

# SENCORE NEWS

3200 SENCORE DRIVE, SIOUX FALLS, S.D. 57107

## COMPLETELY ANALYZE ANY TRANSISTOR OR FET . . . . .IN SECONDS

WITH THE UNBELIEVABLE

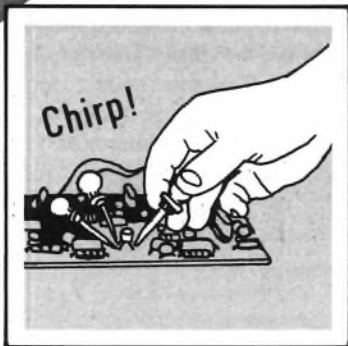
# TF30 SUPER CRICKET



ONLY \$240

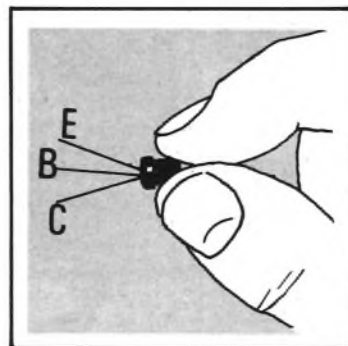
PATENT PENDING

## NOW YOU CAN GO ALL THE WAY . . . AUTOMATICALLY



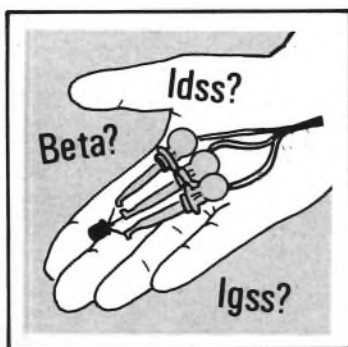
### IT'S A CRICKET . . .

For 99.9% reliable, "Good - Bad" readout for any transistor or FET - without set-up information.



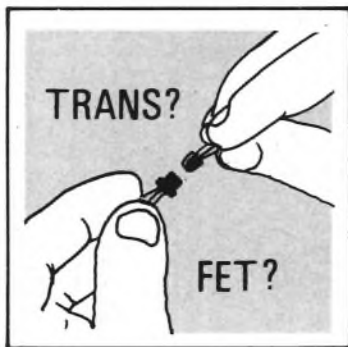
### IT IDENTIFIES ALL THREE LEADS . . .

For complete basing information . . . Fast and reliable front panel roll chart identifies all three leads - without set-up information.



### IT'S A PARAMETER TESTER . . .

For complete transistor and FET analyzing . . . including Beta,  $I_{cbo}$ ,  $G_m$ ,  $I_{gss}$  and  $I_{dss}$  plus lead identification - without set-up information.



### IT WILL EVEN TELL YOU WHETHER YOU'RE TESTING A TRANSISTOR OR FET . . .

Time saving quick check backed up with reference book (supplied with Super Cricket as guide only) for 100% reliability.

## IT'S A SUPER SOLID STATE COMMUNICATOR

# introduction

Ever stopped to count all the different transistors and FET's now being used in our industry? It comes to over 20,000. But the problem isn't that there are so many, as much as there are so many different kinds.

Bipolar transistors, FET's, silicon types, germanium types, NPN, PNP, N-channel, P-channel . . . it's endless. And the greatest problem is, by looking at most transistors, you can't tell them apart. What do you do

when you want to analyze one of these 20,000 transistors? Start reaching for the set-up book? Not any more!

We are using this issue of the "News" to introduce Sencore's answer to this "transistor mix-up" — the TF30 Super Cricket — automatic transistor and FET analyzer. We feel that once you read about the Super Cricket, you'll agree it is truly a solid state simplifier that will pay for itself the first month on

your bench.

Also included in this issue is the second in a series of three business articles. This month we look at the question, "Equipment or a Man?"

The Super Cricket story is being told through a slide film presentation that you can see and discuss at the next Tech-A-Rama at your local Sencore FLPD distributor.



BOB BOWDEN  
TECHNICAL MARKETING

## THE UNBELIEVABLE TF30 SUPER CRICKET

1

IT'S A PROVEN CRICKET for fast, in-circuit troubleshooting without set-up information. Simply switch the parameter test to "Cricket", connect the leads in any order, and push the buttons for a 99.9% reliable, patent pending, "GOOD-BAD" readout.

2

EXCLUSIVE AUDIBLE "CHIRP" tells you that the transistor is connected correctly and it's good (We had to add the chirp because the test can be made so fast, the meter may not have time to deflect.) On-Off tone switch let's you turn "chirp" off if you want when Cricket Test buttons are locked down.

3

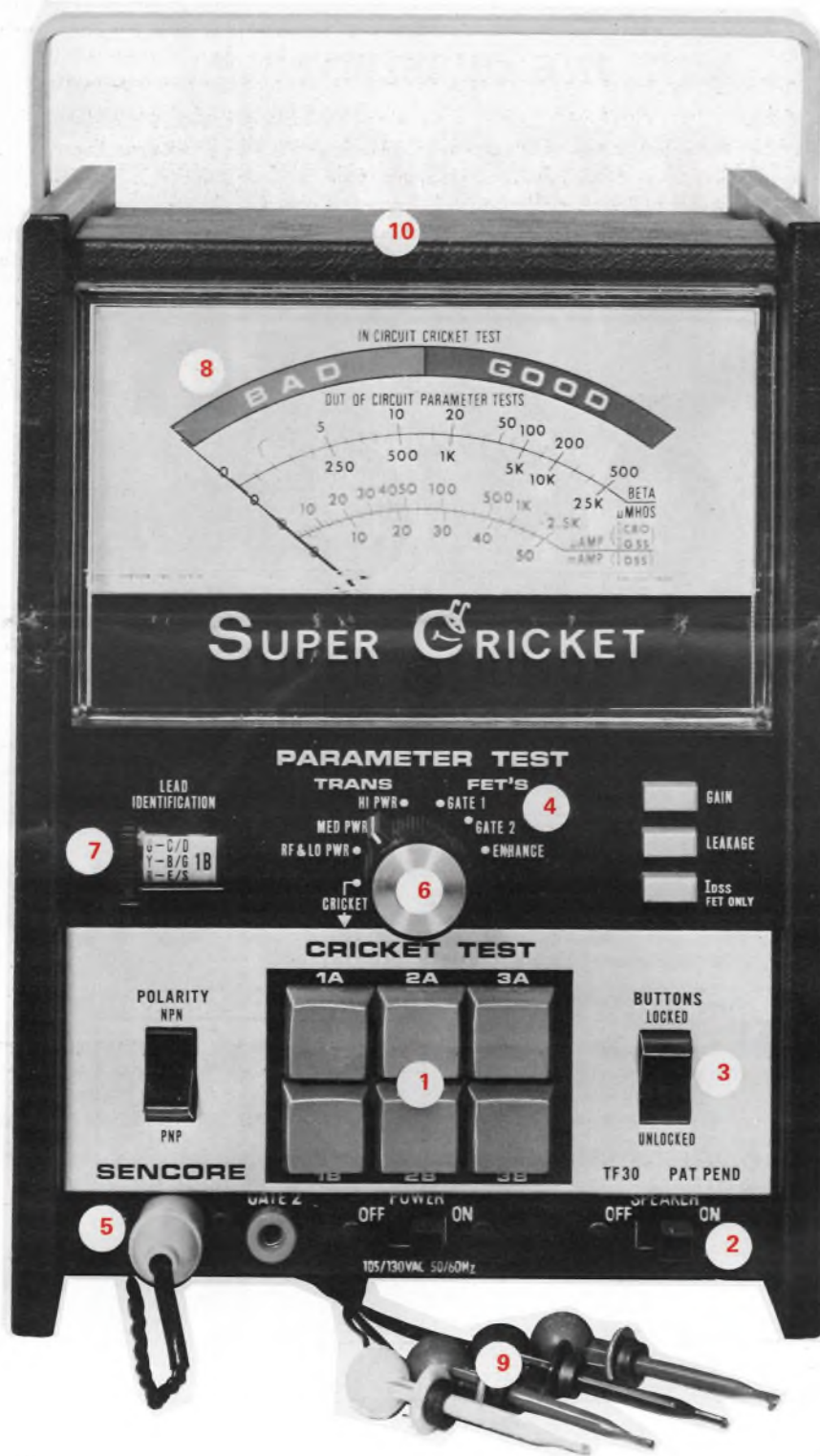
HANDY BUTTON LOCK holds Cricket Test buttons down during parameter tests. Also aids in monitoring intermittents using the Cricket test.

4

TIME SAVING QUICK CHECK will tell you whether you are testing a transistor or FET. Measure gain on FET - Gate 1 position. If you get a gain - it's an FET. If no gain - it's a transistor. (Works for all transistors except seldom used enhancement FET's and germanium types. If you suspect either of these types, the reference book backs you up for 100% accuracy.)

5

GUARANTEED 100% SAFE to transistors, circuit, tester and you. Super Cricket checks transistors in and out of circuit accurately, with effective, yet safe test current. No fear of damaging transistor or being misled by large test currents. You can depend on the Super Cricket for all your transistor measurements.



6

IT'S AN AUTOMATIC TRANSISTOR & FET ANALYZER for Beta, Icbo, Gm, Igss & Idss without any set-up information. Once you've determined a transistor is good using the Cricket Test, simply flip to the parameter tests and push for gain or leakage. No zeroing or calibrating. It's automatic.

7

COMPLETE LEAD IDENTIFICATION. Simply dial in the number of the Cricket button used in the gain test and read the complete basing information. Not just the base lead like other testers, but all three.

8

BIG 6" METER lets you measure those critical transistor parameters accurately and easily, plus indicated "good or bad" for Cricket Test.

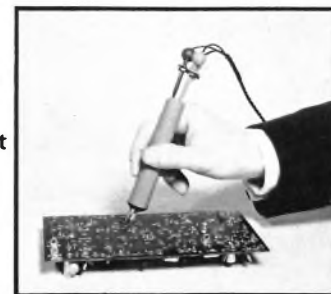
9

CONVENIENT E-Z CLAMPS make it a snap to hook solidly onto the three transistor leads in any circuit. E-Z clamps hook into optional touch-test probe for fast in-circuit transistor troubleshooting in P.C. boards.

