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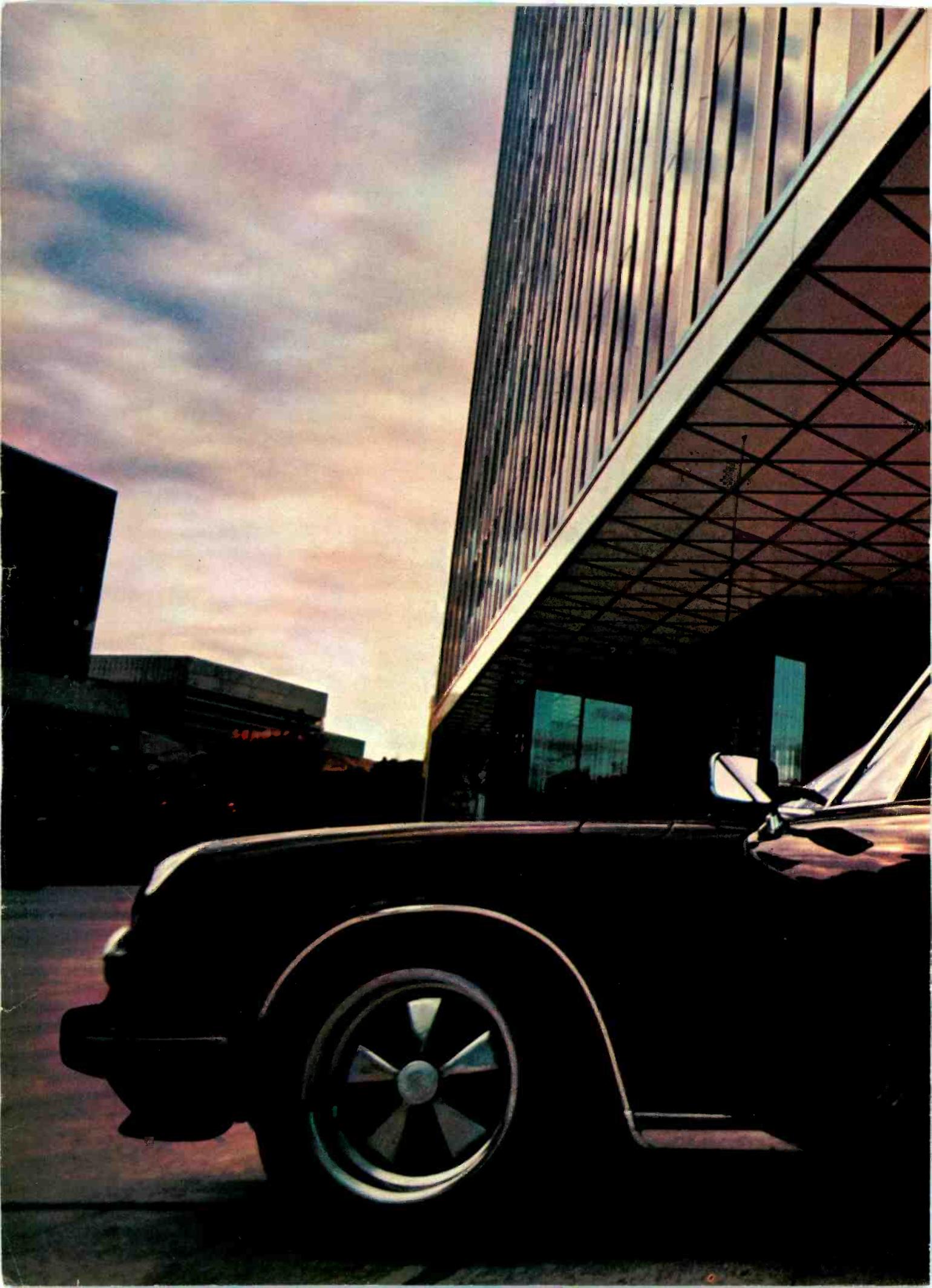
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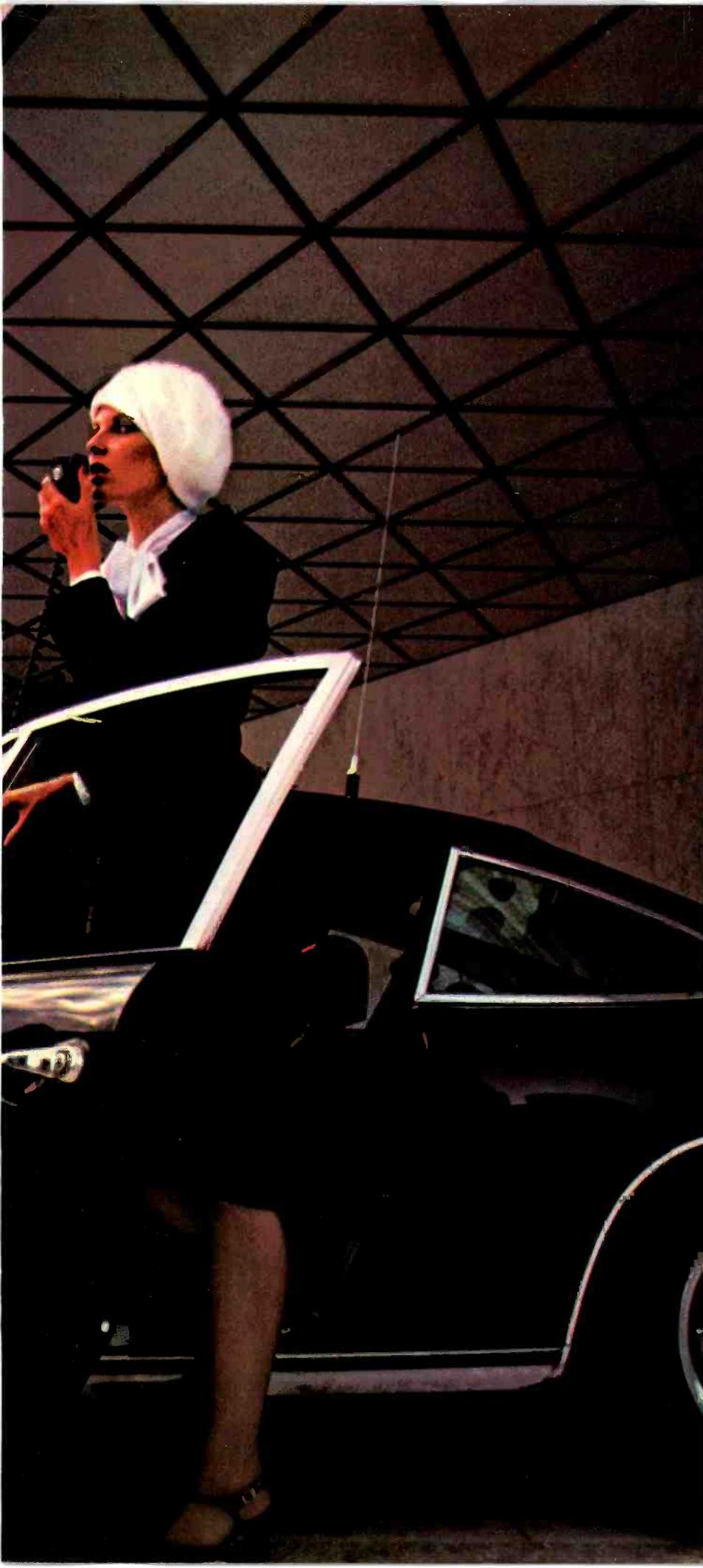
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America's Oldest & Largest CB Magazine

Vol. 17 No. 6 June 1977

### COVER STORY

A few short months ago CB came in handy to summon help on icy roads -- but for June it's recreation-time on the channels! Cover illustration by John Kane.

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Controlled Circulation Postage Paid at Glasgow, KY and Port Washington, NY

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# CB Newswire

YOUR CB NEWSPAPER

JUNE, 1977

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## Suspect Nabbed In CB Theft Try

A thief may have been caught in the act in the parking lot of the Fred Meyer store.

A customer leaving the Wash. state store at closing time, Tim Ramsey, 35, of Tacoma spotted a man detaching a citizen's band radio from Ramsey's car.

Ramsey chased him out of the parking lot, but had to give up the chase after falling and injuring his hand. He called police, left a description of the suspect and went home.

Later, police called Ramsey back to the scene to identify the suspect they had arrested when he returned to a car that had been parked next to Ramsey's.

The suspect admitted being inside Ramsey's car and being chased, but denied he was stealing the radio.

A knob from the radio was found in the suspect's pocket. He was booked into city jail.

## CB Frees Texas Rancher Tied Up By 2 Men

Ranch foreman Travis Parker's experience could have been right out of an old Western movie script, except for one important modern element.

Parker was patrolling the Bois D'Arc ranch south of San Angelo looking for lawbreakers (illegal hunters).

When he confronted two of the bad guys, one got behind him and knocked him out. They chained his hands to the steering wheel of his pickup, and tied his head back with baling wire.

And there they left him, to spend the night in that uncomfortable position and in the biting cold. The temperature in San Angelo was to dip exactly to the freezing mark before the sun rose.

But Parker didn't have to spend the night there. A trusty companion was able to get word of his predicament to the outside world.

The "friend" responsible for his rescue was his CB radio.

Painfully, carefully, Parker was able to move his hands along the steering wheel to the CB microphone, which for-

tunately had been left on.

"I was afraid I would knock it off," he said.

His voice strained by the baling-wire gag, Parker was able to contact a CB dispatcher. The dispatcher said later she thought the man sounded like he had suffered a heart attack.

His location was pinpointed, and Parker was freed. A bump on the hand, and a few bruises, including his tongue, were the only ill-effects of his ordeal.

One change was brought about by the incident: Tom Green County ranchers now patrol in pairs, looking for "road hunters."

(A road hunter is a trespasser, since he hunts on land he has not leased.)

The story does not yet have a typical old movie western ending:

The bad guys haven't been caught and brought to justice at S9 press time.

But if Parker has his way, they will be prosecuted to the full extent of the law, and justice will triumph in the end, just as the script calls for.

## CB Operators Help Chase Down Okla. Kidnapper With Female Captive

A group of CB radio operators chased down a kidnaper with his prey ending a wild chase through northern Texas and southern Oklahoma.

A 17-year-old female Denison High School student reported missing, told police she was choked, beaten and raped by her unidentified captor before her father and uncle rescued her with the help of several CB radio operators.

The girl said she noticed a rattling door in her car after making a bank deposit for her mother Tuesday. She said a man got up from the floor of the back seat where he had been hiding and told her to drive where he told her or he would kill her.

After a forced drive to Oklahoma, the girl said she was choked, raped, and beaten. She said she was kept bound and gagged in the trunk of the car most of the day and night.

Meanwhile, CB operators had been heavily broadcasting a description of the

missing girl. Tootie Little, the operator of a small gas station on the Oklahoma border, notified Denison CBer's after recognizing the girl when she pawned a tire. She said the man threatened her and forced her to sell the tire.

The girl's father and uncle staked out a bridge across the Red River near Little's service station with help from other CBer's.

When the girl's car came into view, the radio operators began their chase. The alleged kidnaper had the girl turn the car around and head north into Oklahoma. As the CBer's were chasing the car, they radioed ahead for assistance. Other CBer's set up a roadblock in front of the fleeing car and the girl slammed into one of the blocking vehicles, ending the chase. Neither the girl nor the man received injuries.

A 29-year-old Denison man was held in a Bryan County, Okla. jail pending further investigation in the case.

## CB Hoax Steers CG Astray

A Citizens Band radio hoaxster sent the Coast Guard Cutter Point Glass on a fruitless nine-hour search for a non-existent "disabled vessel" in waters off Browns Point (Wash.).

A Coast Guard spokesman said the phony distress call was received several times from 3 p.m. to midnight by CB monitors in King and Pierce counties.

The Point Glass returned to the area each time, but no disabled vessel could be found. It was later discovered the hoaxster was using the name of a pleasure boat already safely berthed in Tacoma.

Officers noted that the false call drew manpower away from aiding other small boats that were actually in trouble during the high winds.

The broadcast of a false distress signal is a criminal offense punishable by a fine and imprisonment.

# CB Newswire

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## CB Card Led Police To Slayer

Francis Donald Nemechek, a 26-year-old welder from WaKeeney, Kan., faces life imprisonment for the deaths of four young women and a child after a jury rejected his plea of insanity and convicted him of five counts of first-degree murder.

And had it not been for one critical mistake, an investigator testified during the 5-day trial, Nemechek could be a free man today, possibly unconnected with any of the deaths.

That mistake, the investigator said, was leaving a citizens band radio warranty card at the scene of a park rangerette's murder. The card carried a fingerprint that matched one on file belonging to Nemechek and which was linked to a radio he had purchased the day of the rangerette's death.

Nemechek, termed by a prosecution psychologist as a man "with tremendous hostility for females," sat expressionless Friday as the jury's verdict was read in Saline County District Court.

The jury deliberated almost four hours before returning with a decision that rejected the defense contention that Nemechek was in a psychotic state during the slayings and out of contact with reality.

Instead, they accepted the picture painted by the special prosecutor, Alan Roth, Jr., of a calculated killer who forced his victims to isolated areas, raped two of them, and then put them

to death either by knifing or shooting to eliminate witnesses to his acts.

Roth contended in his closing arguments that a 6-page confession Nemechek signed last October, six weeks after his arrest for the murder of a rangerette, was marked by self-serving lies in Nemechek's outline of how the murders took place.

Jurors would not comment on their decision but Nemechek's attorney, Robert Earnest, offered his own theory: The wording of Nemechek's plea—not guilty by reason of insanity.

"I personally think it should be guilty by reason of insanity," the Russell, Kan., lawyer said. "It's the innocence that ties up the jury. I believe we established a reasonable doubt, but I don't think the jury was ready to accept the plea."

The jury convicted Nemechek of the stabbing death of the rangerette, Miss Paula Fabrizius, 16, killed after her abduction Aug. 21, 1976; the murder of Miss Carla Baker, 20, abducted June 30, 1976, while riding a bike near her home, and the shooting death of Mrs. Cheryl Lynn Young, 21, and Miss Diane Lovette, 20, both of Fort Madison, Iowa, in December, 1974. He also was convicted in the death of Mrs. Young's 3-year-old son, Guy, who died of exposure outside the abandoned farmhouse where his mother and the other woman were shot.

## CB Radios, Fuel Injection Don't Mix?

Some Citizens Band operators with European-made cars are complaining about interference—with the car's fuel injection system.

The combination of a two-way radio and a fuel-injected car can pose problems, even if the two aren't in the same vehicle.

"The wiring in the car acts as an antenna," said Bob Radke, chief engineer for Kris, Inc., a Cedarburg, Wis., CB manufacturer. "Any wiring you have, like your house wiring or your car wiring or any wiring will act as an antenna for certain frequencies."

The problem arises when the wiring picks up radio transmissions from any kind of two-way radio.

The fuel injection system controls the flow of gasoline to the motor by means of electronic signals from the engine. It cannot, however, tell the difference between a valid engine signal and a spurious signal from a two-way radio.

"It causes it to open too long or out of sequence," said the service manager for a car dealership. The fuel injection system, in its confused state, either speeds up or cuts the fuel flow.

## 'Good Buddies' Give CBer Set To Get Him Back On The Air

Often he would continue the conversations from the car while it was parked in the garage, but cold weather cut his transmissions short, and he got a bad cold, cutting them out altogether.

His Channel 17 buddies missed him, and upon learning what had happened, arranged a "coffee break" and bowling party last Jan. to get him the indoor apparatus. The last of the necessary items needed to install the set arrived and the antenna was raised in time for the open house party, complete with a cake from Channel 17 CBers.

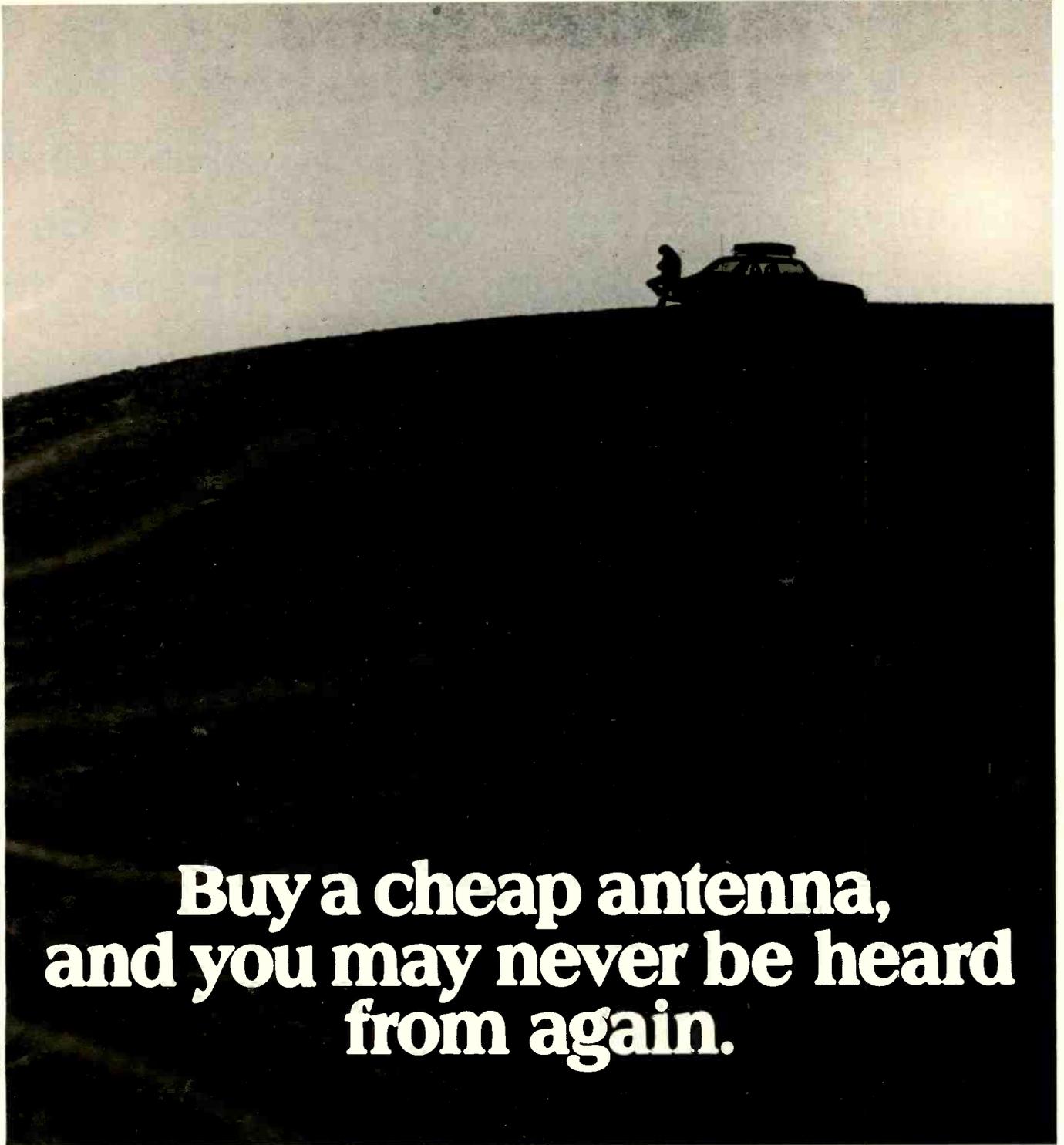
More than 200 persons attended a CB "antenna raising" and open house in the Connecticut home of William G. Hunnewell when the CBers gave him an indoor base set to get him back on the air without endangering his health.

Mr. Hunnewell, whose CB "handle" is "Shakespeare," amassed a host of friends on CB Channel 17 while traveling in his parents' car enroute to the Easter Seal Rehabilitation center, where he receives physical and occupational therapy for cerebral palsy and a congenital heart condition, which he has had since he was born 25 years ago.

His father, Roger M. Hunnewell, is a patient in the West Haven VA hospital, and was unable to be present, but saw his son's party on television.

The committee for the Jan. coffee break and open house included Denver Shipman (CB handle Oakey); his wife, Mrs. Shirley Shipman (Winnie Winkle); and Dino Gannon (Nashville).

The committee which raised the antenna included Mr. Shipman, Edward Tomlinson (Beer Man), Dennis Paradiso (Sparky), and Joseph Szadeczky (Joe the Mechanic).



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# CB Newswire

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## Californian Monitors CB Emergency Calls

Wayne H. Davis is a victim of Multiple Sclerosis. But he doesn't want sympathy—he wants support . . .

For Davis has found his therapy. Helping others. From his home in Fair Oaks he monitors a CB radio, aiding hundreds of people in distress. And, for many, making the difference between life and death.

Davis began monitoring Channel 9 last Sept. He was tired, he said, of watching the TV at the foot of his bed. Since then, he has turned his one-man operation into an organization which he calls, "California REVAC" — Radio Emergency Volunteers for Action to the Citizens. And, since then, it has grown rapidly to include an active 45 units, covering all parts of Folsom, Fair Oaks and Orangevale; parts of Sacramento, and eventually, says Davis *all of California*.

These units under the direction of Davis are concerned with only one thing—helping people in distress—contacting the California Highway Patrol, and the fire departments when there is an emergency, whether it be a crime committed, an accident, fire, or simple vehicle breakdown, and even giving out road service information and directions. "I'm not concerned with what it can do for me," says Davis. "I want to help the people out there in trouble."

He added, "We've got people monitoring the radio 24 hours a day." Davis alone has made close to 700 emergency calls since September.

Monitoring Channel 9 adds meaning to his existence. He feels it can do the same for other paraplegics, shut-ins and people with disabilities. He has already and is trying to recruit these people to monitor from their homes. However, Davis says he'll always need what he calls his "legs"—able-bodied men who can get around and do the outside work . . . qualified, professional radio men, some of them having as many as 40 years of radio experience. These men,

## "Local" Sideband Numbers Get Confusing Away From Home Qth!

Sideband operators have long since discarded the use of CB "handles" in their operations. Instead they identify by means of special identification numbers (permitted by the FCC under the same terms and conditions that "handles" are allowed, Sec. 95.95b). These numbers often are assigned by local and county clubs and other groups, and generally include the initials of the group which assigns the numbers to their area members. So, for example, member number 255 of the Karr Co. Sidebanders Club might have the sideband ID number "KC-255." Member number 255 of the Knox County Sideband Club might also have that same number, as might member 255 of the Kings County, the Kansas City, Kloop Center, Kleenex Company, and dozens of other "KC" sideband clubs. Fact of the matter is that many local and regional sideband club numbers may be as heavily duplicated nationally as AM "handles." This becomes especially tacky during this time of the year when Sidebanders take to the highways for long and short vacations. Sidebanders

often find that their own local numbers may be duplicating local numbers in several areas through which they drive—bending local operators totally out of shape in the process. What's even worse than that, is announcing your local number a few hundred miles from the home QTH and finding that it *doesn't* duplicate anything! In that instance, operators often find that their calls are totally ignored by the local crowd who can't figure out from your "unknown" numbers whether you're fish or fowl—sincere or just being silly! These problems are easily avoided by obtaining "national" "SSB" numbers which are known and recognized from coast-to-coast, and since they have been issued on a national basis since 1964, they will very effectively avoid all of the problems described—in fact, you'll most likely find other operators with national numbers wherever you venture! Seems to be the way to go.

You can get an application for national numbers by sending a SASE to the SSB Network, P.O. Box 381-R, Smithtown, N.Y. 11787.

Davis says, will help in the training of those shut-in persons who want to join his group and get their license from the Federal Communication Commission.

Davis is hoping that, soon, equipment can be donated to REVAC. He is in the process of making REVAC a non-profit, non-political organization. Attorneys have everything in the mail, and Board members have already been chosen.

They include Davis himself as chairman; Phil Favro, California State Chief Fire Marshal; Robert Mason, Deputy Fire Marshal; Al Lockhart, from the California State Office of Emergency Services; James C. Cook, Col., United States Air Force; Howard P. Crum, M.D., medical director; Elmer McBaeth, Chief of the Rancho Cordova Fire Department; K. C. Dobson, United States Federal Protection Officer, N. D. Rhodes, Major, United States Air Force and honorary member, W. G. Hefner,

member of the United States Congress.

James C. Cook is the main training officer, assisted by Cecilia Kelly from the Rancho Cordova Fire Department.

According to Davis, training is one of the most important parts of REVAC, for many emergency calls are hard to take. People have to face reality, they have to face the fact that some calls will say the victim is dead. "We don't want people as monitors who will be disturbed and can't handle the situation."

Davis, a veteran of World War II and Korea, has suffered from MS for 10 years—a chronic disease in which there is a hardening of body tissues or parts of the nervous system, characterized by muscular weakness. But, he believes in his group of Cbers, and wants REVAC to grow. Those interested may call him at 916-961-5243. They've done a lot of good, and, for many, they have given the gift of life itself.



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## N.Y. CBers Face Eviction

Citizen Band radio is running into heavy interference at Syracuse Housing Authority apartments, and the static may end in eviction of a score of CB enthusiasts.

SHA officials say they have been "deluged" with tenant complaints that CBers are disrupting television reception, and add that the use of outside antennas in the high-rise complexes has created safety hazards.

Radio operators reply the authority is overreacting and unfairly discriminating against them. They contend compromise solutions can be found to permit them to continue a "useful" and "therapeutic" hobby.

### 'Can't Walk Away'

"My friends tell me you can't fight city hall, but I just can't walk away with a tail-between-the-legs attitude," said Donald Black, a CBer.

The retired 59-year-old disabled Army sergeant was the first radio operator to receive an eviction notice for refusing to take down the antenna protruding from his 21st floor apartment.

"I've got 24 hours on my hands, and this has been good therapy for me," said Black, who added he is a member of the REACT TWO emergency assistance network. "I'm going to fight this thing."

Mrs. Carol Shepard, SHA deputy commissioner, said eviction proceedings also are beginning against a second CBer who allegedly has been disrupting the television viewing of her neighbors.

She said 18 others have been sent notices threatening eviction unless their antennas are removed.

"If we open the doors to this we'll have 300 antennas on the roofs," said Mrs. Shepard, whose authority operates seven high-rise apartments.

"It's windy up there, and it's not going to be safe."

She added the SHA already has spent an "unreasonable" amount of staff time dealing with CB complaints. "There's no way we could keep up with it."

Black, however, who says he is the only CB operator in his building, for- sees no rush to the roof by tenants.

"We bought these units in good faith because we saw nothing in the rules to

prevent them," he said. "One of my friends spent more than \$1,400 on his equipment. If we have to sell it we'll be taking a sizeable loss."

### No Objections

Black's problems began shortly after he moved in last summer when he placed his antenna on the roof. He later learned that clearly violated the rules, and offered no objection when SHA officials removed it.

He then devised a new antenna which extended above the roof level by being clamped to his window.

This procedure was deemed "unsafe" by the SHA, which last Dec. 8 issued its first directive on CB radio use in an attempt to solve the problem.

### New Rules

The new rules prohibited CB antennas from being attached to the building or creating unsafe conditions, and also required that they not create excessive noise.

Black objected that his antenna was safe and demanded a hearing before the SHA grievance board of two tenants, two authority staff members and a neutral party.

The board cleared Black of charges that his radio interfered with television reception, but ruled he must pull down his antenna.

### Antenna A Must

Black responded by building a new antenna—"There's no other way to operate but with an antenna," he said—which he claims is securely held with clamps inside his apartment.

His eviction notice followed shortly thereafter. "It's still unsafe," said Mrs. Shepard.

A similar controversy at Fulton Housing Authority apartments recently was resolved successfully, but Black and Mrs. Shepard draw different conclusions from the case.

Wilbur Fay, FHA manager, said a Syracuse electronics firm agreed to install, at no charge, more than 100 newly designed filters on television sets and a handful of CB units.

### Problem Solved

"They were very gracious," he said. "That solved the problem."

A representative of the firm, Syra-

cuse Microwave Filter Co., said the filters now are on the market and sell for \$11.98 and \$12.98, but in most cases can be installed by the consumer.

Black contended a compromise could be worked out between CB operators and those who are affected by their operations.

Mrs. Shepard, however, said tenants' rights would be violated by requiring them to pay for filters. She also said the Fulton authority, which has 246 units, has the ability to handle antenna operations and other CB problems.

### 2,800 Units

"We've got 2,800 units to manage here," she said.

Curiously, it appears the CB problem in apartment complexes may be unique to the SHA.

A check with several private apartment complexes in the county turned up no reports of CB complaints, and no regulations on CB use.

Black sees the entire matter as an SHA "vendetta" against the CBers.

"We've got one guy in this building who chews tobacco and spits it everywhere," he said. "We've complained about him for months, but they haven't done a thing to stop it. It seems as though they're singling us out for eviction."

## Walkie-talkie Robs Depositor

Allen Butterfield is not likely to earn any interest on the \$5,000 he "deposited" at a bank.

Butterfield pulled up to Tucson's First National Bank of Arizona at North Campbell Ave. and East Glenn St. to deposit money when he noticed a walkie-talkie next to the drop slot about 9:30 p.m., police said.

A voice coming from the walkie-talkie told Butterfield to drop the money on the ground, get back in his car and get down on the floorboard, or he would be shot, police said.

Butterfield did as he was told.

He then heard a car drive away. When he got up, the money and the walkie-talkie were gone, police said.

Policemen on patrol in the city were requested to check banks in their areas for such devices.

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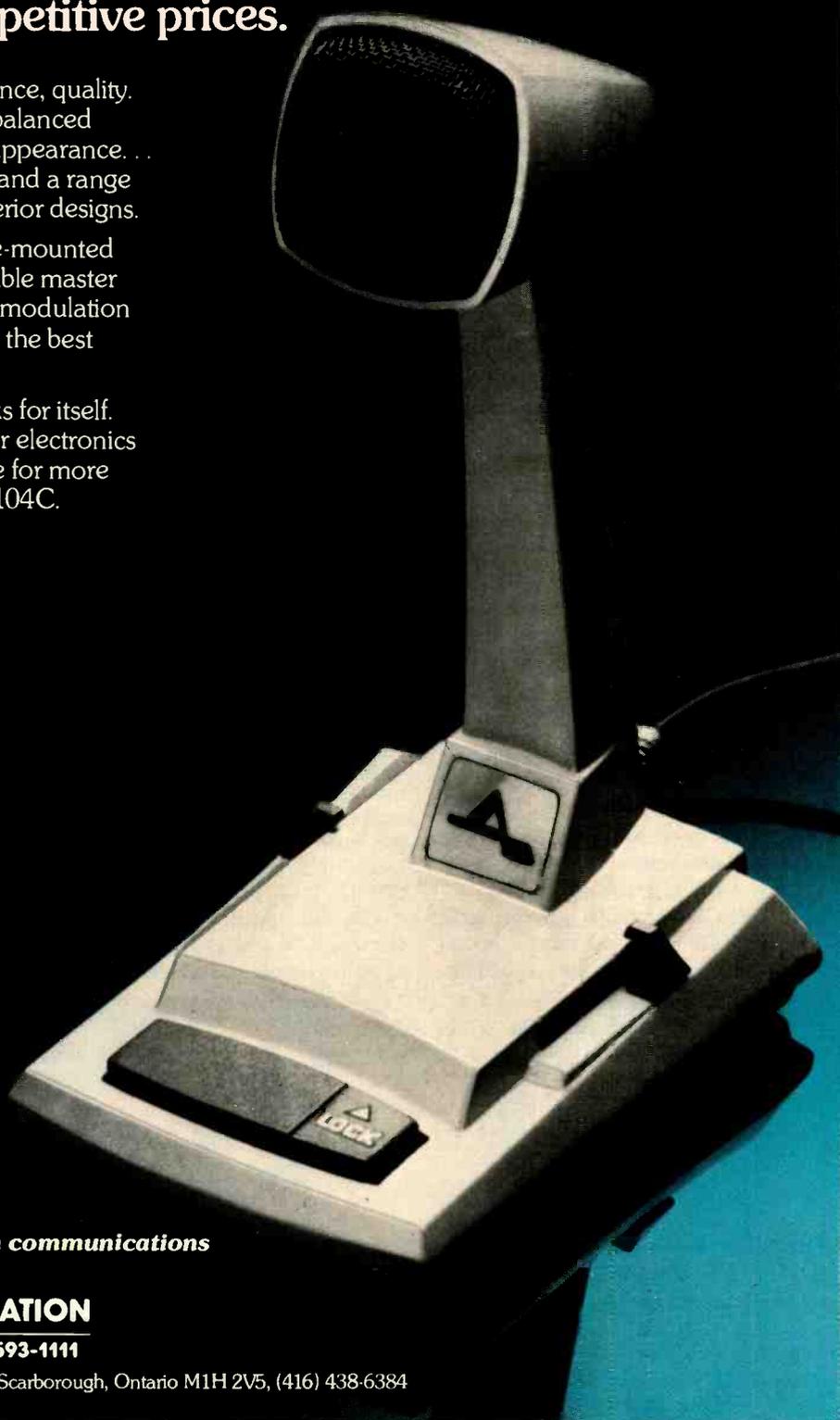
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# CB Newswire

YOUR CB NEWSPAPER

JUNE, 1977

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## Goin' To "Big Movin' on '77"?

The convoys are getting ready to roll, the campers are checking their gear, and a lot of good buddies are spreading the word. What's the occasion? MOVIN' ON 1977, a three-day "Country Holiday" which will light up Pennsylvania's Pocono International Speedway with three days of music, contests and good times, this Memorial Day Weekend, May 28, 29 and 30.

PC '77, the yearly electronics industry get-together called "MOVIN' ON 1977" "the CB'ers Woodstock" and it promises to be the largest event of its kind ever held with 1/4 to 1/2 million people expected to turn out for exhibits, contests and good times in the beautiful Pocono Mountains.

Top country entertainers such as George Jones and Tammy Wynette (George and Tammy are up for top Country Western duet this year and Tammy herself is four times top female vocalist), Ronnie Milsap (the top Grammy Award-winning male Country Western vocalist), Red "Teddy Bear" Sovine, and Dave Dudley (the man who put truckin' in country music) will all be appearing live from the Speedway's grandstand stage. Southern Sheriff, Joe Higgins, star of the Dodge car and Johnson CB commercials is the official Goodwill Ambassador and "Chief Smokey" for the weekend.

For the CB'ers, there will be large displays of CB gear and related equipment, for campers there will be exhibits



of the latest and most convenient items in the field of camping and recreational vehicles. Displays of trucks and truck equipment by the leading names in the business are all in store for added attraction for you truckers. Dave Dudley, the man who put trucks into Country music will be performing at MOVIN' ON 1977 on Monday, May 30.

For those with a competitive nature, there will be contests of every type imaginable—recreational vehicle contests,

CB contests from ratchet jaw to QSL card contests, bicycle contests, Big Rig tractor drag races, even an 18-Wheeler beauty contest. There will be over 20 van contests also.

If that is not enough for you, "MOVIN' ON 1977" will also feature a complete carnival and midway with camel rides, elephant rides, amusement rides and an authentic flea market.

In addition to all of this, there will be square dances, barbecues, coffee breaks and other entertainment throughout the day for each of the three days.

To help accommodate the big crowds expected, there will be free overnight camping both inside and outside Pocono Speedway's spacious track. There will also be completely adequate, clean and convenient facilities, including the first modular showers ever used at any event of this type.

