids that will cut down on your chance of making mistakes when entering your program.

But if you do make mistakes—and this is easy to do—I'll show you how to correct them without

having to start all over again. So let's get started:

1. Press the prgm key.
2. If no previous programs are in memory, the calculator will display: exec edit new across the top of the screen.
3. Press the ► button twice. new will be highlighted (white letters on a black background), and the message creat new is displayed.
4. Press enter and the message program name = is displayed.

The calculator is asking that you now name your program, and you must do so to proceed.

Also, although not indicated, alpha-lock is on. I assume you know a little about your calculator and the meaning of "alpha-lock is on." If not, read your TI instruction manual.

I named my program VDB (which stands for Voltage Divider Bias). When alpha-lock is on, the letter printed in green on the face of the calculator just above a key at the right edge will appear on the screen when a key is pressed.

Thus, VDB is selected by pressing the 6, x and apps keys in that order. The program name can be one to eight characters long, but the first character must be a letter and the rest can be letters and / or numbers or @.

One further note: You cannot place spaces in a program name. That is, the space key is nonfunctional in this mode. I don't know the reason for this; I have not seen it explained anywhere. BASE BIAS, for example, is entered as BASEBIAS. But this offers no special difficulty.

Giving a program a name also makes it possible to use one program as part of another. Suppose you're preparing a new program that needs the same answers as that supplied by a program you've already written, say VDB.

Instead of rewriting the earlier program, you use the instruction recall vdb (rcl key) at the place in your new program when you need the information provided by VDB.

5. After selecting a name, press enter.

6. You are now in the editor mode, and the colon (:) in the first column and second row indicates the calculator is ready to receive program instructions (TI calls these commands).

7. Our first instruction is the prompt instruction. Press prgm ► 2 to select prompt.

Press alpha A, alpha B, alpha C, alpha D, alpha D enter (Note: Don't forget the commas!) In all calculations to follow, A is Vcc, B is R2, C is R1, D is Re and E is Rc.

Now we are ready for Step I.

8. Press the following keys:

((alpha A x alpha B)÷(alpha B + alpha C)) sto alpha P enter

Now press prgm 3 to select display, then press the 2nd alphalock "VBB IS" alpha, alpha P enter (Note: Don't forget the quotes).

Now press prgm 8 to highlight pause, then press enter (Note: To place a space between VBB and IS, use the ■ key).

NEXT.

Press (alpha P - 0.7) sto alpha Q enter

Then press prgm ► 3 (display) and press 2nd alpha-lock "VE IS" alpha, alpha Q enter. Then press prgm 8 (pause) enter

Press (alpha Q÷alpha D) sto alpha R enter

Press prgm 3 (display) 2nd alpha-lock "IC OR IE IS" alpha, alpha R enter

Now press prgm 8 (pause) enter Press (alpha A - (alpha R x alpha E)) sto alpha S enter

Press prgm ► 3 (display) 2nd alpha-lock "VC IS" alpha, alpha S enter Press prgm 8 (pause) enter

And finally:

(alpha S - alpha Q) sto alpha T enter

Press prgm ► 3 (display) 2nd alpha-lock "VCE IS" alpha, alpha T enter

If you want to run the program again, press 2nd quit prgm enter enter (you are prompted to enter data and rerun the program). Otherwise, press 2nd quit clear to return to the home screen.

Your program is now saved under the name VDB. To access it at any time, Press prgm, select VDB from the list of programs stored, then press enter.

That's it for the VDB program. In order reduce your chances of mistakes (and also greatly shorten the time) when entering a program, you should write on paper all keystrokes for the program. But in place of letters, list the actual keys to press.

In step 1, for example, do not write:

((alpha A x alpha B)÷(alpha B+alpha C))

```
sto alpha P enter. Instead, write:
((alpha math x alpha apps)÷(alpha
apps+alpha prgm)) sto alpha 8 enter
In like manner, prgm ▶ 3 (display) 2nd
alpha lock "VBB IS" alpha, alpha P
enter is written: prgm ▶ 3 2nd alpha-
lock + 6 apps apps x ln + alpha, alpha
8 enter
Having done all of the above, let's
see if our program works. Press 2nd
quit enter enter and the prompt. A? is
displayed. Let's use a value of 10
volts for Vcc, so press 10 and enter.
B? is displayed, and let's use 2,200
ohms for B, so press 2200 enter.
C? is displayed, and let's use 10,000
ohms for R1, so press 10000 enter.
D? is displayed, and for Re let's use
1,000 ohms, so press 1000 enter.
E? is displayed. We'll use 3,600 ohms
for Re, so press 3600 enter.
If the program does not have any
mistakes, it starts and displays vbb is
1.803278689.
Press enter and displayed is ve is
1.103278689.
Press enter and displayed is ie or ic
is 0.0011032787.
Press enter and displayed is vc is
6.028196721.
Press enter and displayed is vce is
4.924918033 done.
```

The data can be used for constructing the DC load line and locating a Q-point (Figure 2).