10

DETAILED AND UPDATED REFERENCE BOOK is supplied with your TF30 Super Cricket as a reference only. It is not required for either the Cricket or Parameter Tests. Fits neatly in holder on back side of unit so you'll always have it handy.

Touch Test P.C. board probe included with Super Cricket for fast in-circuit checks . . .



### It's A Super Solid State Communicator

# SENCORE

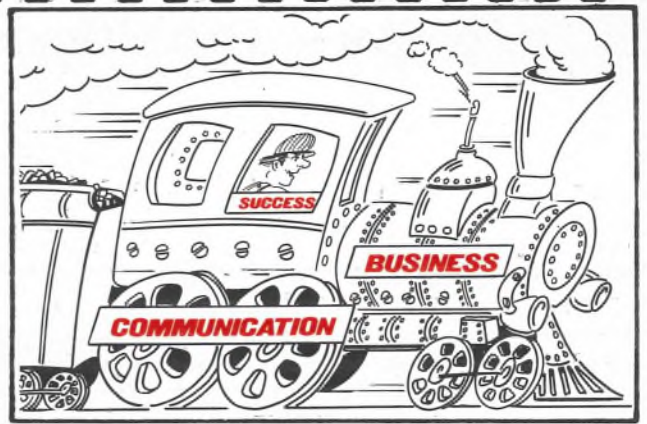
Presents

## **SUPER CRICKET -- A SUPER SOLID STATE COMMUNICATOR**

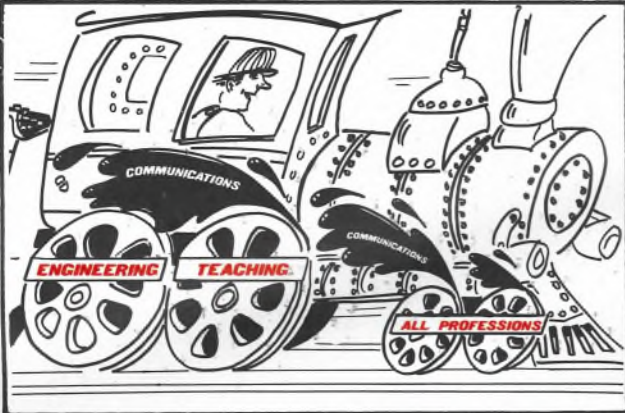
**By Professor  
Head Strong**



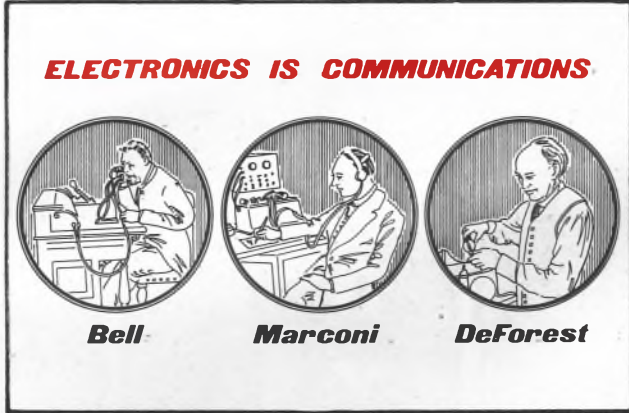
1. SUPER CRICKET - A SUPER SOLID STATE COMMUNICATOR



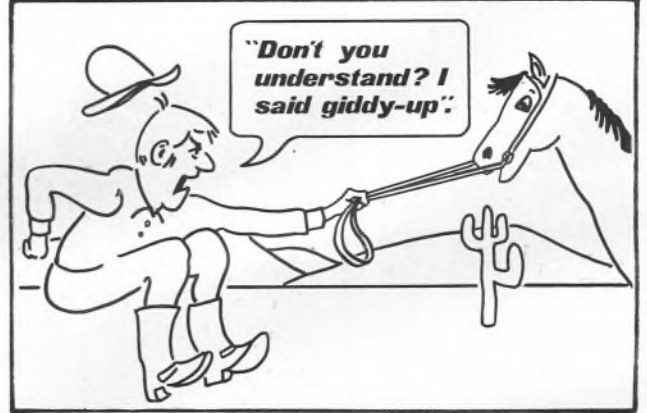
2. Communications are the wheels that keep business rolling. Communication is the vehicle that success rides on in sales.



3. Communications are the axle grease to the wheels of success in engineering, teaching and almost all other professions. Nothing is quite so important as communications.



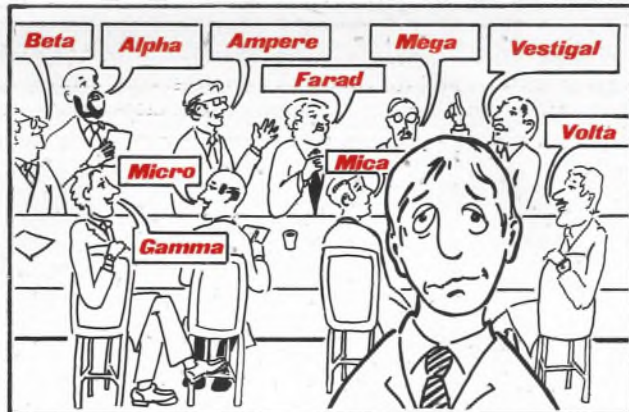
4. Electronics is the basis of all mass communications. Alexander Graham Bell invented the telephone. Marconi the wireless and DeForest the vacuum tube that enables us to amplify and transmit communications. You might say that electronics is communications.



5. If it weren't for electronics, communications would be as difficult and old-fashioned as the horse and carriage.



6. Electronic engineers are the masters of communications. It is these communications, audio and visual, that keep these engineers in business. Yet . . . when they communicate with each other, you would think that they never heard of communications.



7. Alpha, Beta, Gamma, to make the Greeks happy. Mega, Mica, Micro to keep those in the Metric System tuned in. And, of course, farad to make the Europeans happy. And ampere and volta and vestigal, and oh my gosh. Do we complicate things when we communicate?



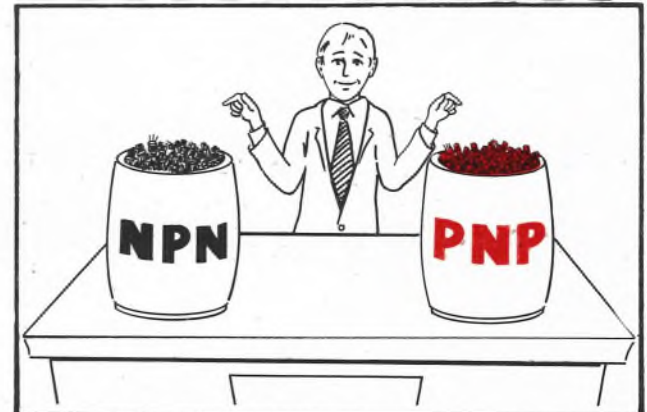
8. The communication mixup hadn't really hit its zenith until the transistor came along. Not only did the engineers think that they had invented the Greek alphabet but each engineer thought he had invented each transistor, too, and gave a separate number to over 20,000.



9. How about that! The fathers of communication can't even get together on like transistors, but try to make 20,000 look different with 20,000 different numbers. Even the man selling peaches in a grocery store has a standard processing number for peaches - but not our engineers.



10. Oh, and that wasn't all. There were germanium and silicon transistors that you really couldn't tell apart. Then came the field effect transistor. We had a chance here to make this "cold vacuum tube" look different. We could have made it purple - but we didn't. We fathers of radio just weren't communicating.



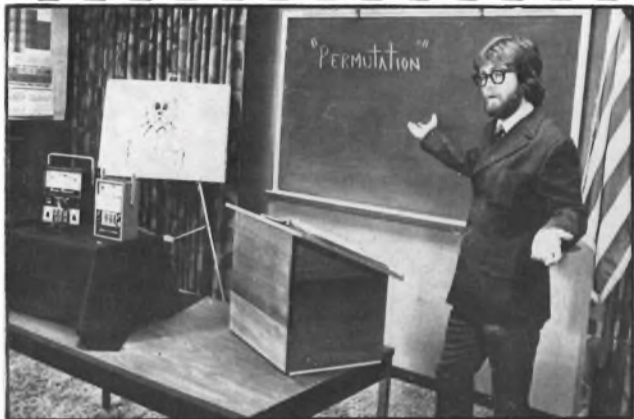
11. Think how simple it would be to have colored each PNP red, and each NPN black, just like we do with positive and negative. Hey, wouldn't that have been something. We could have separated them into bins of only 10,000.



12. That would have helped. But, they didn't. They made them all look alike just to confuse you and me. What to do? What to do? Of course, one can always carry around a transistor guide and refer to every single set-up. But that would be very, very time consuming.

13. It is like having to take a cook book to look up a recipe every time you visit a restaurant. It is a shame that we couldn't standardize to something as simple as a T-bone steak. What a waste of time. And today, the name of the game is time.

14. One must move faster, think faster, travel faster, and communicate faster. There we go with that word communicate again. Just how do we communicate this very complicated, totally mixed up solid state dilemma so that we can make some sense out of it.



### ALL Possible Configurations

15. Well, if this problem were given to a computer engineer, he would say, "This is a mixed up matrix network. We have to change form," just like in those late movies where the man changes into a cat. You know what they call that? Permutation. Remember those old movies?

16. So, what we need is a permutator. That is just what we have on the Sencore Cricket and Super Cricket. And it works just like a computer, too. Let us see if we understand.

17. If we take all the possible configurations that a transistor can be connected in, and wire them to a switch, we could take three leads and hook up to a transistor any way we want. Then, we could push the switches, one at a time until one was correct. Right?

### 6 Possible Configurations



### TRANSISTOR

18. Right. That is just what is done here. There are six different possible connections, represented by the six different switches. If we could just get some reliable source to tell us when we were on the right switch, we would have permutation and communication.