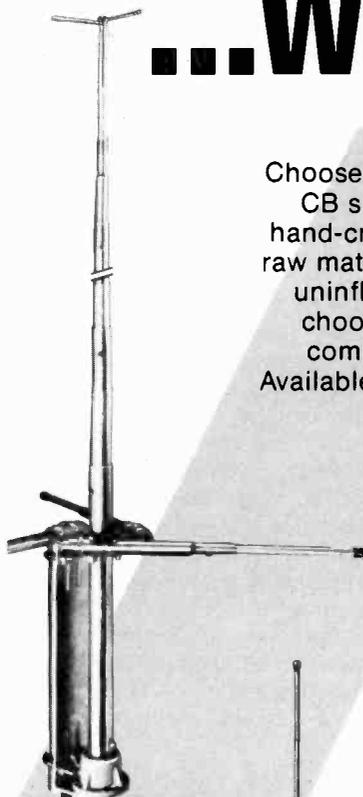
Convoys of CB'ers, campers and truckers will also be forming from all different parts of the country to meet at "MOVIN' ON 1977". Prizes will be awarded to the largest convoy and also for the convoy which has traveled the longest distance.

Tickets are available at Ticketron or from "MOVIN' ON 1977" organizers. Tickets are \$4.00 per day for adults, \$2.00 per day for children. Special 3-day tickets are available at \$10.00 per adult and \$5.00 per child. Children, six and under, are admitted free when accompanied by an adult. Pocono Productions is producing the show and additional information is available from Pocono Productions, 8422 Hamilton Mall, Allentown, PA 18101. Phone: (215) 435-4720 or toll free outside of PA (800) 523-9470.



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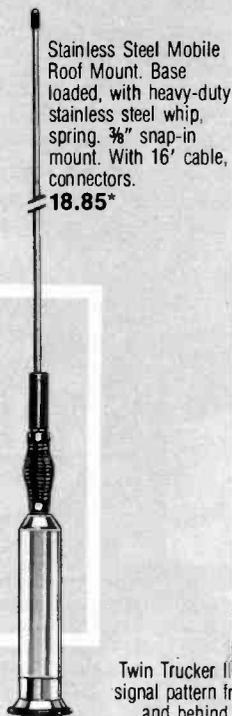
Choose the perfect antenna for your CB at Radio Shack — the nationwide CB supermarket. Made in our own USA factory, Archer antennas are hand-crafted to exacting standards. And because we control quality from raw materials to carton, you can be sure of maximum dependability at low uninflated prices. With over 20 models, Radio Shack makes it easy to choose the right antenna for your base or mobile CB. There's also a complete line of Archer accessories to improve any CB installation. Available wherever you go in the USA and Canada. Radio Shack — leading the way in quality CB since 1959.



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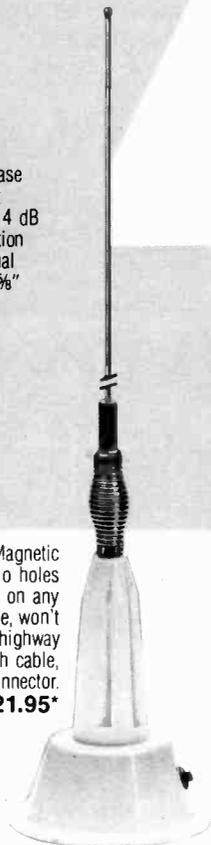


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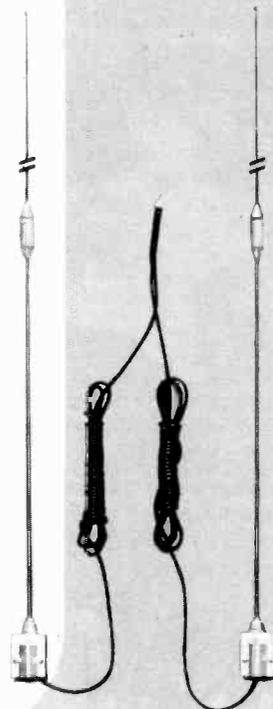
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# CB Newswire

YOUR CB NEWSPAPER

JUNE, 1977

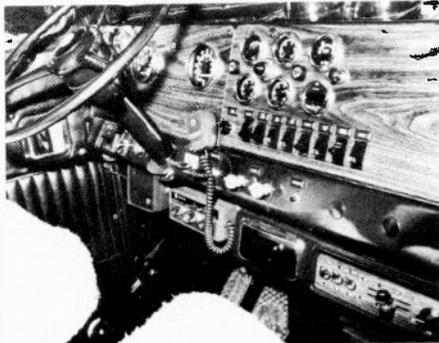
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## "Break On 19 For That Kenworth 4-wheeler"

What? A Kenworth 4-wheeler?

Ten-four, CBers. You heard it right. And don't be surprised when that crisp, clean reply comes back over your CB. It's the sound of a Johnson Messenger 123SJ CB and the voice of the proud owner of a truly unique pickup truck.

The vehicle is a custom-built, two-thirds scale replica of a Kenworth W-900 conventional tractor. It was secretly built by volunteers from several Kenworth plants for Murray Aitken, senior vice-president and director of PACCAR, parent company of Kenworth Truck Company. It was presented to him at his retirement party late last year as a



**STANDARD CAB FOR CUSTOM PICKUP.** The interior of this one-of-a-kind Kenworth pickup makes use of standard dash components and instrumentation, including a conventional installation of the Johnson CB and external speaker. Standard Kenworth air seats were lowered slightly for headroom.

tribute to his 12 years service to the company.

Many of the components were donated by Kenworth suppliers so there is no accurate measurement of the vehicle's cost, but replacement value is listed at \$23,600, according to Kenworth. It's a faithful reproduction of its big brothers except for the lack of vertical exhaust stacks and the addition of an aluminum box and teak side boards.

The cab is standard aluminum and fiberglass construction with a complete Kenworth dash, full instrumentation and a nifty underdash installation of the Johnson CB and external accessory speaker. Standard Kenworth air seats were used, but lowered slightly for headroom.

If you're ever driving in the Seattle area, keep an eye out for this custom Kenworth pickup—and keep listening for the Johnson CB carrying the voice of the "Kenworth 4-wheeler."



**KENWORTH PICKUP?** If you've seen one, you've seen them all. Because it is the only one you'll ever see. It's a custom-made, two-thirds scale replica of a Kenworth W-900 conventional tractor using standard components, including a Johnson Messenger 123SJ CB rig.

## Penna. CBers Help Nab Suspects

Three Pittsburgh men were arrested for burglary as the result of fast thinking by a CB operator, North Huntingdon police said.

According to NHT police, three men broke into the Thrift Drug Store in Norwin Shopping Center, shortly after midnight and made off with \$1,200 in drugs and narcotics. A man sleeping in his truck heard the alarm system, which was set off when the culprits broke a

window to enter the store. Realizing a burglary was taking place the man called for help on the emergency channel of his CB radio. A woman listening to her CB radio at home heard the call for help and alerted police.

Officers Richard Dedo and Donald Austin, after a short chase on Route 30, arrested David Nickel, 28; Raymond Lewis, 25; and John Phillip Schuck, 25, of Pittsburgh.

The men were arraigned before Murrysville Magistrate Robert Scott and currently are being held at the Westmoreland County Detention Center, Greensburg, in lieu of bail set at \$10,000 each.

## Mich. Judges Get CB's

Michigan's Supreme Court and Appeals Court judges have joined the CB radio set—at taxpayers' expense.

The state cars of the seven Supreme Court justices and 18 Court of Appeals judges are being equipped with CB radios at a cost of nearly \$2,600.

The two courts made separate arrangements for the radios, but the reasons given were similar.

"We decided to get them for the court as a highway safety precaution," said Phillip Sprague, a Supreme Court spokesman. "The justices have to do a lot of traveling and if one of them has a breakdown on the highway, he can radio for help."

Robert Danhof, chief judge of the appeals court, added, "We've been worrying some about traveling in the Detroit area and the judges often have to travel long stretches on the way to Marquette, Benton Harbor or wherever."

## Ohio State 'Smokeys' To Get CB Tags

Ohio State Hwy. Patrol cars equipped with Citizens Band (CB) radios have specially marked license plates.

The plates read "CB CH 9" to remind motorists that the patrol monitors the CB emergency channel, 9.

Patrol Col. Adam G. Reiss said the importance of CB radios to enforcement efforts is increasing all the time.

"It is an important tool," Reiss said. "Response time to emergency situations has been substantially reduced because many CB calls are taken directly by troopers on the road."

Patrol figures show 18,459 accident reports were taken over CB radio during 1976. Other calls included 9,842 reports of drivers under the influence of alcohol, 6,100 calls reporting objects lying in the roadway and 135,255 calls for assistance.

The patrol maintains 912 mobile and 60 base CB radios.

# Why buy GE CB? That's what Howard Cosell wanted to know.

*"Finally, a company I've actually heard of is making CBs. (A subject, I freely acknowledge, I know little about.) But neither do a lot of people, so on behalf of everyone, I questioned General Electric. Their answers make it abundantly clear why GE is expert in CB."*

**COSELL:** Give me one persuasive reason to buy GE CB versus another make.

**GE:** Performance. For instance, our new 40-channel models are as powerful as our 23's yet exceed FCC guide lines on interference.

**COSELL:** Another reason?

**GE:** Quality. All GE sets are made with specially designed heavy-duty parts. They continue to perform from 20 below zero to 120 above.

**COSELL:** Impressive. Does GE have any features I won't find in every brand on the shelf?

**GE:** Sure. For example: an antenna warning indicator that lets you know if you're not hooked up right or transmitting with enough power... a channel priority feature that automatically and continuously monitors any channel you select...

a switchable noise suppressor...

**COSELL:** That's terrific. Now, what have you guys done to make sure your new 40-channel units don't turn out to be turkeys?

**GE:** Researched the devil out of them. With new products, GE's procedure is to place hundreds of units in a test market, then survey the owners and investigate any complaints. We tear down the entire set to find out what's wrong. Once we've isolated the problem we can eliminate it.

**COSELL:** One last question. Do your designers ever think about the guy who'll be using your units?

**GE:** Absolutely! He's why we do all we can to make our numbers extra legible... why we position our controls so they're easily reached... why GE mikes are designed for either hand... we even backlight our meters to improve readability.

**COSELL:** Where does Cosell come out after investigating the subject with my usual thoroughness? *GE.* That's more than you can say about any other CB.



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# CB Newswire

YOUR CB NEWSPAPER

JUNE, 1977

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## FLORIDA CB'ERS ELECTROCUTED

Two Miami Citizen's Band Radio enthusiasts were electrocuted when a 45½-foot-tall radio antenna they were removing from the side of building struck a high voltage wire.

Dead are Albert Baughman, 31, of 8524 SW 107th Ave., Apt. C-2, and Michael Purinson, 29, of 8101 SW 94th Ct. The accident occurred at the Baughman residence, according to rescue workers.

A spokesman at Baptist Hospital, where attempts were made to revive the men, said Baughman was married and Purinson was single. The spokesman said Baughman had no children.

A rescue worker who was on the scene gave the following account of the incident.

Purinson was helping Baughman low-

er the antenna, when it struck a high voltage wire, knocking both men to the ground.

The fire station received a call for help at 6:37 p.m. and had fire engine nine at the scene by 6:40.

When rescue workers arrived, they saw several neighbors attempting to revive the men with mouth-to-mouth resuscitation and external heart massage. Rescue workers, taking over, found no signs of breath and no pulse in either Baughman or Purinson.

Ambulances arrived shortly afterwards and various resuscitation methods were attempted, all unsuccessful.

"The men had apparently received such massive voltage that nothing could be done," said the rescue worker.

The men arrived at Baptist Hospital at 7:10, with Baughman showing some signs of cardiac activity and Purinson already dead, the hospital's nursing supervisor said.

"We tried numerous resuscitation methods," she said, "including open cardiac massage, but there was nothing that could be done."

## CB Crimewatch Mich. Reports

State Police officers monitoring citizen band radios received a record 1,182 calls in November, making 82 arrests based on citizen tips.

The program of monitoring citizen band channels began last June. About 40 mobile units and 30 base stations are involved in the project which principally covers the Detroit area's I-94 and I-96 corridors, the I-75 and US-23 area at Bay City and Flint, portions of the Upper Peninsula and the Traverse City district.

According to program supervisor Lt. Roderick LaMore, there were 953 messages involving dangerous conditions or requests for assistance and 229 reports of violations in November.

There were 111 reports of drunk driving, leading to 36 arrests, nine warnings and 34 referrals to other agencies.

A total of 74 speeding reports led to 44 arrests, eight warnings and four referrals.

There were seven reports of felonies resulting in two arrests and four referrals.

Officers also responded to fire reports and requests for assistance.

In 65 cases, reports proved unfounded, and locations could not be determined in 153 cases.

The State Police operation monitors Channels 9 and 19.

## CB Crimewatch: N.J. Community Says "OK!"

The Madison Police Department (Madison, N.J.) is another example of CB radio making believers of law enforcement officials.

Police Chief Harry Bartow decided what was good for him was good for the force. He had a set installed in his personal vehicle several months back and then purchased a base station for business.

It has already proved its worth.

During the first week of action Bartow's men nearly saved the life of a 54-year-old Morristown man who suffered a heart attack while driving on Main Street in Madison.

A passerby, realizing the man was in trouble, called for help using CB. Madison police picked up the call and were quickly on the scene. The heart attack victim died several days later but there is no question CB helped prolong his

life.

"CB radio gives us tremendous advantages," said Bartow. "It just so happened that the heart attack incident was one of many problems encountered the first week we had the radio.

"There were a good many breakdowns of automobiles and several fires which were reported over CB. We responded in greater haste because we now monitor the emergency channel."

Bartow has found Madison citizens most cooperative and not inclined to fool around on the airways. He is convinced CB is "a very valuable tool" and is not surprised nearby departments, such as Morristown and Chatham Township, have also turned to CB.

There is another important reason why Madison is symbolic of the new CB world: Cooperation with volunteer groups.

Inter-County REACT is an amalgam of 150 volunteers who give of their own time and monitor the emergency channel. The group covers all of Essex and Morris counties and parts of others.

Inter-County has persuaded police departments, including Madison, to combine forces with the volunteers.

"If we adopt similar codes and sign-

off techniques, we make life easier for everybody," said Inter-County member Neil Spear of Summit.

"In case of an emergency call, we don't duplicate measures of assistance. The volunteers know when the police are able to handle a call and when they're not, perhaps because the police lines were jammed."

Inter-County is determined to persuade police to become fans of CB. The group offers equipment on 90-day loans, and is willing to coach police on proper procedures and means of fighting interference.

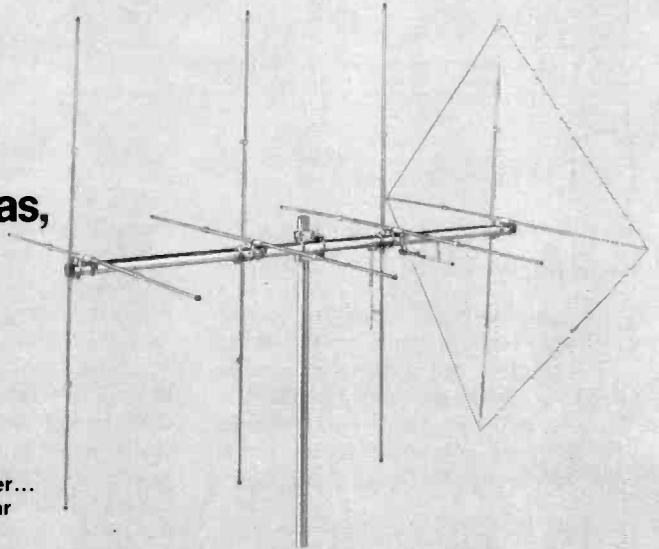
Inter-County sends Madison its regular newsletter and couldn't be happier with the cooperation its received.

"We're happy to work with the police and we feel they're happy to work with us," said Spear.

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To Deliver your Thunder...  
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**With Dual Parasitic Excitation**, the size of your antenna is increased electrically. Wilson's unique design, using DPE, combines the best advantage of the Yagi Antenna with the best of the Quad unit. Thus you get more power out the front door...up to effective power level 60 times the power of the transceiver itself; with less interference..

40 channel capacity...All Wilson antennas provide the famous 2,000 watts handling capacity, adjustable gamma match, lowest SWR, heavy wall aircraft aluminum tubing, no holes drilled in elements, solid fiberglass reflector arms, and on and on.

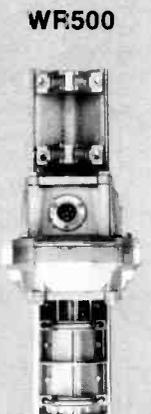
**Our crank up towers are unique too!** Up to 64 feet high, allows access to antenna and rotor from ground or roof; available in free standing or guyed models; one man raising fixture options, you name it we've got it. Features include galvanized steel tubing, tested to handle 10 sq. ft. of antenna at 50 mph wind, and the 800 lb. winch is easy to raise and has lockable security feature; great looking for the ecology minded, and the price makes it easy to buy.

**Rotors Too!** They'll easily turn the biggest antennas...for pinpoint accuracy...capable of handling antennas with wind load areas up to 25 sq. ft., with a braking system four times that of other rotors on the market.

**For a complete catalog of these Wilson products: C.B. Antennas, Crank-Up Towers, Rotors,**



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# CB Newswire

YOUR CB NEWSPAPER

JUNE, 1977

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## Farmers Find CBs Valuable

The citizens band radio has become a valuable tool for many Iowa farmers.

"I wouldn't be without it," volunteered a Delaware county operator. "We use it to call the elevator for markets or to place orders. It has almost replaced our local telephone for nearby farm business.

"And it's great company for those long hours in the field," added another Delaware countian. "You can keep in touch with the family at home or visit with your neighbor in the next field."

Those were typical comments from CB owners interviewed in a Wallace Farmer poll last July.

Of the 492 farm men and women quizzed in the representative sample from all areas of the state, nearly one-fourth indicated they presently have a CB system. The poll asked:

"Do you have a 2-way radio communication system on your farm?"

Yes, we have a citizens band system—23 percent.

Yes, we have an FM (business) system—1 percent.

No, but we are considering buying one—10 percent.

No, we have no plans for one—60 percent.

Even among several farmers who said they had no immediate plans to purchase a system, interviewers detected some hesitation. One man said: "No, I don't intend to buy a set now. They are really more a toy than anything." He paused and thought, "But with our local co-op putting in a system, they may have some real value."

I can't see spending the money right now," said a Story county man. "But they are getting cheaper. If my neighbors keep buying them, I may change my mind."

Most farmers who own a radio system have more than one unit. Typically, a base system and 2 to 4 mobile units are included in the setup. The question was:

"If you have a 2-way radio system, how many units are involved?"

Base unit and one mobile—23 percent.

Base unit and 2 to 4 mobiles—50 percent.

Base and 5 or more mobiles—10 percent.

One mobile only—10 percent.

Two to 4 mobiles only—7 percent.

There were many enthusiastic comments.

A Carroll county farmer said: "We've got one unit now that I move from pickup to tractor to combine. We're about to buy a base for the house and another mobile or two. It's sure a handy thing, and sort of fun, too."

"The CB is a live-saver for us," responded a young farmer from Marshall county. "It has saved us many, many hours and miles and miles of running after this thing and that."

Women were impressed, too.

"It's nice to know what's going on in the field and I can tell them when meals are ready," said a young Carroll county housewife.

"We use it in place of a telephone. My daughter lives in a neighboring community, but it's a long distance call. We both bought base units and it's just great," offered a Delaware county woman.

A Story county man quipped, "I have one in my car. It's good insurance in case I ever get lost."

## Fla. Patrol Asks For 'Moving Radar' To Thwart Speeders Using CB

Tallahassee—The Florida Highway Patrol announced plans to buy 400 sophisticated "moving radar" units to help catch speeders who use citizens band radio to avoid tickets.

The patrol has asked State Cabinet permission to buy the new units under a \$233,200 federal grant.

Col. Lee Simmons, deputy director of the Highway Patrol, said the new units are much more advanced than old radar employed by the patrol or even the Vascar equipment purchased several years ago.

Old radar must be kept stationary to

work and Vascar, while it will work with the trooper moving, is somewhat limited on direction and requires the user to calculate mentally, Simmons said.

But the new "moving radar" can be used while the trooper is moving to catch speeders in front of him, on the other side of a divided highway or even behind him, Simmons said.

"This new radar will give us the capability to catch the speeders we need to catch—those who think they can outsmart anyone," Simmons said.

Ever since speed limits in Florida and nationally were lowered to 55 miles an hour on December 1973, a growing number of motorists have used citizen band radios to tell each other where troopers are.

But with the increased capability of the radar units, Simmons said, motorists would be wise to slow down.

He said that since the new units are switched easily from one car to another the request for 400 would give the patrol the capability to have units for every trooper on traffic duty.

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# Tomcat's

## CONFIDENTIAL REPORT:

More than  
you ever  
wanted to know  
about CB Handles.

Psychologists say your handle reveals the real you!

*Illustrations by GARY VISKUPIC*

ONE of the more interesting aspects of CB radio is the specialized method of station identification used by operators—a wide and varied, complex cacophony of clashing and confusing callsigns and code words. Fact is, how, why, and what we call ourselves is really sort of far out when you get right down to it! Lots of heavy people are starting to take a serious look at the social and psychological implications of CB handles—so before they get too fired up on peering into our craniums and ids, maybe we should stop and take a good look at it ourselves!

Of course, many folks on CB frequencies don't use CB handles—and maybe that says something too!

Well, we'll put it all together here and see how it all shapes up!

## WHAT IS A HANDLE?

In the CB world, a handle is a code name used by an operator to identify his or her station. In the world of Ham radio, a handle is the first name of the operator—however in CB-talk an operator's first name is usually called a *first personal*. How this curious turn of events came to pass is not clear at this time.

Why a *handle*? Well, the dictionary says that a handle is a part of a thing made for the primary function of facilitating the grasping of an object—so if someone wants to get ahold of you on CB—they use your *handle*. Dictionary also goes on to say that it means to *touch, feel, or hold*—as in *don't handle the merchandise*.

## THE USE OF HANDLES, ETC. ARE THEY LEGAL?

The FCC, not too long ago (in the face of mounting uses of handles and the like), decided to give some official recognition and sanction to special personal identifications. Current rules permit them to be used, so long as the regular assigned FCC station callsign is also given properly—so long as CB'ers use their callsigns they can add on whatever personalized identifications they want!

## HISTORY OF HANDLES ON CB

Many people feel that CB handles and other specialized identifications are a rather recent innovation, perhaps dating back to early 1975 or so when CB caught on with the general public. Many people don't even realize that CB'ers were on the air for more than 15 years before the majority of the citizens ever heard of it.

Back in the very earliest days of CB there were handles—in fact back in 1961 and 1962 I used to hear the famous CANDYMAN, from "Candytown, Indiana" on almost 24-hours a day. This was a station operated by Jessop's Candies's owner Kurm Jessop, then licensed as 18B2250. I always think of Kurm every time I hear someone claiming first rights on the handle CANDYMAN.

Another early handle heard was that of Jess Wyder—the ever popular BAG OF PENNIES since 1962. Jess still has copies of his original 2W6173 QSL cards to prove it (see page 50, Feb. '77 issue of CB RADIO/S9).

## WHY NOT USE YOUR OWN NAME?

Sometimes you hear a CB'er using his own name as his handle—y'know, just BILL, or SAM. This is a practice which seems to cause raised eyebrows on the band—seems to be against some of the unwritten traditions. After all—why should someone be just plain SAM when he might be something exotic—like CHOPPED LIVER, or (at the very least) SAM THE MAN!

While some operators have decided upon the use of

a personalized identification as a means of making it more difficult for Uncle Charlie's monitors or irate TV viewers to locate them—to the majority of operators a handle is an extension of their own personalities, and that has been the cause of no small amount of problems.

And still—if you really think about it—it's all been done before and CB'ers, far from being the originators of special names, are no more than the latest to get on the bandwagon. Hey, alternate names are all around us—been there for years!

CB'ers, upon entering into the mysteries of Citizens Radio—upon their initiation, when they first press their mike buttons, are expected to take upon themselves a new and special name to denote this new aspect of their lives. Just as a member of a lodge or fraternity, or numerous other groups which expect members to adopt special names. Some folks even become better known by these alternate special names than they are by their own real names—know who Archie Leach is? He's Cary Grant! What about Roy Fitzgerald? That's Rock Hudson. Fact of the matter is that C. W. McCall isn't even the real name of the composer of CB Radio's *Convoy*!

And, let's not forget that many religions require members to adopt special names as they progress through different degrees of learning and training.

No—folks are quite often called something vastly different than they were known as when they started out—and CBers are one manifestation of this age-old practice.

So, if your name is Robert, and they call you Bob, Rob, Robbie, Bobby, or even Slim—well you've had an alternate name (or handle) for years—even before you discovered CB Radio and racked your noggin to come up with something special (and different) to call yourself—except you probably never realized it!

## DO OTHER RADIO SERVICES USE HANDLES?

Technically, even your CB callsign would qualify for the dictionary definition of a *handle*, however there is an unwritten CB law which mandates that the handle be the personal creation of the CB operator. Actually, stations in a number of other radio services use what amounts to handles.

For instance, radio broadcast stations expend much more effort selling the public on their personalized handle than they do on their FCC callsign—although the callsign is always properly announced according to FCC regulations. In the New York City area there is a rock music FM station which is known far and wide as "99X," and probably less than half of their audience even knows their actual callsign—although it is announced regularly. But throughout the country there are countless broadcasters whose reputation is based upon something other than their callsign—TV stations know as "Channel 2" (or whatever), the VOICE OF AMERICA, etc., etc. (continued)

Military communications are more often than not conducted by means of so-called tactical identifiers, which are like handles except that the operators are usually told what to use for identification rather than create them—so if you listen on military communications frequencies you hear stations such as TOPHAND, RED ROVER, SKYKING, and the like. Even the quasi-military Civil Air Patrol uses tactical identifiers (seldom using actual callsigns).

Ships and yachts, are also prone to identifying themselves by means of the name of their vessel, frequently forgetting to include the FCC callsign. Aircraft (especially airliners) are seldom heard using a complete callsign on voice—and the aero bands abound with aircraft known only as SPEEDBIRD 288, UNITED 7, CLIPPER 174, CESSNA 28-ECHO, and so on. Meanwhile, on the ground, aeronautical stations are better known as CHICAGO TOWER, LOS ANGELES OMNI, MIAMI APPROACH CONTROL, than actual callsigns—just as fixed stations in other mobile services are called things like NEW HAVEN MARINE OPERATOR, or DALLAS MOBILE OPERATOR.

Aren't these handles? You bet they are—the FCC is not nearly as paranoid about callsigns being used as you might imagine if you based your entire outlook upon their attitudes toward callsigns on CB. Yes, in some radio services, you don't even have to announce an FCC callsign! One example which immediately comes to mind are the mobile radiotelephone units which announce only their mobile telephone numbers—the only time you hear a callsign is when the base station sends it out once in a while in CW!

### **CB'ERS AREN'T ALONE IN PROTECTING THEIR RADIO IMAGE**

Unlike CB'ers and most other FCC licensees who are forced to accept whatever callsign Uncle Charlie's computer wishes to crank out, AM/FM/TV broadcast stations can (and usually do) request specific callsigns, and the FCC generally accommodates them so long as the requested callsigns aren't already assigned.

Broadcasters know full well the ability to project a certain image by means of their identification, and the high value of that image within a community which has become familiar with the callsign. Very often broadcasters become involved in rather animated squabbles over who has the right to use a particular callsign which has earned public identity value—not much different from the way CB handles are often fought over! Just recently, for example, there was a big hassle in Indianapolis between several broadcasters and the FCC—it involved who had first claim on the callsign WIFE!

Last year, New York FM station WNCN was sold to new owners who promptly dropped its long-standing classical music programming format and started transmitting hard rock. To indicate the station's new image, the new owners changed the callsign to WQIV (stand-

ing for "Quad-4"). The WNCN audience was horrified and eventually caused such a ruckus that the station was again sold to new owners who promised to restore the classical music programming. But the listeners wanted more than just Bach and Schumann—they demanded that the old image—the old callsign, WNCN, be restored; replacing the detested image which WQIV conjured up in their minds. While the FCC was arranging this change, the station used the curious identification, "WNCN programming coming to you over the facilities of WQIV." Today it's WNCN again, and Mozart prevails.

Another example of how the station identification projects a desired image, there was N.Y. City FM station WNBC-FM (image: listeners being made aware of major network ownership of station by use of letters NBC). The station switched over to an all-news format—the callsign became WNWS (image: call letters implied the word *news*). When that format didn't work out they went to music programming—but then the image of WNWS was no longer of value. So a new callsign was selected!

So, the fact is that it appears to be true that what we call ourselves over the air somehow shapes our image in the minds of those who listen to us, determines the amount of acceptability we will receive—all borne out by the actions of commercial broadcasters who, for many years, have been most paranoid about the possibility of another station ripping-off their identities.

In fact, so aware of the value of these on-the-air identities in relation to their image that broadcasters will complain to the FCC about the possible assignment of a callsign similar to their own if it is sought by another broadcaster in their coverage area. If the FCC is about to assign a callsign which either looks or sounds like one already claimed for an area, the squawk is loud and long! For instance, if there was a broadcaster whose callsign was WYZT—anybody hoping to set up another station in the same area using a callsign such as WIZT, WICT, WYZP, WIZP, WYCT, etc. would certainly hear about it; and the FCC would most likely protect the identity of WYZT and tell the new broadcaster to pick another callsign which couldn't be confused with any local broadcasters. It's a common situation, happens every day! So the FCC is the original handle registry for broadcasters!

### **HANDLES AS PERSONAL PROPERTY**

When a CB handle is selected (sometimes after much thought) it is considered by many to be their very own personal and exclusive property. I mean—how would it look to Archie Leach if someone else in *Tinseltown* decided to use the handle *Cary Grant*? It just *isn't done!* Right? Suppose there were two local radio broadcasters in your area both announcing they were THE VOICE OF SOUTH HURLEYVILLE? Just not done!

(continued)

So, after putting so much thought into thinking up a handle which you (and your family) feel captures the real you—you may therefore be rather startled to find out upon first using it over the air, that someone else locally had it first and is rather bent out of shape because you have apparently ripped-off their personal and exclusive property. You have stolen a very real part of their identity and personality—a theft just as close to their hearts as if you had yanked the CB rig from beneath the dashboard of their car! CB'ers have come to violence over the *theft* of a handle—it's *spooky*, smacks of the supernatural—one person stealing a portion of the personality and identity of another! The person who had been ripped off in such a manner—lurking around the edges of the band—a hollow shell—as someone else cashes in, as it were, on the many years of effort they had put into building their radio-ego. Gee—sounds like something written by Kafka or Gogol!

Of course, before it comes to this—there is often a cordial warning given—*Say fella, how long ya been usin' dat handle? I bin usin' it for 26 years now!* This is a shot fired across your bow and should be immediately recognized as such—a definite warning shot for sure! *"Stop and stand ready for boarding! We are about to inspect and investigate your motives!"* Your choice is to say *Golly Gee, I'm sorry—I'll get another one right away;* or you can take the *Yeah, so what about it? That makes two of us!* approach. One sure fire retort is *Oh, you're the guy I been lookin' for—I've been usin' this*



*handle for 30 years and I heard someone ripped it off!!* You can, if you're in the mood, simply say *Up your nose, 'guy—it's mine too, now!* You'll have to play it by ear, because it seems that there are only a certain limited number of words and combinations of words in the English language which can be turned into CB handles—and there are already far more CB'ers than this potential of word combinations. So unless you have a handle like *THE SMELLY SHOE*—something that nobody else would want—then you can be pretty sure that your handle matches up with that used by one or more other operators!

And if you've selected one of the many popular handles like *FOXY LADY*, *GEAR JAMMER*, *WHITE*

*KNIGHT*—you'd better believe that you share your handle with *thousands* of others! *TOMCAT* is apparently a popular handle—I hear new ones every day!

### PROTECTING THE PROPERTY

New operators who have not yet become emotionally attached to their handles give them up when they are contested much easier than fellows and gals who have gotten used to their handles after a few months of use.

New people, especially, are also more good natured on the channels than old timers—they don't fully understand the way things are done and some of them become undone at the seams at the mere mention that they have usurped someone else's handle. They don't want to offend, so they immediately back off when challenged. There are, however, operators who have been using handles for many months who will still sheepishly back off on the use of the handle when pushed even slightly. Fallback positions include adding a word or two to the problem-handle to modify it, or changing it altogether!

Those who feel that their handles are given some degree of protection by having them placed in print, can cause their handles to be listed in any number of directories which guarantee not to permit others using the same handle to become listed. This does give some reassurance, and such directories have become rather popular—however having one's handle listed thusly doesn't stop someone else from using it, nor does it stop another operator from listing that same handle in *another* directory!

The result is that there are many handle duplications, and as CB grows in popularity, so do the duplications. It seems that there is little objection when an operator in Oregon uses the same handle as a CB'er in Florida—it's only when they are in the same general geographic area that tempers can flare.

And yet, some operators seem to remain totally aloof from these problems—one day I heard no less than three CB'ers using the handle *WHEELER DEALER*—none of them had known each other previously, they were all in contact with one another—and nobody asked the others who used the handle first! Put that in the *Guinness Book of World Records!*

### THE STUFF OF WHICH HANDLES ARE MADE

For some, the selection of a handle is a simple matter—they just pick the first word(s) to come to mind a few seconds before the mike button is pressed for the very first time. In the first few days or weeks of operation they may use as many as a dozen different handles until they find one that is not only unused by others, but which *feels right* and can be said and copied easily.

Others have their handles selected for many months before going out to purchase CB equipment.

To others, the selection of a handle is an exercise in metaphysics, which includes deep meditation, feel-out the "vibes" of the handle, checking it with *nu-*

merology, the planets, Ouija Boards, and finally asking many others for an opinion on several possible handles being considered. Some people put more thought, effort and time into picking a handle than they do into deciding which car they are going to buy! It has to be *special*—has to capture the very essence of the *ego*. Such handles then have an almost mystical significance to their owners—handles selected by communion with the inner self and the cosmos—the microcosm and the macrocosm. It is those handles which seem to cause CB'ers to become totally unravelled when others seemingly rip them off!

Of course, to those of brave heart and an *I don't give a damn* persuasion—the selection of a handle is accomplished in short order by listening on the band until a nice one is heard—and then adopting it!

### CATEGORIES OF HANDLES

There has been some research done by university psychologists regarding an analysis of CB handles and what they tell about those who have selected particular handles. It's true—some shrinks say that the type of handle you use tells a lot about the inner you, it's the 1970's version of Rorschach ink blot test!

One of the things used to determine personality makeup depends on which of the several categories of handles an operator might select. In fact there are *sub-categories*, and *sub-sub-categories*—each presumably adding to the story.

A common category, for instance, would be job or career related—an operator who is interested in letting you know his or her occupation, hoping that you will offer acceptance on that level. Some examples might be a pharmacist whose handle is PILL ROLLER, a mechanic called VALVE JOB, an attorney known as LEGAL EAGLE, a nurse with the handle MOLLY PITCHER, you get the message. If you heard the following handles, wouldn't you have a good idea as to the occupations of the operators: TEACHER'S PET, BRUSH 'N BUCKET, GEAR JAMMER, PRINTER'S DEVIL, FARMER ALFALFA, SHUTTERBUG, SAWBONES?