If, however, after entering the data and pressing enter there is something wrong with the program, you will be greeted with one of several messages. The most common is:

- improper syntax
- 1. quit
- 2. goto.

Press 2 goto and this will take you to the location in the program where the problem lies. The word *syntax* refers to the orderly flow of instructions. At some point in the program, the instructions don't make sense.

Perhaps you left out a divide or multiplication sign or asked for a memory location that does not exist (you entered a wrong letter, for instance). Or maybe you omitted a quotation mark.

In our final installment next month, we'll look at some mistake correcting tactics. We'll also try our hand at another program—a swamped CE amplifier.

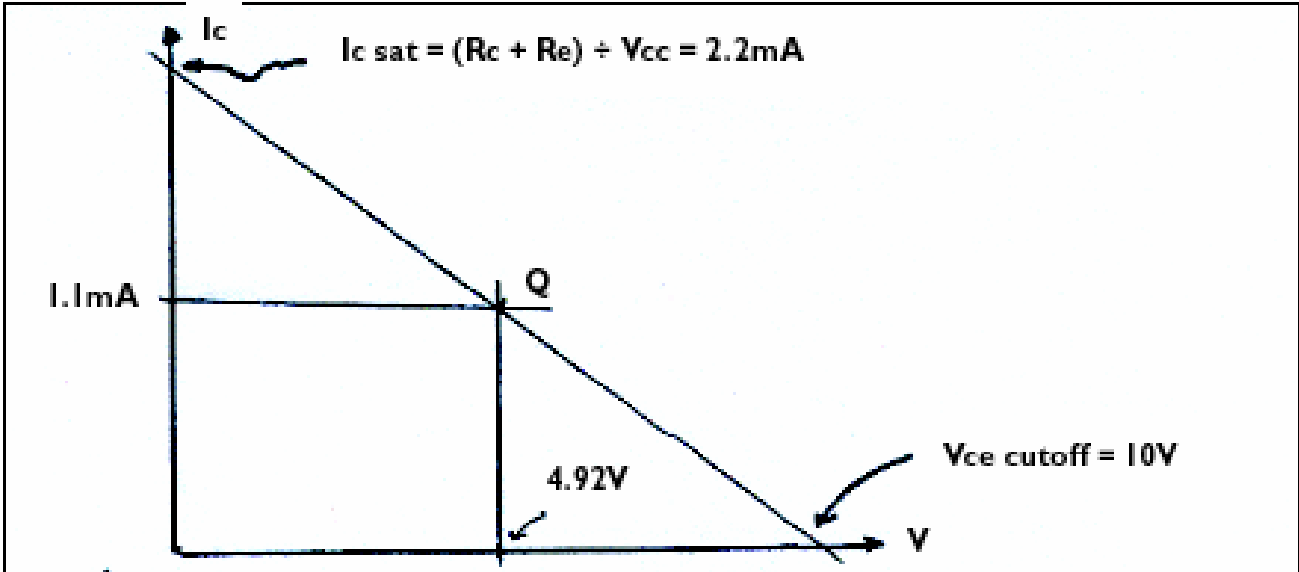


Figure 2: The DC load line and Q-point.

MEETING HOUSE

The Superstition Amateur Radio Club Meets at the Mesa Community College, at Southern and Dobson in Mesa.

Our meeting room is in the basement of the Clock Tower, center of Campus.

CALENDAR OF EVENTS

BOARD MEETING

PLACE: VILLAGE INN
POWER ROAD AND MAIN STREETS IN MESA
TIME: 6:30 PM, SECOND TUESDAY OF THE MONTH
DATE: 8 NOVEMBER 2005

GENERAL MEETING

PLACE: MESA COMMUNITY COLLEGE AT SOUTHERN AND DOBSON STREETS
ROOM: KIVA – BASEMENT AT CLOCK TOWER
TIME: 7 PM, THIRD TUESDAY OF THE MONTH
DATE: 15 NOVEMBER 2005

VE TESTING

PLACE: MESA UTILITIES OFFICE, 640 NORTH MESA DR.
TIME: 6:00 PM, THIRD MONDAY OF THE MONTH
DATE: 21 NOVEMBER 2005

FUTURE MEETING LOCATIONS

NOVEMBER: EMPLOYEE LOUNGE

2005 OFFICERS

President: Mike Swiader, KA9E
Cell: 480-201-1916
Email:
Vice Pres.: Bob Burleson, KG7QJ
Secretary: Rodney Bevill, K7RLB
Treasurer: Ron Hedtke, AC7MN
Directors: Terry Cross, NK7T
Jim Hoggard, K7MY
Harold Newman, KD7VK
Jonathan Simmonds, KD7VCF
Gene Wilson, WA8TSG