19. Well, there is a way. When you think it over, there is only one thing that both a transistor and FET do that tells you whether it is amplifying. It inverts the signal 180 degrees, now doesn't it?

20. Well, that is just what the Cricket test checks. As soon as you hit the right connection, and the transistor inverts the signal, a chirp is heard that tells you that you are connected and that the transistor is good. If there is no chirp, the transistor is bad.



### 12 Possible Configurations

21. Hey, wait a minute. You mean that thing actually chirps? It really hollers out and tells you that the transistor or FET is good? Both in or out of circuit? That is talking to you, man. Now I know why you call it the solid state communicator.

22. Hey, Professor, may I ask another question? (Notice that I said may and didn't say can. I had this guy in English.) Professor, do you mean to tell me that there are only six possible connections on all transistors and FET's? Are you sure this is everything?

23. Well, not exactly six. Actually, it is twelve in all. But, half of these are PNP and half of them are NPN. So, we can simply add a switch for NPN and PNP and run the six buttons through twice. Now, we get all twelve possibilities.



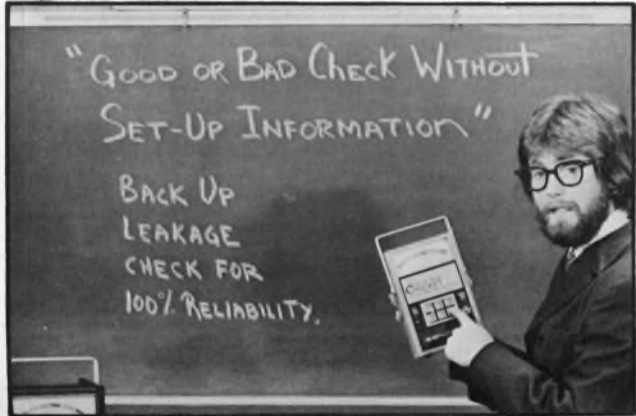
24. That is all there is to testing transistors and FET's with Sencore's new patent applied for phase inversion permutator circuit that is in both the Sencore Cricket and Super Cricket. There is something that you should know, though. The meter isn't put there for nothing.



25. When it comes to communications, there is nothing like both seeing and hearing. Some people don't hear so good and must see. Customers can't hear anything when it comes to paying a bill. They must be shown. The meter shows you the transistor is bad.



26. There is one more reason for the meter: A back-up leakage check. If a transistor checks bad in circuit, it should be removed. At this point it is a good idea to know whether or not it was the circuit or the transistor. The best way to tell is to check leakage, and this requires a meter.



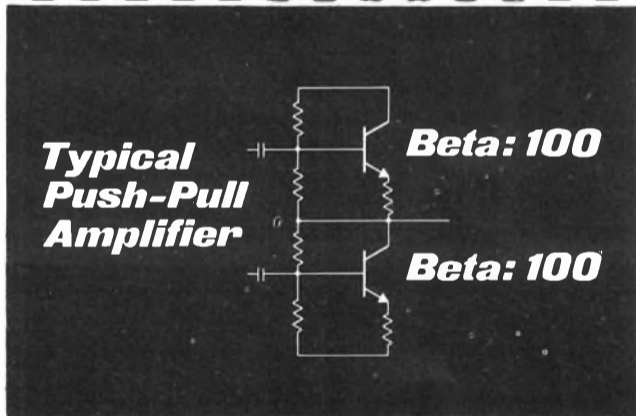
27. So let's sum it up. The Cricket tests any transistor for good or bad, without basing information, without knowing whether it's NPN or PNP or whether it's a transistor or FET. Add an out of circuit leakage check for 100% reliability and you've got simplified communications, man.



28. O.K., Professor. I have the Cricket and I see why you call it a solid state communicator but, I think I will call it a solid state simplifier from what I see. It seems like you have simplified about all that you can. Why do you have a Super Cricket? Glad you asked that.



29. There are times that you want to go further. The Cricket test doesn't give you gain measurements. Yes, it gives you leakage measurements in actual terms, but not gain. There are many times when we might want to know Beta or transconductance as well as leakage.



30. For example, suppose that we are trying to pick matched pairs in a push-pull amplifier. Don't you think gain would be important there? You know that it is, as one must have both matched gain as well as leakage.



31. How about Idss for industrial culling of FET's? Don't you think it would be necessary to have additional leakage checks on for these critical cases? Or how about the time that you are trying to find a replacement transistor?

BF377					BFS43						
TRANS	BASE	POWER	POL	GAIN	LEAK	TRANS	BASE	POWER	POL	GAIN	LEAK
				min	Icho					min	Icho
BF377	210	Lo	N	20	01	BFS13E	500	Lo	N	100	05
BF378	210	Lo	N	20	01	BFS13F	500	Lo	N	100	05
BF379	210	Lo	N	48	05	BFS13G	500	Lo	N	100	05
BF384	210	Lo	N	75	05	BFS14E	500	Lo	P	70	05
BF385	32	Lo	N	34	05	BFS14F	500	Lo	P	70	05
BF390	210	Hi	N	20	05	BFS14G	500	Lo	P	70	05
BF397	210	Med	P	20	05	BFS14H	500	Lo	P	70	05
BF397A	210	Med	P	40	05	BFS15E	500	Lo	N	55	05
BF397B	210	Med	P	130	05	BFS15F	500	Lo	N	55	05
BF398	210	Med	P	25	05	BFS15G	500	Lo	N	55	05
BF398A	210	Med	P	30	05	BFS16E	500	Lo	P	30	05
BF398B	210	Med	P	50	05	BFS16F	500	Lo	P	30	05
BF414						BFS16G	500	Lo	P	30	05

32. You look it up in the reference book, that incidentally is included in the Super Cricket, for reference only, and it gives you gain and leakage. These parameters are necessary. Now they are automatic and can be determined as part of a test without a set-up book. Is that simple enough?



33. It sure is! I wondered just how far good and bad would go. There are plenty of times that I'd like to know gain without having to use a reference book. Are you saying that you can simply switch to the parameter test as soon as you have used the Cricket portion of the Super Cricket?



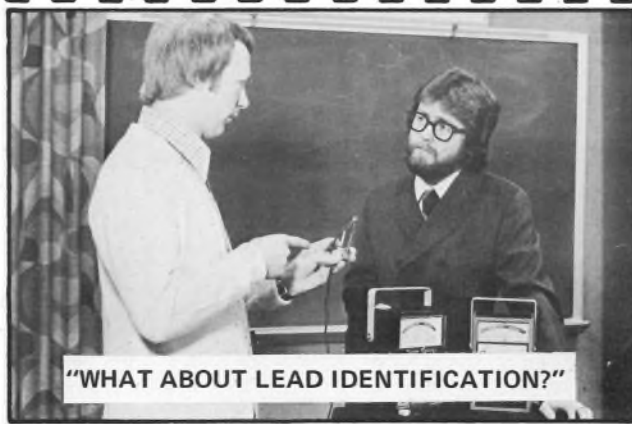
34. You are right. Give that man six silver permutators. If the Cricket told you that the transistor was good, you may want to go to the parameter tests. All you do is lock down the permutator button. But before you do, there is one thing that I want you to know.



35. There are usually two buttons that will cause the Cricket to chirp. One is forward connection on the transistor and the other reverse. These buttons are always right above or below each other. You will note that we call them out in pairs for this reason.



36. It makes no difference which button you use with the Cricket, but it does with the Super Cricket parameter tests. Reverse connection gives you little or no gain. Forward connection gives you the anticipated gain. Simply try both buttons and lock down the one with the most gain.



"WHAT ABOUT LEAD IDENTIFICATION?"

37. Professor. Since you know that you are connected just right, why not come up with a simple guide that tells us how that switch is connected? Then, we could identify the lead basing configuration of the transistor or FET. That would be communicating, man.



38. And you can do that. Once you have a gain reading, you know that you are connected just right. You simply dial in that button number on this wheel and it will tell you which lead is connected to the base, the emitter and the collector. It is that simple.



39. Other testers on the market say they can locate lead connections for you, but they really only identify the base. This just doesn't go far enough and is mighty cloudy communications in my book. The Super Cricket goes all the way with complete lead identification.



40. O.K., let's wind this up. All we do now is read the gain or leakage as dialed in on the Parameter Test switch. Push the gain button to read gain and the leakage button to read leakage. And you can do all this without zero referencing the meter. It, too, is all automatic and accurate.



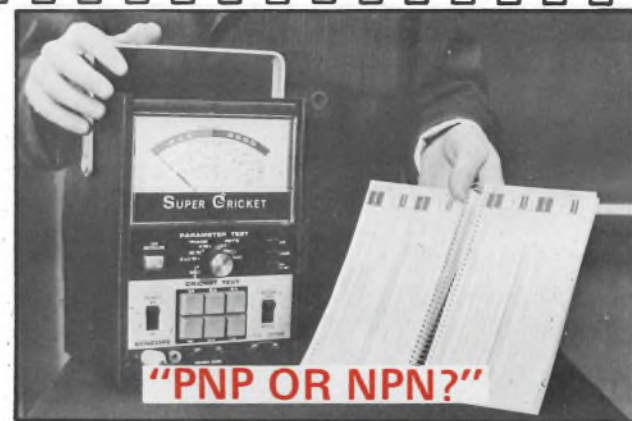
41. I hope my lesson today has made you realize that the Super Cricket is truly a Super Solid State Communicator. They both belong on my bench because they pay for themselves in time saved in the very first week. It is really a sin to be without one.



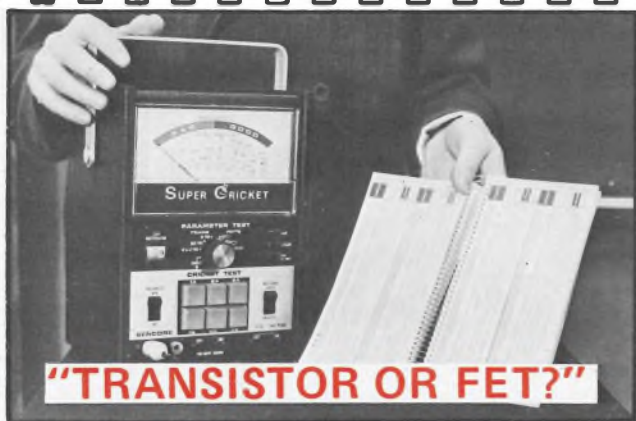
42. What are you going to do the next time that you need to know a transistor basing? Take the time to look it up or trust the Super Cricket?