You hear a lot of hobby related handles, too—a guy who is into fishing using the handle ROD 'N REEL, a chess fan known as CHECKMATE, a camper who likes to be called TENT PEG, a coin collector (or *numismatist*, if you prefer) with the handle REEDED EDGE.

Location oriented handles tell the geographic status or origin of the operator—TEXAS KID, OREGON FLASH, CONNECTICUT YANKEE, SOUTHSIDE JOE, GAS HOUSE CHARLIE, MISPLACED MEXICAN, PHILADELPHIA PHIL, BAYOU BOY, and so on. Well, some folks are proud of where they come from!

Sports create handles, sometimes overlapping into the hobby category. What about LOUISVILLE SLUGGER (combo category of location and sport), PIGSKIN, ARCHER, BACKSTROKE, TENNIS SHOE, BOOTS 'N SADDLE, SKYDIVER, SKIPOLE, etc.

Some operators are into vehicular identification—this can cause problems if the vehicle by which one becomes known is replaced with another one of a different type. Nevertheless there are plenty of HEAVY CHEVY operators, also ones with handles like GTO, BRONCO BILLY, DAN IN THE VAN, VAN MAN, VETTE SET, and others of that ilk.

A number of handles relate to the entertainment industry and have been inspired by songs, rock groups, TV programs, films. These might also include cartoon strip characters. Within this category we might find CAPTAIN KIRK, WHITE KNIGHT, CONVOY, SNOOPY, SPOCK, COLUMBO, POPEYE, ROLLING STONE, NIGHT STALKER, KISS, JOHNNY COME LATELY, DISCO GAL, etc.

A popular group of handles relate to guys and gals and their mutual appeal—handles such as CUDDLES, DAPPER DAN, LOVER BOY, BEACH BABY, FOXY LADY, HOT LIPS, PASSION PIT—and many which are sort of far out.

Next we have the spook show people—you know, DRACULA, VAMPIRE, FRANKENSTEIN, FANG, PHANTOM, EXORCIST, SATAN, WARLOCK, DR. BLOOD, THE CLAW, etc., etc.

There are countless astrological handles too—GEMINI, TAURUS, AQUARIAN, PISCES, and eight more!

A separate category would include those used by police officers and would include KOJAK, BLUE KNIGHT, DIESEL CHASER, GREENSTAMPER, BIG BEAR, SMOKEY JOE, THE LONG ARM, BIG BADGE MAN, PICTURETAKER, GUMSHOES—there are *hundreds*. I know two Smokies who usually work a pictoretaker as a team—one has the handle SMITH the other is WESSON!

Well, you've got the picture. I haven't expanded upon all of the known categories here, but there are dozens—those with an ethnic or national origin association, handles used by kids, those which refer to some outstanding or unusual physical attribute of the operator, pavement princess handles, handles which include the name of the operator, drug related handles, handles relating to animals, nonsense word handles, agricultural handles, political handles, pun handles, and on and on. Combinations are also in wide use.

Sub-categories might include the addition of color references, and the psychological interpretations of why one color was selected over another—like, why does the guy call himself GREEN GHOST instead of GRAY GHOST? Why RED DRAGON instead of GREEN DRAGON?

It might also be taken into consideration if the handle is self-humiliating or degrading (JELLY BELLY, BULLET HEAD, BIG DOPE, SAD SACK, POOR ME, WRETCHED, etc.), if the name is aggressive (such as SUPERMAN, THE BOSS, MAKE WAY, THE CHIEF, MIGHTY MOUTH, BIG BRUSER, KING KONG, NUMBER ONE, etc.) or passive (WALLFLOWER, THE LISTENER, ME NEXT, MR. QUIET, LITTLE ONE, CREAM PUFF, etc.).

(continued)

## TOMCAT'S CONFIDENTIAL REPORT

As you can see—there are many things which can possibly be determined from a handle. Did you ever stop to think over the image that your handle has—not only to a research psychologist—but to everybody else on the band within earshot of you? It's the mask you hide behind—an extension of your own personality. It is the mask you *really* want?

Since handles are a manifestation of your inner self and your creative expression—better make sure you haven't created a monster, or let any skeletons out of the family closet!

### HANDLES: SOME PROBLEMS & SOLUTIONS

One of the oft-heard complaints about some handles is that they are confusing and difficult to understand over the air, especially with the channels getting so thickly inhabited. One example I actually heard which gave a vivid picture of this was a CB'er whose handle was SNOW GOOSE. Station he was talking to thought he was using the handle SLOW MOOSE. After a few minutes, SNOW GOOSE told the other guy that conditions were so rotten that there was no use in trying any further. He signed off with his handle, SNOW GOOSE. The other station came back and said, "just got the last few words, you said your handle was IT'S NO USE!"

### SOME SAY HANDLES ARE HOGWASH!

Believe it or not there are some operators in CB land who use only a callsign—at least for a while. Newcomers especially will often struggle with one of the often-tongue-twisting computer creations for several weeks before ditching the idea.

Undoubtedly in the vast world of CB there are those few operators who have used callsigns-only for many years. This is a small minority.

Sideband operators, for instance, don't use handles on their frequencies, in fact anybody showing up to use a handle while talking to a Sidebander would probably be laughed right off the frequency! Possibly laughed right out of the county!

Sidebanders have avoided the whole scuzzy handle question by using the membership numbers which they have been assigned by the organizations to which they belong. These numbers indicate their own individuality. Those same operators who also operate on the AM channels may well use handles, but when on sideband, it's a totally different scene!

Not that sideband numbers are without personality—there are some interesting correlations. For instance, a fellow whose sideband number is SSB-1776 is actually named George Washington! Sidebander SSB-1040A is a tax collector, while SSB-1230A is the number of a broadcast station's II Meter emergency communications sideband system—the frequency of the broadcast station in question being 1230 kHz AM!

Sideband groups may exist on a local or regional

basis, even on a statewide level, and each type of group may offer its own distinctive numbers. Sideband numbers are available for national coast-to-coast use and recognition by the *SSB Network*. What with more and more operators turning to single-sideband (many insiders feel that CB will eventually become an all-sideband service), the popularity of sideband identification numbers is growing steadily. If you have been seeking a set of national sideband numbers for yourself, see the CB FIX'M-UP in this issue of CB RADIO/S9—they're handy to have, and even if you don't have a need for sideband numbers right this minute, for sure you'll be needing them soon! Without a sideband number, you become a non-person on a sideband frequency—handle, callsign, or whatever, notwithstanding!

But AM operators have also started to come to the conclusion that AM-type handles are at best confusing, hard to copy on crowded channels, heavily duplicated—and perhaps *too* revealing to any amateur or professional headshrinks out there in their audience! And, perhaps, after all is said and done, they may be just *silly!* It's a matter of opinion—some CB'ers just *love* handles; but it's the opinion of a growing number of operators that CB is no longer the little *rinky-dink* toy that it seemed to be 10 or even 5 years back down the slab. Today CB operators are seeking to use their equipment in close cooperation with various public safety agencies, and some feel that handles may well work at cross purposes to these ends.

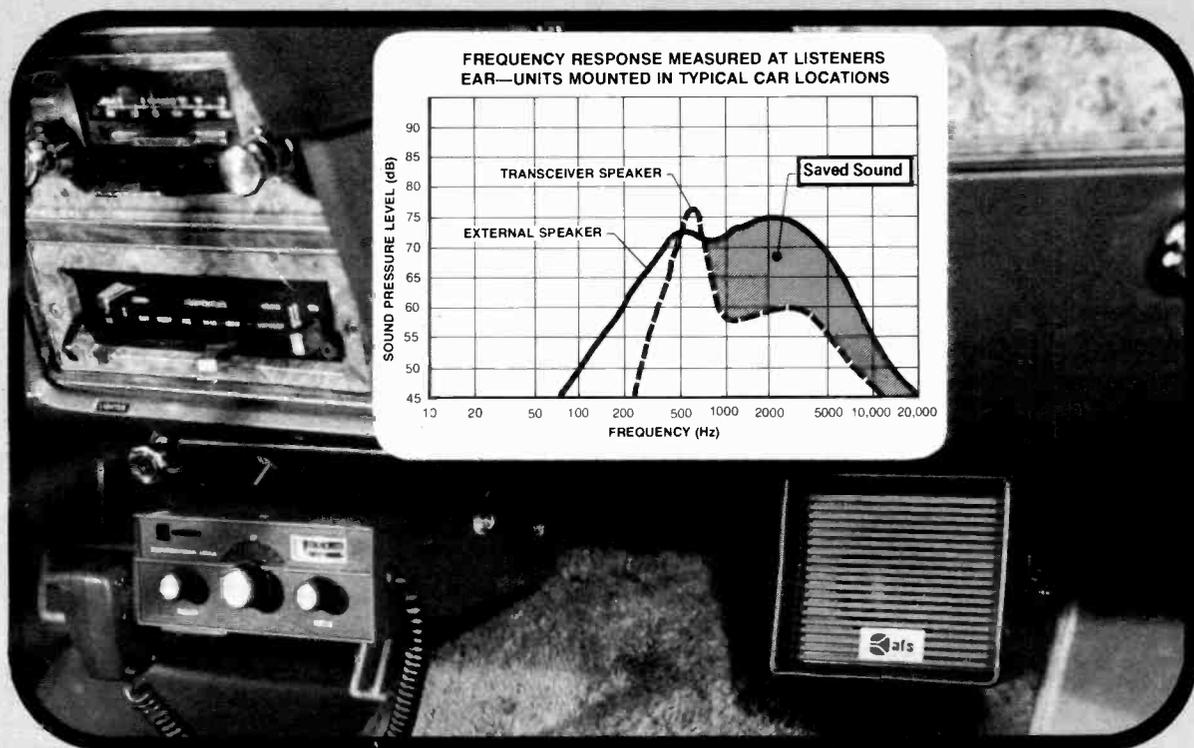
Can you imagine walking into your local Police Chief's office and offering to coordinate or participate in a community Crimewatch program (such as are now being established all over the country.) The Chief asks you what you are called on the air and you tell him that folks call you HOG JOWLS, or DOUBLE CROSS. I dunno—somehow it just doesn't inspire confidence!

As a result, for the past several years there have been an ever increasing number of AM operators using Unit Numbers for identification. Sometimes they use their handles, for other occasions they use Unit Numbers—although many operators are now using Unit Numbers for all AM transmissions, having dropped all use of their former handles. Every time you tune across the channels you hear these numbers in use. If you think that this is something for you—see the FIX'M-UP section in this issue for information on getting yourself a set of Unit Numbers for AM operation.

### WHAT'S IN A NAME?

So there you have it—some food for thought on the many ways we are known to one another, the past, present, and future of CB identifications.

So before you hit that mike button and make yourself known (again, or for the very first time), you might mull it over and decide if you really want to be thought of as HORSEFACE, or MR. MISERABLE, or SILLY SEATCOVERS—or something of equally revealing nature!



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# Eyeballing "Citizens Band"



**B**REAKER, breaker! Here come the movie makers! Hollywood has made hit movies about everything from sharks to Godfathers. Now comes Tinsel Town's first film all about CB and CBers. (This is our kind of "jaws"!)

The Paramount Pictures release is even titled "Citizens Band." It's a comedy-drama about the good (and some not-so-good) buddies in Everytown, USA.

In this movie, CB is not just a prop or action gimmick. CB (and its effects on people's lives) is the main subject matter and theme of this unique feature. In the original script, CB is the lifeline connecting most of the characters in their colorful adventures. They all converge in the film's outdoor climax, a CB-controlled search for a missing buddy.

Here, in a special shout from Tinsel Town to S9 readers, is a portrait gallery of the principal characters in the movie—the citizens of "Citizens Band"—with some messages from the talented stars who play them.

Jonathan Demme directed the movie from an original screenplay by associate producer Paul Brickman. The Fields Company production was filmed entirely on locations in northern California.

"Citizens Band" is due for release this month. Eyeball your local newspaper for time and place, and move in on this terrific flick!

## HOW IT CAME ABOUT

"It was really a great experience getting into the bodacious world of CB" says Jonathan Demme, director of "Citizens Band." "In researching and making this movie, we all got to meet and jaw with some fine and interesting people."

Demme first read Paul Brickman's script while vacationing in Australia with his Sydney-born wife, filmmaker Evelyn Purcell. Fascinated by CB and the idea of a movie about CBers, Demme plunged into research and transmitting using the handle "Heavy Lumber."

He and film editor John Linke kept a Realistic Navajo constantly going in the Paramount Studios editing room where they cut "Citizens Band."

Writer Paul Brickman's interest in CB began over a year earlier. He scanned the CB phenomenon by hanging around a CB store in the Mar Vista area of Los Angeles, *CBers Haven*, which he calls "a purist shop." He operated his own rig in his Beverly Hills home with the handle "Chicago Fin," a name he retained from his teen days in pool halls in his home town.

Brickman, 26, calls "Citizens Band" "warm, human comedy, a 'people picture.'" The theme of the film, he says, is "distances between people . . . CB is an extension of their personalities." (continued)

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**BRUCE MCGILL** as "DEAN"

"It's not easy to be the brother of a hero."  
Dean Lovejoy is love-starved, bitter, and alienated from his family. He takes out his frustrations by trying to bully his basketball team to victory. Jealous of his brother's CB achievements, he goes after Blaine's girl. Then the wires get hot.



**CANDY CLARK** as "PAM"

"She's restless and longing for adventure. She feels trapped in her small town, and she's tired of playing second fiddle to a transceiver."  
A pretty and vivacious Phys. Ed. teacher in the local high school, Pam's got one eye on her mobile lover and another on the horizon. There's a lot of voices out there she's never copied.



**MARCIA RODD** as "PORTLAND ANGEL"

"She's trying not to show her true feelings, trying not to get hurt again. But beneath her tough exterior, she's fighting to keep her man."  
Connie knows her buffalo's not the greatest, but she's trying to make the marriage work. She's not gonna give him any more chances to be unfaithful. What a surprise when her jealousy is overwhelmed by an even bigger problem.



**PAUL LE MAT** as "SPIDER"

"He's a CB hero."  
CB repairman Blaine Lovejoy (handle: "Spider") is a dedicated REACT CBER who monitors Channel 9 and responds to emergency distress calls. "Spider" uses his ears to save lives in sometimes dangerous situations. He gets a medal from the American Legion, jealously from his brother, and hassles with his girl friend. When ratchet jaws and bleeders interfere with rescue transmissions, "Spider" launches a private crusade to clear the channels. The angry young man rolls into action in his '56 Chevy Nomad, with a DF loop on the roof and a Realistic TRC-56 (telephone-type) under the dash.

**ROBERT BLOSSOM as "PAPA THERMODYNE"**

"He's an oldtime trucker, a part-time father, and a full-time dreamer".

Floyd Lovejoy could have had his dream if he'd stayed in Canada and got that ranch. Or so he thinks. Now he's stuck in a CB repair shack with his son and that smelly mutt. Floyd is cranky and depressed, toying with senility. But he lights up when he turns on his vintage CB (a deluxe Realistic TRC-X23). He'd rather talk to strangers on the mike than his own family, face to face. One day "Papa Thermodyne" disappears, and all the good buddies in town get on the wire and turn out to hunt for the old billy goat.

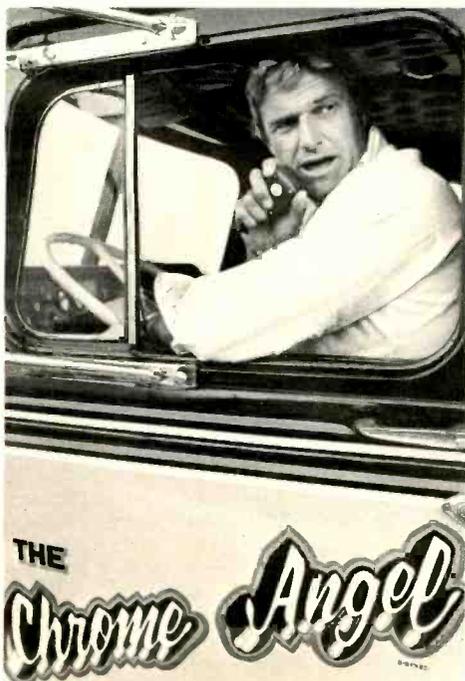
# WHO'S WHO IN CB?

**CHARLES NAPIER as CHROME ANGEL**

"He's an independent, free-wheeling soul."

"He wants everybody to be happy—especially him."

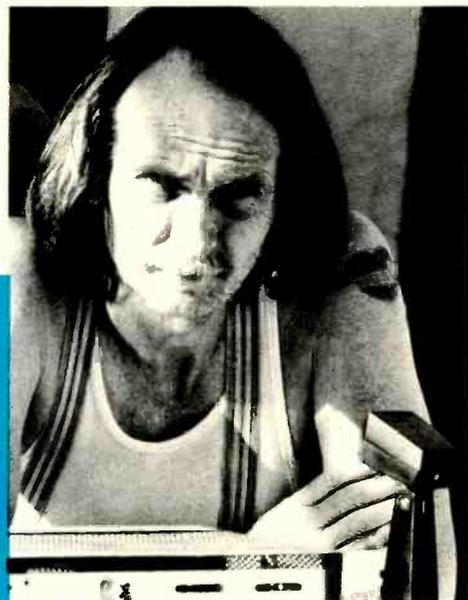
Harold Rissley is a hot-blooded "gippo." He's got 18 wheels on the slab and too many beavers in his life. His personal affairs may be a mess, but his truck, the "Chrome Angel," is a brilliant beauty. It's his own private world, and his CB is his lifeline to the outside. He wouldn't be in such a jam if he didn't have to jack-knife the "Angel" on that dark, rainy, unlucky night.



**ALIX ELIAS  
as "HOT COFFEE"**

"Today a woman's got to be resourceful."

Debbie Price is a pavement princess with a truckload of bad luck. They moved the highway and lowered the speed limit, keeping the truckers out of her neighborhood and her arms. So Debbie goes mobile with a CB-equipped motor coach. She transmits with the handle "Hot Coffee", after the special blends of thirty-weight she brews for her clientele. ("She puts across the image of her mother, the giver. Coffee represents all the good things a woman can give a man.")



**ANN WEDGEWORTH  
as "DALLAS ANGEL"**

"She's adoring and naive. When trouble hits her marriage, she's totally shocked and torn between love and anger."

Sweet Joyce was worried about her husband's health till she found out just how healthy he was. Stranded in a strange town, her emotions are spliced like a red-hot wire.



The Sonar FS-2340 CB base station is, perhaps, the world's only limited-edition citizens band radio. We build fewer than 10,000 of these extraordinary pieces of professional communications equipment each year.

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1964 are still on the air today.)

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**EYEBALLING "CITIZENS BAND"** (continued)

The film unit's resident CB expert was none other than S9's former "Kings of the Road" columnist Chuck Napier. Chuck's acting career is now rolling into high gear in Tinsel Town.

Famous in real life as SSB-55 and "Overdrive," Chuck stars in "Citizens Band" as a hot-blooded trucker whose handle is "Chrome Angel."

Says the veteran trucker and CB'er: "CB brings out the best in people. This fabulous machine can turn an average citizen into a good buddy and a friendly neighbor, with a helping hand that can save your life. People with CBs will really go out of their way to help someone in trouble.

In the movie Chuck gets pinned under his jackknifed 18-wheeler in a freak accident. His only hope is a sharp-eared good buddy (Paul Le Mat) who monitors his distress call late at night.

**OTHER CBers in "CITIZENS BAND":**

**WILL SELTZER** as "WARLOCK," an ardent and adventurous high school athlete who uses his mobile unit for kicks.

**ED BEGLEY JR.** as "THE PRIEST," an unorthodox minister who officiates at a CB wedding and spreads the gospel, all over channel 9.

**MICHAEL ROTHMAN** as "COCHISE." Spider's loyal, wall-to-wall buddy who reluctantly goes along on his channel-clearing crusade as the zany-disguised getaway driver.

**RICHARD BRIGHT** as "SMILIN' JACK," a gas station owner whose CB-equipped vehicles help tow wrecks and breakdowns off the highway, he enlists in a suspenseful search for a missing CBer.

**HARRY NORTHUP** as "THE RED BARON," a motor-mouth crank who transmits propaganda and protects his linear with firearms.

**MICHAEL MAHLER** as "THE HUSTLER," a girl-crazy teen-ager who hustles telephone numbers and measurements on the wire.

**LEILA SMITH** as "THE OLD LADY," a senior citizens band operator who racket-jaws her whole life story to anyone who'll listen.

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**FEAR**

# What You Try is What You Buy

## (At a CB Specialty Shop)

ONE CB shop I know makes it almost impossible to purchase a CB transceiver in a sealed carton. Fact is, you would probably have to threaten to take your business elsewhere before they will sell you a "sealed carton", for the owners—who work out on the floor, not in the office, insist you *use* the actual rig you will take out of the store. Lined up on their display shelves, connected to power supplies and an antenna, is every model they sell. The customer can try every rig and if he or she decides a particular rig is best the customer leaves with that very same transceiver.

Later, after a duplicate model has been checked out on the test bench, the empty shelf space is filled.

Sound like a bunch of CB nuts trying to run a business doomed to failure? The CB shop owners might seem like fools for giving up a fast stock turnover and high profits to insure satisfied customers, but *CB specialty shops* are becoming popular places to buy CB gear. From coast to coast the specialty shop that started out on a shoestring and a couple of "own our own business" dreams is probably the most reliable place to purchase CB equipment. (And the retail outlets of some national chains such as Radio Shack and Lafayette CB specialty shops.)

What makes the CB specialty shop among the most reliable of CB distributors is the fact that CB is a prime factor in its existence. The department store,

discount house, auto parts store, or whatever, stocks CB as "just another" item. Along with CB they sell pantyhose, plumbing supplies, oil filters, socks, ties and possibly some electronic components for car stereos and home TV. If they dropped CB tomorrow it would hardly cause a dent in their overall profits.

But the CB specialty shop must not only try harder by offering more service and savvy, they must price the same as their general business competitors selling CB as a sideline. In some instances the CB specialty shop provides higher quality service and equipment performance than their general merchandising competitors at a lower price.

A closer look at the operations of a typical CB specialty shop in my area shows why it pays to shop where CB is the primary product sold. Let's look at B & E Communications Center on Long Island, N.Y.

Like many good CB shops, B & E insists the CBer take home the transceiver he tried in the store. Well, when the customer is looking over the goodies, deciding which one to try, he'll find the shelves are filled with a broad range of models from several manufacturers, ranging in price from the least expensive to "gold plated specials"; and each and every model has the price prominently displayed. Every customer pays the same price, and no one is forced to take a "general purpose" trunk lip mounting antenna as part of a



"No, this sideband rig isn't for you. Take something simple in an AM transceiver if you just want it as a standby in case you break down on the road." As a general rule, the CB specialty shop will give extra attention to the non-active CBer who wants CB as an emergency back-up. Note there is a price tag on each transceiver—a specialty shop won't try to bargain or get what the traffic will bear. Also note each transceiver has a dust cover. In this shop the CBer buys the set he or she actually tries, a set previously checked out on a test bench before it was put on display.

For Information About Our Advertisers...

# Want maximum CB performance? You'll know you're exactly "on-channel" with B&K-PRECISION's NEW FREQUENCY COUNTER!



B&K-PRECISION Model 1827  
\$120\*

For the serious CBer, the 1827 and accessory signal tap provides digital readout of transmit frequency, mobile or base on all 40 channels. For best range and signal clarity, your transmitter should be operating exactly on the assigned channels. The only way to accurately check this is with a frequency counter.

The new B&K-PRECISION Model 1827 is a full-feature battery portable frequency counter for only \$120\*. Not much larger than a pocket calculator, the 1827 offers six-digit LED display and guaranteed operation to 30 MHz with 1 Hz resolution. Other features include a unique battery saver that turns off the display after 15 seconds, and autoranging or "1 second" operation. In the 1 second position, you'll get 1Hz resolution for eight-digit accuracy.

When used with the optional SA-10 signal tap, you'll be able to use the 1827 to constantly monitor the out-

put frequency of your CB or ham transceiver, up to 100 watts, without affecting performance. Other accessories include: mobile and ac adapter/chargers, nickel cadmium batteries, under-dash mounting bracket, portable antenna and leatherette case.

With the 1827 you'll always be sure that you're exactly "on-channel" for maximum range. It's like having a technician check your rig every time you transmit!

\*Suggested retail price, less accessories.

For the complete story, contact your  
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package. The CB specialty shop will fit the best possible antenna to each vehicle; for example, they will not sell a trunk lip antenna mount to a customer with a Volare or Aspen, just as they will forcefully suggest a van owner use something other than a bumper mount.

Speaking of antennas, a specialty shop usually stocks a complete line of antenna hardware. If you break, say, a trunk lip bracket, you don't have to blow twenty or thirty dollars for a complete antenna system as you would in a general merchandise store; the average specialty shop will sell you a replacement bracket for a couple of dollars.

Another place where the specialty shop runs miles ahead of their general merchandise competitors is in tests, adjustments, and service. When you buy in a general merchandise store the installation and antenna adjustments are usually your headache. When the antenna instructions say "adjust for lowest SWR" you find you suddenly have the additional expense for an SWR meter. But many CB specialty shops will not only provide installation instructions and recommendations as part of the sale, they will either loan an SWR meter for an "in the street" antenna check or will actually make the adjustment for no, or little charge. They are also there for professional checks when you think your signal "just isn't getting out".

CB specialty shops also often feature a minor repair test bench out in the open for walk-in service and tests. They'll check for transmitter output power and frequency, maybe percent modulation and receive sensitivity, make minor repairs while-you-wait, and will connect and test accessory equipment such as a power mike. While there is often a modest charge for these services—usually from \$3 to \$10—you at least get the job done within an hour. There's no need to leave your equipment for days or weeks. Also, just imagine what would happen if you purchased a power mike in a department store . . . who's going to make the hook-up, or install the mike connector? For the average CBER

A test bench out in the open for walk-in checks and minor service is a common feature at many CB specialty shops. In minutes, rather than days or weeks, this customer has learned there's nothing wrong with his rig; that his signal isn't getting out because of a defect in the antenna system.



"When not using the antenna just unscrew it and throw it in the trunk." Extra attention and instructions like this are the difference between the specialty shop and the general merchandise store that also sells CB equipment. For those of you familiar with equipment, you can see that this school girl who only needed CB as protection when driving back and forth to school was sold one of the most reliable mobile antennas, even though the salesman had suggested a relatively low cost, no frills transceiver. It's this kind of extra thought and consideration that makes the CB specialty shop the ideal place for newcomers to CB.

installing and properly adjusting a powermike is as complex as launching a rocket to the moon.

And while we're on the subject of installation, what of the CBERs who can't tell a coax connector from a power cable, who only want CB as a standby in the event the car breaks down on the road? To the salesperson in a general merchandise store it is probably "just another" customer.

To the specialty shop however, he or she is the same as everyone else, someone who not only will come back for additional equipment, but someone to recommend them to friends! This customer gets the same attention as anyone else, in fact, the "average" customer is treated like any newcomer to CB: they not only take time to recommend equipment specifically tailored to her needs even if it means a smaller sale, they give extra

The front of this store leaves no doubt it is a CB specialty shop. CB represents 99.99% of its business (car stereo is the rest) and its staff are expert in the individual problems of CB. You won't find someone selling you CB equipment who is on temporary leave from their usual job in the housewares department. As a general rule all, or most, specialists in a CB Specialty Shop are active CBERs familiar with all phases of CB equipments and operation.





A few more tests and the trouble is narrowed down to a corroded trunk lip mount, an item stocked in a CB specialty shop. Instead of spending twenty or thirty dollars for a new antenna system this customer gets all the individual parts needed for his antenna for under \$5. By the way, that display of antennas is just part of what's in a specialty shop. If you think it has an antenna for just about every type of vehicle, there's another antenna section on the other side of the room with different antennas and components. This is a far cry from those package specials that include a transceiver with a trunk-lip mounting antenna.

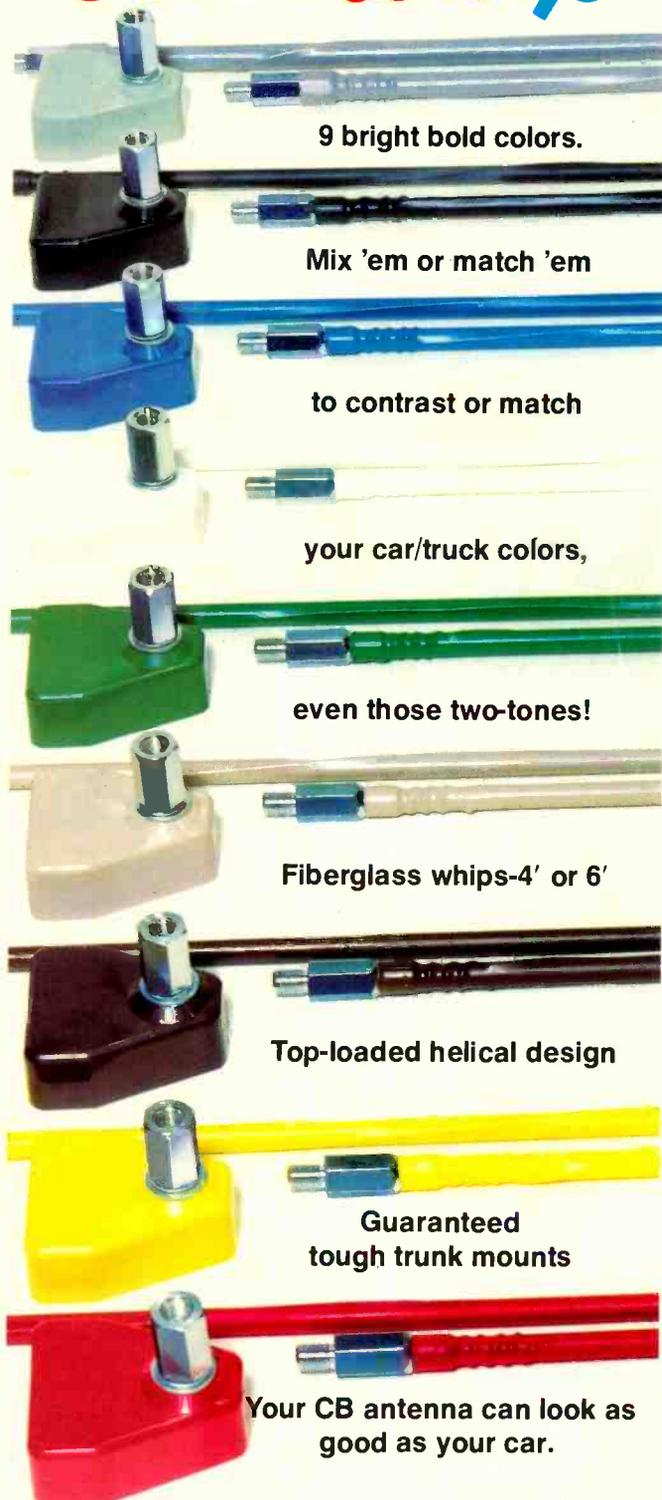
instructions in operation and routine care. For example, at the time we were taking photographs to illustrate this article a shop owner was trudging out in the snow to personally install a trunk antenna bracket for a customer and there was *no extra charge!* Even if a specialty shop charged a few dollars for this type of service it's worth every cent, for it insures that you not only have the correct equipment for your particular needs, but also know how to use it!

While you will most often get personalized service and attention and the best value for your CB dollar in a CB specialty shop, bear in mind they are there to make a living. While they might give free advice on antenna adjustment and/or a quick check, if you want a full installation they will charge the same as anyone else, but you will be getting more than a routine installation. They know how to install CB equipments, and more important, how to prevent or reduce mobile noise pickup, and how to adjust antennas for optimum operation. And since they want you back for repeat business you will generally get a little better service; perhaps a little extra care with the antenna adjustment, or a "permanent" rather than "quick-splice" power connection.

But don't expect extra service if you buy your equipment at a discount or general merchandise store and then go to the specialty shop for free advice or even installation. From bitter experience the specialty shops know the discount buyer isn't even coming back for equipment purchases no matter how good the free advice and assistance. As someone said, "There ain't no such thing as a free lunch." If you want expert advice buy your equipment where you get your advice. You have no idea how much valuable professional assistance you can get when the CB dealer knows you'll be back next week for more, or new equipment.

the end of the drab CB antenna

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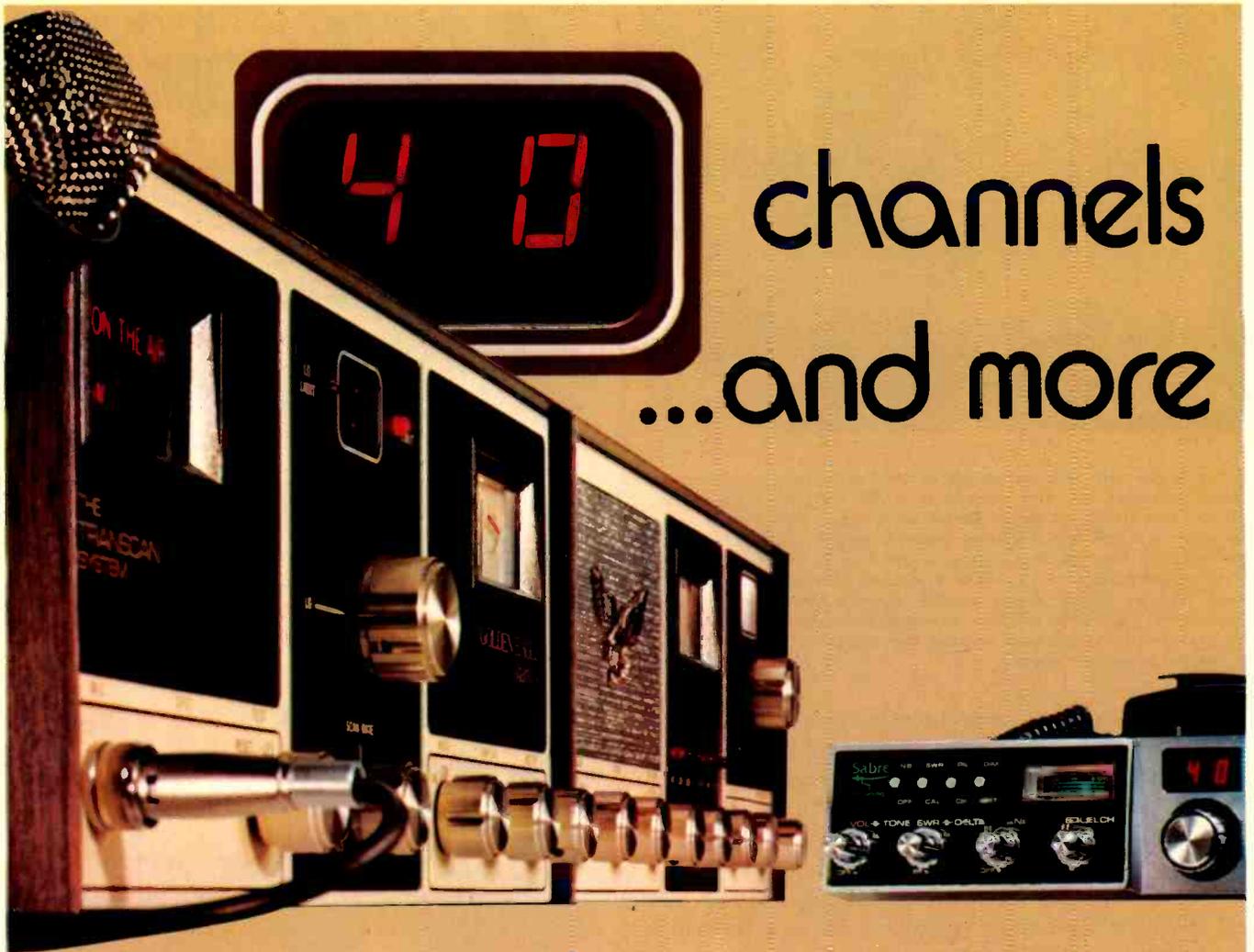
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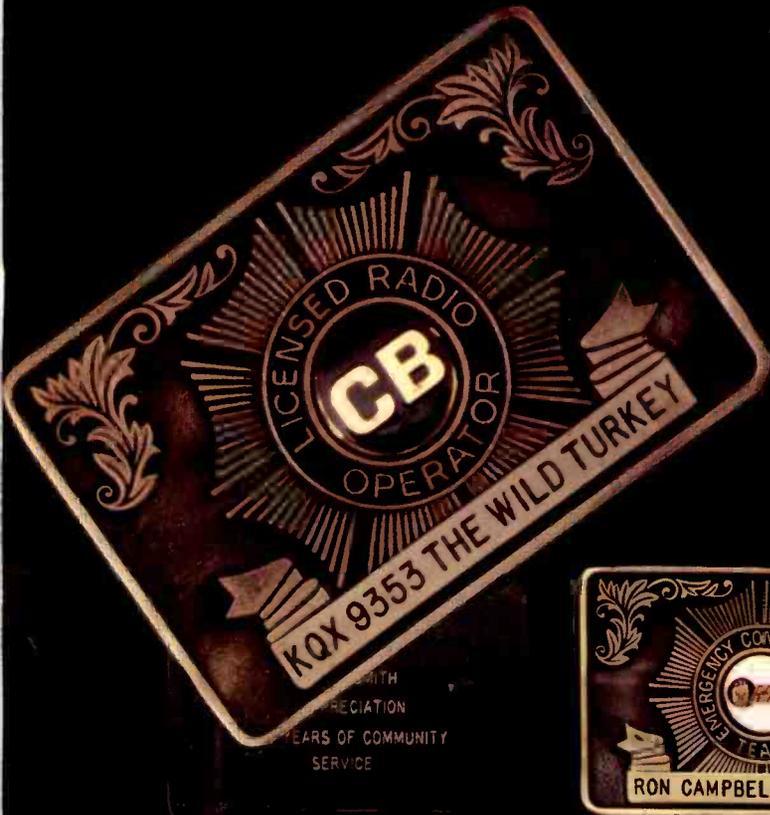
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A perfect way to be identified at jamborees, coffee breaks, or team drills. Badge is a heavily gold plated jewelers metal with a heavy duty badge pin. Your choice of emblem and personalization is included in price. Badge shown here is actual size.