COMMITTEES

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Editor: Rod Bevill, K7RLB
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Net Control Station

Wednesdays: KG7FA, John
147.12 MHz Repeater at 8:00 PM
Thursdays: (Various)
28.47 MHz at 7:30 PM
Amateur Radio Newline both nights: Provided by
the net host

Classifieds

Help Needed

I am needing assistance in raising an antenna. I have recently bought and 90% assembled a GAP Titan antenna. I am ready now to put it up, assemble the bottom counterpoise loop, and tune/calibrate it. I do not have an SWR/Power meter outside of my radio, and do not have experience in these final steps. If anyone would be willing to lend their help (hopefully this weekend), I would be grateful. Since I have installed the mast is next to my flat patio roof I don't expect access for raising, or adjusting the antenna will be difficult. I am located in Mesa near the cross streets of Southern and Val Vista

Greg
(480) 854-8789
KD7NKH

LINKS

[ARRL Southwestern Division](#)
[ARRL Arizona Section](#)
[Arizona Repeater Owners Frequency Coordination Committee](#)
[Tucson Amateur Packet Radio](#)

Who We Are

The Communicator is published monthly by the Superstition Amateur Radio Club, Inc. (SARC), and is e-mailed to all club members.

Please notify the editor if you do not receive your newsletter, have a change of address, or have found an error. Please direct all submissions to the editor.

The SARC generally permits reuse of any article in the Communicator as long as the newsletter and the article's author are credited. However, some articles may be copyrighted by the author. Please contact the editor.

Club Repeater: WB7TJD/R
147.120 MHz(+), 162.2 Hz PL
449.60 MHz(-), 100.0 PL
Club Web Site: www.wb7tid.org

NEEDED!

We need your article for the Newsletter. Write us about your most embarrassing situation relating to Ham Radio. Send photos as well.

2005 HAM EVENTS

December 3, 2005

Superstition ARC
Mesa Community College
Mesa, AZ

February 17-19, 2006

Yuma Amateur Radio Hamfest Organization
Yuma County Fairgrounds
Yuma, AZ

September 22-24, 2006

Southwestern Division Convention
San Diego County Amateur Radio Council
Marriott Mission Valley Hotel
Camino Del Rio North
San Diego, CA

"NO-CODE" AMATEUR RADIO LICENSE CLASSES SPRING 2006

**STARTING Saturday, February 25th, 10:00AM to 1:00PM at Mesa
Community College (Dobson & Southern in Mesa)**

**Instructors: Bob Burleson, KG7QJ, Rick Checketts, KA0KZB, Robert L. Strauss, W7JTR,
and Larry Randall, KA7UIH Amateur Radio licensees and operators.**

**Saturdays Feb 25th - Apr 29th 10:00am - 1:00pm
Nine 3-hour sessions Tuition \$25**
(VE test Saturday April 29th)**

**To register call MCC Community Education at 480-461-7493
Section NC 500 0770**

****Required text "Now You're Talking", 5th Edition, will be available from the instructors
at the first class for approx. \$16. The fee for the FCC Amateur License test is \$14 and
can be paid by cash or check at the VE Test session April 29th.**

SIGN UP TODAY for the MCC No-Code Technician license classes. Earn your Amateur Radio license in just 8 weeks. The classes are planned to prepare you for the "No-Code" FCC Amateur Radio Technician license. Class material is based on the ARRL book "**Now You're Talking**" (5th edition) containing the **NEW Technician license question pools as of July 1st, 2003**

"Hams" with the Technician no-code FCC Amateur Radio license have privileges on all Amateur frequencies above 50 MHz. With the "No Code" license you can operate SSB or FM voice, Amateur TV, Packet, Satellite, IRLP, and many other modes. One of the more popular modes is FM voice operation on the 2 Meter VHF and 70-cm UHF bands.

Technician licensees can help their communities by assisting in Public Service events, search and rescue, and as communication links in times of disaster.

Note: Morse code and Technician frequency privileges will be changing in 2006. We will keep you posted.

The No-Code Technician amateur radio license testing session will be Saturday, April 29th, 2006 at MCC. Other testing opportunities will be announced. If you are interested in getting an Amateur Radio license or getting back in to Amateur Radio, contact MCC Community Education at 480-461-7493 or 461-7494.



The Maricopa County Community College District is an EEO/AA institution.