43. What do you do next time that you need to know whether a transistor is good or bad? Take the time to look up all the settings or trust the fast Cricket or Super Cricket?



44. What will you do next time that you don't know whether the transistor is PNP or NPN? Take the time to look it up or trust the Cricket or Super Cricket?



45. What are you going to do next time that you need to know whether you have a transistor or FET? Take the time to look it up or trust the Super Cricket? It will do that, too, automatically on the Parameter Test.



46. Simple? Take a lesson from me. Time is everything in servicing, experimenting, successful designing or just testing transistors. The Super Cricket has taken all those mixed up engineer's communications and simplified them so that you and I can understand them in seconds.



47. Get yourself a Cricket . . . or step up to a Super Cricket. You can't go wrong and it will start communicating for you today. THAT'S CRICKET, MAN, ANYWAY YOU LOOK AT IT.

Available  
Now!

# BE EQUIPPED TO SERVICE ANY AMPLIFIER ON ANY CALL WITH THE ALL NEW **TC28 HYBRIDER** TUBE AND TRANSISTOR TESTER



BE IT A TUBE

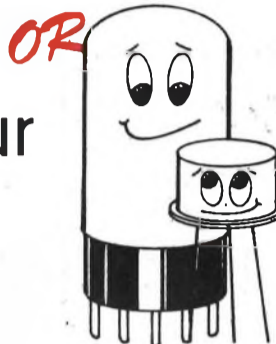
It's a Mighty Mite For your tube calls

OR

BE IT A TRANSISTOR

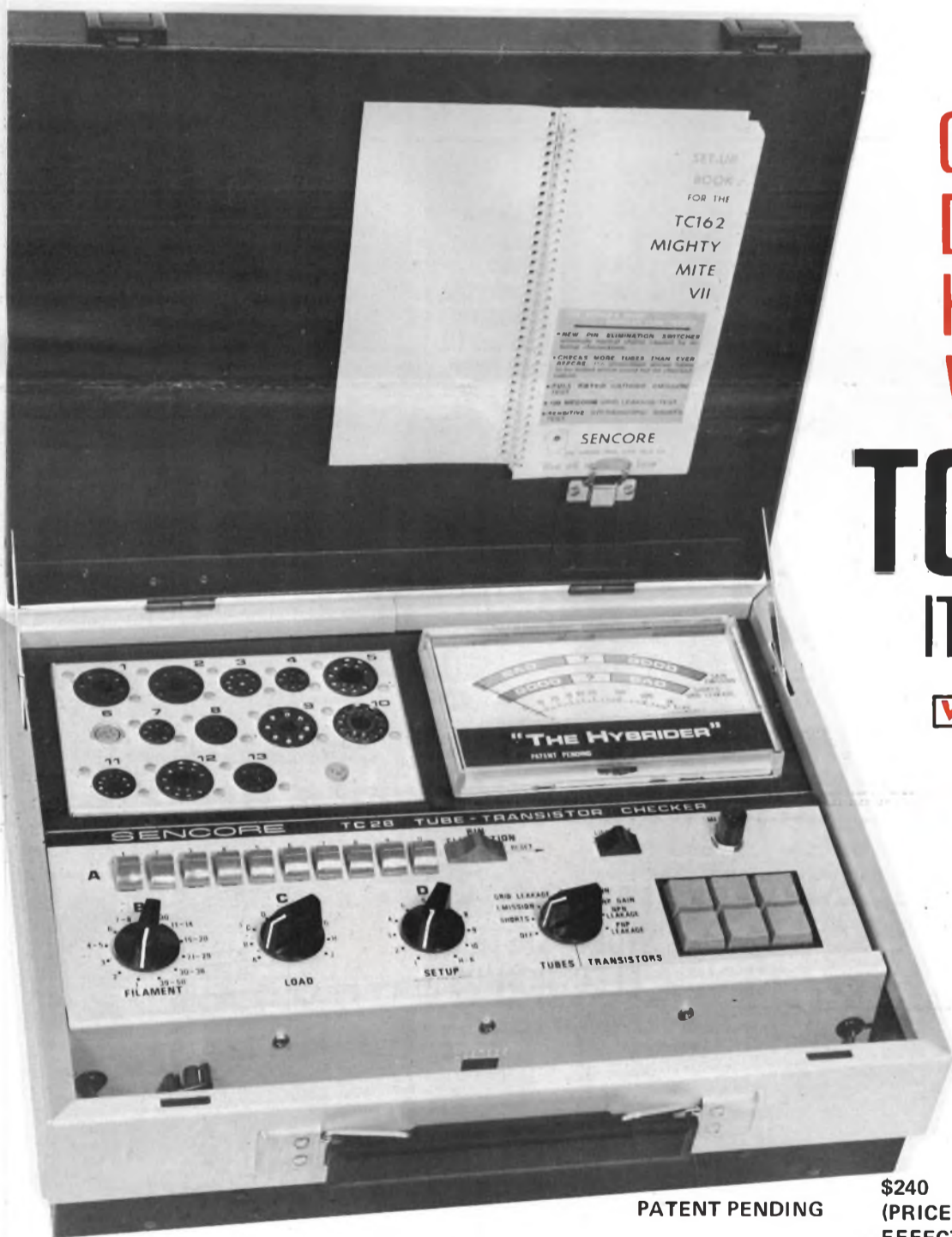


It's a Cricket for your solid state calls



A COMBINATION HYBRID CIRCUIT

The Hybrider now takes care of them ALL



OVER 80% OF ALL TV INTRODUCED IN THE LAST 2 YEARS HAVE BEEN HYBRIDS. THAT'S WHY YOU'LL WANT SENCORE'S

## TC28 HYBRIDER IT'S AN AMPLIFIER CHECKER

- Checks over 3000 tubes, foreign and domestic, as easily as the Mighty Mite.
- Checks over 20,000 different transistors, with the same simple pushbutton test as the Cricket.
- Now you can show your customer every tube and transistor fault right on the Big 6" meter. No more hard to read idiot lights.
- Only tester in the world that checks all amplifiers.

PATENT PENDING

\$240  
(PRICE INCREASE  
EFFECTIVE APRIL 1,  
1975; \$260)

**NO MORE TUBES... NO MORE TRANSISTORS... JUST AMPLIFIERS**

IF YOU LOOK AT IT THIS WAY, YOU INCREASE YOUR SERVICE EFFICIENCY, SATISFY YOUR CUSTOMER, AND LOOK LIKE A PRO NO MATTER WHAT YOU RUN INTO. BE EQUIPPED FOR ANY AMPLIFIER SERVICE CALL WITH . . . .

## TC28 HYBRIDER

LOOK FOR IT . . . . . AT YOUR  
NEAREST FLPD DISTRIBUTOR.

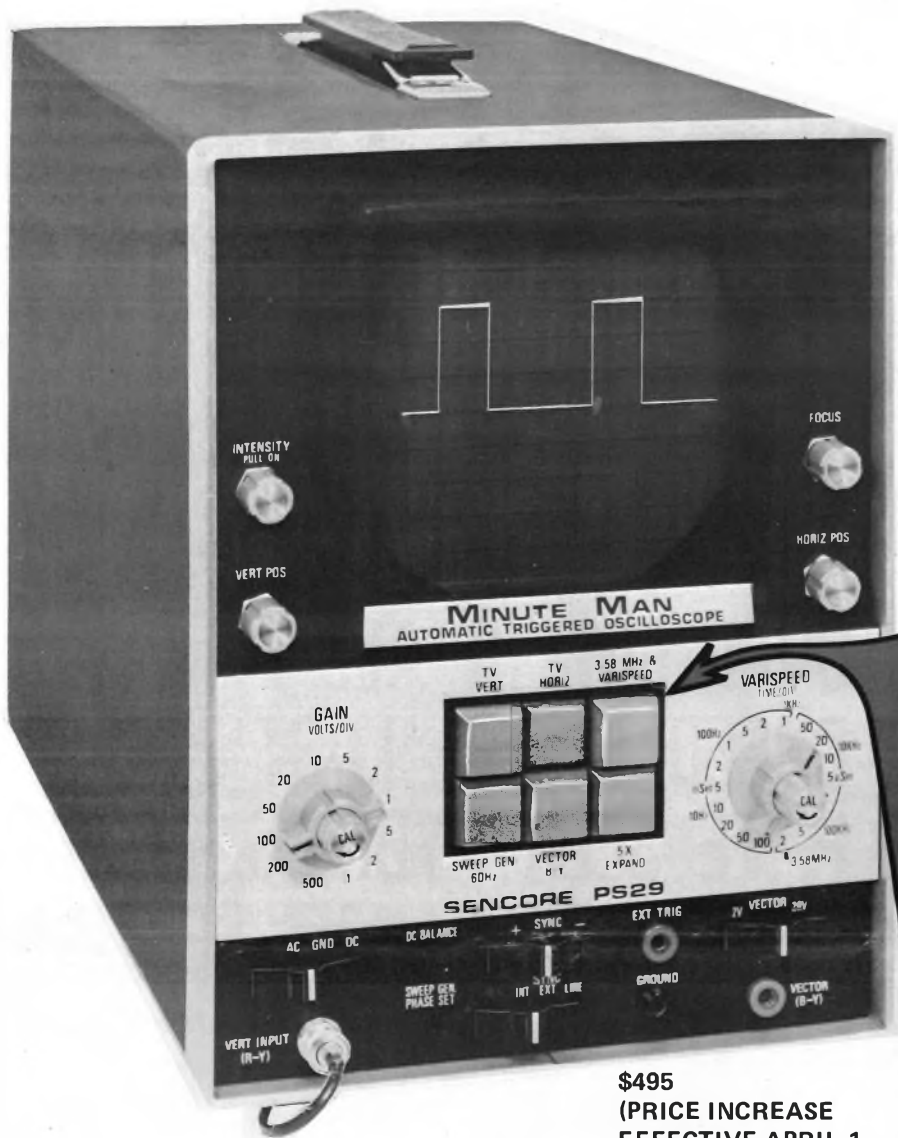
**Available  
Now!**

# IF YOU CAN PUSH A BUTTON . . . YOU CAN OPERATE THIS ALL NEW **PS29 MINUTE MAN**

## **AUTOMATIC TRIGGERED PUSHBUTTON OSCILLOSCOPE**

THE MINUTE MAN IS A COMPLETELY AUTOMATIC TRIGGERED, PUSHBUTTON TV SCOPE FOR VIEWING ANY COLOR WAVEFORM IN A MINUTE.