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Please type or print clearly wording for badge or front and/or back of buckle. We are not responsible for mistakes due to illegible handwriting. Specify which badge or buckle gets which wording and emblem if more than one is ordered. Attach a separate sheet if needed.

ITEM	DESCRIPTION	PRICE	QTY	TOTAL
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2	Pewter Finish Buckle—Style <input type="checkbox"/> A <input type="checkbox"/> B Emblem <input type="checkbox"/> CB <input type="checkbox"/> MIC <input type="checkbox"/> REACT <input type="checkbox"/> CD	10.95		
3	Front Personalization—Front of Buckle Routed & Filled	3.95		
4	Back Engraving—Jewelry Style on Back of Buckle	.20/ltr		
5	Leather Belt-Top Grade Cowhide, Black (belt size _____)	7.95		
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# The Connector, Without Grief!

**T**HE most misunderstood and least appreciated part of a CB station, either mobile or base, has got to be the antenna system. More often than not, it is bought separately, and because it is usually the last and most time-consuming part of the installation, it tends to receive the least attention. After carefully installing the transceiver according to the well-detailed instructions, the layout of the cable and the soldering—or crimping—of UHF connectors should be done with the same diligence.

Common sense, a few simple rules, and above all, patience will more than pay for the time spent in connecting the antenna. First, the coaxial cable should be routed by the most direct means avoiding sharp bends and metal edges which might cut or abrad the cable

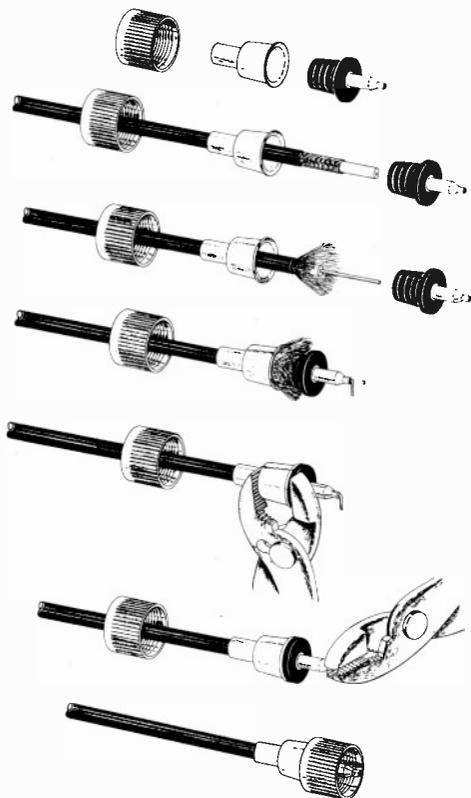
jacket. Wherever possible, the other electrical wiring in the vehicle should be avoided to minimize electromagnetic interference.

Secondly, a good bare metal-to-metal contact must be made between the base of the antenna and the vehicle body. Thirdly coaxial connectors must be carefully attached to the cable if not done so at the factory.

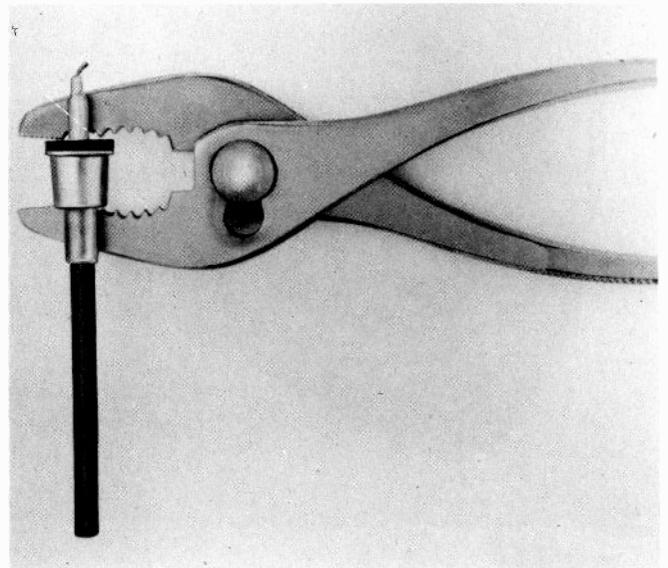
When soldering connectors onto the cable, particular care must be taken to assure good signal quality. If the solder is too cold, the connection will be faulty. If it is too hot, the insulation could swell or even melt, ruining the connection.

For most popular cable connectors, a coupling plug or nut is first put over the cable. The cable jacket is then trimmed back a prescribed length taking care not to nick the braid. The braid is then folded, pushed or combed back and lightly coated, or tinned, with solder.

Next, the internal layer of insulation is trimmed back, this time taking care not to nick the center conductor. The exposed end of the center conductor is then tinned with solder making sure the cable insulation does not get overheated. If melted, the metal braid could come in contact with the center conductor ruining the connection and the signal. If the insulation is swollen by excessive heat, it will not fit into the mating jack thus eliminating contact.



(Top to Bottom) To assemble the AMP antenna connector, slip the collar and shell over the cable, then strip the cable. Flare the braid and then strip the insulation from the center conductor. Insert the center conductor into the contact assembly. Push the shell over the contact assembly and compress the two pieces with pliers. Firmly squeeze the end of the contact to crimp the center conductor. Trim any excess braid protruding from the shell and the center conductor that might be extending from the contact assembly.



Squeeze the shell over the contact assembly and trim any excess braid that might protrude from between the shell and the contact assembly.



For optimum performance, firmly torque the collar to the mating jack.

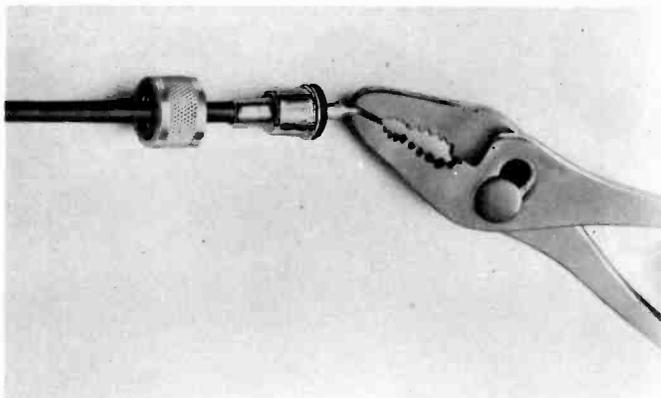
At this point, a plug assembly is screwed over the cable and attached by soldering through the prescribed solder holes. While these holes tend to minimize overheating, the assembly covers the cable and thus the soldered connections can not be inspected for damage.

An easier type of cable connection better suited to field application is the crimped connector developed by AMP, Inc. of Harrisburg, Pennsylvania. No heat or solder is required, only a hand crimping tool or a pair of pliers.

The reliability of crimped connections has been repeatedly proven in a wide variety of demanding applications over the past 35 years. Virtually all factory installed antenna connectors are crimped rather than soldered because of the speed, efficiency and performance of this termination technique. Almost all other electrical connections in cars, trucks, military and civil aircraft, in appliances, medical electronics systems, and onboard ship are solderless crimped connections. Probably the most demanding application for crimped UHF connections is on tank radio antennas. Few CB systems have to withstand the severity of the vibration this unit must undergo.

To complete the crimped antenna connection, a collar and shell are pushed over the cable. Then the jacket is trimmed back, the braid is flared open, and the insulation trimmed to expose the center conductor. As before, neither the braid nor the conductor should be nicked.

*(continued on page 103)*



Firmly squeeze the end of the contact with pliers to crimp the center conductor.

... Use S9 READER SERVICE.

# Ride with the No.1 Traffic Radar Detector...



## SENTURION by Radatron

Why settle for anything less! Choose Senturion, the traffic radar detector designed for professional drivers, and put safety up front.

- Continuously monitors all types of highway radar
- Gives advance warning of radar-controlled speed and danger zones
- 12-volt operation — plugs into cigarette lighter (positive or negative ground)
- Exclusive extra-long-range antenna design
- Simultaneous dual warning — light plus audible tone
- Exclusive automatic noise limiter circuit
- Mounts on dashboard or clips onto visor
- Rugged die-cast metal case with glare-free black finish
- Handsome modern design blends with all car and cab interiors
- Made by Radatron, the company which pioneered traffic radar detectors fifteen years ago.



SENTURION IS AVAILABLE nationwide from dealers who handle the finest quality automotive and electronic products. And it's realistically priced. See it at your nearby dealer, or write for literature to

 **senturion**

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2424 Niagara Falls Blvd. • North Tonawanda, N.Y. 14120 • Phone (716) 731-4171  
In Canada: Len Finkler Ltd., 25 Toro Rd., Downsview, Ontario M3J2A6

Helping you put safety first on the highway.

# Aircommand CB Brings out the "Bogart" in you!!



Around the office Harold Earnshaw may have the personality of a paper cup. But when he hits the road with Superscope's Aircommand CB-640, he's ready for anything.

Maybe it's knowing that Aircommand's got **40 channels** with the cleanest, clearest reception on the road today. And Aircommand's **exclusive scanner** that "beeps" when there's a call on emergency Channel 9. And **LED (light-emitting diode) displays** for both **signal strength** and **digital channel numbers** — easier to read, night or day. And **delta fine tuning control** to compensate for off-channel signals. And **phase-locked-loop** to maintain ultra-stable performance under a wide variety of operating conditions. And **automatic gain control** to boost weak signals, tone down overly strong ones for uniform reception. And **automatic noise limiting** and **noise blanking controls** to suppress harsh interference. And knowing that Aircommand CB is brought to you by the makers of Marantz stereo systems — the world's finest.

Whatever it is, and there's a lot more, with Superscope's Aircommand CB-640 you feel like you're really somebody — sweetheart. Aircommand offers 3 exciting 40 channel CB models. See the complete line at your Superscope Aircommand dealer.

**Aircommand**™  
by **SUPERSCOPE**.



©1977 Superscope, Inc., 20525 Nordhoff St., Chatsworth, CA 91311. Prices and models subject to change without notice. Consult the Yellow Pages for your nearest Superscope dealer.



# ON THE COUNTERS



## 40-CHANNEL AM BASE STATION

President Electronic's dramatic new top-of-the-line 40-channel AM base station, Dwight D, comes with an elaborate list of features, including a separate speaker and digital alarm clock.

Controls include volume, squelch, adjustable mike gain, RF gain, time set, alarm set, meter mode switch, noise blanker, delta tune and PA/CB switch. It has two dual-functioning meters, the SWR-mod and the SR/F calibrate, as well as a large 100mm digital L.E.D. channel indicator.

The Dwight D also features a new automatic speech compression circuit for consistent high level modulation. Selectivity is rated at  $-65$  db or better.

On the back panel are jacks for AC and DC power, antenna, PA and external speaker. Earphone and mike jacks are on the front panel.

The transceiver is  $4\frac{3}{4}$ "H x 15"W x  $11\frac{1}{2}$ "L, and weighs 13.2 lbs. The separate speaker is  $4\frac{3}{4}$ "H x  $5\frac{3}{4}$ "W x  $11\frac{1}{2}$ "L and weighs 3.5 lbs.

The Dwight D is backed by a limited one-year warranty covering both parts and labor. The suggested retail price is \$329.95. Complete details on the new Dwight D are available by writing to President Electronics Inc., 16691 Hale Ave., Irvine, CA. 92714, or mark number F18 on Reader Service Card.

## 40-CHANNEL TRANSCEIVER

The Hy-Gain II (2702) is an advanced Phase-Lock-Loop personal communications system that transmits and receives on all 40 channels. And it packs the features and performance of more expensive units to make it a leader in its price range.

Measuring only  $2\frac{1}{4}$ "H x  $6\frac{3}{8}$ "W x  $7\frac{5}{8}$ "D, the Hy-Gain II has room for advanced engineering features like



separate RF gain control, ANL (Automatic noise limiter) switch, automatic modulation control, illuminated S/RF meter, and new 40 channel selector with electronic digital read out, external speaker jack, TVI television interference filter, unique floating ground. And PA provision to turn the whole thing into a powerful public address system.

There's a full 4 watts RF output. And its slip mount design makes a neat professional looking installation almost everywhere. Retail price is \$189.95. Mark number F06 on Reader Service Card.



## TAHOE 40

Watsonville, Calif.—SBE, Inc., a leading manufacturer of quality Citizen's Band, Marine and other personal communications products, is introducing a highly compact 40-channel CB transceiver, the Tahoe 40. Measuring only 4.5" wide, 1.4" high and 7.25" deep, the set is small enough to fit in cars where space is at a premium such as mini-compacts and sportscars.

According to SBE president David Thompson, the

Tahoe 40 includes all standard features and controls found in larger mobile CB radios, including a large, high-intensity LED channel readout. Styling of the unit is highlighted by a contoured brushed-aluminum bezel. Included in the front panel are controls for squelch, volume, channel selection, and a switch for an auxiliary PA speaker. A red transmit light indicates "on-the-air" operation. The unit incorporates both positive and negative ground, for use in any type vehicle, including motorcycles.

The Tahoe 40 emits full legal power, and includes the exclusive SBE "Speech-Spander" circuit for automatic control of modulation for varying speech levels. Digital phase-lock-loop circuitry derives all 40 channels with outstanding accuracy. The receiving section incorporates double-conversion circuitry, and includes a tiny 4-pole bandpass filter for steep-slope selectivity. Other features include an automatic noise limiter, RF output/S meter, and a built-in down-vented loudspeaker driven by a special "acoustically-shaped" audio output circuit for clear, well-balanced sound.

The Tahoe 40 is equipped with a dynamic microphone with a full-length coiled cord, mounting hardware and microphone bracket.

Further information is available by writing SBE, Inc., Dept. P., 220 Airport Blvd., Watsonville, CA 95076, or mark number F08 on Reader Service Card.



### SUPERSCOPE ENTERS CB MARKET

Three top quality 40 channel Citizens Band radio units—to be marketed under the trademark "Aircommand"—have been introduced by Superscope, Inc.

In providing the 40 channel units, Superscope has included an array of features in all its Aircommand CB models. The top-of-the-line CB-640 is equipped with an Emergency Channel 9 Scanner. This unique feature constantly monitors emergency Channel 9, and an audible beep indicates when someone is transmitting so that this channel may be tuned in and possible assistance alerted.

A LED Meter Display monitors standing wave ratio (SWR), modulation and incoming or outgoing signal strength, and an auxiliary input jack allows music to be played from a tape recorder or FM radio through a public address speaker.

The CB-340 model is equipped with a Noise Blanker (NB) switch which eliminates annoying repetitive noises such as ignition, spiking, and a RF Gain Control to assure the clearest possible reception. A Delta Fine Tuning control pinpoints signals which are off frequency and helps reject adjacent channel interference.

The economical CB-140 is also equipped with advanced features common to the CB-340 and CB-640. These include:

- The legal maximum limit of 4 Watts of RF output power.

- Advanced mike preamp and compressor designs which provide 100% modulation capability so that messages are transmitted audibly regardless of input volume.

- A full 6 Watts of audio power, teamed with a built in 4-inch speaker, overcomes any freeway wind noise and insures that the weakest signals come through clearly.

- Dual-Conversion Superhetrodyne Receiver with Dual-Cascoded Ceramic Filters eliminates unwanted signals and provides unsurpassed selectivity and sensitivity.

- LED Channel Selector Indicator.

Mark number F16 on Reader Service Card.



### 40 CHANNEL UNDER-DASH

Featuring an aircraft type channel number readout, visible even in bright sunlight, Craig's 40 Channel L101 under-dash CB radio comes standard equipped with a unique "total-slideout" bracket. With the new bracket, the CB user can instantly remove his CB radio for safe storage or transfer to another car or to a RV or boat equipped with an extra accessory bracket. Hookup or disconnection of antenna, power, external speaker and PA speaker is made when the CB radio is placed in or removed from the bracket.

The L101 also features a pulsating modulation ring to monitor transmission and a large illuminated input signal/power output meter. A uniquely styled microphone provides comfortable use over long time intervals.

Front panel controls include a PA/CB switch with

# Would You Buy A Used CB Radio From This Man?



PROBABLY NOT, because there are so many great values available in new gear you wouldn't even want the used equipment. But consider what you look for in a salesman who's trying to sell you a new radio.

## But...

## Consider this:

The most important ingredient in a customer-salesman relationship would always be missing. The ability to communicate. And that's what good salesmanship and service is all about.

We at Trevoze Electronics have been selling communications equipment for more than forty years. Our success has been based on our ability to give every customer personal service. No matter how small or how large your purchase, you'll find that buying your CB gear from Trevoze is a fun experience.

Sure, our prices are great. They have to be in a competitive market. But we don't sell on price alone. Every CB set, every antenna, every accessory you buy, will be given personal attention by a salesman who wants you back as a happy repeat customer.

And this great one-to-one service applies to all our customers. That means the CBer who shops in our retail store, or the dealer who orders from our fabulous two-step wholesale department. So make your next CB shopping adventure at Trevoze. Think of us as the outfit that keeps the monster in the ad, but never behind the sales counter.

OVER 40 YEARS IN ELECTRONIC 2-WAY COMMUNICATIONS

# TREVOZE Electronics

4033 BROWNSVILLE ROAD, TREVOZE, PENN. 19047

(215) 357-1400

## ON THE COUNTERS (continued)

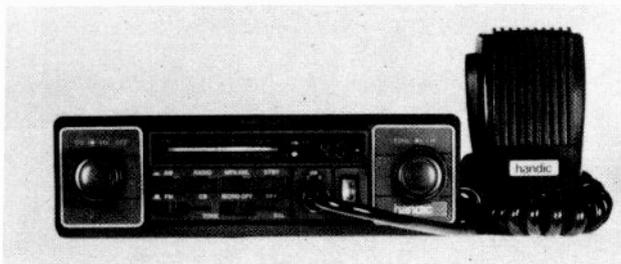
noise limiter position to minimize background noise and a channel indicator and meter light dimmer for safer nighttime operation. Circuitry includes built-in voice compression for maximum clarity and range and stable accurate PLL frequency synthesis.

Mark number F17 on Reader Service Card.

### 40 CHANNEL AM/FM/MPX/CB

Sweden's advanced technology now combines a 40 channel CB transceiver with AM/FM/Multiplex radio. In-dash installation.

A full power, full feature AM/FM/MPX/CB that delivers top performance with maximum efficiency. Synthesized with phase-lock loop circuitry to keep you right on frequency. High-intensity LED channel readout is visible even in bright daylight.



Equipped with Standby/On/Off switch so you can monitor CB while listening to your favorite AM or FM station. What a great way to combine the enjoyment of 2-way communications with AM/FM radio.

#### Special Features:

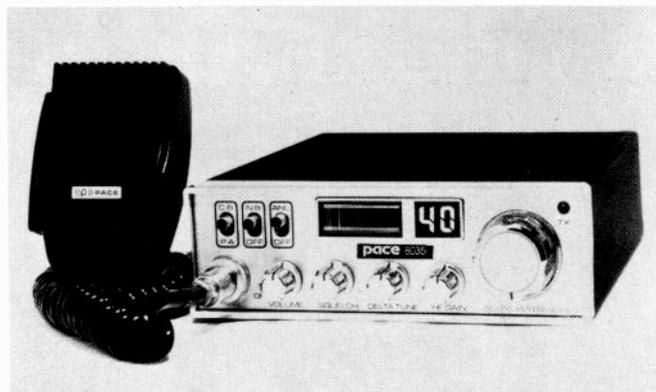
40 AM Channels, PLL synthesis; Digital LED Channel Readout; Tone Control System for Audio amplifier; Stereo Balance Control; Power Out Signal Strength Meter; Transmit & Receive Indicator Lights; AM/FM Band Select Switch; MPX/Mono Switch for stereo sound while receiving FM Broadcast; RADIO/CB Select Switch; Standby/On/Off Switch so you can monitor CB while listening to AM or FM; Automatic Noise Limiting System. Suggested list price: \$259.95.

Contact: Handic-USA Inc., Kennedy Building, 14560 N.W. 60th Avenue, Miami Lakes, Florida 33014 or mark number F09 on Reader Service Card.

### PACE 8035

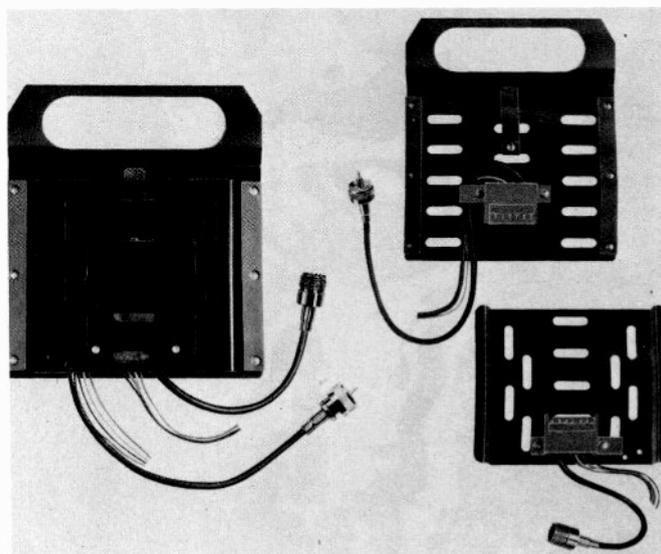
Functional beauty. That's the Pace 8035 because inside are features not normally found in this price range. 40-channel capability with "get-on-now" accessibility. Electronic channel selection. Delta Tune for Crystal clear reception. Automatic noise cancelling. L.E.D. Channel Display. RF Gain control. Noise Blanker switch. Automatic Noise Limiter switch.

- L.E.D. Channel Display—Bright, solid state L.E.D. digital channel numbers read fast. For fast identification and less chance of error.
- Delta Tune—If another CB'er is off frequency and sounds raspy, Delta Tune shifts your receive frequency to match his and thus fine-tune his voice.
- RF Gain Control—Provides precise variable con-



trol so that when increased, weak signals are made stronger. When lowered, strong signals are received without distortion.

- Noise Blanker Switch—Reduces static-type noise caused by man-made interference i.e. car ignition system.
  - Automatic Noise Limiter Switch—Switchable on/off to automatic reduction of atmospheric hissing.
- Mark number F07 on Reader Service Card.

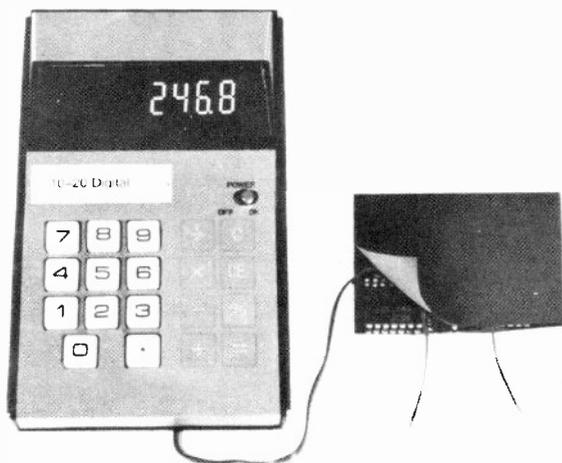


### SLIDE MOUNT

Universal Machine Company, Inc., unveils a line of unique precision crafted CB Radio accessories. Among the products available for immediate delivery are Slide Brackets for easy removal of radio transceivers, replacement Mounting Knobs, Universal Mounting Brackets, Hump Mounts, and a variety of other sought after products. Dealer and Distributor inquiries are invited. For information, write Nelson Roberts, Communications Products Manager at 2300 Reagan Street, Dallas, Texas 75219, or mark number F04 on Reader Service Card.

### DIGITAL MILE MARKER IS HIGHWAY SAFETY AID

Highway travellers have a new aid to locate their position accurately and instantly for reference by emergency help and for many other driving needs including safety and energy conservation. The new low-cost 10-20 DIGITAL™ POSITION INDICATOR



with CONTINUOUS MILE MARKER READOUT gives exact location at all times, without time-consuming calculations, and is accurate to one-tenth of a mile! The 10-20 Mile Marker with C.B. Radio is a great new safety combination that directs help with no wasted time. Quick reference establishes exact distances to restaurants, turnoffs, police activity, fuel and rest stops and helps to avoid major tie-ups via alternate routes. Commercial highway users and professionals such as truck drivers and emergency crews save valuable time and are able to maintain travel pace effortlessly by controlling speed and to establish arrival times for critical shipments.

Extra large lighted display in a comfortable viewing position is quickly visible night or day—especially valuable when conventional mile markers are missing or obscured by snow or vegetation. The minicomputer section detaches readily to avoid theft or for use as a pocket calculator. In operation, the dash mounted keyboard and display unit is set at the beginning of each highway stretch by punching in the correct mileage at the point of entry, to agree with the highway mile-marker. The vehicle travel miles are then automatically added or deducted from the punched-in figure depending upon the operator's wish. North and east travel mileage generally is added, and south and west travel deducted on many interstate highway systems. Units install in minutes.

The 10-20 Mile Marker answers a need for mileage computing and display in agreement with standard highway systems, without time-consuming calculations. Professionals regularly exchange information relying on exact current position reference. The aid simplifies the process and makes the driver independent of poorly visible or non-existent road side markers. Information and dealer arrangements may be obtained from: GEOMETRICS CORP., 24 Forest Hill Drive, Nashua, New Hampshire 03060, or mark number F25 on Reader Service Card.

#### POWER BASE STATION MICROPHONE

Broadcast radio frequency can be achieved with GC Electronics Power Base Station Microphone 18-002.

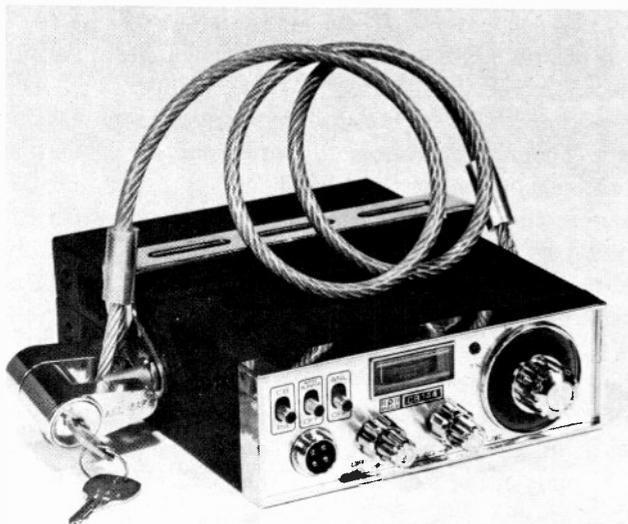


The microphone is designed specifically for CB usage, 23 or 40 channel AM or SSB radios. A fully adjustable volume control permits easy, instant adjustment. It features a push-to-talk button as well as a lock switch for free-hand operation.

The transistorized amplifier stage is mounted inside the mike and boosts modulation to broadcast radio frequency. It connects easily to any transceiver, even older tube types.

There is automatic compensation for high or low impedance sets. A common 9 volt battery (not supplied) will provide a minimum of 200 transmit hours.

GC Electronics, 400 South Wyman, Rockford, Illinois 61101, or mark number F24 on Reader Service Card.



#### ALL-SAFE CB LOCK

Now, ALL-SAFE LOCKS have developed a CB lock, which not only locks your set to the original mounting bracket, but even if the set is torn from the dash or hump mount it is still secured to the steering column or dashboard bracing by a 4200 lb. test, plastic covered aircraft cable.

Replace your original mounting bolts with one of the

## ON THE COUNTERS (continued)

three sizes of bolts attached to the cable. One of the three sizes will fit your rig. Run the cable around the steering column or braces. Insert the same color bolt into the opposite mounting hole. Run the ALL-SAFE LOCK pin through the hole in the bolt and the cable loop and close. ALL-SAFE "Locks like a vise". No holes to drill—No special wiring—Uses your original mounting bracket.

Mounting bolts are "cold-headed" manufactured, meaning they would have to be bent more than 90 degrees before fracturing. This is impossible because of the wire flush-fitted head. Available at all better radio, marine and RV dealers. Suggested retail price \$9.95.

Manufactured by: Clyde T. Johnson Associates, Inc., Drawer 100, Escanaba, Michigan 49829, or mark F13 on Reader Service Card.



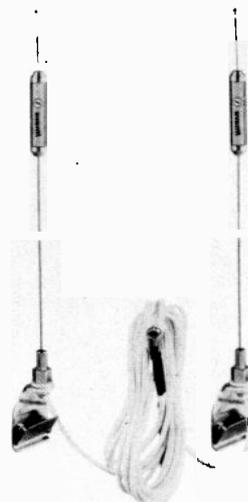
### 300 OHM CB INTERFERENCE FILTER

A 300 ohm Citizens Band interference filter just introduced by RMS Electronics, Inc., Bronx, N.Y. 10462, knocks out CB and ham radio interference on television sets. The filter connects directly to the VHF antenna terminals on rear of the TV set. To split VHF and UHF signals, the filter can be used in conjunction with RMS model #MA-332 or #SPF-555 splitters. Outstanding features are miniaturized circuitry, totally shielded network and housing, and heavy duty twisted and tinned lead that is oval cut for additional strength at the connection point. Penetrating washer terminals provide simple connection of the antenna lead-in-wire to the unit, and eliminates the need to strip and bare the wire ends of the lead-in wire. The RMS CB interference filter, model #CB-300F has a list price of \$7.75.

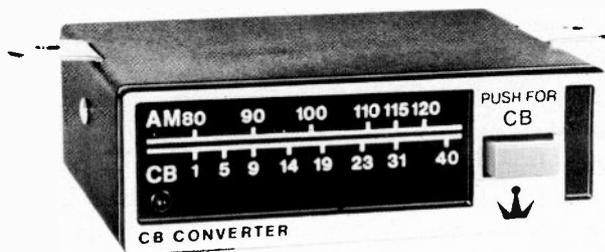
Mark number F22 on Reader Service Card.

### DUAL ANTENNA SYSTEM

New from Avanti Research & Development is the AV-535 co-phased dual antenna system. Designed for use on cars, pickups, campers and other recreational vehicles, the system consists of two 48" stainless steel, top loaded Avanti "FAZER" antennas with chrome plated steel gutter clip mounts and 24-ft. co-phasing



harness. The system is said to increase performance approximately 25% over a single antenna, and to minimize the problem of a skewed or shifted radiation pattern. The system is readily removable for easy transfer from one vehicle to another. AVANTI RESEARCH & DEVELOPMENT, Inc., 340 Stewart Ave., Addison, IL 60101, or mark number F21 on Reader Service Card.



### CB CAR RADIO CONVERTER

Antennacraft of Burlington, Iowa, has introduced a 40 channel CB Converter that turns any AM/FM car radio into a CB receiver. Crystal controlled, one switch operation works on 12V negative or positive ground using standard car radio antenna. Easy plug-in hook-up under dash or in glove compartment requires no special tools. Only 4" x 3". For further information on model No. 5140, write: Antennacraft, P.O. Box 1005, Burlington, Iowa 52601, or mark number F10 on Reader Service Card.

### CB 10-CODE COLORING BOOK

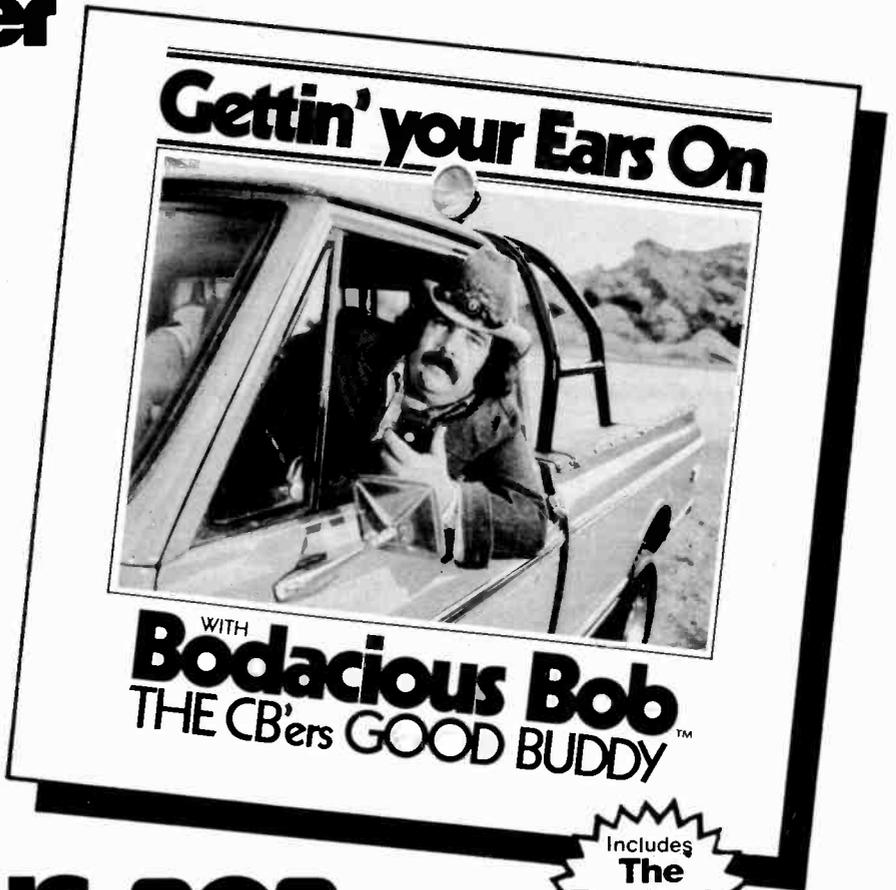
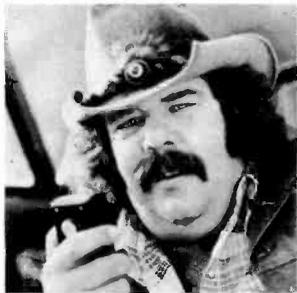
RCA has launched a new promotional program, centered on an unusual children's coloring book that also appeals to adults, to promote its new line of 40-channel Citizens Band radios.

The program is being offered through the company's network of CB radio distributors who in turn can make it available to dealers who wish to participate.

The book also includes a glossary of most common

**EVERY CB'er  
NEEDS A  
GOOD  
BUDDY.**

**NOW  
HE'S  
HERE!**



**BODACIOUS BOB**

and his first album of CB songs & stories.

**GET A COPY ON BODACIOUS.**

He has somethin' to say to all CB'ers — old or new.

- The history and future of CB
- The hottest new CB slang from around the country
- City CB'n
- Country CB'n
- How to get the max out of your rig
- CB courtesy, safety, theft prevention and fun
- Shakin' the "CB Jeebies"
- The sunspot "crisis"
- The Trucker's Prayer
- Gettin' into The Squelch Squad

**PLUS - 2 ORIGINAL  
CB HIT SONGS!**

- "On the Road"  
(the story of a once-lonely trucker)
- "Get a Copy"  
(with impersonations of famous people talkin' on their CB's)

Plus other original music, from country to rock. And lots more! Order yours today!

Available on LP, 8-track, or cassette.

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20969 Ventura Blvd., Woodland Hills, Calif. 91364

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10-4 Bodacious. You're talkin' on my channel. Send me:

\_\_\_\_\_ LP(s) @ \$6.95

\_\_\_\_\_ 8-track tape(s) @ \$7.95

\_\_\_\_\_ cassette tape(s) @ \$7.95

Total of order: \_\_\_\_\_  
(Check or money order please)

Charge to my:

BankAmericard # \_\_\_\_\_

or  Master Charge # \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Mail orders to: BODACIOUS BOB  
Box 1020 • Woodland Hills, Ca. 91364

API-S9



terms used in the colorful CB "slanguage" such as: bubble gum machine (light on top of police car); bucket mouth (Cber who can't stop talking); cup of mud (coffee); ears (CB antenna); eighty-eights (love and kisses); foxy lady (attractive woman); green stamp (toll road); lollipop (microphone); and snore shelf (bed).

Other features of the book are a listing of words in the phonetic alphabet, CB channels most frequently used by truckers in various sections of the country, as well as a chart to explain reporting of CB readability and signal strength.

Mark number F20 on Reader Service Card.

### MESSENGER 92

The E. F. Johnson Company has announced the availability of the Messenger 92, an all new, professional quality 5-channel hand-held CB transceiver with a cast aluminum alloy frame for exceptional sturdiness. The new model features low power consumption and superior receiver sensitivity and transmit range.

Johnson's Messenger 92 has a nickel-cadmium battery pack that stores enough power for a full day of normal

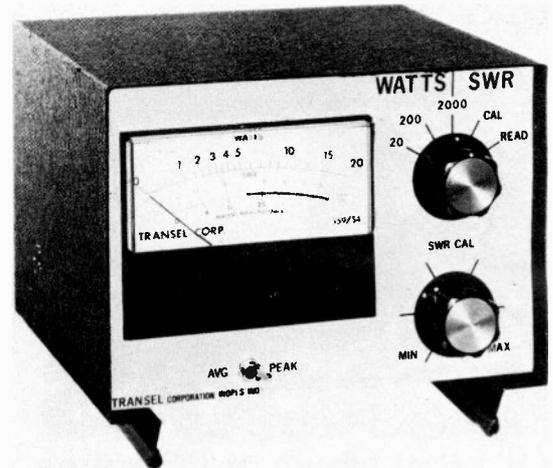


use. Additionally, the charger unit, which is supplied with the radio, permits full re-charging overnight.

The Messenger 92 comes with a LED battery indicator that tells at a glance when charging is required. It is also equipped with a flexible antenna that gives years of trouble-free service in the field.

The Messenger 92 radio is backed by a full one year parts and labor warranty and the Company's country-wide network of more than 1,000 Authorized Service Centers.

For further information, contact: The E. F. Johnson Company, Personal Communications Division, Clear Lake, Iowa 50428, or mark number F15 on Reader Service Card.



### NEW WATTMETER

A new wattmeter for amateur and CB radio operators is offered by Transel Corp.

Known as the Mark II wattmeter, it is designed for use with 50 ohm, coaxial radio frequency systems, and features all three power ranges (20, 200 and 2000) on a single meter scale. Frequency range is 3.5 to 30 MHz, and accuracy  $\pm 5\%$  of full scale.

Along with the direct reading SWR scale in red, there is a complementing percentage of reflected power scale. The SWR function can be used as an aid in the adjustment of carrier suppression for SSB operation. A peak-average switch allows measurement of either positive peak power or average power.

The sloping cabinet has a cover with rugged black crackle finish and recessed light gray front panel. Control knobs have two white dots for accurate positioning and observation. The back is open to permit removal of R.F. connector box for remote reading of the wattmeter. Dimensions are 5½" high x 6⅝" wide x 6⅝" deep.

Sold through electronic distributors, Mark II has a suggested retail price of \$79.95.

Contact Transel Corp., 2898 N. Catherwood, Indianapolis IN 46219, or mark number F27 on Reader Service Card.

*(continued on page 123)*

# DEALERS, STILL LOOKING?

DEALERS, ARE YOU STILL LOOKING FOR THE "LAST WORD" IN A CATALOG OF CITIZENS BAND RADIOS AND ACCESSORIES? WE THINK WE HAVE THE ANSWER.

BENNIES' 1977 CATALOG IS OUT, AND AT 672 PAGES, IT'S THE WORLDS LARGEST CATALOG OF IT'S KIND! FOR ANYTHING IN CB FROM 'A TO Z', OUR GIANT NEW CATALOG IS THE PLACE TO FIND IT! AND AT OUR DISCOUNT PRICES, YOU CAN'T AFFORD NOT TO LOOK!

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# CB Types: Number 6 of a Series

by WOLVERTON

## WILD-EYED ANARCHIST

Since many people insist on operating illegally, we have a proposal which should make them happy: The FCC would withdraw completely from CB. All restrictions would be removed, plunging the band into a state of total confusion and mass hysteria. To maintain this state, control of the band would be turned over to wild-eyed anarchists (one shown here, presiding over a small CB gathering), who would set confusion standards, and ensure that levels of disorder were kept at a healthy high. Unfortunately, all this would quickly become boring to illegal operators. In search of excitement, they would revert to the old FCC regulations.





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# UNCLE TOMCAT'S CB BEDTIME COLORING BOOK

## THE CB'ER AND THE SHOE

There was a CB'er with a 500  
watt shoe,  
He ran so much power we didn't  
know what to do;  
He bled through the channels till  
his buddies were red,  
When Uncle Charlie found him,  
it was *he* who was bled.

## PETER PETER

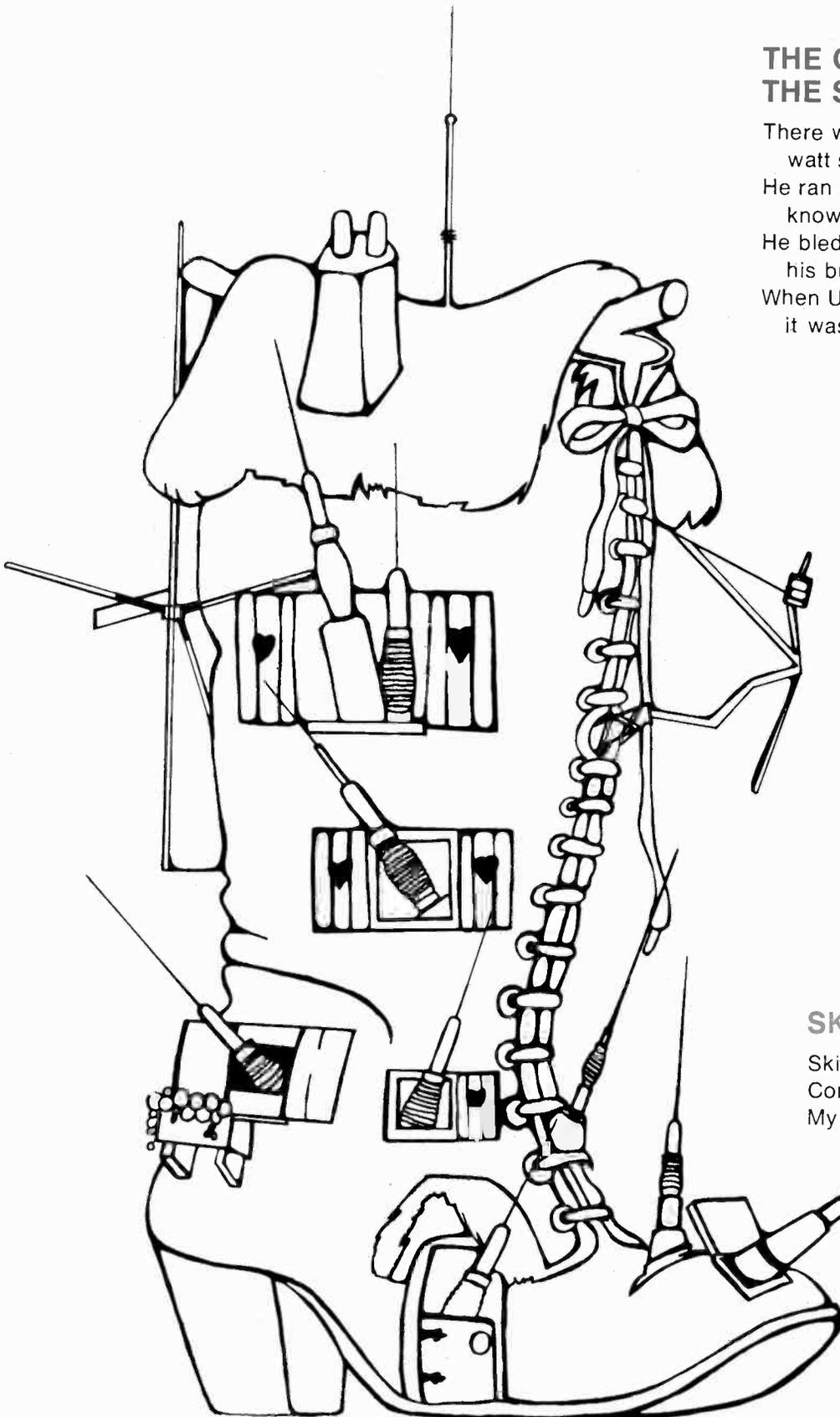
Peter, Peter, Power Meter,  
Had a rig, *The Super Defeater*,  
2 kilowatts out, it sounded like  
hell,  
(Of course he hid it very well).

## BREAKER MAN

Pat-a-cake, pat-a-cake,  
Breaker Man,  
Get in your break as fast as  
you can;  
Shout it and call it and say it  
with glee,  
But you'll still use the channel  
long after me.

## SKIP SKIP

Skip, skip, go away,  
Come again another day,  
My linear's broke. Wadd'ya say?



## TWINKLE TWINKLE

Twinkle, Twinkle power mike,  
Won't you give my voice a hike?  
Up above the rest so high,  
Those skipland stations I must try.

## FE-FI-FO-FUM

Fe, Fi, Fo, Fum,  
I smell the badge of Uncle  
Charlie's men,  
Be they alive or be they dead,  
If they see my rig, it'll cost me  
bread.

## GEORGIE PORGIE

Georgie Porgie's beam was too  
high,  
Those wall-to-wall signals made  
us all cry.  
But Uncle had his Judgement  
day,  
And Georgie Porgie lowered  
away.

## THE HEAVY DUTY BEAM

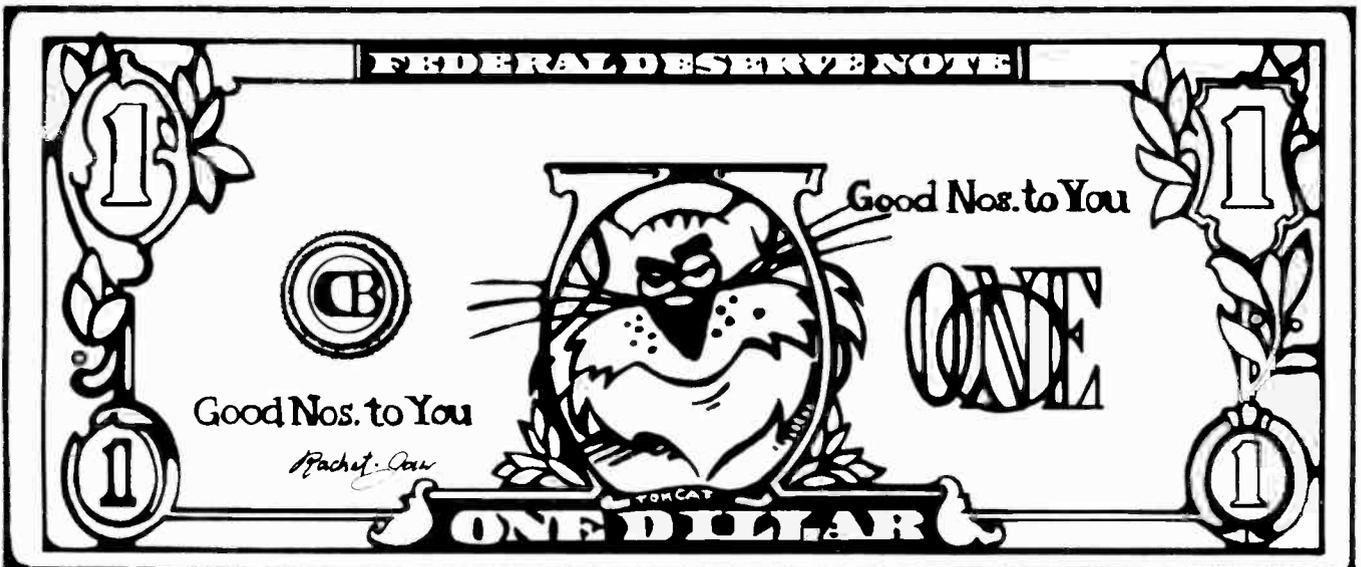
My heavy duty beam sat on a wall,  
The monstrous thing was 300 feet  
tall;  
But an eyeball upon it from  
Charlie's men,  
Cost me big dollars, ten times ten.

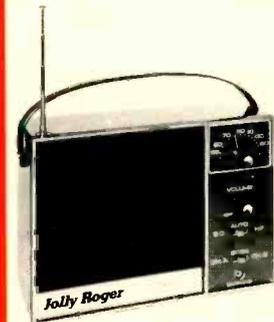
## GOOSEY CITIZENS BANDER

To inspect the Citizens Bander,  
Uncle Charlie has to wander,  
Upstairs and downstairs,  
And in my radio chamber.  
Once they sent an old man  
Who couldn't see at all,  
But he tripped over my linear  
And nailed me to the wall.

## A DILLER A DOLLAR

A diller, a dollar, a ratched-jawed  
holler,  
What makes you talk too soon?  
You used to babble from 2 o'clock,  
And now you start at noon.



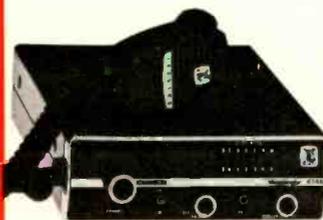


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# TOMCATTIN' with "Tomcat!"

Across The Channels With  
S9's Editor, Tom Kneitel (Tomcat/ KEZ5173)



**T**OMCAT JR., writes that he met another sailor who works so much skip that when Uncle Charlie assigned him a callsign it had an Area Code! . . . OUR WORD IS GOSPEL? In the February issue we ran a gag certificate which supposedly granted readers ownership of the CB channel of their choice—a few weeks after the issue went on sale (I kid you not) I received a letter from KIDDY KAR of Longview, Wash., telling me that someone used that joke certificate to actually “sell” Channel 3 in his area—the fee was \$1,800 and included a high powered linear amplifier to dominate the channel. *Good grief!* . . . *Two Nominees For Sad Sack of The Month:* As sent in by Tim—a Smokey, who is a long-time reader of *CB RADIO/S9*—One sad sack he knows of is known as THE LOUDMOUTH—tooling along the zip strip at 75 MPH and running off at the mouth about it, checking 10-13's every 50 feet, telling everybody that there weren't any Tijuana Taxis in sight. Spent so much time broadcasting that he didn't see the flashing red lights of a Smokey in a plain wrapper until the guy was riding right on his rear bumper. Well, it was his second greenstamp in 60 days—and the next several days of his CB'ing consisted of saying how fair it was for Smokeys to drive around in unmarked cars! Next nominee: We'll call him SPEECHLESS. Moving along the slab at a healthy clip he spots a blue 4-wheeler up ahead—the blue job is equipped with 2 whips. SPEECHLESS shouts the blue mobile and asks him to be his front door. After about 10 miles of 10-13's, SPEECHLESS asks the blue car driver for his handle—the reply was SERGEANT SMOKEY. After a few seconds of silence, SPEECHLESS asks, “Are you a Smokey?” The reply: “Yes I am.” SPEECHLESS' silence at that point was punctuated only by the howls of laughter from all of the 18-wheelers on the channel, and one of them who commented: “SPEECHLESS, you have to be the dumbest cottonpicker in CB-land to pick a *Taxi* for a front door!” Tim (who is a Sergeant in a municipal PD in N.Y. State) reports that there are many more Smokeys with ears on the Interstates than most folks imagine)

most of them just *sandbag* (listen without talking) until they hear a 10-33—often swinging into action because of a CB report even before it is flashed out over the police radio; they will also come back to requests for road directions, locations of pit stops—most of those CB'ers to whom they speak never even know that it's the *Big Badge Wolf* they're talking to!! Tim passes along the reminder that not all Smokeys use handles which reveal who they are (such as GREENSTAMPER, SGT. SMOKEY, DIESEL CHASER)—many of them are just plain PARSON or HEAVY CHEVY, or MULE TRAIN, or something similar. Tim's handle? He'd rather not see it in print. Maybe you'll meet him on Channel 19 one day! . . .

**TECHNICAL DEPT:** When you're checking the SWR in your mobile installation, close the car door(s)—you're liable to get different readings with the doors open and closed, especially on smaller cars. . . .

**TRENDS:** A note from Frank (SWAMP FOX/SSB-1888) in Chicago discusses the current trend for various ethnic, racial, and other cultural interests to claim ownership of this or that CB channel—such as Channel 16, which seems to be the *Soul channel* in many metropolitan areas these days. Checking into this further, Frank notes that if “outsiders” attempt to use these channels sometimes things get rather ugly—verbal warfare breaks out, racial or ethnic insults explode, violence is threatened. Nevertheless, Frank explains, there are (in various areas), *Black channels*, *Chicano channels*, *Gay channels*, *Puerto Rican channels*, and in Hawaii there is a *Japanese channel*! Of course, just as “outsiders” aren't welcomed on these channels, those who normally use these “special” frequencies are hassled should they attempt to use channels other than “their own.” Well, Frank, when you add this to other frequencies staked out by clubs and neighborhoods, the channels used by truckers and 4-wheelers looking for 10-13's, agricultural channels, the maritime channel, and what have you—CB'ers might eventually have to fill out an application con-

sisting of 55 personal questions which will be fed into a computer in order to advise which channels they can use! Hey—let's get at least *one* channel set aside for *everybody* to be friendly with one another! Anybody second the motion? . . .

An unhappy reader called me on the *double-L* to say that the off-brand cheapie CB rig he purchased at a novelty shop worked for about one hour before calling it quits (in a flash of smoke). He took it back to the guy who sold it to him, only to be reminded that the set was sold with a *lot line guarantee*. Asking the "dealer" to explain further as to the exact terms of that guarantee—the fellow pointed out of the store window and said to the CB'er, "See that line at the edge of the parking lot? When you crossed that line your guarantee expired!" Our unfortunate friend asked me to tell readers what he should have known in the first place himself—buy from reputable CB and electronics dealers handling known brands of equipment. He did say that the novelty shop owner did eventually offer to take the defunct CB set back in exchange for other merchandise he was selling—things such as rubber spiders, poopoo cushions, and *unusual* movies! . . .

A Voice From the Past: I was happily surprised to hear from reader SY THE GUY—he just got into CB radio, picked up a copy of CB RADIO/S9 and thought he recognized my name. SY THE GUY and I worked together many years ago when I was a DJ and studio engineer at a broken down one-lung AM broadcasting station in Coral Gables, Fla. SY THE GUY had his own program on the same station—we hadn't come across one another since we were both in college years ago! . . .

CAPGUN (also known as SSB-1427) out in San Diego, tells me that CB has a new twist—many babysitters (teenagers and senior citizens alike) have started asking if their babysitting job includes the right to use the CB base station—and in many instances they won't even consider taking a job that doesn't include the use of CB! Bill tells me that he heard of one instance where the neighborhood's best babysitter was won over to a family which had tried in vain to get her to work for them for over a year. Secret of their success? They were the first folks in the neighborhood to get a 40 channel sideband rig! . . .

Another yarn told me by CAPGUN (he's a Naval Officer, by the way) was of the unfortunate sailor (a Radioman) who tried to tune up the high powered transmitter on his ship to "see how it would sound" on CB. Everybody said it was a big 10-1—everybody—except Uncle Charlie and some concerned Navy officials. His CB career was rather short! . . .

The early morning DJ at a local radio station I heard while mobiling in West Virginia had a novel approach to broadcasting. Guess he was a CB'er because when he signed the station on at 7 AM he announced the station's callsign and asked for a break on the channel! . . .

CB'ers ARE SPECTACULAR DEPT: The Gold Coast Jamboree was held in Calif. for the primary purpose of raising some funds to help in the fight against muscular distrophy. They collected \$2,500! During the jamboree, one of the club members received the news that her brother and sister had been killed in an auto accident in Minnesota—a hat was passed around to help have the bodies shipped to California for burial—in less than 20 minutes they had more than \$600 collected. CB'ers are like that! Thanks to THE STAMP COLLECTOR for telling me about it . . . Uncle Charlie still giving serious consideration to the following frequency bands for additional channels in any future expansion of the CB service: 220 to 225 MHz and a 10 MHz slot somewhere between 890 and 947 MHz. They recognize the need for another 1 MHz worth of CB frequencies in the frequency region of the present 27 MHz band, however there isn't that much frequency space available there to scrape together for CB. All of this will bubble on the back burner until Uncle Charlie goes to the World Radio Conference to be held in Switzerland in 1979. An FCC insider tells me that current user efforts to legalize "HF" CB on frequencies just below 28 MHz are more than likely an exercise in futility and a waste of time—FCC sez Uncle Sammy feels the frequencies there are necessary for communications by military and civilian agencies of the government and they are ill disposed to giving them up! . . .

REPORT FROM MEXICO: According to the *Untouchables CB Club* of Mexico City, the Mexican government is now seriously considering making CB legal for citizens of that country. This is a reasonable decision inasmuch as there are already 10,000 bootleg CB'ers in Mexico City alone—all equipment for these stations having been smuggled in over the border. Having a bootleg CB rig in Mexico is such a status symbol, that many non-CB'ers are buying the mobile antenna alone because it makes them look like CB'ers! We have many readers in Mexico (had 'em for several years now)—those seeking to make contact with the *Untouchables*, the meetings are every Saturday nite at the *Pizza Pit* in Mexico City. Visiting American and Canadian CB'ers are probably welcome guests! . . .

GETTING PERSONAL DEPT: A special "thanks" to CB'er WAIT A MINUTE in southern California—

she's one gal who has proven in many ways that CB'ers are the *very best!* . . .

Didja know that last year there were 92 CB'ers killed and 156 injured while putting up base station antennas—most of the mishaps taking place when the antenna or supporting structure came into contact with electrical power lines. Each accident usually resulted in involvement of more than one person . . . A psychiatrist at the American Association of Family Counselors says that CB can be a major hassle in marriages and is even “becoming a source of breakups.” He says that many people show up at marriage fix-em-uppers with the wife complaining that Charlie walks straight into the home-20 from the salt mines, barges right past her and the kiddies, and breezes straight into the room with the CB rig—often shutting the door on the family when they make any attempt to give him an eyeball while he is shouting all of his good buddies on the CB! The shrink says that it's getting to the point where some folks are becoming addicted to CB. Looking at it all from another standpoint, another marriage counselor says that some guys might even be considered to be having an *affair* with their CB rigs. One expert claims that a major cause of marriage failure is a lack of communication—especially a problem when husbands and wives can't or won't communicate with one another, but seem to do very well with others via CB. The typical case, he says, is the husband saying that he wants to shout his buddies on the CB, but using that as an excuse not to have to spend the evening with his wife—it's an escape. What's the solution? Easy! Wives who feel that this is happening to them can solve the problem by becoming involved in CB radio and sharing the experience! . . .

Out on the highways its the many rumors of where Smokey is—often dozens of reports going out over the channels reporting the 10-20 of a Smokey who doesn't exist. In Oregon it has a different twist, so I am told by my goodbuddy Bob Kuhn, KAIM5568 (ex-KPC2190) of the Oregon Dept. of Fish & Wildlife. Bob says that during the hunting season the CB channels used by outdoorsmen often buzz with stories about the Fish & Game people buzzing the elks with choppers and/or fixed wing aircraft to scare the animals away from the hunters. The reports usually say that bags of flour are being dropped from the aircraft, sometimes they say that shotguns are being fired. Bob tells me that there isn't a *shred* of truth to *any* of these tall tales, which seem to become heard with more and more frequency with each passing year, and have gotten especially prevalent with the expanding use of CB. Despite all efforts made by the Fish & Wildlife folks

to explain this—the rumor was hotter than ever last year. What next? Well, the 1977 elk season is a few months away, and the rumors will probably be worse than ever this year. If you live in Oregon and you hear this tired old tale coming over your CB next Fall—tell the guy you know better. Anybody who wants more information can get in touch with the Oregon Fish & Wildlife Dept., at P.O. Box 3503, Portland, Oregon 97208. . . .

**FAST ACTION DEPT:** Last November we ran a story on how Channel 9 (the emergency channel) was being abused and misused. A few readers thought we were making it all up. In our March issue we ran a follow-up story with comments from many readers on the Channel 9 situation—seems that a lot of others also had complaints about Channel 9. No sooner had the March issue been received by subscribers than Uncle Charlie decided that maybe we had a valid gripe—they hurriedly issued a public notice telling CB'ers to use Channel 9 properly. That's what we like—*aggressive leadership!* . . .

A pat on the back to *Radio Shack*—they were expanding the CB slang dictionary in the 2nd edition of their excellent book *All About CB 2-Way Radio*. Although a multi-million dollar outfit, RS exec Hy Siegel (SSB-42) took the time to listen to Judy (SSB-99) who gave him a long list of reasons why the CB term “Beaver” *shouldn't* be included. Hy agreed, and the tacky word, which seems to offend many, does not appear in the edition (which just went on sale)! . . .

Uncle Charlie is pulling the knot tighter around the sale and use of CB linear amplifiers; more on this next issue! . . .

**Signs of Inflation:** Ever hear the CB'er who likes to wish you to “Have yourself one fine day”—well the other day one of these guys gave me this benediction with a new inflationary twist. He told me that I could have myself “*two*” fine days! . . .

Young Terri Myers, the 12 year old cancer victim of Smyrna, Ga., known far and wide on the CB channels as TIPPY TOES, passed away Feb. 25th. So popular was TIPPY TOES that the *Tippy Toes CB Club* was formed by her goodbuddies to help pay her medical expenses. At her funeral there were the members of the club, the Navy, Smokies, firemen, and about 400 local residents. Everybody remembered the voice of the brave and friendly young CB'er who used to announce. “This is TIPPY TOES, how y'all doin down there?” She will be remembered for a long time to come! . . .

A CB'er called me on the landline the other day to say that he had a lot of static coming through his rig. He said that he had seen a can of a laundry

spray called "Static Guard" and he wanted to know if it would help if he sprayed it on his antenna and inside of his CB rig! . . .

*Dropping like Flies Dept.* Towards the middle of 1976 new CB magazines and newspapers began to show up by the dozens per week. Most lived for only one or two issues, a few survived for a little longer. Today, there is little trace left of most of them—lack of relevant articles, readers, advertisers, editorial direction, and familiarity with the world of CB seemed to combine to be the problem. . . .

As an interesting sidelight, a few months back we reported that a lurid girlie magazine had "reviewed" CB magazines (it was never clearly understood why) and scolded S9 because we didn't run any so-called "beaver of the month" photos. They *did* select another CB magazine, however, as being *much* more interesting because of their coverage along these lines (no pun intended). Ironically, the publisher of the girlie magazine was recently given a 25 year prison sentence (now being appealed) for peddling filth, and the "more interesting" CB magazine with the "beaver" photos just announced that it was dropping from 12 issues a year to only 6! . . . Time To Help: CB'ers have always been helpful in time of personal and public distress—and here's something which deserves some of the kind of help



we can give. Last July a young girl was kidnapped in Ocala, Fla.—right in the parking lot of a shopping center. Her father, the police, and many local area CB'ers have been searching for her ever since (her father has offered a \$2,000 reward for infor-

mation leading to the return of the child). The girl is Dorothy (*Dee Dee*) Scofield. She has blue eyes, long light brown hair, she wears eyeglasses. Her 13th birthday was last January, she would be about 5 feet tall and weigh just over 100 lbs. now. Here is a photo of *Dee* taken shortly before her abduction. If you have seen *Dee Dee*, or have any information at all about her, please *immediately* contact the FBI, the Ocala (Fla.) Police Dept., Dorothy's father (John Scofield), or you can contact me directly. The Ocala PD landline is 904-629-8555, and John Scofield's landline is 904-236-4873 (his 10-20 is 4624 N.E. 11 st., Ocala, Fla. 32670). . . .

The *Citizen's Radiophone Association* of Detroit, Mich., must be one of the oldest "local" CB clubs still in existence. I recall seeing their newsletter back about 1961—it's still being published! Might well be a record! . . .

*Tomcat!*

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# Nuts and Bolts Dictionary

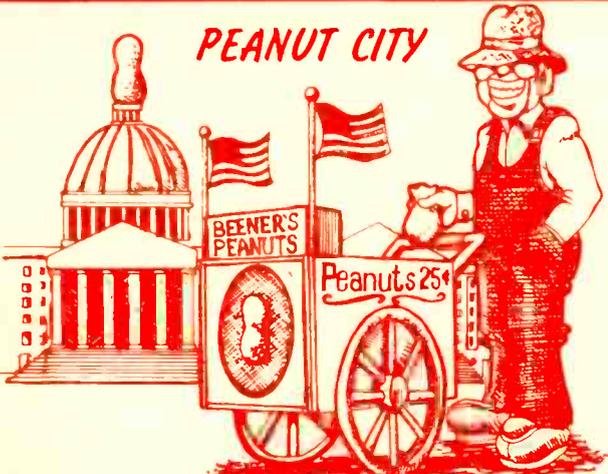
A Special THANKS to our Goodbuddies who sent in these great CB Slang Words.

By Harold Perry

Scott Peters (*Watergater*) Washington, D.C.

Craig Morrison (*Dynomite*) Coraopolis, PA

**PEANUT CITY**



In the beginning of CB usage the handle for Washington D.C. was "Flag Town." Then when President whatizname made tape recorders popular, CBers around the country began calling it "Watergate City." CBers from the Big Apple (NY) referred to Washington D.C. as the "Rotten Apple." Now with Jimmy Carter in town, we're told that the handle is slowly changing to "Peanut City." Maybe Scott will have to change his handle to "Peanut Butter."

**QUARTER BACK, HALF BACK, FULL BACK, ect, ect . . .**



Craig says that instead of saying, "Come Back," you can use the above words. It all sounds pretty darn confusing to me, but, sometimes you can learn a lot about a person by his, "come back." Examples are: pig farmers say hog back, swimmers (wet back), overweight people (fat back), photographers (flash back), olympic runners (fast back), bankers (green back) and politicians (kick back).

Send Slang Words to: Harold Perry c/o CB Radio/S9 14 Vanderverter Ave. Port Washington, NY 11050

## Big 40 Channel Performance THE HORIZON 29A

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# COMING EVENTS!

If you wish your Jamboree or Coffee Break listed in this column, the information must be sent to S9 at least 4 months in advance.

## JUNE

**Ottumwa, Iowa**, 2nd Annual Armadillo Flats National Jamboree, June 3rd-5th, Ottumwa Coliseum. Hosted by Armadillo Flats Iowa. For more information contact Armadillo Flats, Inc., P.O. Box 313, Oskaloosa, Iowa.

**Webber City, Virginia**, Jamboree of Scott County Communications Club, June 3-5th. 5 miles East of Kingsport, Tennessee at the Cozart Tobacco Warehouse. For more information contact Secretary, Catherine Daugherty, Rt. 2, Box 184-A, Nickelsville, Virginia 24271.

**Great Bend, Kansas**, Jamboree, June 4-5th, Sponsored by Kansas Flatlanders C.B. Club. For more information contact Bob Shanks, The Budman, 1209 8th, 792-2209 or Box 114, Great Bend, Kansas 67530.

**Alexander, New York**, Coffee Break of Wyoming County React. June 5th at Alexander Firemans Hall, Rt. 98. For more information contact Chairman Marty Burshtynsky, Attica, New York, 591-2323. Or 796-5447 for Co-Chairman.

**Marietta, Ohio**, 3rd National Jamboree of New Breed CB Radio Club. June 10-12th at Washington County Fair Grounds. For information write club at P.O. Box 516, Marietta, Ohio 45750 or call (614) 373-3575, Susan Blazavich, President.

**Beaufort, South Carolina**, 4th Annual Jamboree of the Low Country Modulator CB Club. June 11-12th at the National Guard Armory. For more information contact Low Country Modulators, P.O. Box 4736, Burton, South Carolina 29902. (803) 524-8539 or 524-3349.

**Wellington, Ohio**, 2nd Annual MDA Jamboree sponsored by Greater Cleveland C.B. Council. June 17-19th at "Clare-Mar Lakes Campgrounds." Benefits Muscular Dystrophy. For more information and advanced camping reservations contact The Wonder Man, P.O. Box 35453, Cleveland, Ohio 44135.