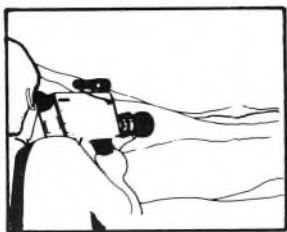
IT'S COMPLETELY AUTOMATIC . . .  
JUST PUSH FOR . . .



**\$495**  
(PRICE INCREASE  
EFFECTIVE APRIL 1,  
1975; \$595)

<p><b>TV VERTICAL</b></p> <p>SOLID TRIGGERING DOWN TO .005 VOLTS</p>	<p><b>TV HORIZONTAL</b></p> <p>HIGH SENSITIVITY WITH TV SYNC SEPARATOR STABILITY</p>	<p><b>3.58 COLOR</b></p> <p>INSTANT TRIGGERING ON COLOR OSCILLATOR SIGNAL</p>
<p><b>SWEEP GEN.</b></p> <p>SETS SCOPE UP AUTOMATICALLY FOR SWEEP ALIGNMENT WORK</p>	<p><b>VECTOR</b></p> <p>X AND Y COMPARISONS WITH LOW PHASE SHIFT</p>	<p><b>5X EXPAND</b></p> <p>FOR A CLOSER LOOK AT SINGLE WAVEFORMS</p>

**THE MINUTE MAN TAKES YOU FURTHER THAN TV — IT'S A PUSH BUTTON AUTOMATIC VIDEOSCOPE FOR SERVICING THE RAPIDLY EXPANDING VIDEO MARKET.**



- MATV SYSTEMS
- CATV SYSTEMS
- TV STATIONS
- CLOSED CIRCUIT TV
- HOME VIDEO TAPE SYSTEMS

- SECURITY SYSTEMS
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**THE MINUTE MAN IS A GENERAL PURPOSE BROADBAND SCOPE TOO.**

- TRUE DC TO 10 MHz BANDWIDTH USING NO PEAKING COILS THAT CAUSE RINGING.
- HIGH SENSITIVITY DOWN TO 10 MILLIVOLTS PER DIVISION.
- FULL SWEEP CAPABILITIES FROM .2 MICROSECS TO .1 SEC PER DIV.
- EXCLUSIVE 5000 V INPUT PROTECTION USING 10X PROBE.

**THERE HAVE BEEN AUTOMATIC TRIGGERED SCOPES BEFORE . . . BUT**

THE MINUTE MAN IS THE FIRST COMPLETELY AUTOMATIC SCOPE WITH TRIGGERING SOLID ENOUGH TO USE PUSHBUTTONS. IT'S "FIDDLE FREE". TAKE A MINUTE AND LEARN TO OPERATE

## **THE PS29 MINUTE MAN**

*Look for it . . . . . at your nearest Sencore ALPD Distributor*



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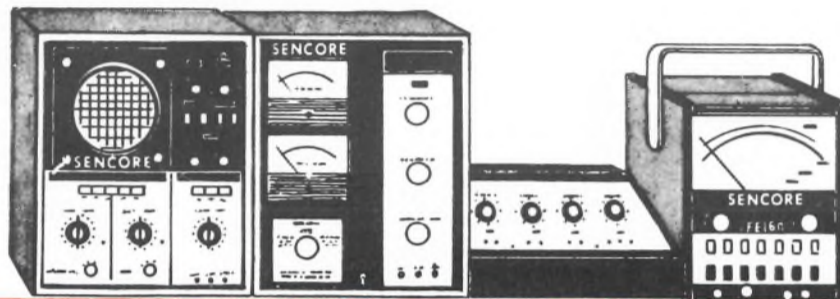
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Bob Baum



Norm Pedersen

**BOB  
AND  
NORM'S**

# SHOP

- SERVICE TIPS
- SHORT CUTS

This is the second in a series of three business articles being featured in the Sencore News. The first article, appearing last month in the PS29 Sencore News, looked at the question, "Does Test Equipment Cost or Pay?" This time we compare the cost of equipment to actual cost of hiring a new man for the bench as we answer the question, "Equipment or Man?"

Good morning Bob. Gosh am I tired this morning! I worked until almost eleven o'clock. These TV sets just keep coming in. But Bob, do you know what else? We have tripled our business in Hi-Fi work since we bought that SG165 Stereo Analyzer. I don't know how we did it before Sencore showed us how to do it with that unit. I wouldn't give that up for the \$495.00 we paid for it, ever. It has paid for itself the first month but not only that, it has increased our store traffic. I wonder when this recession is going to hit us?

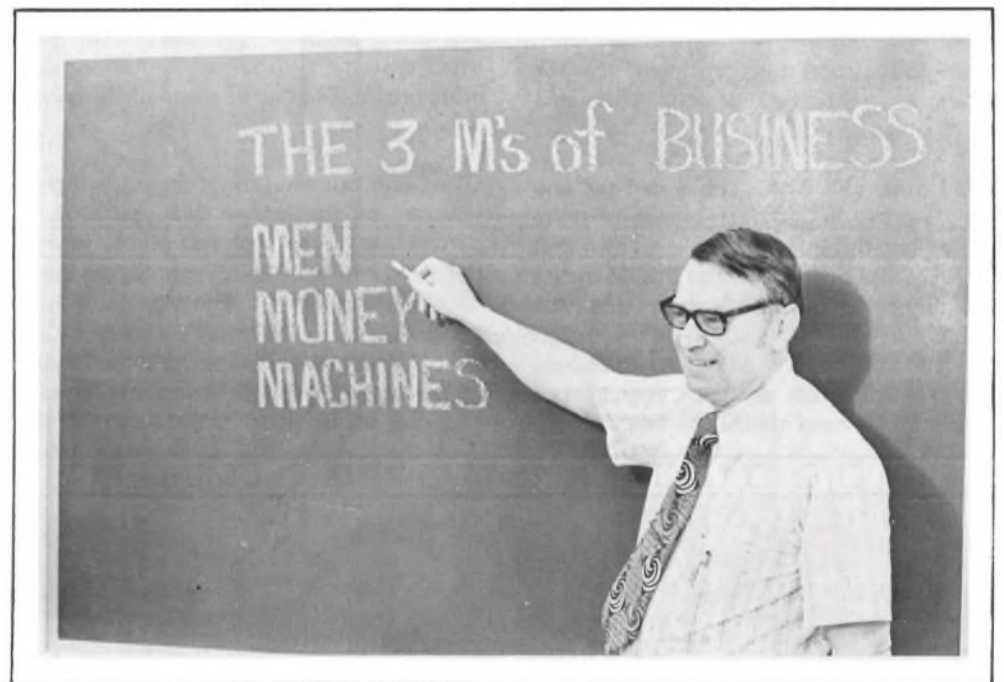
Recession? Recession? Who said we are in a recession Norm? We are in a boom in the service business. Can't you remember how our business picked up in the slight recession that we had in 1970 and how it boomed in 1966? Let's go back over our books and see just how much it boomed. Look here, we had our biggest growth year in 1966 when everyone else was passing out the crying towels. It is simply economics, Norm; when "brown goods" stop

selling in the front of our store, "brown goods" repairs start increasing in the back door for service. I think that we should take a good look at our three M's of business to see if we are equipped for this expansion in service. We don't want to lose those customers to someone else when they get ready to come back in and buy. We can hold them only if we do their service.

Gosh Bob, that is right. Sometimes I just love you as a partner because you have that extra year of business administration that I forgot to take. But, you have to admit that extra year of vocational education that I took helps when you can't find a problem in those new solid state sets. Doesn't it?

You bet it does Norm. I wouldn't give you up for anything, fella. I do think that it is my responsibility to keep you on the straight and narrow though, only because I know that you don't have this background in business. I will stand corrected on the technical issues if you will just listen to me now.

Okay, Bob, it is your floor, start dancing or you are going to get a six shooter in the foot. But, be practical huh? Don't give me that P and L junk again. I know that you know how to run a profit and loss statement. But, it seems to me that if figures are any good, you could use them to project your decisions, not just to determine whether or not you made any money.



Norm, that's right. And that is the difference in budgeting and running a profit and loss statement. A budget tells you what you intend to do, (or better, you tell it) and a statement gives you your financial report card. But, Norm, to be practical, each budget is simply broken down to those three M's of business.

You mean that everything is in those three M's? Now, let me see, you went over those with me last year. See if I can get it? Men, Money and Machines? Is that right?

Heh, I am getting through that thick skull of yours. This is true if we look at buildings, benches and all, like machines. And, there is really no reason not to, because a bench wears out and a building wears out over a period of time.

Well, that is true Bob but this building is too expensive to pay for in one year. Doesn't that stop you?

Nope, it doesn't because you simply take the life of the building and write it off over the years that it has left in it; just

like a machine. Now, may I also add that you do the same thing with all of your machinery? And, test equipment too. It is simply a machine as far as the government is concerned.

Why did you bring up the government? Do they insist that you write off the machines and equipment over many years, instead of just one? Is that called depreciation?

Hey, I am going to get a business partner after all. That is right. The government says that you do not use equipment up in the first year. So, if you write it all off as an expense, you are cheating them out of income tax. Generally speaking, they want you to write off instruments in four years.

Does this mean that I have used up only one fourth of a piece of equipment, such

don't run around with women. Anyway, as long as I'm the best technician around town, I don't think you can have any complaints. . . . .but I want to make this clear. Does this mean that I simply add 20 cents to each customer's bill and get my money back? You know that I can easily add a dollar and make 80 cents. We have been servicing at least two more FM stereos a day since we've had that SG165. I gotta say it again, I don't know what we did before we got that machine.

Well Norm, I don't think that you can write up an extra dollar for equipment on each invoice that is sent out but I do think that you can add much more on the bill than just the dollar if you will put down what you did with the machine; such as sensitivity checks, or an alignment check on stereo demodulators and write down the DB separation, on the invoice; it is mighty impressive to the customer.

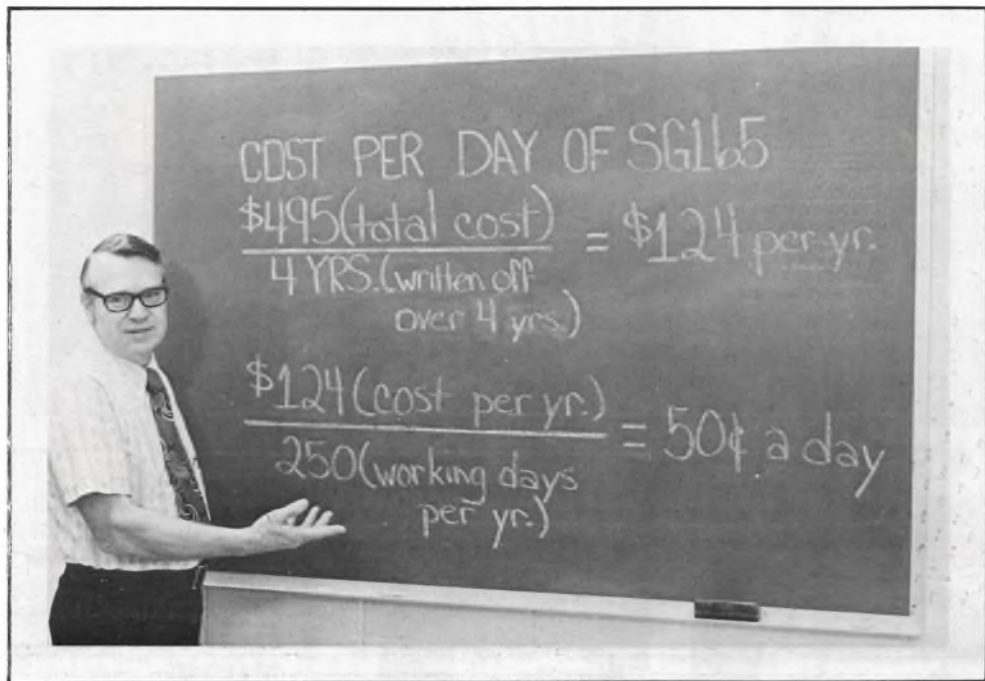
present time. We borrowed the whole smear to buy that SG165 over there. That was \$495.00. We paid 10 percent interest this year. That is \$49.50 total. Next year we will have this paid down to \$370.00 because we are paying our total loan off in four years. Interest next year is \$37.00. The third year, we have it paid down to \$245.00. This costs us only \$24.50 interest. The last year, we have only \$120.00 left to pay. This costs us only \$12.00. Let us add these together to see what our average interest cost is. \$49.50 plus \$37.00 plus \$24.50 plus \$12.00 is \$123.00.

That looks like a lot of interest Bob. How can we justify this?

train a new man just the first week. That is if we go to the bank and make a loan.

I don't want to mislead you Norm, but you will have to have that equipment if you put on the new man too. He can't work without tools. So, you have the cost of the equipment plus the man. More than this Norm, I don't think that you know just how expensive a new man is. Let us go through just a few of the costs. I know where there is a young guy that is a comer but he will cost us five bucks an hour.

Okay, it is half my shop too, so let's have a good look at it. I can multiply. That is \$200.00 bucks a week to start. Well, I



as that SG165 Stereo Analyzer of Sencore, each year? Holy cow, that is only \$124.00 a year. Now, just a minute Bob, give me credit for something. \$124.00 a year, divided by 250 servicing days, is just a little over 50 cents a working day. Check me Bob, it isn't \$5.00, is it? I didn't slip a decimal, did I? Could this be, only 50 cents a day and that instrument goes for 24 hours, without any extra cost, if I want it that way?

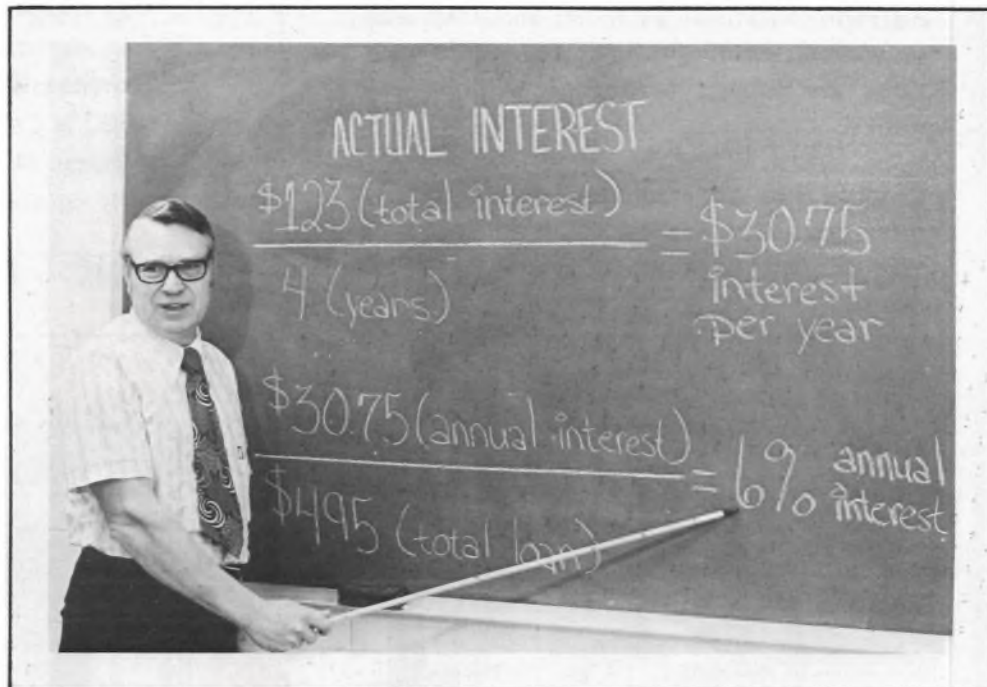
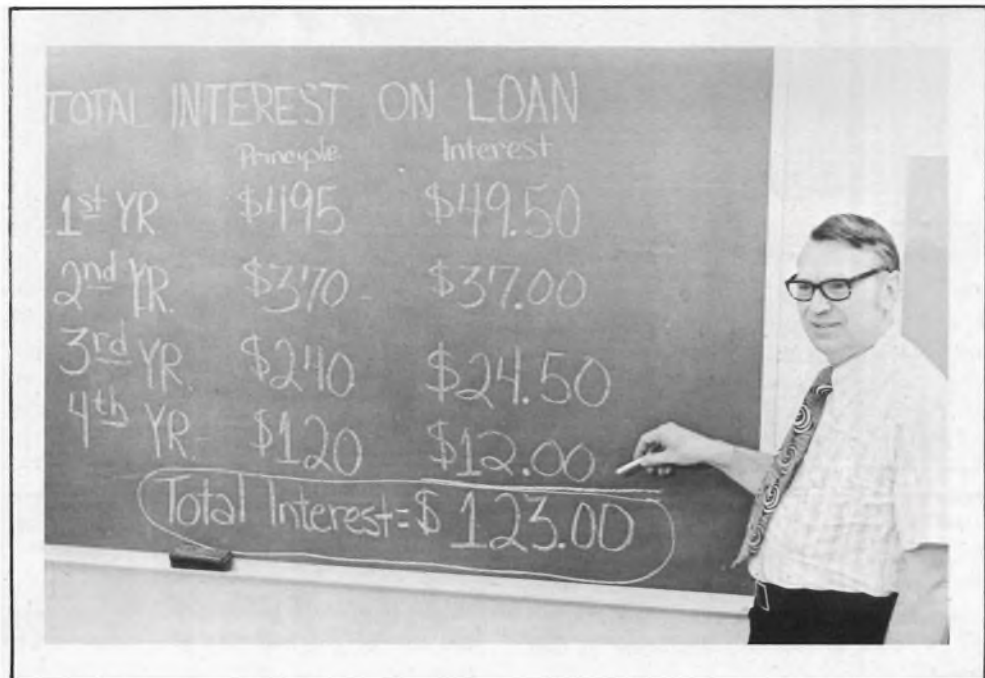
No, Norm, you didn't slip a decimal and it does cost you less than a pack of those damn cigarettes that you smoke to own that SG165. More than this, the SG165 makes you money and those cigarettes slow you down.

Okay, Bob, get off my back about those cigarettes. I need them to think. But, I

Get it? You know that a customer will pay an extra five bucks for each of those things, not just a dollar, now don't you. You still won't have a bigger bill because you serviced the set in less time with the SG165. They got that benefit. No sense in charging less for each set, just do more and do it better. This means more satisfied customers, a better reputation, and more profit. That is the name of the game, fella.