**Wichita, Kansas**, 3rd Annual Good Guys Jamboree. June 17-19th, Cotillion Ballroom. 11120 W. Highway 54. For more

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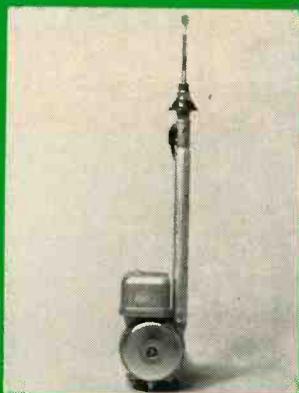
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information contact William Webber, Chairman, P.O. Box 1694, Wichita, Kansas 67201.

**Millport, Pennsylvania,** Coffee Break of Eldred Interstate React. June 18-19th at Potter County Fairgrounds on Rt. 44. Proceeds for community services. For more information contact Barney Bishopp, RD No. 3, Wellsville, New York 14895.

**Mt. Pulaski, Illinois,** Coffee Break of Vinegar Hill C.B. Club. June 19th at Recreation Center, Rt. 54 and 121. For more information contact Club at P.O. Box 61, Mt. Pulaski, Illinois 62548. Glenn Michaelis, President.

**Middletown, New York,** Mobile Jamboree and Coffee Break of Orange County CBers. June 19th (rain date June 26). Monitor Ch. 20. For more information contact John Fournier at Club, P.O. Box 315, Goshen, New York 10924.

**Fond du Lac, Wisconsin,** 2nd Annual Charity CB Jamboree. June 24th-26th, at Fond du Lac Fairgrounds. For more info write Fox Valley Wave Lengths, P.O. Box 415, Fond du Lac, Wisconsin 54935.

**Hanover, Pa.** 14th Annual Jamboree of York CB Assistance Club. June 24-26th at Eagles Park, Rt. 234—(York St.). For more info contact Glenn L. Elicker,

Rd. #1, Box 174-A, East Berlin, Pa. 17316. (717) 292-3194.

**Woodinville, Washington,** Moonrakers Jamboree, June 24-26th at "Norm's Resort." For more info write club at P.O. Box 86, Auburn, Wash. 98002.

**Newark, Delaware,** 1st Annual Summer Festival of Starduster's CB Radio Club. June 25th at Our Lady of Grace Home, Chestnut Hill Road. For more info contact club at P.O. Box 589, MNRBA, New Castle, Del.

**Newton Falls, Ohio,** First Annual Jamboree of Ohio Community Center. June 25-26. Sponsored by the Blue Knights International Sidebanders Ass'n. For more info write Blue Knights SSB, P.O. Box 126, Niles, Ohio 44446.

**Abingdon, Illinois,** 2nd Annual Jamboree of Sky Watch CB Club. June 25 & 26th at Fall Festival Grounds, Rt. 41. For more info: Sky Watch CB Club, P.O. Box 29, Abingdon, Illinois 61410. 309-462-2834.

**Munice, Indiana,** June 25 & 26th. 1st Annual Magic City Modulators Jamboree and Coffee Break, Delaware County Fairgrounds. For information contact Gloria King, 406 E. 3rd St., Munice, Ind. Phone 289-8701.

**Palmer, Alaska,** Annual Jamboree of Channel Breakers. June 25 & 26th at Palmer State Fair Grounds. For infor-

mation contact Channel Breakers, Betty Boop, SRA Box 332, Anchorage, Alaska. Phone (907) 344-2857.

**Hicksville, Ohio,** Jamboree of Defiance County React #2102. June 25 & 26th, at Defiance County Fairgrounds. For info & camping reservations, write Dave Hohenberger, 730 Front St., Defiance, Ohio 43512.

**Valley View, Pa.** Coffee Break of Tri-Valley Citizens Band Association. June 26th at Valley View Park, 8 miles west off Exit 34 of Interstate 81. For more info contact Association, Doris Edwards, 1006 Walnut St., Valley View, Pa. 17983.

## JULY

**Bailey, Colorado,** Annual convention of National CB'ers Association, Inc. July 1st-3rd, at the Farmers Union Bldg. For details write to Association at Rt. 1, Box 108, Pine, Colorado 80470. Diana M. Kloppe, secretary.

**Shallotte, North Carolina,** 1st Independence Jamboree of the Land and Sea Search and Rescue C.B. Club. July 2 & 3. At the National Guard Armory Bldg., Hwy. 17 South; halfway between Myrtle Beach, S.C. and Wilmington, N.C. For info, P.O. Box 843, Shallotte, N.C. 28459. Telephone (919) 754-6564. Mon. Channel 22.

**Beatrice, Nebraska,** NEB Sidebanders Club 1st Annual Jamboree, July 2-4 at Gage County Fairgrounds. For more information contact: NEB Club, Box 81, Holmesville, Neb. 68357.

**Whitney Point, New York,** Jamboree of International Order of Chiefs & Squaws QSL Club. July 8-10th at Whitney Point Fair Grounds, North of Binghamton, South of Syracuse. Rt. 11—Use Exit 8 off Rt. I-81. For more info write Club at P.O. Box 25, Binghamton, N.Y. 13903. (607) 722-3536 or (607) 797-9051.

**Whitney Point, New York,** Electronic Show and CB Jamboree, July 8-10th, Whitney Point Fairgrounds. Rt. 11, Exit 8I 81. For more information. International Order of Chiefs and Squaws QSL Club, P.O. Box 25, Binghamton, New York 13903. (607) 722-3536 or 772-8860.

**Eureka, Calif.** Jamboree of Redwood Empire Bigfoot. July 8-10th, at Redwood Acres Fairgrounds, Rt. 1. For more info write club at Box 278, Sp. 62, Eureka, Calif. 95501.

**Menoken Grove, N. Dakota,** 4th Annual Jamboree of the Central North Dakota CB'ers. July 8-10th. Exit 38 on I94, just east of Bismark. For more info write Gary, 602 N. 24th, Bismark, North Dakota 58501.



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**Olean, New York.** 2nd Southwestern Jamboree. July 10th at Royal Ed-Nor, Smith Hollow. For more info contact David Grimes, 3742 Birch Run Rd., Allegany, New York 14706.

**Butte, Montana.** Treasure State CB Jamboree. July 15-17th at Rodeo Grounds. Sponsored by Bagdad Shrine —proceeds to Shrine Hospital. For more info: write P.O. Box 3083, Butte, Mt. 59701.

**Grand Island, N.Y.** Jamboree of Bison City. July 15th-17th at Island Lanes, 1887 Whitehaven Road, Exit N19 off I-190. Featuring "Live Nashville Entertainment." For more info write Am-Can Radio Club, P.O. Box 147, Hiler Station, Buffalo, N.Y. 14223. (716) 883-8060.

**Jacksonville Beach, Florida.** July 16 & 17th, Jacksonville Beach Coliseum. 4th Annual Voice of the Beaches Jamboree. For information: Bill Jackson, P.O. Box 50906, Jacksonville Beach, Fla. 32250 or 904-285-2937.

**Bristol, Ind.** Jamboree, July 16-17, Eby's Pines, Rt. 2 Junction, U.S. 131 & Interstate 80-90. Contact Chairman, R. M. Shipman, P.O. Box 7092, Toledo, Ohio 43615.

**Douglas, Wyoming.** Jamboree of Jackalope CB Club. July 22-24th at the 4-H Bldg., State Fair Grounds. For more info write the club at P.O. Box 789, Douglas, Wyoming 82633. Or call Mama Blue at (307) 358-2289 or 2320.

**Shortsville, New York.** Superbreak & Jamboree of the Alert React CB Club. Sunday, July 24th at the Turner-Schrader American Legion Post on Rt. 21 North. For more info contact the club at P.O. Box 613, Shortsville, New York 14548.

**Eugene, Oregon.** Twin Rivers Channel Breakers Jamboree. July 29-31st at Lane County Fairgrounds. For more info write club at P.O. Box 1162, Eugene, Oregon 97401.

**Paragould, Arkansas.** Sixth Annual Jamboree of Paragould Area CB Club. July 30 & 31st, at Reynold Park, approx. 2 miles west off Hwy. 1 Bypass on Country Club Rd. For info: Claude Gore, Jr. 605 West Court St., Paragould, Ark. 72450. 239-8325.

(continued on page 122)

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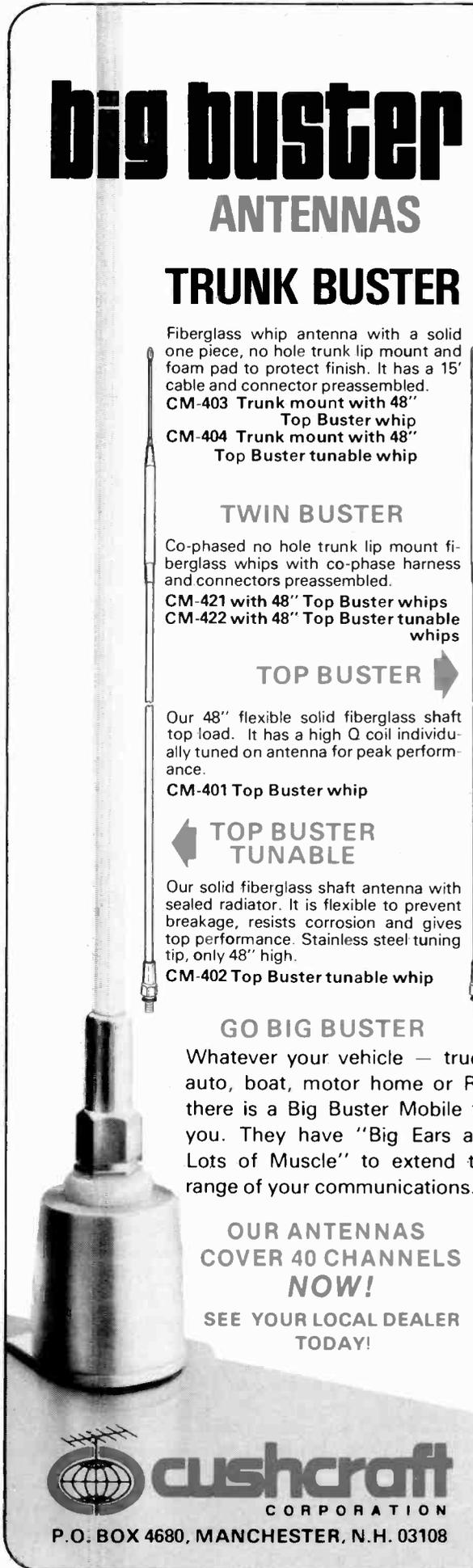
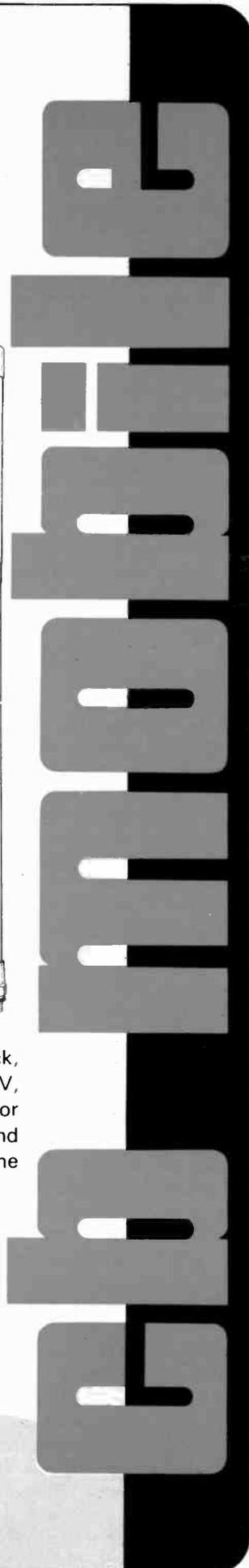
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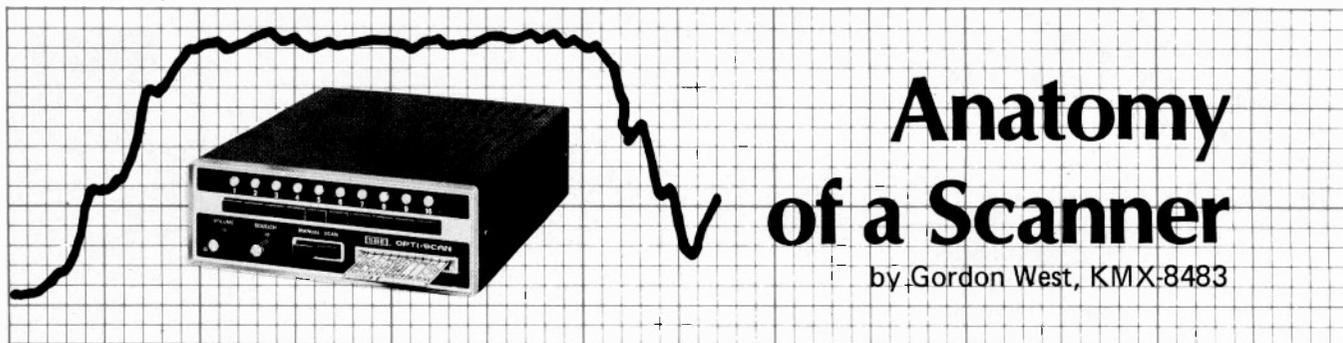
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# Anatomy of a Scanner

by Gordon West, KMX-8483

## PART 7: HIGH BAND MONITORING

**L**AST month we talked all about the excitement on scanning the frequencies between 30 and 50 MHz. This month we're going to take a look at the "high band" of frequencies which span from 150 MHz to 173 MHz. For those of you interested in exciting police calls, ambulance calls, and fire calls, these are the frequencies where the action is!

We spoke briefly of the aircraft "high band" frequencies last month—and since that time, I have received a considerable amount of mail wanting more explanation as to who is on what frequencies, and which frequencies are best to be monitored by aircraft enthusiasts. I confine all my flying to commercial aircraft, and aboard a commercial aircraft, they do not allow monitor receivers—or any type of radio receivers—which could cause harmful interference to the on-board electronics. But to give you a brief look at what goes on between the frequencies of 108 through 137 MHz, I called on my aircraft radio expert, Bill Alber, to tell you what there is to listen in on. I think you'll find Bill's review of the aircraft band quite exciting!

### MONITORING THE AIRCRAFT BAND

Much has been written about monitoring Police, Fire, and other public service bands, but little is said about the aircraft band. Aircraft radios operate A.M. instead of F.M. as do most other services. Few receivers are useable in both public service and aircraft monitoring. If you have never listened in on the aircraft band you may be in for quite a surprise. These may be some of the most active frequencies in your area.

The aircraft band is 108 to 136 Mega-Hertz, and is divided into two sections, 108-118 for navigation aids, and 118-136 for communications. There are 200 navigation channels and 720 communications channels. With so many channels, a tunable receiver is generally the best way to get started. These tunable receivers will usually cover the entire

band. You might wonder why anyone would want to listen to a navigation channel, but airport weather conditions and other information called "ATIS" (Automatic Terminal Information Service) are broadcast on these frequencies in many areas. In addition, tower controllers and Flight Service Stations can talk back to pilots on these channels also.

The communications portion is broken down this way; 118.0-121.4 is designated for A.T.C. or Air Traffic Control. Here will be found control towers plus RAPCON or Radar Approach Control. Towers identify themselves by the airport name. Example: Kennedy Tower, or Miami Tower. RAPCONs identify themselves by a name representative of the area which it serves. Example: BAY APPROACH handles traffic to all airports in the San Francisco Bay area. On these channels you might hear something like this "UNITED 169 THIS IS BAY APPROACH, RADAR CONTACT 13 MILES EAST OF THE SAN JOSE V.O.R., CLIMB AND MAINTAIN FLIGHT LEVEL 240".

121.5 MHz is the world-wide emergency channel. Don't hold your breath waiting for this one to talk, but when it does come alive, it can be very interesting. Communications on this channel usually start with the word "MAYDAY". Need I say more? You may also hear a funny sounding downswept tone that sounds like a siren that inhaled instead of exhaled. This is from an E.L.T. or Emergency Locator Transmitter. In a crash, the ELT is automatically turned on by the impact, or the pilot can switch it on manually after a forced landing. The ELT signal is traced by rescue teams so they may more easily find a downed aircraft. All aircraft in the U.S.A. are required by law to have an ELT aboard, except airliners and a very few others.

121.6-121.95 are used for airport ground control. You would hear something like this, "WESTERN 703 THIS IS McCARREN GROUND, USE THE HIGH SPEED TURN-OFF AND TAXIWAY BRAVO. YOU ARE

CLEARED TO GATE #7. USE CAUTION FOR THE DC-9 LEAVING GATE #2."

122.0 is assigned to a service called Flight Watch. On this channel an en-route aircraft may receive up-to-the-minute weather information. A typical communication would be, "OAKLAND FLIGHT WATCH THIS IS ROCKWELL 49Y OVER STOCKTON, REQUESTING CURRENT WEATHER AT RENO."

122.1 is the common channel through which aircraft may contact any Flight Service Station. 122.2, 122.3 and 122.6 are used at selected Flight Service Stations. A typical communication here would be, "BAKERSFIELD RADIO THIS IS CESSNA 1239Q, PLEASE ACTIVATE MY V.F.R. FLIGHT PLAN FROM BAKERSFIELD TO PORTERVILLE."

122.4, 122.5, 122.7 are used for private aircraft to towers. Example: "HILLVIEW TOWER THIS IS CARDINAL 34286 OVER ANDERSON DAM, FOR LANDING, OVER."

122.8, 123.0, 122.95 are used for Aeronautical Advisory Stations, more commonly known as UNICOM. They are used at airports that have no tower or Flight Service Station. A base station at the airport can advise the pilot which runway is preferred and assist in getting fuel, lodging or repairs. Example: "BEL-LANCA 1254R THIS IS WHITEMAN UNICOM, RUNWAY 12 IS PREFERRED. THE GAS PUMPS WILL STAY OPEN FOR YOU UNTIL YOU ARRIVE." 123.05 is the channel for heli-ports.

122.9 is referred to as MULTICOM. It is used at airports that have no tower, Flight Service Station, or Unicom. It is also used for air to air communications. Example: "HUGHES 975 THIS IS CHEROKEE 298PW. I'LL MEET YOU OVER THE LAKE TO TAKE THE PHOTOS."

123.1-123.55 is used for flight test and flight school operations. Example: "234X, TRY ADDING MORE POWER DURING THE TURN AND CHECK FOR THAT VIBRATION AGAIN."

123.6 is used at airports with a Flight Service Station but no tower.

123.6-128.8 and 132.05-135.95 are used by Air Traffic Control to communicate with enroute aircraft. The ground station usually identifies by their section of the country. Example: "TWA 840 THIS IS LOS ANGELES CENTER. TRAFFIC AT 11 O'CLOCK IS A P.S.A. BOEING AT FLIGHT LEVEL 280 SOUTH WEST BOUND."

122.85-132.0 are used by enroute air carrier (airline) aircraft to communicate with their company offices. Example: "CONTINENTAL BASE THIS IS FLIGHT 169, DEPARTED AUSTIN AT 2145, ESTIMATING DALLAS AT 2250, 38,000 LBS. FUEL ON BOARD."

To find out which channels are used in your area, I would suggest a ride out to the local airport on any clear weekend and ask one of the pilots you can usually find washing and polishing his winged pride and joy. Most pilots would be glad to help and their information should be first rate. A flight school would also be a good source for this information.

Tunable receivers work well for general monitoring in the aircraft band. The high level of activity makes it easy to find most of the wanted. You can tell what exact frequency you are listening to as many times the pilot or controller will state the channel frequency. Example: "VAN NUYS TOWER THIS IS CESSNA 6262T ON 119.3, OVER." Scanners are available to cover the aircraft band. When choosing crystals, pick channels from several of the above mentioned groups. 121.5 is a must. It doesn't talk often, but when it does it is worth hearing. Also pick the local approach/departure control channel and of course the tower frequency. Around smaller airports, a Unicom or Multicom channel would be a good choice.

Here is a glossary of a few of the terms used on aircraft radio that you may not be familiar with.

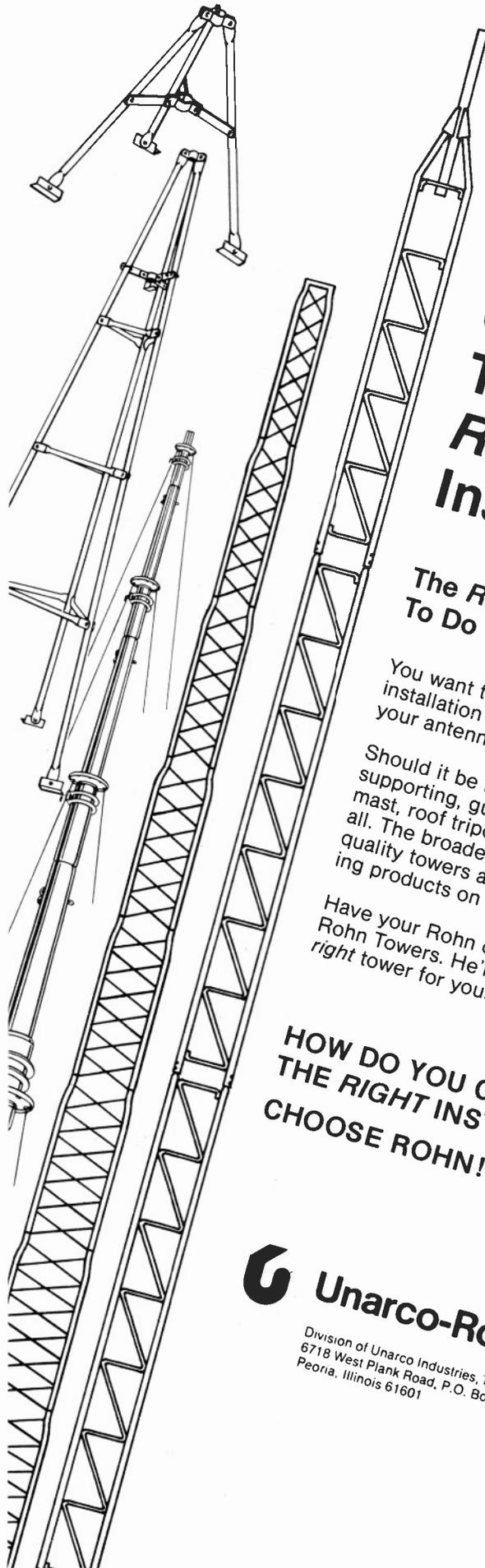
**SQUAWK:** This doesn't mean to talk like a parrot. It refers to the setting of the aircraft's radar beacon, called a transponder.

**SQUAWK "IDENT":** The controller is telling the pilot to push the "ident" button on the transponder.

**V.F.R.:** Visual Flight Rules means that aircraft must meet minimum ceiling and visibility requirements; stay away from clouds, and are not under positive control from the ground.

**I.F.R.:** Instrument Flight Rules means the pilot is using instruments in the cockpit to control the plane. In IFR, controllers on the ground follow the progress of the flight and insure a clear path.

(continued)



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**FLIGHT SERVICE STATION:** This is a Government operated facility that provides weather and flight plan information to pilots both in the air and on the ground.

**V.O.R.:** This stands for VHF Omnidirectional Range. These are the primary radio navigation stations.

**OUTER MARKER-MIDDLE MARKER:** These are low power radio beacons, used by pilots to determine critical points in an instrument approach.

**GOOD LISTENING!**

### FREQUENCIES IN THE AIRCRAFT BAND

#### AIR NAVIGATION AIDS

108.1-111.9 MHz: ILS localizer with simultaneous radiotelephone channel operating on odd-tenth decimal frequencies (108.1, 108.3 etc.)

108.2-111.3 MHz: VOR's operating on even-tenth decimal frequencies (108.2, 108.4 etc.)

112.0-117.9 MHz: Airway track guidance (VORs)

#### COMMUNICATIONS

118.0-121.4 MHz: Air Traffic Control Communications

121.5 MHz: Emergency (World-Wide)

121.6-121.95 MHz: Airport Utility (Ground Control)

122.0 MHz: FSS's, Weather Selected Locations, Private Aircraft and Air Carriers

122.1 MHz: Private Aircraft to Flight Service Stations

122.2, 122.3 MHz: FSS's, Private Aircraft, Selected Locations

122.4, 122.5, 122.7 MHz: Private Aircraft to Towers

122.6 MHz: FSS's, Private Aircraft

122.8, 123.0, 122.85, 122.95 MHz: Aeronautical Advisory Stations (UNICOM)

122.9 MHz: Aeronautical Multi-com Stations

123.05 MHz: Aeronautical Advisory Stations (UNICOM) Heliports

123.1-123.55 MHz Flight Test and Flying School

123.6 MHz: FSS's, Airport Advisory Service

123.6-128.8 MHz: Air Traffic Control Communications

128.85-132.0 MHz: Aeronautical Enroute Stations (Air Carrier)

132.05-135.95 MHz: Air Traffic Control Communications

think they will be able to steer you in the right direction to an inexpensive low cost scanner or monitor for the aircraft band.

### VHF/FM HIGH BAND

150.815 through 150.965 are a group of 11 channels set aside expressly for tow trucks. Tow trucks generally use different codes than police channels—a T-1 might be a dead battery, a T-2, the car just won't start, etc. Not much excitement here unless you hear of a spectacular accident and the tow truck operator describing to his dispatcher how he is going to right a series of overturned cars.

150.980 should be of interest to those of you on the east or west coast seashores—that's the frequency used for oil spill clean-up operations.

150.995 to 151.130 MHz are frequencies used exclusively by highway maintenance vehicles—from chuck holes to broken center divider fences, you'll hear it all—drab as it is—on these frequencies.

151.145 to 151.475 are a slug of frequencies designated for forestry conservation—and you may hear who is out in the woods where, and if there happened to be any forest fires, chances are these frequencies might be activated in your area. If there are no fires in your area, listening will be again dull.

151.490 and 151.625 are "itinerant" frequencies used by services passing through a local area. If the local circus is setting up in your town for a few weeks, you might be able to hear their itinerant radio operations on these frequencies. Organizations putting on special events across the country are perfect candidates for the use of an itinerant frequency. Also radio shops demonstrating new pieces of equipment—or finding out how far a certain transmitter reaches—will use an itinerant frequency.

151.655 through 151.955 are business radio channels—and you'll hear everything from gardeners to garage operators on these channels. Some may be dull—some may be quite exciting.

152.030 to 152.210 are the radio common carrier channels—and believe me, here is where you'll find some juicy conversations between homes and automobiles. These are the base station frequencies that carry both sides of the conversation when a husband is telling his wife he is going to be late for dinner—then turns right around and makes a phone call to his girlfriend saying he'll be over in five minutes! Remember, everything you hear on any channel I have listed is purely confidential—you can't say what you've

Thanks, Bill, for filling us in on what's out there on the skywaves.

Now let's take a look at the VHF/FM high band.

If your local scanner store does not have access to aircraft monitor receivers, try your local airport, and I

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heard—but I think you'll find what you hear quite amusing.

152.270 through 152.450 is a band of frequencies used by taxicabs—if you want to see how someone can dispatch 115 taxicabs in 35 seconds take a listen in on these channels. What you may hear is barely discernable as the English language—but some of the finest dispatchers operate on taxicab frequencies. In major cities, you'll never hear anything like this before. And, remember, everything you hear is completely understood by each taxicab operator which means a trained dispatcher talking to trained listeners.

152.510 to 152.810 are the mobile telephone channels operated by the Bell System. These are the base stations, and here you will hear loud and clear the transmissions from mobile telephone users to homes and offices. Because all mobile units will be automatically repeated, you'll hear both sides of the conversation crystal clear. There's no need for tall antennas on these frequencies—they generally broadcast with considerable amounts of power with directional antennas, and a paperclip in your antenna terminal will suffice! Believe me, there's a lot of juicy phone calls that go on over the air waves. Remember, don't tell!

152.870 to 153.725 are a group of frequencies assigned for the water and power companies, the petroleum industry, forestry industry, and manufacturers requiring two way radio. Some channels may be interesting—probably all will be dull.

### NOW COME THE EXCITING CHANNELS!

153.740 to 154.445 MHz are frequencies assigned to the local fire departments, fire patrols, and other government agencies. Chances are you'll hear some mighty exciting fire calls on these frequencies—and if your local fire department is on "high band" with an 18 inch antenna, chances are you'll find them within this frequency range.

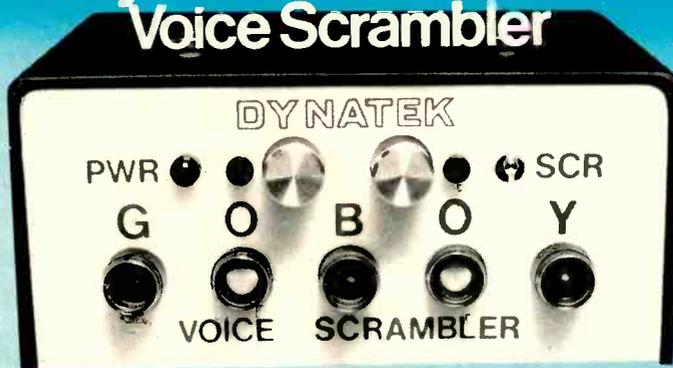
154.650 to 155.145 are frequencies set aside for police agencies and local governments. Here is where you may find some of those exciting police calls in your neighborhood.

155.160 is the national mountain search and rescue frequency assigned to rescue squads throughout the country. It is also shared by ambulance operators, local lifeguards, and other medical emergency organizations. On a secondary basis, school buses, and veterinarians are permitted to use this frequency.

155.160 to 155.295 are special emergency frequencies chiefly used by ambulance operators throughout the country—so if your local ambulance company is on "high band", you'll find them on one of these channels. (con't)

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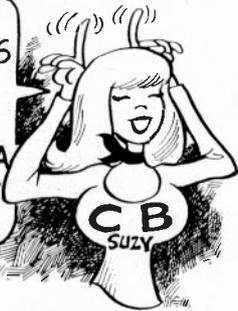
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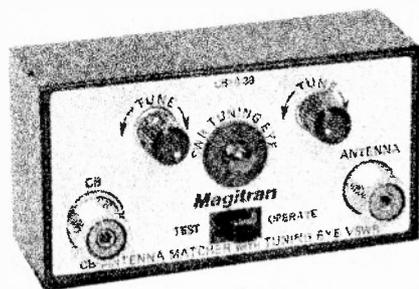
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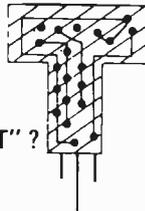
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155.325 to 155.400 MHz are frequencies set aside for hospitals to communicate directly with ambulances coming in with patients.

155.340 MHz is the national channel used by hospitals as an inter-hospital network frequency. You might hear one hospital radioing to another hospital that they need blood type O Negative Stat—and that means right now! In case of large disasters, all hospitals are hooked up via radio in case the telephone lines should fail.

155.415 to 156.030 are more police frequencies and local government frequencies where you'll hear where all the action is. Whether it's a robbery, hold-up, or an assault with a deadly weapon—if they're using high band transmitters, they may be on one of these frequencies.

156.275 to 157.025 MHz is the VHF/FM marine band. This is the band that has become so popular since mariners may no longer utilize their older double side band medium frequency equipments. When you hear boat owners talk about going into VHF, these are the many channels that are allocated to the marine service. Probably one of the most exciting channels to listen to is 156.800 MHz which is the international distress and calling channel. Here you may hear the United States Coast Guard talking with a stricken vessel moments before it sinks plunging its crew members into the icy waters. If it's on the water, you'll hear all the action on these frequencies.

157.530 to 157.710 are more frequencies used by taxicabs.

158.730 to 159.210 are additional frequencies allocated to the police radio service as well as the local government service. From narcs to hidden bugs, you may hear any one of these on the local government or police frequencies.

159.495 to 160.200 is a group of frequencies allocated expressly to the trucking industry—here is where you will hear the inside story that those "18 wheelers" are talking about when you can't pick them up on your trusty CB—Chances are they're using their own private radio system on high band in these frequencies.

160.215 to 161.565 are a group of frequencies allocated expressly to the railroad services. Although I first thought that these would again be drab channels to listen in on, I did find some exciting "switching" of engine and railroad cars taking place on these frequencies. Take a listen—if you have a lot of railroad activity in your area, you might find them surprisingly interesting.

161.640 to 161.760 are frequencies used by the television, newspaper, and radio for relaying messages back to

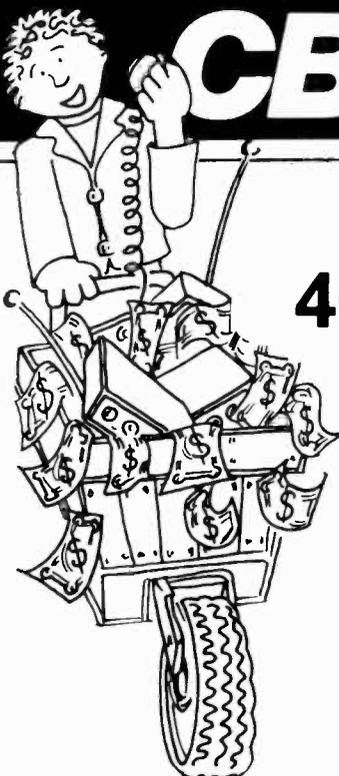
their home offices. You can hear some interesting news tips on these frequencies.

173.225 to 173.375 are additional frequencies used by the press to cover news stories, major disasters, and other exciting events you may hear hours later on your home broadcast radio. Your advantage in listening to these frequencies is you'll hear news as it is happening—not in delayed taped broadcasts later.

That's it for high band monitoring—there's a lot of excitement up there folks, and I encourage you to sample some of those frequencies. You might be surprised as I was, that what you might think would be a dull channel to listen to, might end up high on your priority list! There's no telling who gets to use what channel and when. High band is easy to listen to because many base stations utilize remote transmitters—high power transmitters that travel a long way to get into each and every mobile unit miles away.

Next month we'll be taking you into the UHF region, frequencies between 450 MHz and 512 MHz, and more, in next month's issue of S9 "Anatomy of a Scanner—UHF Frequencies".

Until then, good monitoring.



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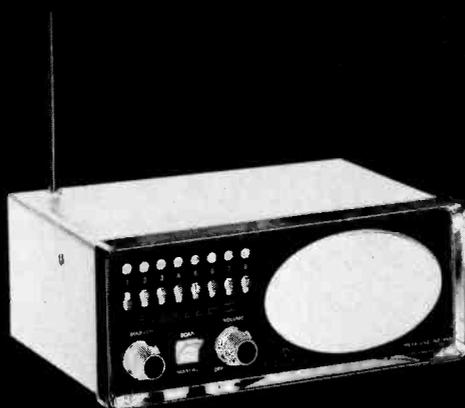


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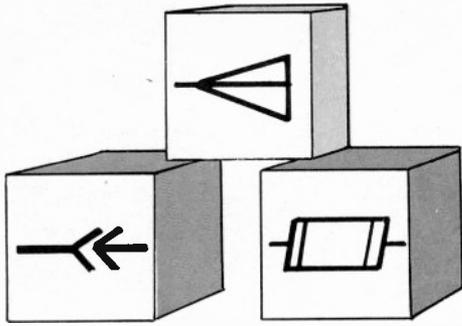


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## PART 16

## AC Circuits and Computations

**A** leading technician is capable of analyzing complex AC circuits and performing most calculations for these circuits. Those readers who do not have an extensive mathematical background should not despair or turn away. First, if you bypass most of the math about to be presented but follow the understanding of the circuit operation, you will survive very nicely. Second, an intensive mathematical background, while desirable, is not *essential*. You need not have full courses in algebra, geometry and trigonometry. You simply have to be able to do the most elementary operations in each of these areas that relate to electronics. The background for these operations are covered in Information Sheets #12, 13 and 14. Third, the use of calculators takes all the drudgery out of the math, reducing it to simple mechanical procedures. A scientific calculator such as the Radio Shack 65-638 will handle any type of calculations you will encounter as a technician. If you choose to purchase a simpler unit be certain that it can at least extract square roots. Again, we must emphasize that if you can afford a scientific calculator that can handle powers of ten, trigonometric functions and logarithms, it would be best.