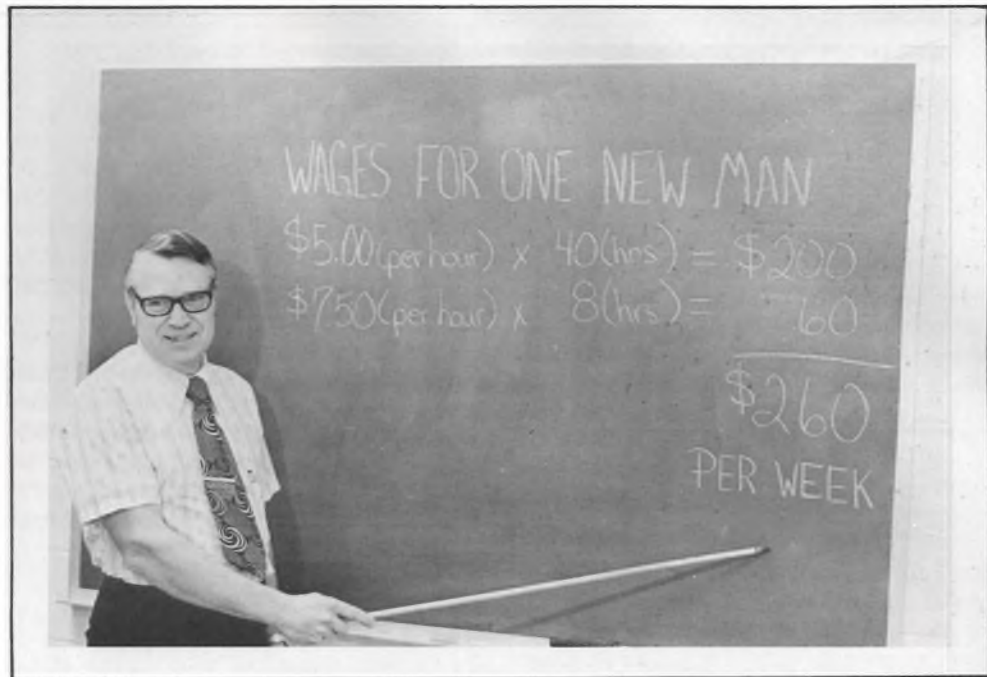
Okay, Bob, but what about the interest that you pay on the money that you have to borrow each time that you plunk down a thousand dollars for a couple of those Sencore instruments? Who pays that?

Okay, Norm, that is right. We are paying 10 percent interest right now. That is really high but let us figure at that rate for the



Now come on Norm, you still aren't the business man that you thought you were. You took your five hundred bucks and went out and bought a camper. You didn't have that investment but were having fun. The bank had the total investment in this one. Wasn't it worth \$123.00 extra to have your camper these past four years

want to get it clear right off. We work 48 hours a week around here because Saturday is customer's day. We would have to have him do the same. That would be \$7.50 times 8 is \$60.00. Do you mean that he would make \$60.00 on Saturday? This would mean \$260.00 a week. That comes to \$43.00 a day or 86 packages of cigarettes a day even if I bought them by the carton.



rather than tie it up in the shop? This \$123.00 is to be divided by four, leaving an interest cost of \$30.75 a year. Divide \$30.75 by \$495.00 and you paid only a little over 6 percent. Does that sound like a lot?

No it doesn't. I see now what you are going to get around to. If we put on a man with this expanding business, we will spend more than that in just one working day. I am right, aren't I? A new man would be the other "M" and an option we would have? Are you sure your figures are right Bob? We can have the full set of everything that we want, and need, right now in the Sencore line, for less than it would cost to

Norm, that isn't all, there are more cigarettes to add up. This guy wants insurance. That is another two dollars a week. That comes to four more packs of cigarettes. Next, the unemployment group insists that we contribute directly at a three percent of wage rate. This is another eight bucks or 16 more packs. Then, there is social security that we have to match. Oh, you didn't know that we matched that huh? Well it comes to another five percent plus or \$13.00 plus. That's another 26 packs a week.

Gosh, I didn't think of all that. These extras really sneak up on you, don't they? I suppose he will want a two week vacation.

He isn't going to be here to work those two weeks. Doesn't that mean another \$520.00 out of our pocket?

Well, not quite, because we won't pay him overtime those two weeks but it will mean \$400.00. That is spread over 52 weeks, so, it costs us \$7.69 a week throughout the year. His wages might go up though and I think that we had better round that out to \$8.00 a week to make sure.

Well, I can add, that is \$2.00 for hospital insurance, \$8.00 for unemployment insurance, \$13.00 for social security, and \$8.00 for vacation pay. That comes to about \$30.00 extra that I wasn't counting on. Hey, this really brings this guy to \$290.00 a week, doesn't it?

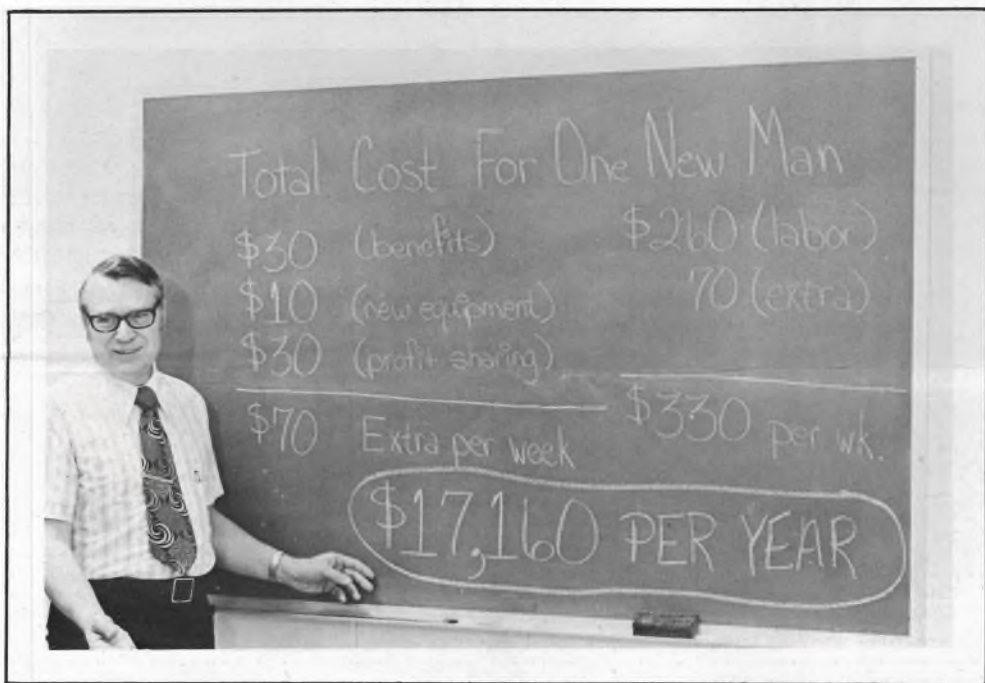
Now, you are figuring just right. But that isn't all, you can't have men without machines. If we buy another \$2,000 worth of equipment for him, and simply put in \$80.00 worth of material into a new service bench, that is \$2,000 plus \$80.00. This is \$520.00 a year or another \$10.00 a week. That comes to an even \$300.00 a week.

Can we write his services off for more than one year? You can't can you? This is where the difference comes in.

by 25 percent, he would probably pay for himself but this guy isn't costing us \$5.00 an hour, he is costing us \$17,160.00 a year. We could buy all the equipment in the world for that. How much savings would we have if we could find equipment that would save us 25 percent of our time and come up with the same work output?

Glad you asked me Norm, because I had it all figured out. If we went out and bought that new Sencore PS163 Dual Trace Scope, to go with our SG165, another SG165 Stereo Analyzer, the new PS29 Minute Man Scope for faster TV troubleshooting, the UPS164 Universal Power Supply for firing up those car radios, the new TC28 Hybrider to update our tube testing with more of those old tube operated sets coming in for service now and a new TF30 Super Cricket, we would have a total bill of:

PS163 Dual Trace Scope	\$695.00
PS29 Minute Man Scope	\$495.00
UPS164 Universal Supply	\$240.00
SG165 Stereo Analyzer	\$495.00
TF30 Super Cricket	\$190.00
(after trade-in)	
TC28 Hybrider	\$240.00
	\$2355.00

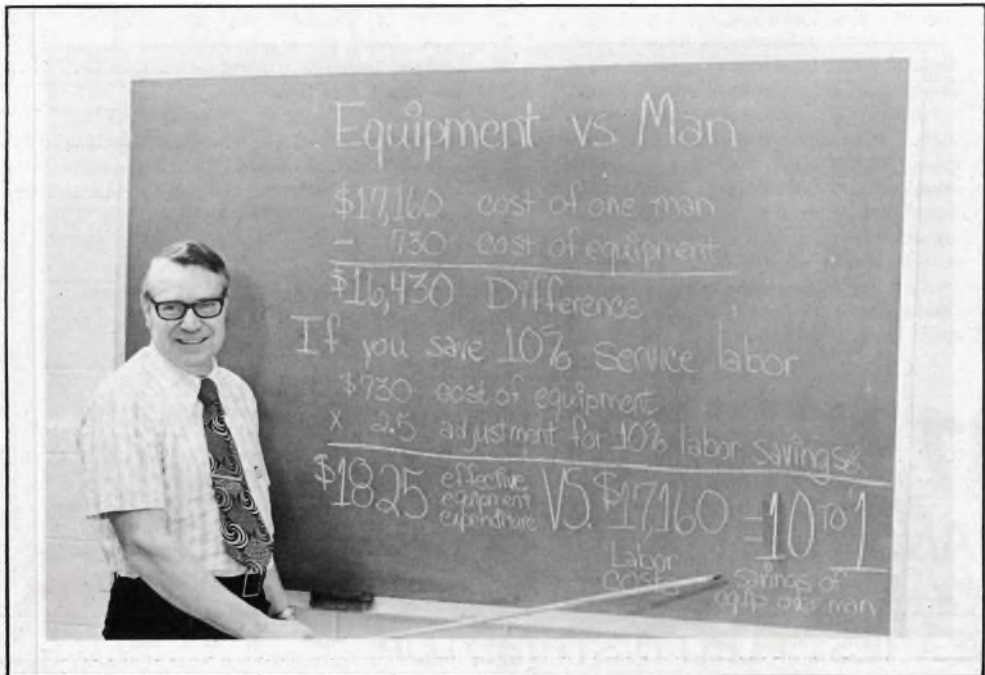


That is right. This is all solid expenses. But that isn't all. We are thinking of starting a profit sharing program. I think we can pay 10 percent of wages into it. This is another \$30.00. This money has to come from somewhere, now doesn't it? So, we have a true cost of \$330.00 to bring in another service tech.

We are going to have to get a lot of service out of this guy. If he increases our output

This would cost us \$2355.00 or only \$588.75 a year. Add 6 percent interest of \$141.30. We would have a total outlay, if we borrowed the money, of \$730.05 a year.

Hey man, that would pay for this new man for only two weeks. I know that this equipment would save us up to 25 percent of our time. Sencore equipment is built to save time. This is to say nothing of



the costly call backs that we make for free because we didn't check carefully enough.

But, you asked me what savings would be. Well, take your \$17,160.00 and subtract \$730.00. What do you get? \$16,430.00. If you saved only 10 percent of your service labor with better equipment, the ratio would be 2.5 times \$730.00 or \$1825.00. Extra cash that we could have saved and put toward equipment with only a 10% labor savings. Compare this to that \$17,160.00 for a ratio which is almost 10 to 1. Of course, it is 30 to 1 if you can actually save the 25 percent that you mentioned. I like to be conservative, Norm.

Ten to one, or 30 to 1, huh? Boy, am I glad that you took the time to go over these economics today. For some reason, I always thought that test equipment costs more because you see it sitting on your bench every day. Then too, you have to come up with a good buck to buy it so, you see it as one lump expense. Golly, a guy can be pretty foolish not watching efficiency of service and overhiring when he should be reducing costs with good test equipment. Those Sencore guys have national factory owned three day service too, so we can figure on this stuff staying right in there and working. No sick leave either. Ha.

Maybe you can see now why Electronic Industries Association has been using the slogan, "Test equipment doesn't cost, it pays", and, "You are already paying for the equipment that you don't have." In school, we learned that:

a. Any equipment that would pay for itself the first month, you should buy without hesitation and kick yourself for not having it sooner. Take that Sencore Cricket for example, you are paying for this every call you make by wasted time if you don't have it. It will pay for itself the first month.

b. Any equipment that will pay for itself the first three months should be purchased without discussion.

c. Any equipment that will pay for itself the first 6 months should be purchased as soon as you have assured yourself of the time that it will save.

d. Any equipment that will pay for itself the first year, should be studied carefully and placed on next year's budget.

e. Any equipment that will pay for itself in two years is still economically safe to purchase, especially if it will improve your work standards.

f. Equipment that will pay for itself in over two years should not be purchased unless it is needed as a standard to do your work.

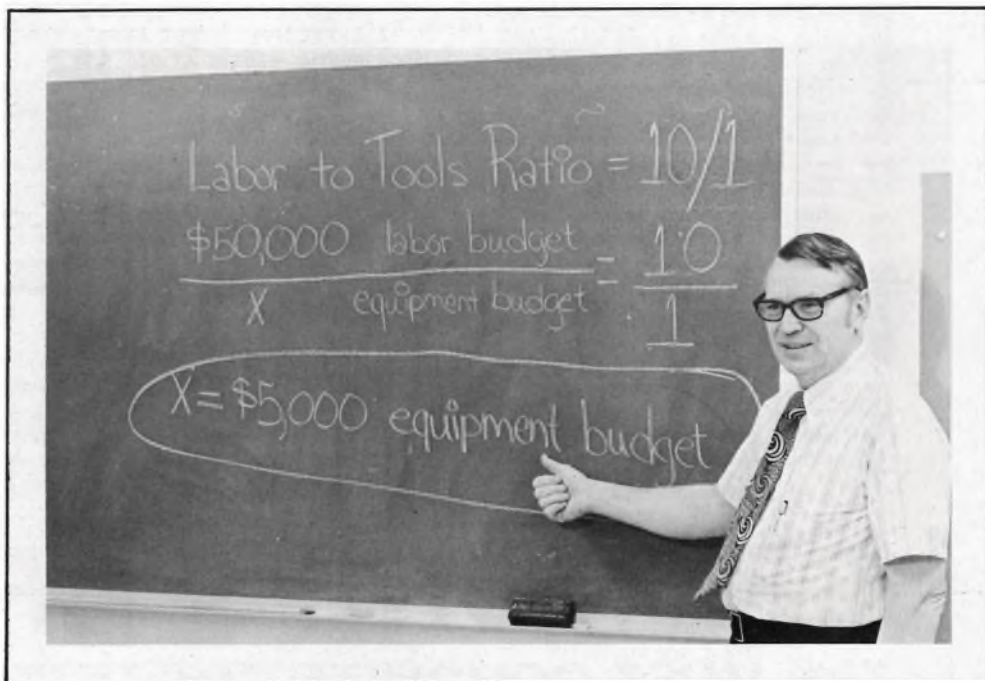
Well, it looks to me that a ratio should be set up of labor to tools so that one keeps up on new equipment for this fast moving and changing technology. Isn't that a good way to look at things?

Norm, old buddy, you are going to make a businessman after all. In our business, I think that this ratio should be 10 to 1. That is the least that one can spend on new tools and equipment to be modern and to keep up, let alone working to be more efficient. If we budget \$50,000 worth of wages and benefits a year, we should budget \$5,000 in equipment and tools.

This is the only way that we can call ourselves experts and charge what we should, to be professional in this business. I think that we should do it in the future and attend every single Sencore Tech-A-Rama that they have. They have a ten day free trial. We should take advantage of that offer to see if this piece of equipment will save us 10 to 25 percent of our time. If it will, we should and must buy it. If it doesn't, we can take it back because Sencore has no refurbishing charges for trying this equipment.

Okay, buddy, I can see that \$5,000 multiplying itself so that we are the most prosperous, best equipped shop with the most satisfied customers in the business. Heck, they will pay the extra 10 percent if they will just come in our shop and look at our equipment. We won't have to do anything else. Now, I know what my Vo-Tech instructor meant when he said, "Don't forget, a man is only as good as his tools and tools only as good as the knowledge of the man." I am going to start looking at every Sencore instrument introduced as an opportunity to make more money, not an expense.

You are a good partner, Norm. Come on over to my house and I will give you some Nyquill for your cold.



The concluding article of this series reviews some of the basic economic principles that

are essential to operating a profitable service business, in the 70's. Be looking for it.

featured  
next  
month

# INCREASE YOUR INCOME WITH CONFIDENCE.....

ON EVERY CRT SERVICE CALL WITH SENCORE'S ALL NEW

## CR31 SUPER MACK

PATENTED AUTOMATIC CRT TESTER AND BEAM BUILDER



PATENT 3688184

ONLY \$395  
(Price includes all sockets, 10Kv  
Focus Probe, 50Kv Hi Voltage Probe  
and updated CRT Reference Book)

THE INDUSTRY'S ONLY COMPLETE, AUTOMATIC CRT TESTING AND RESTORING SYSTEM THAT GOES ALL THE WAY ON ALL CRT'S.

### 1. ACCURATE, AUTOMATIC, PATENTED TESTING . . . . .

It doesn't make "cents" to have a CRT restorer without an accurate, industry standard, tester to first determine if you need restoration, and then to see if you've done the job. All Super Mack CRT tests are performed under actual circuit operating conditions, including filament voltage and CRT biases, thus offering you a true test and not just a simulated check. "True Beam Current" is measured for the emission test rather than the total cathode current, like other testers check, for an actual operating measurement. The patented tracking test automatically stores, then compares the 3 guns' emission based on the CRT manufacturer's standard 1.5 to 1 ratio, for a simplified "Good - Bad" readout on one meter, no interpretations, calculations or guesswork. Only Sencore has this simplified, automatic, one meter tracking test that is easier to use and explain to your custom-

er. All other testers have three meters, and always will . . . Sencore has the patent. If Super Mack says a CRT is bad, you can go ahead with restoration with confidence.

### 2. EFFECTIVE - YET SAFE - AUTOMATIC RESTORATION . . . . .

Any restoration has the potential of damaging the delicate CRT elements. Testers with only manually timed restoration put this "Monkey" square on your back. Super Mack gives you 3 automatic and 2 manual restore options that will effectively, yet safely, restore those worn out CRT's, for greater profits and more content customers. We went right to the CRT manufacturers and asked them the best way to reactivate worn out CRT's. Their specs are now part of the Super Mack. If restoration is required, Super Mack's 2 low level "no surge" rejuvenation positions should be used first, to avoid any damage from long durations of excess currents. If sufficient restoration is not achieved, step up to the higher level

auto-cycle restore. If auto-cycle doesn't do it, 2 manual positions, like on other testers, are available with "wide open" manual 2 used as a last resort. Super Mack gives you the options so you'll get the job done with confidence.

### 3. ERROR PREVENTING CIRCUIT TESTS . . . . .

Don't make the mistake of testing or restoring without checking the circuit first. Only Sencore prevents this mistake from happening so you can save wasted hours of changing a CRT because of a faulty check, to say nothing of customer relations. Here's why: A weak or milky picture is often caused by off value line, focus or second anode voltage. Super Mack is the only CRT tester that meters line voltage plus comes equipped with a 10KV probe for focus voltage checks, with a 50KV adaptor to measure the high voltage, so you'll know if the problem is the CRT or the circuit. Filament voltage is measured and adjusted on

each CRT test to assure accuracy. If the problem isn't the circuit, you can go on to testing with confidence. You're only guessing with other testers . . . with Super Mack you know.

### 4. ALL SOCKETS AND VOLTAGES SUPPLIED - NO HIDDEN COSTS . . . . .

Super Mack will never let you down on a service call because you didn't have the socket for the CRT you needed to test. Super Mack comes equipped with all 15 sockets, including sockets for RCA Inline, GE Inline, Magnavox Inline and the Trinitron tubes. The most any other tester has available is 11. Super Mack also supplies you with accurate adjustable filament voltages so you can test any CRT you'll encounter. Some testers limit you to 6.3V only. You're completely equipped with Super Mack. No hidden costs or surprises. Now you can make every CRT service call with confidence.

## SENCORE'S CR31 SUPER MACK

THE MOST COMPLETE CRT TESTER AND RESTORER ON THE MARKET.

LOOK FOR IT SOON AT YOUR NEAREST FLPD DISTRIBUTOR