**Impedance**—In the pure resistive circuit shown in Fig. 5.1(A), we know that the current is in phase with the

voltage as shown by the sine waves and the vectors of Fig. 5.1(B) and (C). The power dissipated in the circuit is equal to  $E \times I$ .

For the inductive circuit shown in Fig. 5.2(A),  $E$  and  $I$  are no longer in phase. If the inductor is *pure*, that is, no resistance,  $I$  will lag  $E$  by  $90^\circ$ . No power will be dissipated by the inductor as all the energy in the magnetic field is returned to the circuit each half cycle. It is, however, very difficult to wind an inductor with no resistance since all wire used to wind coils has resistance. While the resistance may be low it is there. As a result, a true inductor must be represented as shown in Fig. 5.3(A), a combination of  $L$  and  $R$ . When this inductor is connected to an AC source, the *total* opposition to the flow of current will be determined by the combination of  $X_L$  and  $R$ . This combination,  $X_L$  and  $R$ , is called the *impedance*, because it *impedes* the flow of current and it is identified as  $Z$ .

Because the current flowing through  $X_L$  and  $R$  are not in phase,  $X_L$  and  $R$  cannot be added directly to find the impedance of the circuit. They must be added vectorially. If in the circuit of Fig. 5.3(A),  $X_L$  is 3 ohms and  $R$  is 4 ohms we can solve for the impedance graphically as shown in Fig. 5.3(B). We may also solve for im-

pedance,  $Z$ , mathematically as follows (right triangle computation for the hypotenuse):

$$\begin{aligned} Z &= \sqrt{X_L^2 + R^2} \\ &= \sqrt{3^2 + 4^2} \\ &= \sqrt{25} \\ &= 5\Omega \end{aligned}$$

**Phase Angle in the RL Circuit**—In a pure inductive circuit we know that  $I$  lags  $E$  by  $90^\circ$ . Since the circuit of Fig. 5.3 is not purely inductive, the angle of lag must be *less* than  $90^\circ$ . If the graphic plot of  $Z$  in Fig. 5.3(B) were large enough it would be possible to measure angle theta with a protractor but it is simpler and more accurate to calculate it using simple trigonometry as follows:

$$\begin{aligned} \text{tangent of } \theta &= \frac{X_L}{R} \\ \tan \theta &= \frac{3}{4} \\ \tan \theta &= 0.75 \end{aligned}$$

Look up the tangent of 0.75 in the trig tables (or find it with a calculator) and it is equal to  $36.87^\circ$ . Thus the phase angle is

$$\theta = 36.87^\circ$$

**RC Circuits**—In a pure capacitive circuit, the current and voltage are not in phase. As shown in Fig. 5.4(B)  $I$  leads  $E$  by  $90^\circ$ . This is shown vectorially in (C). In a pure capacitive circuit no power is dissipated since the power taken from the source is stored and returned to the circuit. Thus the rule is that *no power is dissipated in a pure capacitive circuit*.

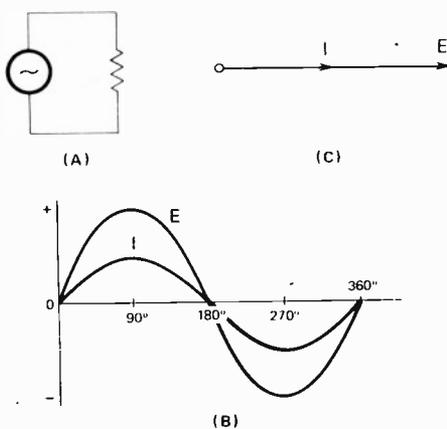


Fig. 5.1(A)—For a pure resistive circuit across AC, the voltage and current are in phase as in (B). (C) The vector representation for in phase quantities.

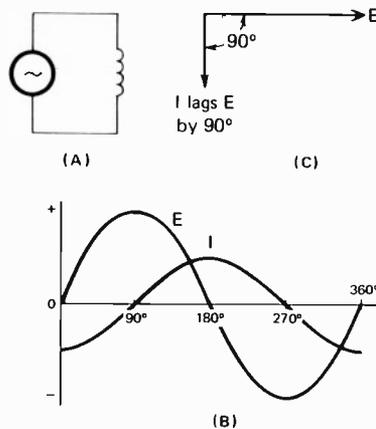


Fig. 5.2(A)—When a pure inductance is placed across an AC voltage,  $I$  lags  $E$  by  $90^\circ$  as shown in (B). The vector shows the lag by appearing  $90^\circ$  before  $E$  as in (C).

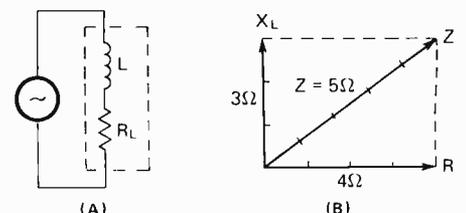


Fig. 5.3(A)—All coils have some resistance and can be represented as shown for purposes of explanation. (B) Vector addition of  $R$  and  $X_L$ .

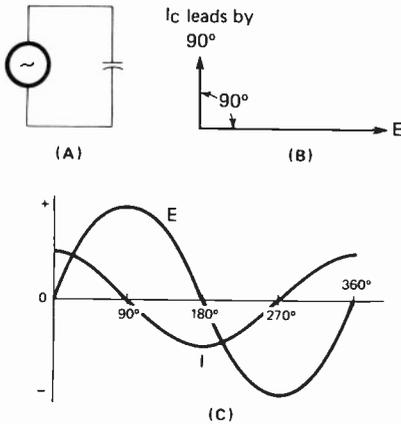


Fig. 5.4(A)—In a pure capacitive circuit  $I$  leads  $E$  by  $90^\circ$  as shown in (B). This can be shown as in (C) by vectors.

Even though a nearly perfect capacitor, one with little resistance, can be made, there are very few circuits in which a capacitor is used that does not have a resistor also. In the circuit of Fig. 5.5A the capacitor acts to couple the AC signal to the load, the  $6K$  resistor. The opposition to the flow of current is determined by the combination of the capacitive reactance and the resistance. We know from our earlier experience that these quantities cannot be added directly because they are not in phase. We also know from previous discussions that the sum of the two values is known as the *impedance*. To determine the impedance it is first necessary to calculate  $X_C$  of the  $0.1 \mu f$  capacitor at  $400$  Hz, the applied frequency. How this is done is shown below:

$$X_C = \frac{1}{2\pi f C}$$

where  $f$  is in Hertz

$C$  is in farads

$X_C$  is in ohms

To convert  $0.1 \mu f$  to farads we multiply  $0.1$  by  $10^{-6}$  (See Info. Sheet #12) Substituting, we have:

$$\begin{aligned} X_C &= \frac{1}{6.28 \times 4 \times 10^2 \times 0.1 \times 10^{-6}} \\ &= \frac{10^{-2} \times 10^6}{6.28 \times 4 \times 0.1} \\ &= \frac{10^4}{2.512} \\ &= 3,981\Omega \end{aligned}$$

To determine the impedance of the circuit we may plot a vector as shown in Fig. 5.5(B) and determine the resultant graphically. Note that when plotting reactance,  $X_C$  points in the opposite direction to that of  $X_L$  (in Fig. 5.3B) since they are  $180^\circ$  out of phase with each other. A graphical approach may not be too accurate and so  $Z$  may be calculated as we did earlier:

$$\begin{aligned} Z &= \sqrt{X_C^2 + R^2} \\ &= \sqrt{(3,981 \times 10^3)^2 + (6 \times 10^3)^2} \\ &= \sqrt{1.5848 \times 10^7 + 3.6 \times 10^7} \\ &= \sqrt{51.848 \times 10^6} \\ &= 7.2K\Omega \end{aligned}$$

To determine the phase angle we use the same formula used earlier.

$$\begin{aligned} \text{tangent of } \theta &= \frac{X_C}{R} \\ &= \frac{3,981}{6,000} \\ &= 0.6635 \\ &= 33.35^\circ \end{aligned}$$

This indicates that the current leads the voltage by  $33.35^\circ$  and not  $90^\circ$  as would be the case for a pure capacitive circuit.

*Ohm's Law for Impedance*—Ohm's Law as presented earlier was for resistive circuits powered by DC or AC. In AC circuits when reactance is present, either inductive or capacitive, Ohm's law has to be modified. In an inductive circuit where the resistance is negligible, we have the following relationship:

$$E = IX_L$$

$$X_L = \frac{E}{I}$$

$$I = \frac{E}{X_L}$$

In a capacitive circuit the same formula holds except that we now substitute  $X_C$ . Thus

$$E = IX_C$$

$$X_C = \frac{E}{I}$$

$$I = \frac{E}{X_C}$$

In the case where there is considerable resistance and it must be taken

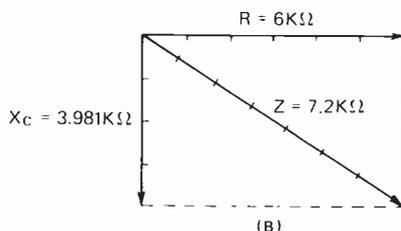
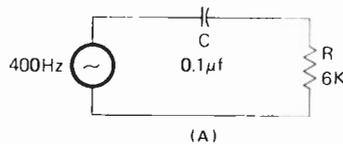


Fig. 5.5(A)—Typical RC coupling network. (B) How to determine the impedance of the circuit graphically.

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## Information Sheet #12— Scientific Notation (Powers of Ten)

Looking back at the numbers encountered so far you will find very few between 1 and 100. Current values have been in milli and microamperes, capacitances have been in micro and micromicrofarads and frequencies have ranged from a low of 60 Hz to the billions. When calculating problems with these numbers it is very difficult to keep track of all the zeroes and decimal places. Imagine trying to perform the following multiplication without making an error.

$$\begin{array}{r} \times 5,250,000,000 \\ \hline 0.000000472 \end{array}$$

This problem could not even be done in this form on some calculators as most can handle no more than 9 digits.

A method of presenting very large numbers or very small numbers has been developed and is called *scientific notation*. When properly used it will simplify our calculations and thus minimize errors. In this method large numbers are presented as positive powers of 10 and numbers less than one are presented as negative powers of 10. To illustrate

$$\begin{aligned} 1000 &= 10^3 \\ 0.001 &= 10^{-3} \end{aligned}$$

For a positive power of ten the plus sign is understood to exist and need not be shown. For negative powers the minus sign *must* be shown. Some of the most often used multiples of 10 are shown below:

Number	Power of 10	Verbal Expression
10	$10^1$	Ten to the one
100	$10^2$	Ten to the two (ten squared)
1000	$10^3$	Ten to the three
10,000	$10^4$	Ten to the fourth
100,000	$10^5$	Ten to the fifth
1,000,000	$10^6$	Ten to the sixth
0.1	$10^{-1}$	Ten to the minus one
0.01	$10^{-2}$	Ten to the minus two
0.001	$10^{-3}$	Ten to the minus three
0.0001	$10^{-4}$	Ten to the minus four
0.00001	$10^{-5}$	Ten to the minus five
0.000001	$10^{-6}$	Ten to the minus six

Using powers of ten it is possible to present a large number as a small number multiplied by some power of ten. It is done by moving the decimal point to the left and counting the number of places moved to determine the positive power of ten. For example:

$$\begin{aligned} 1) \ 5,330,000. &= 5.330000. &= 5.33 \times 10^6 \\ 2) \ 379 &= 3.79 &= 3.79 \times 10^2 \\ 3) \ 6700 &= 6.700 &= 6.7 \times 10^3 \end{aligned}$$

Note that all numbers have been changed to some value between 1 and 10 multiplied by the proper power of ten. This is because prior to the development of the calculator, we used the *slide rule* which accepted numbers between 1 and 10 only. Try the problems shown below. Express the numbers in scientific notation. The correct answers are listed under the Self Check answers.

- |               |                   |
|---------------|-------------------|
| 1) 57,000,000 | 4) 2,700,000      |
| 2) 6740       | 5) 450,000        |
| 3) 74,500     | 6) 10,000,000,000 |

It is also possible to express a *decimal* as a whole number between one and ten multiplied by some power of ten. It is done by moving the decimal point to the *right*. Count the number of places moved and that will give you the negative power of ten. For example:

$$\begin{aligned} 1) \ 0.000025 &= 0.000025 &= 2.5 \times 10^{-5} \\ 2) \ 0.00065 &= 0.00065 &= 6.5 \times 10^{-4} \\ 3) \ 0.000006 &= 0.000006 &= 6 \times 10^{-6} \end{aligned}$$

Try some typical problems. Express the answers in scientific notation.

- 7) 0.00483
- 8) 0.00000573
- 9) 0.02
- 10) 0.57000
- 11) 0.003
- 12) 0.0000000306

*Multiplication with Powers of Ten*—Since large numbers can be presented easily using powers of ten, it is possible to simplify arithmetic operations with powers of ten. For example:

$$\begin{array}{r} \times 1,000,000,000 \\ \hline 5,000 \\ \hline 5,000,000,000,000 \end{array}$$

Doing the same problem with powers of ten we *add* the exponents and have the following:

$$\begin{aligned} 1,000,000,000 &= 10^9 \\ 5,000 &= 5 \times 10^3 \\ 10^9 \times 5 \times 10^3 &= 5 \times 10^{9+3} \\ &= 5 \times 10^{12} \end{aligned}$$

We know that  $5 \times 10^{12}$  is equal to 5 followed by 12 zeroes. Several more examples are shown below.

1)  $5,400,000 \times 200,000$

$$5,400,000 = 5.4 \times 10^6$$

$$200,000 = 2 \times 10^5$$

$$5.4 \times 2 = 10.8$$

$$10^6 \times 10^5 = 10^{11}$$

$$5,400,000 \times 200,000 = 1.08 \times 10^{12}$$

2)  $350,000 \times 0.0000002$

$$350,000 = 3.5 \times 10^5$$

$$0.0000002 = 2 \times 10^{-7}$$

$$3.5 \times 2 = 7$$

$$10^5 \times 10^{-7} = 10^{-2}$$

$$350,000 \times 0.0000002 = 7 \times 10^{-2}$$

*Division With Powers of Ten*—Division can be made easier by the use of powers of ten just as for multiplication. When dividing 1,000,000 by 10,000 using conventional arithmetic we have:

$$\frac{1,000,000}{10,000} = 100 = 10^2$$

Using powers of ten, we have

$$\frac{1,000,000}{10,000} = \frac{10^6}{10^4}$$

We now bring up the power below the dividing line to above the line and change its sign, in this instance from plus to minus, as follows:

$$\frac{10^6}{10^4} = 10^6 \times 10^{-4} = 10^2 = 100$$

Some typical examples are shown below.

1)  $450,000 \div 20,000$

$$450,000 = 4.5 \times 10^5$$

$$20,000 = 2 \times 10^4$$

$$4.5 \div 2 = 2.25$$

$$10^5 \div 10^4 = 10^{5-4} = 10^1$$

$$450,000 \div 20,000 = 2.25 \times 10^1 = 22.5$$

2)  $240 \div 0.000002$

$$240 = 2.4 \times 10^2$$

$$0.000002 = 2 \times 10^{-6}$$

$$2.4 \div 2 = 1.2$$

$$10^2 \div 10^{-6} = 10^2 \times 10^6 = 10^8$$

$$240 \div 0.000002 = 1.2 \times 10^8$$

While the process of division with powers of ten may look more complicated than conventional division it is not really because most of the steps shown are explanatory and not usually written down. They are done mentally. The two values of the first illustration would be converted to powers of ten mentally and divided as follows:

$$\frac{4.5 \times 10^5 \times 10^{-4}}{2} = 2.25 \times 10^1$$

We can do a combined problem that involves both multiplication and division at the same time. For example:

$$\frac{250,000 \times 0.0015}{1200}$$

Convert the problem to powers of ten.

$$\frac{2.5 \times 10^5 \times 1.5 \times 10^{-3}}{1.2 \times 10^3}$$

Regroup the numbers and powers for simplification, if you wish to.

$$\frac{2.5 \times 1.5 \times 10^5 \times 10^{-3} \times 10^{-3}}{1.2}$$

$$= 3.125 \times 10^5 \times 10^{-6}$$

$$= 3.125 \times 10^{-1} = 0.3125$$

If you wish you can try some typical problems involving combined multiplication and division.

13)  $\frac{4,7000 \times 5,000 \times 594,000}{25,000 \times 55,000}$

14)  $\frac{0.0007 \times 0.005 \times 594,000}{0.002 \times 0.00005 \times 400}$

The answers are listed under the Self Check answers.

*Addition and Subtraction with Powers of Ten*—When adding or subtracting with powers of ten it is only necessary to be certain that the quantities are all raised to the same power of ten. For example, to add 50,000 and 230,000 we proceed as follows:

$$230,000 = 23 \times 10^4$$

$$50,000 = 5 \times 10^4$$

$$280,000 = 28 \times 10^4$$

When adding  $82 \times 10^3$  and  $16 \times 10^4$  it is necessary to change  $82 \times 10^3$  to  $8.2 \times 10^4$  or change  $16 \times 10^4$  to  $160 \times 10^3$  and then add as follows:

$$\begin{array}{r} + 82 \times 10^3 \\ + 160 \times 10^3 \\ \hline 242 \times 10^3 \end{array} \quad \text{or} \quad \begin{array}{r} + 8.2 \times 10^4 \\ + 16.0 \times 10^4 \\ \hline 24.2 \times 10^4 \end{array}$$

Examining and comparing both answers shows them to be equal.

The procedure for subtraction is essentially the same. When subtracting  $2.7 \times 10^3$  from  $28 \times 10^3$  we proceed as follows:

$$\begin{array}{r} 28.0 \times 10^3 \\ - 2.7 \times 10^3 \\ \hline 25.3 \times 10^3 \end{array}$$

In the event of different powers of ten the exponents must be shifted until they are equal before you can subtract. For example:

$$47.5 \times 10^6 - 73 \times 10^4$$

(continued)

## BASIC RADIO (continued)

into account, the impedance of the circuit is calculated and Ohm's law is modified as follows:

$$E = IZ$$

$$I = \frac{E}{Z}$$

$$Z = \frac{E}{I}$$

**Parallel RL Circuits**—Many electronic circuits include resistors and inductors wired in parallel combinations as shown in Fig. 5.6(A). The operation of the individual components remains unchanged but their combined effect is quite different than when placed in series and the method of calculating the total impedance is also different.

The voltages across each branch of the circuit are equal as in any parallel circuit. Also, the voltages across each

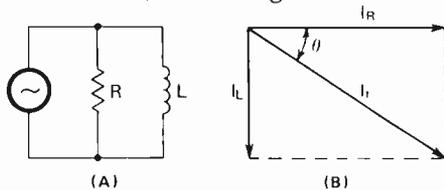


Fig. 5.6(A)—In a parallel RL circuit the voltages across each branch are in phase with each other. As shown in (B) the branch currents are NOT in phase and must be added with vectors.

branch are in phase with each other and the source.

The current in each branch is determined by the component in that branch. For example, the current flow through the resistance is determined by Ohm's law and the voltage and current in that branch are in phase with each other. The current through the inductive branch is also determined by Ohm's law but  $I = E/X_L$  and the current in this branch is not in phase with the voltage. It is  $90^\circ$  out of phase, lagging (assuming that the DC resistance of the inductor is negligible).

Since the two currents in the parallel circuit are  $90^\circ$  out of phase they must be added with vectors as illustrated in Fig. 5.6(B) or mathematically as previously illustrated.

The phase angle,  $\theta$  is the angle between the applied voltage and the total current drained from the generator (often called the line current). Since the line voltage and  $I_R$  are in phase, theta can be measured between  $I_R$  and  $I_T$ . (Fig. 5.6B).

To illustrate the solution of a parallel RL circuit problem consider the following values assigned to the circuit of Fig. 5.6A.

$$E_{\text{gen}} = 100\text{V}, 60 \text{ Hz.}$$

$$R = 100 \text{ ohms.}$$

$$L = 0.5 \text{ H with a negligible DC resistance.}$$

Find:  $I_T$ ;  $\theta$ ; the total impedance, Z.  
Step 1) Find  $I_R$ .

$$\begin{aligned} I_R &= \frac{E}{R} \\ &= \frac{100}{100} \\ &= 1\text{A} \end{aligned}$$

Step 2) Find  $X_L$ .

$$\begin{aligned} X_L &= 2\pi fL \\ &= 6.28 \times 60 \times 0.5 \\ &= 188.4\Omega \end{aligned}$$

Step 3) Find  $I_{XL}$ .

$$\begin{aligned} I_{XL} &= \frac{E}{X_L} \\ &= \frac{100}{188.4} \\ &= 0.531\text{A} \end{aligned}$$

Step 4) Find  $I_T$ .

$$\begin{aligned} I_T &= \sqrt{I_{XL}^2 + I_R^2} \\ &= \sqrt{0.531^2 + 1^2} \\ &= 1.1322\text{A} \end{aligned}$$

Step 5) Find Z, the total impedance.

$$\begin{aligned} Z &= \frac{E}{I_T} \\ &= \frac{100}{1.132} \\ &= 88.34\Omega \end{aligned}$$

Step 6) Find  $\theta$ , the angle by which the current lags the applied voltage.

$$\begin{aligned} \text{tangent } \theta &= \frac{I_L}{I_R} \\ &= \frac{0.531}{1} \\ &= 27.97^\circ \end{aligned}$$

It may also be found from

$$\begin{aligned} \text{cosine } \theta &= \frac{I_R}{I_T} \\ &= \frac{1}{1.1322} \\ &= 27.97^\circ \end{aligned}$$

**Parallel RC Circuits**—A large number of electronic circuits include capacitors wired in parallel with resistors. As explained for parallel RL circuits, in parallel RC circuits, the individual components behave as they would singly. In the resistive branch of the circuit, E and I are in phase; in the capacitive branch of the circuit I leads E. The total effect of R and C in parallel is quite different than when they are in series.

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The voltages across each branch of the circuit are equal as in any parallel circuit. Also, the voltages across each branch are in phase with each other and the source.

The current in each branch is determined by the component in that branch. For example, the current flow through the resistance is determined by Ohm's law and  $E$  and  $I$  in that branch are in phase. The current through the capacitive branch is also determined by Ohm's law but in this case  $I = E/X_C$ . The current in this branch is *not* in phase with the voltage. It is *leading* by  $90^\circ$  (assuming no resistance in the capacitor).

Since the two currents in the parallel circuit are  $90^\circ$  out of phase they must be added with vectors as illustrated in

Fig. 5.7(B) or mathematically as previously explained.

The phase angle,  $\theta$ , is the angle between the applied voltage and the total current drained from the generator (called the line current). Since the line voltage and  $I_R$  are in phase, theta can be measured between  $I_R$  and  $I_T$  as shown in Fig. 5.7(B).

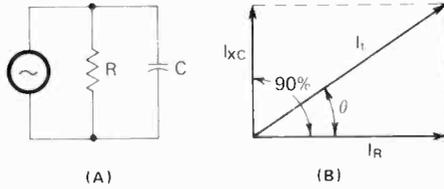


Fig. 5.7(A)—In a parallel RC circuit the voltages across each branch are in phase. (C) The branch currents are  $90^\circ$  out of phase and must be added by vectors.

To illustrate the solution of a parallel RC circuit problem consider the following values assigned to the circuit of Fig. 5.7(A).

$$\begin{aligned} E_{gen} &= 100V \\ R &= 200 \text{ ohms} \\ C &= 2 \mu f \end{aligned}$$

Find:  $I_T$ ;  $\theta$ ;  $Z$ .

Step 1) Find  $I_R$ .

$$\begin{aligned} I_R &= \frac{E}{R} \\ &= \frac{100}{200} \\ &= 0.5A \end{aligned}$$

(continued)

## BASIC RADIO Information Sheet #12 (continued)

Change one exponent:

$$\begin{array}{r} 4750 \times 10^4 \\ - 73 \times 10^4 \\ \hline 4677 \times 10^4 \end{array}$$

**Squaring and Finding the Square Roots of Powers of Ten**—When solving problems using powers of ten it is often necessary to square their value. This is indicated as follows,  $(10^3)^2$ . The brackets around the power of ten prevent confusion; you know that the 2 is a squaring operation and not part of the exponent. To find the square of a power it is only necessary to *double the exponent*. For example:

$$(10^3)^2 = 10^6$$

To check this proceed as follows:

$$\begin{aligned} 10^3 &= 1000 \\ 1000^2 &= 1000 \times 1000 = 1,000,000 \\ (10^3)^2 &= 10^6 = 1,000,000 \end{aligned}$$

To find the *square root* of a power of 10 we *divide* the exponent by 2. For example, to find the square root of  $10^4$  we have

$$\sqrt{10^4} = 10^2$$

We know that  $10^4$  is equal to 10,000 so to check we may proceed as follows:

$$\sqrt{10^4} = \sqrt{10,000} = 100 = 10^2$$

Some practical illustrations of squaring are:

$$\begin{aligned} (5 \times 10^4)^2 &= 5^2 \times (10^4)^2 = 25 \times 10^8 \\ (17 \times 10^3)^2 &= 17^2 \times (10^3)^2 = 289 \times 10^6 \\ (4 \times 10^{-5})^2 &= 4^2 \times (10^{-5})^2 = 16 \times 10^{-10} \end{aligned}$$

Some practical examples of extracting square roots are:

$$\sqrt{52 \times 10^6} = \sqrt{52} \times \sqrt{10^6} = 7.21 \times 10^3$$

$$\sqrt{144 \times 10^4} = \sqrt{144} \times \sqrt{10^4} = 12 \times 10^2$$

In those instances where the power is an odd number (3, 5, 7 etc.) We cannot divide by 2. It becomes necessary to shift the decimal point in either direction to obtain an even exponent and then proceed normally. To illustrate:

$$\sqrt{5 \times 10^5} = \sqrt{50 \times 10^4} =$$

$$\sqrt{50} \times \sqrt{10^4} = 7.07 \times 10^2$$

$$\sqrt{9 \times 10^{-7}} = \sqrt{90 \times 10^{-8}} =$$

$$\sqrt{90} \times 10^{-8} = 9.487 \times 10^{-4}$$

**Powers of Ten Prefixes**—The powers of ten all have prefixes that are used in verbal or written form. When someone refers to a 50 picofarad capacitor, you should know immediately that this is equal to  $50 \times 10^{-12}$  F. When the expression, *a rise time of 25 nanoseconds*, is used, you should know that this represents  $25 \times 10^{-9}$  seconds.

Some of the more frequently used powers of ten are listed below along with their prefixes.

Exponent	Prefix
$10^2$	hecto
$10^3$	kilo
$10^6$	mega
$10^9$	giga
$10^{12}$	tera
$10^{-1}$	deci
$10^{-2}$	centi
$10^{-3}$	milli
$10^{-6}$	micro
$10^{-9}$	nano
$10^{-12}$	pico

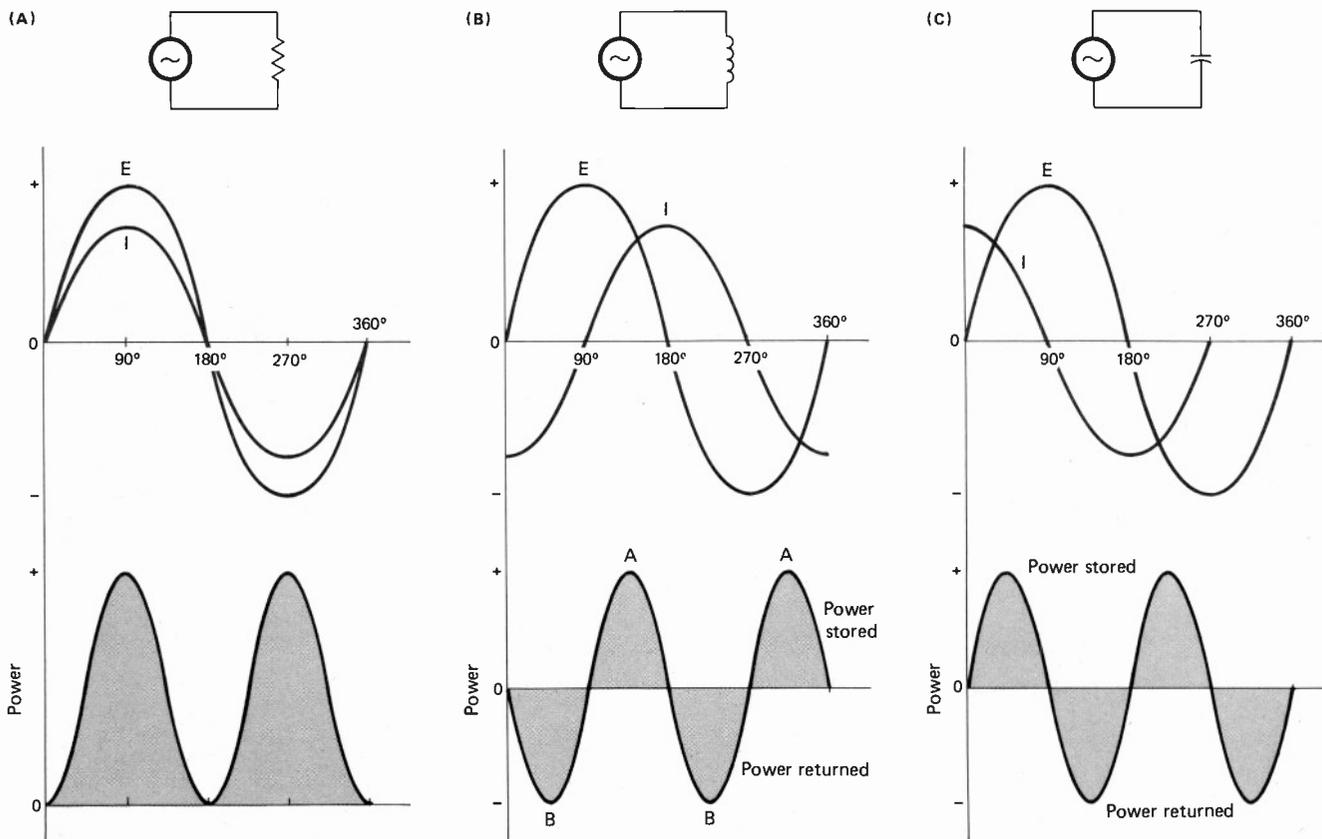


Fig. 5.8(A)—In a resistive circuit  $E$  and  $I$  are in phase and power is dissipated each half of the cycle. (B) In an inductive circuit power is stored for one quarter of a cycle and then returned to the circuit. (C) In a capacitive circuit power is also stored for one quarter of a cycle and then returned to the circuit. Neither a pure inductor or a pure capacitor dissipate power.

Step 2) Find  $X_C$ .

$$\begin{aligned}
 X_C &= \frac{1}{2\pi fC} \\
 &= \frac{1}{6.28 \times 60 \times 2 \times 10^{-6}} \\
 &= \frac{10^6}{753.6} \\
 &= 1,327\Omega
 \end{aligned}$$

Step 3) Find  $I_{X_C}$ .

$$\begin{aligned}
 I_{X_C} &= \frac{E}{X_C} \\
 &= \frac{100}{1.327 \times 10^3} \\
 &= \frac{10^2 \times 10^{-3}}{1.327} \\
 &= 75.358 \times 10^{-3} \text{A} \quad (75.358 \text{ mA})
 \end{aligned}$$

Step 4) Find  $I_T$ .

$$\begin{aligned}
 I_T &= \sqrt{I_{X_C}^2 + I_R^2} \\
 &= \sqrt{(75.358 \times 10^{-3})^2 + 0.5^2} \\
 &= \sqrt{25.5679 \times 10^{-2}} \\
 &= 0.50565 \text{A}
 \end{aligned}$$

Step 5) Find  $Z$ , the circuit impedance.

$$\begin{aligned}
 Z &= \frac{E}{I_T} \\
 &= \frac{100}{0.506} \\
 &= 197.6\Omega
 \end{aligned}$$

Step 6) Find  $\theta$ , the angle by which the current leads the applied voltage.

$$\begin{aligned}
 \text{tangent } \theta &= \frac{I_{X_C}}{I_R} \\
 &= \frac{75.358 \times 10^{-3}}{0.5} \\
 &= 8.57^\circ
 \end{aligned}$$

Theta may also be found from

$$\begin{aligned}
 \text{Cosine } \theta &= \frac{I_R}{I_T} \\
 &= \frac{0.5}{0.50565} \\
 &= 8.57^\circ
 \end{aligned}$$

### Power in AC Circuits

In a pure resistive circuit powered by DC, the power dissipated is expressed by  $W = E \times I$  (or  $I^2R$  or  $E^2/R$ ). When the resistive circuit is powered by AC the power dissipated is calculated the same way except that the effective values of the AC voltage and current are used. The power curve for one cycle of AC in a resistive circuit is shown in Fig. 5.8(A). Power is dissipated during each half of the cycle and is shown as two positive power loops.

When the same AC power source is applied to a pure inductance as shown in Fig. 5.8(B) the voltage leads the

current (or  $I$  lags) by  $90^\circ$ . Note that each time the maximum current and voltage coincide, power is dissipated. For the one cycle shown there are four pulses of power below the line represents *energy returned to the circuit*. This means that for power pulse A, energy is stored in the magnetic field and in pulse B it is returned to the circuit. If there is no resistance in the circuit or the coil (a theoretical situation) no power is lost and it is all returned to the circuit.

When AC is applied to a pure capacitance as in Fig. 5.8(C) the current *leads* the voltage by  $90^\circ$ . Again we have four power pulses for each cycle. The first *positive* power pulse stores energy in the electrostatic field of the capacitor and this power is returned during the negative power pulses. If there are no losses in the capacitor (a theoretical situation) it will return all the energy to the circuit.

**Apparent Power**—In practice we can never have a pure reactive circuit in which all power is returned. Some resistance will always be present in the inductor or capacitor to dissipate some energy in the form of heat. If the resistance is not a part of the reactor it will be one that has been added into the circuit. As a result, the power dissipated in a circuit such as shown in

## Information Sheet #13—Right Triangles

The right triangle plays an important role in the study of AC and the applications of this triangle will be shown as we progress. In order for us to be able to solve problems involving the right triangle we must be familiar with its features and rules.

In a right triangle (Fig. 1) one of the angles is  $90^\circ$ , a right angle (angle C). Since in any triangle, the sum of all the angles is always  $180^\circ$ , the remaining two angles must add up to  $90^\circ$ . If, as in Fig. 1, the base (b) and the altitude (a) are equal in length, angles A and B will also be equal,  $45^\circ$  each. Thus  $45^\circ + 45^\circ + 90^\circ = 180^\circ$ .

Side (a) of the triangle is known as the altitude, side (b) as the base and side (c) as the hypotenuse. *In the right triangle, the hypotenuse is always the longest side.*

The lengths of the sides of the right triangle have a definite relationship to each other. The length of the hypotenuse can be calculated if the lengths of (a) and (b) are known. The relationship is

$$c^2 = a^2 + b^2$$

and to solve for c we have

$$c = \sqrt{a^2 + b^2}$$

The angle formed at point A by the base and the hypotenuse is frequently called *angle theta* or just *theta* and shown as  $\theta$ .

To determine the hypotenuse of the right triangle shown in Fig. 2, we can use the formula:

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{3^2 + 4^2} \\ &= \sqrt{9 + 16} \\ &= \sqrt{25} \\ &= 5 \end{aligned}$$

It is also possible to solve for the hypotenuse graphically, that is, actually constructing the right

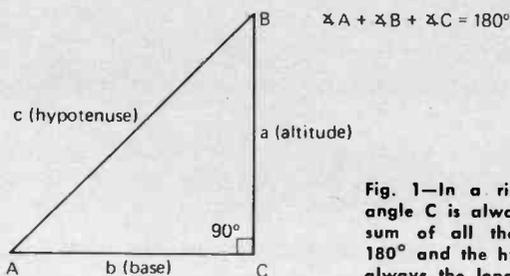


Fig. 1—In a right triangle angle C is always  $90^\circ$ , the sum of all the angles is  $180^\circ$  and the hypotenuse is always the longest side.

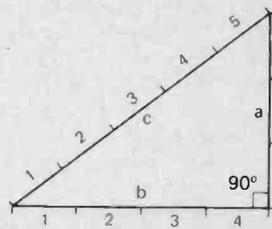


Fig. 2—The length of the hypotenuse in the right triangle can be determined by constructing the figure and measuring the hypotenuse.

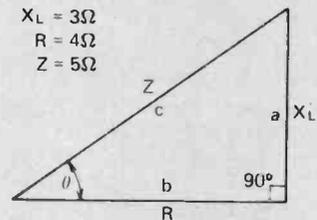


Fig. 3—The right triangle as it is used to calculate impedance in an AC circuit.

triangle on paper and measuring the length of the hypotenuse as shown in Fig. 2. The base is drawn 4 units long and the altitude 3 units long. When measured, the hypotenuse will be 5 units long.

One of the applications of the right triangle to electronics work is the solution of impedance problems, that is the addition of resistance and reactance. The values are assigned as shown in Fig. 3; the base represents resistance, the altitude represents reactance and the hypotenuse represents the resultant impedance.

The phase angle,  $\theta$ , can be calculated by one of three relationships listed below. Each relationship is illustrated with typical calculations based on the problem shown in Fig. 3.

$$\begin{aligned} \text{sine of } \theta &= \frac{\text{opposite side}}{\text{hypotenuse}} \\ &= \frac{a}{c} = \frac{X_L}{Z} \\ &= \frac{3}{5} = \text{sine of } 0.6 = 36.87^\circ \end{aligned}$$

$$\begin{aligned} \text{cosine of } \theta &= \frac{\text{adjacent side}}{\text{hypotenuse}} \\ &= \frac{b}{c} = \frac{R}{Z} \\ &= \frac{4}{5} = \text{cosine of } 0.8 = 36.87^\circ \end{aligned}$$

$$\begin{aligned} \text{tangent of } \theta &= \frac{\text{opposite side}}{\text{adjacent side}} \\ &= \frac{a}{b} = \frac{X_L}{R} \\ &= \frac{3}{4} = \text{tangent of } 0.75 = 36.87^\circ \end{aligned}$$

The relationship used may be the one that is most convenient, or the formula for which you have the data.

Fig. 5.9 is not zero as in a pure reactive circuit nor is it equal to  $E \times I$  as in a pure resistive circuit. The reactive portion of the circuit dissipates no power but the resistive portion *does* dissipate power.

The generator that supplies power to the circuit must supply power to charge the reactance (L or C) which is then returned to the circuit. The reading of the ammeter does not reflect the power returned and so the power computed from the meter readings is known as the *Apparent Power* and expressed in voltamperes, VA. Thus

$$\text{Apparent Power} = E \times I$$

or

$$VA = E \times I$$

True Power—The true power of a

Apparent power =  $E \times I$

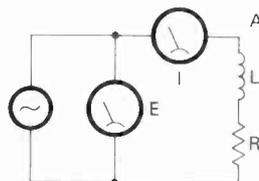


Fig. 5.9—A simple method of measuring apparent power.

circuit is that part of the apparent power *actually dissipated* by the resistive portion of the circuit of Fig. 5.9. Since the cosine of the phase angle in a circuit containing R and L (or R and C) indicates how much the current is out of phase with the source voltage it also indicates the ratio between the resistive and reactive portions of the circuit and thus how much power is dissipated by the resistive part of the circuit. The true power, measured in watts, can be found from

$$P = E \times I \times \text{cosine of theta}$$

or from

$$P = I^2 \times R$$

if the resistance and current are known.

Let's try a typical calculation for the circuit of Fig. 5.9 given the following:

$E_g = 200V$ ;  $X_L = 400\Omega$ ;  $R = 1000\Omega$

Step 1) Find Z.

$$\begin{aligned} Z &= \sqrt{X_L^2 + R^2} \\ &= \sqrt{400^2 + 1000^2} \\ &= \sqrt{116 \times 10^4} \\ &= 1,077\Omega \end{aligned}$$

Step 2) Find I.

$$\begin{aligned} I &= \frac{E}{Z} \\ &= \frac{200}{1,077} \\ &= 0.1857A \end{aligned}$$

Step 3) Find the apparent power.

$$\begin{aligned} \text{Apparent Power} &= EI \\ &= 200 \times 0.1857 \\ &= 37.14 \text{ voltamperes} \end{aligned}$$

Step 4) Find the cosine of  $\theta$ .

$$\begin{aligned} \text{Cosine } \theta &= \frac{R}{Z} \\ &= \frac{1000}{1077} \\ &= 0.9285 \end{aligned}$$

Step 5) Find the true power.

$$\begin{aligned} P &= E \times I \times \text{Cos } \theta \\ &= 200 \times 0.1857 \times 0.9285 \\ &= 34.4W \end{aligned}$$

## Information Sheet #14—Vectors

There are quantities for which a single number tells us all we have to know such as one's age, room temperature, or the number of wheels on a truck. There are, however, other situations where more than one quantity has to be defined. It is not enough to tell a pilot that the wind speed he will encounter in flight is 45 m.p.h. He must also know the *direction* of the wind. When the weatherman tells us there will be a 20° change in temperature we would surely like to know the direction of the change. In both examples we must not only know the *magnitude* but the *direction* as well.

To describe a situation or event that requires both magnitude and direction we use what is called a *vector quantity*. When dealing with voltages, both DC and AC, it is necessary to indicate the magnitude *and* direction, in this instance *polarity*. Two DC voltages are shown in Fig. 1 (A) and (B). In both cases they are in series. In (A) they are series *additive*, that is, both voltages will force current to flow in the same direction. The vectors are 9 units

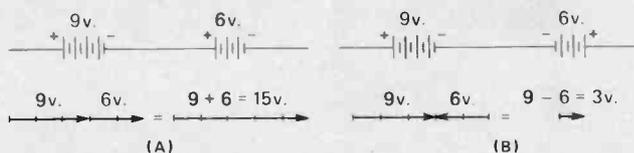


Fig. 1(A)—Two DC voltages in series aiding are added with vectors in the same direction. (B) When the voltages are series opposing they cancel and the vectors point in the opposite directions.

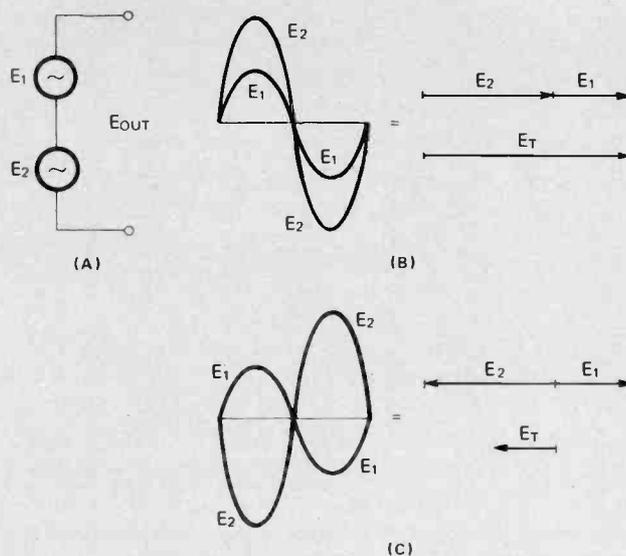


Fig. 2(A)—Two AC voltages in series. (B) Graphical and vector presentation when the two voltages are in phase. (C) Graphical and vector presentation when the two voltages are 180° out of phase.

and 6 units long pointed in the *same* direction for a total of 15 volts.

In (B) the batteries are connected in series *opposing*. Each battery is trying to force a current flow in the opposite direction. The result is that the 6V battery *cancels* part of the 9V battery and the total voltage is only 3V. The vectors show this by being pointed in *opposite directions* and the resultant vector is 3 units long as shown.

or

$$\begin{aligned}
 P &= I^2R \\
 &= 0.1857^2 \times 1000 \\
 &= 34.48W
 \end{aligned}$$

### Power Factor

The mathematical relationship between the true power and apparent power is known as the *power factor*, PF, and is expressed as

$$PF = \frac{\text{True Power}}{\text{Apparent Power}}$$

When the true power is equal to the apparent power the circuit is pure resistance, the power factor equals one and theta is equal to 0°.

**Power Factor in a Series Circuit**—As the reactive component is introduced into the series circuit the phase angle increases from 0° to 90°. The power factor reduces from one towards zero which is achieved when the series circuit is all reactive and theta is 90°. For a series circuit, the power

factor formula can be expanded as shown below:

$$PF = \frac{P_{\text{true}}}{P_{\text{apparent}}} = \frac{I^2R}{I^2Z}$$

Since I<sup>2</sup> is the same at all points in a series circuit the quantity I<sup>2</sup> cancels and

$$PF = \frac{R}{Z}$$

Since, as was noted earlier, R/Z is equal to the cosine of θ, then

$$PF = \cos \theta$$

**Power Factor in a Parallel Circuit**—The method of calculating the PF in a parallel circuit such as shown in Fig. 5.10 is different because the current is not equal in each branch and thus

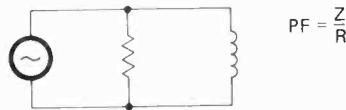


Fig. 5.10—A parallel RL circuit and its power factor relationship.

does not cancel out in the formula. It is possible to expand the basic equation using a different power formula.

$$\begin{aligned}
 PF &= \frac{P_{\text{true}}}{P_{\text{apparent}}} = \frac{\frac{E^2}{R}}{\frac{E^2}{Z}} \\
 &= \frac{E^2}{R} \times \frac{Z}{E^2}
 \end{aligned}$$

Since, in a parallel circuit, the E<sup>2</sup> values are equal, they cancel and so for a parallel circuit

$$PF = \frac{E^2}{R} \times \frac{Z}{E^2} = \frac{Z}{R}$$

Since the PF is also equal to the cosine of θ as shown earlier, for a parallel circuit

$$PF = \cos \theta = \frac{I_R}{I_T}$$

Power factor is frequently defined as either *leading* or *lagging*. A leading power factor is one in which the cur-

If two AC voltages of the same frequency are added as shown in Fig. 2, the total voltage is dependent upon how the two voltages are *phased*. If they are in phase as shown in (B) they will add directly. If they are 180° out of phase they will cancel as shown in (C) by the waveforms and the vectors.

It is also possible to plot two forces that are not in phase or 180° out of phase but somewhere inbetween. For example, if two forces or voltages are only 90° out of phase, they could be plotted as shown in Fig. 3(A). These forces neither add directly nor cancel, they add partially. The sum of the two forces is not 3 + 2 nor 3 - 2 but something inbetween. To solve this problem graphically, we add line XY and line YX (Fig. 3B) to form a *parallelogram*. (This is a structure in which both pairs of opposite sides are parallel.) The resultant force can now be drawn as shown. By measuring the length of the resultant you will have the *vector sum*, approximately 3.6 units. You should recognize this as two right triangles with the resultant as the hypotenuse. If the two forces are related by 90°

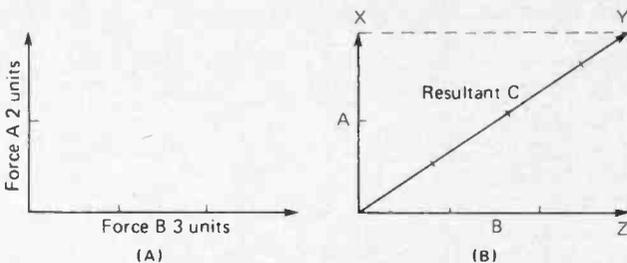


Fig. 3—Solving for hypotenuse graphically when the angle is 90°.

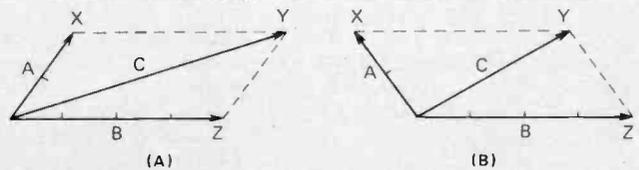


Fig. 4—Vector solutions when the angle is less than and greater than 90°.

then the solution can be obtained using the formula described earlier in Info. Sheet #13.

$$c = \sqrt{a^2 + b^2}$$

Thus for the problem of Fig. 3, we have

$$\begin{aligned}
 c &= \sqrt{2^2 + 3^2} \\
 &= \sqrt{4 + 9} \\
 &= 3.6055V
 \end{aligned}$$

When the two forces are not related by 90° the graphical procedure is still the same. A parallelogram is constructed as shown in Fig. 4 and the length of the resultant can be measured. While the resultant can be calculated mathematically, it is too complex and not really necessary for our purposes.

To summarize, vectors must be used to add voltages or currents that are not in phase.

If two vectors are 90° out of phase to form a right angle, the resultant can be calculated mathematically as well as graphically.

Vectors in phase are added.

Vectors 180° out of phase are subtracted.

Vectors that form angles other than 180° or 90° are calculated graphically.

rent is leading the voltage and indicates a capacitive circuit. A lagging PF is indicative of an inductive circuit where I lags E.

### Series RLC Circuits

When using vectors to determine impedance and phase angle for an inductive circuit, the reactive component,  $X_L$ , always pointed upward (Fig. 5.3). For capacitive circuits  $X_C$  pointed downward (Fig. 5.5) indicating that these two are *opposite quantities*. Recall that inductance delays I by  $90^\circ$  and capacitance advances I by  $90^\circ$ .

If we connect an inductor, capacitor and resistor in a series circuit the effect is to have the two reactances cancel leaving the remainder and the circuit resistance. Consider the circuit shown in Fig. 5.11(A) where  $X_L = 75\Omega$ ,  $X_C = 50\Omega$  and  $R = 25\Omega$ . To solve for Z we first construct the vector (B). Note that  $X_L$  and  $X_C$  are opposite quantities and so cancel, resulting in vector (C) which is solved in the usual manner.

To solve this problem mathematically we modify our formula slightly

$$\begin{aligned} Z &= \sqrt{(X_L - X_C)^2 + R^2} \\ &= \sqrt{(75 - 50)^2 + 25^2} \\ &= \sqrt{625 + 625} \\ &= 35.355\Omega \end{aligned}$$

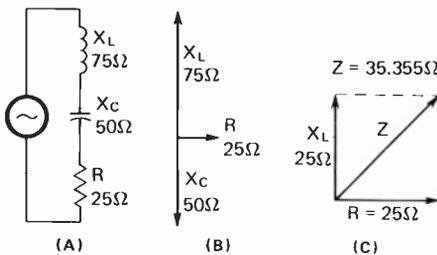


Fig. 5.11(A)—Typical series RLC circuit. (B) Vector presentation of circuit. (C) Vector solution for the circuit.

### Parallel RLC Circuits

When R, L and C components are placed in parallel behavior of the circuit and the procedure for the solution are similar to those used for parallel RL and RC circuits. Since the branch voltages are identical we use the currents to solve for the vector resultant as shown in Fig. 5.12(A). To solve this problem for  $Z_T$  we proceed as follows:

Step 1) Find the current for each branch.

$$\begin{aligned} I_R &= \frac{E}{R} \\ &= \frac{100}{100} \\ &= 1A \\ I_{X_L} &= \frac{E}{X_L} \end{aligned}$$

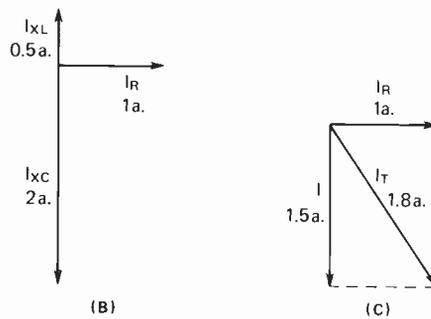
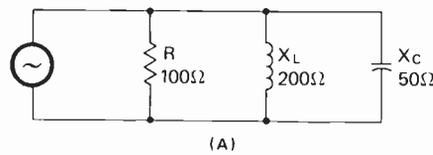


Fig. 5.12(A) Typical parallel RLC circuit. (B) Vector presentation of the circuit and (C) the vector solution for the circuit.

$$\begin{aligned} &= \frac{100}{200} \\ &= 0.5A \\ I_{X_C} &= \frac{E}{X_C} \\ &= \frac{100}{50} \\ &= 2A \end{aligned}$$

Step 2) Draw a vector diagram of the three currents as shown in Fig. 5.12(B).  
Step 3) Solve the vector for the line or total current or use the formula

$$\begin{aligned} I_T &= \sqrt{(I_{X_C} - I_{X_L})^2 + I_R^2} \\ &= \sqrt{(2 - 0.5)^2 + 1^2} \\ &= \sqrt{3.25} \\ &= 1.8A \end{aligned}$$

Step 4) Solve for Z

$$\begin{aligned} Z &= \frac{E}{I} \\ &= \frac{100}{1.8} \\ &= 55.5\Omega \end{aligned}$$

### Resonance—Tuned Circuits

A *resonant circuit* is one that responds to a single frequency and rejects all others; it is often called a *tuned circuit*. It is the tuned circuit that makes possible the operation of receivers, transmitters and antennas. In a receiver the tuned circuits are used to select the frequency of the signal to be received while in the transmitter, the tuned circuits determine the frequency of the transmission. If an antenna is not resonant at the desired frequency of reception and transmission, it is very inefficient or simply does not work at all. Because resonance is so important to communications, the technician who intends to work in this area should have

a solid understanding of the subject area.

There are two basic types of resonant circuits, series and parallel. Both are used in the communications field and are discussed below.

**Series Resonance**—When a series RLC circuit (Fig. 5.13A) is constructed, a special situation occurs when  $X_C$  and  $X_L$  are equal to each other. In this state  $X_C$  *cancel*s  $X_L$  and only the resistance of the circuit opposes the current flow. This set of conditions can exist for only one frequency as shown in the plot of Fig. 5.13(B). As we start from the low end and gradually increase the frequency,  $X_L$  will rise in value while  $X_C$  drops in value. *At one frequency and one frequency only*,  $X_C$  will equal  $X_L$  and their curves will cross. At this point the circuit is *resonant*. The vector plot of this condition is shown in Fig. 5.13(C); note that  $X_L$  and  $X_C$  are equal in length and so cancel resulting in (D), R only.

The current flow in the series circuit, at resonance, is controlled by R and *flows through L and C*. When the inductor returns energy to the circuit, the capacitor absorbs this energy. The capacitor then returns its energy to the circuit and it is absorbed by the inductor. The two components continue to exchange energy as long as there is an input voltage and the circuit is resonant to that input voltage.

**Voltage Distribution in the Series Resonant Circuit**—When  $X_C$  and  $X_L$  in the circuit of Fig. 5.14 are equal only R limits the current flow. To show how  $Z = R$  let's solve for Z for this circuit

$$\begin{aligned} Z &= \sqrt{(X_L - X_C)^2 + R^2} \\ &= \sqrt{(50 - 50)^2 + 10^2} \\ &= \sqrt{100} \\ &= 10\Omega \end{aligned}$$

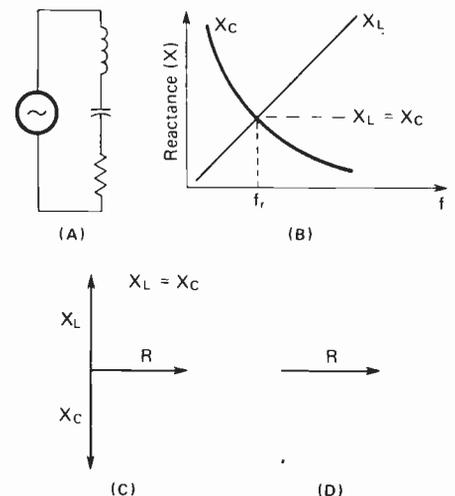


Fig. 5.13(A)—Typical series RLC circuit. (B) Plot of reactance variation versus frequency. Resonance occurs when  $X_C$  equal  $X_L$ . (C) Vector presentation of the circuit. (D) Vector solution for the circuit.

The current flow in the circuit equals

$$I = \frac{E}{Z}$$

$$= \frac{100}{10}$$

$$= 10A$$

$$E_{XC} = I \times X_C$$

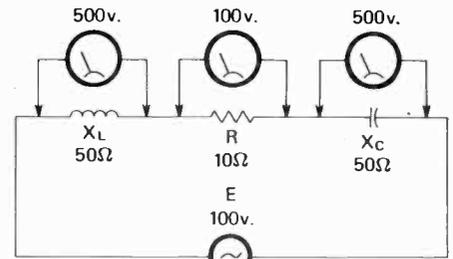
$$= 10 \times 50$$

$$= 500V$$

The two reactive voltages *cancel each other* and have no effect upon the load or the source voltage. These voltages, however, *do exist* and can be measured across each reactance as shown in Fig. 5.14.

In addition, we must remember that the reactances in the circuit dissipate no power and that they also cancel so the phase angle, theta, is zero degrees. The power in the circuit is dissipated only by R.

A summary of the conditions in a



$$X_C = X_L$$

$$Z = R$$

$$E = IR$$

$$I = \text{Maximum}$$

$$Z = \text{Minimum}$$

$$\theta = 0^\circ$$

$$E_L = E_C$$

$$P = I^2 R$$

$$P_{XC} = 0$$

$$P_{XL} = 0$$

$$f_r = \frac{1}{2\pi\sqrt{LC}}$$

Fig. 5.14—Voltage distribution in a series resonant circuit and summary of conditions in a series resonant RLC circuit.

Since the current has to flow through L and C, the voltage drops across each is calculated from

$$E_{XL} = I \times X_L$$

$$= 10 \times 50$$

$$= 500V$$

## Experiment #18—Voltages in an RC Circuit

### Materials:

- 1—Chassis constructed in Exp. #16
- 1—VOM, Radio Shack #22-202A
- 1—1K ½ watt resistor, Radio Shack #271-023
- 1—10 μf, 35V capacitor, Radio Shack #272-1013

The voltage drops across R and C in Fig. 1(A) cannot be added directly because they are 90° out of phase. Measure the voltages and see if the circuit performance conforms to the theory.

### Procedure

- 1—Wire the circuit shown in Fig. 1(A) and (B).
- 2—Measure the voltages indicated in Chart I and enter the readings in the spaces provided. Read the voltages carefully and accurately.
- 3—According to Kirchoff's law, the sum of the voltage drops around the circuit should equal the source voltage, in this case E secondary. Add  $E_R$  and  $E_C$ ; does it equal  $E_{\text{secondary}}$ ? No, it does not.

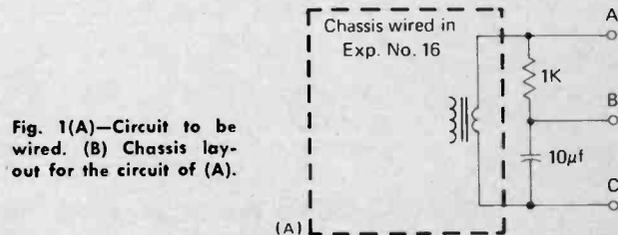
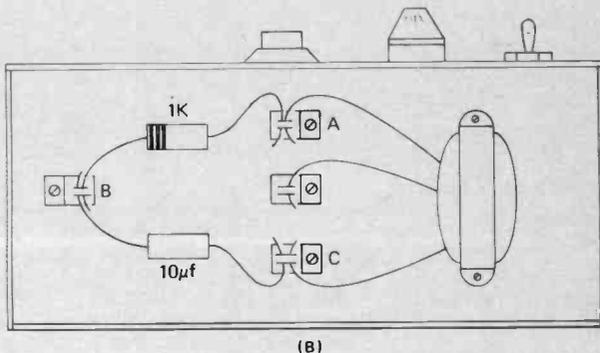


Fig. 1(A)—Circuit to be wired. (B) Chassis layout for the circuit of (A).



- 4—The voltages have to be added by vectors or by the formula

$$E_{\text{secondary}} = E_R^2 + E_C^2$$

When calculated by the above formula does the sum equal the secondary voltage? It should match very closely; any error will be due to the meter and the approximate readings.

### Checking Impedance

- 5—If we knew the current flow through the series circuit we could calculate Z from  $E/I$ . We can calculate I from E and R. Using the voltage drop across R measured in Chart I, find I where

$$I = \frac{E}{R}$$

- 6—Find Z from

$$Z = \frac{E}{I}$$

- 7—Next, calculate Z from

$$Z = \sqrt{X_C^2 + R^2}$$

To do this, it is necessary to calculate  $X_C$  from

$$X_C = \frac{1}{2\pi f C}$$

where  $f = 60 \text{ Hz}$  and  $C = 10 \mu\text{f}$

The result should equal Z calculated in step 6.

From	To	Description	Volts AC
A	B	Across 1K	
B	C	Across 10 μf	
A	C	Across secondary	

Chart I

series resonant circuit is presented in Fig. 5.14.

**Resonance Curves**—If the frequency of the voltage source in Fig. 5.13 could be varied,  $X_C$  and  $X_L$  would change value. As the frequency moved away from resonance and  $X_C$  and  $X_L$  would no longer cancel and *the circuit impedance would rise*. If we plotted the rise in impedance *versus* frequency we would develop a curve such as shown in Fig. 5.15(A). If we were to plot *current flow versus* frequency, it would result in the curve of Fig. 5.15(B).

**Resonant Frequency Calculations**—Resonance exists in a circuit when  $X_L$  and  $X_C$  are equal. This can be shown as

$$X_L = X_C$$

$$2\pi fL = \frac{1}{2\pi fC}$$

where  $f$  = frequency in Hertz

$L$  = inductance in Henries

$C$  = capacitance in farads

By solving the above equation for  $f$  we get

$$f = \frac{1}{2\pi\sqrt{LC}}$$

one of the most vital formulas in communications work. It permits the solution of all frequency problems involving tuned circuits.

To illustrate the application of the resonance formula, assume the circuit of Fig. 5.13(A) has the following component values:  $C = 100 \mu\text{f}$ ;  $L = 2$  millihenries (mH);  $R = 50$  ohms. Calculate the resonant frequency,  $f_r$ .

Before substituting the values into the formula it is necessary to convert  $C$  and  $L$  to farads and henries. This is done as follows:

To convert  $\mu\text{f}$  to  $\text{f}$  multiply by  $10^{-12}$

To convert mH to H multiply by  $10^{-3}$

Thus:  
 $100 \mu\text{f} = 100 \times 10^{-12}$  or  $10 \times 10^{-11} \text{ f}$   
 $2 \text{ mH} = 2 \times 10^{-3} \text{ H}$

Now, proceeding:

$$f_r = \frac{1}{2\pi\sqrt{LC}}$$

$$= \frac{1}{6.28\sqrt{10 \times 10^{-11} \times 2 \times 10^{-3}}}$$

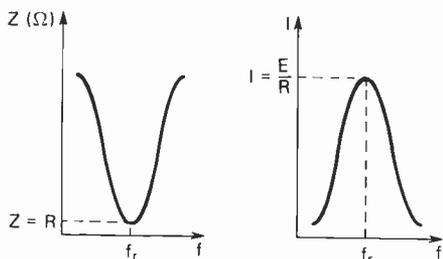


Fig. 5.15(A)—Plot of impedance versus frequency for an RLC circuit produces the resonance curve. (B) Plot of circuit current versus frequency also produces a resonance curve.

$$= \frac{1}{6.28\sqrt{20 \times 10^{-14}}}$$

$$= \frac{10^7}{6.28 \times 4.472}$$

$$= \frac{10^7}{28.084}$$

$$= 356 \times 10^3 \text{ Hz} = 356 \text{ kHz}$$

If you have difficulty in dividing  $10^7$  by 28.084 it can be simplified by using the following procedure. Change  $10^7$  to  $10^4 \times 10^3$ , thusly.

$$= \frac{10^4 \times 10^3}{28.084}$$

$$= \frac{10,000 \times 10^3}{28.084}$$

$$= 356 \text{ kHz}$$

Now divide  $10^4$  (10,000) by 28.084 and multiply by  $10^3$  as shown below

Another example will help to make certain that we can handle this formula. For the circuit of Fig. 5.13(A),  $L = 200 \mu\text{H}$ ;  $C = 350 \mu\text{f}$ ; Find  $f_r$ .

Convert  $L$  and  $C$  to henries and farads and put them into scientific notation form.

$$L = 200 \times 10^{-6} \text{ H} = 2 \times 10^{-4} \text{ H}$$

$$C = 350 \times 10^{-12} \text{ F} = 3.5 \times 10^{-10} \text{ F}$$

$$f_r = \frac{1}{2\pi\sqrt{LC}}$$

$$= \frac{1}{6.28\sqrt{2 \times 3.5 \times 10^{-14}}}$$

$$= \frac{10^7}{6.28\sqrt{7}}$$

$$= \frac{10^7}{16.615}$$

$$= 601.87 \text{ kHz}$$

The resonance formula can be transposed to permit us to find  $C$  if  $L$  and  $f$  are known and  $L$  if,  $C$  and  $f$  are known. These equations are

$$L = \frac{1}{4\pi^2 f_r^2 C}$$

$$C = \frac{1}{4\pi^2 f_r^2 L}$$

### Next Month

Part 17 will continue with resonance and also cover time constants and wave shaping with RLC networks.

### Availability Of Reference Texts

We have received several inquiries regarding the two reference texts recommended for use with this series. If the books are not available locally they may be ordered by mail as follows:

Schrader, R. L. *Electronic Communications*. Send check or money order

for \$15.95 to McGraw Hill Book Co., Princeton Road, Hightstown, N.J. 08520. The book will be sent fourth class. If you wish faster delivery indicate this in your order and it will be sent first class or UPS and you will be billed for the additional postage.

Tepper, M. *Basic Radio*. Send check or money order to Hayden Book Company Inc., 50 Essex Street, Rochelle Park, N.J. 07662, Att. Sales Dept. Books will be mailed Fourth class unless you request first class when you order. You will be billed for the postage. Book prices are as follows; Vol. 1—\$4.50; Vol. 2—\$4.95; Vol. 3—\$4.95; Vol. 4—\$4.95; Vol. 5—\$4.95; Vol. 6—\$5.25. All six volumes in a single binding costs \$22.95.

## Self-Check Questions

1—In a pure inductive circuit the relationship between  $E$  and  $I$  is

- a) in phase                      c)  $I$  leads  $E$   
 b)  $I$  lags  $E$                     d)  $E$  lags  $I$

2—When  $X_L$  and  $R$  are connected in series the total opposition is defined as  $R_{\text{Total}}$ .  $T$  or  $F$

3— $X_L$  and  $R$  can be added by vectors only when the phase angle is  $90^\circ$ .  $T$  or  $F$

4—A series circuit is made up of a 50K resistance and an  $X_L$  of 50K. Find the phase angle by which  $I$  lags  $E$ .

5—In a pure capacitive circuit the relationship between  $E$  and  $I$  is

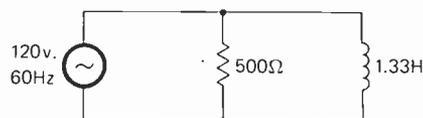
- a) in phase                      c)  $I$  leads  $E$   
 b)  $I$  lags  $E$                     d)  $E$  leads  $I$

6—When  $X_C$  and  $R$  are in series the total opposition is defined as impedance.  $T$  or  $F$

7—Determine the following for the circuit shown below;  $X_C$ :  $Z$ :  $\theta$ :  $I$ .



8—For the parallel RL circuit shown below, determine  $X_L$ :  $I_{X_L}$ :  $I_R$ :  $I_T$ :  $Z$ :  $\theta$ .



### Suggested Reading

Schrader, R. L. *Electronic Communications*, Third Ed., New York: McGraw Hill, pp. 105 to 117; 126 to 129.  
 Tepper, Marvin, *Basic Radio*, Second Ed., Vol. II, Rochelle Park, New Jersey: Hayden Book Co., pp. 2-33 to 2-43; 2-84 to 2-91.

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9—In a parallel RC or RL circuit the current in each branch is the same only insofar as phase is concerned. The individual branch voltages will differ. T or F.

10—Apparent power in an AC circuit is equal to the true power. T or F

11—The unit of measurement for apparent power is  
 a) VA                      c) W  
 b) E                        d)  $V_{app}$

12—True power is equal to which of the following?  
 a)  $P_T = E \times I \times \cos \theta$   
 b)  $P_T = E^2 \times R$

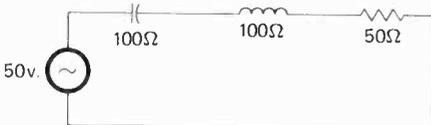
13—For the circuits of Question #7 and 8 above, determine the following:  
 $P_{apparent}$ ,  $P_{true}$

14—Plot a vector solution for a series RLC circuit where  $R = 3$  ohms,  $X_L = 8$  ohms and  $X_C = 4$  ohms to find Z.

15—Find Z for a parallel RLC circuit given  $R = 100$  ohms,  $X_L = 55$  ohms and  $X_C = 105$  ohms.

16—At resonance in a series RLC circuit  $X_C$  cancels  $X_L$  and I is limited only by Z. T or F

17—The circuit shown below is resonant. Calculate the voltage drop across R, L and C, and determine the phase angle.



18—Calculate the resonant frequency of a series LC circuit give  $L = 50 \mu H$  and  $C = 100 \mu f$ .

**Happy Father's Day**

### Self Check Answers

Information Sheet #12

1—b  
 2—F, it is known as Z, impedance.  
 3—F, it can also be added by  $\sqrt{X_1^2 + R^2}$   
 4— $\tan \theta = \frac{X_L}{R} = \frac{50K}{50K} = 1$   
 $\tan \theta = 1 = 45^\circ$   
 5—c  
 6—I  
 7— $X_C = 331.74\Omega$   
 $Z = 2.027.3\Omega$   
 $\theta = 9.42^\circ$   
 $I = 0.0592A$

8— $X_L = 501.14\Omega$   
 $I_{X_L} = 0.23945A$   
 $I_r = 0.24A$   
 $I_T = 0.339A$   
 $Z = 353.98\Omega$   
 $\theta = 44.93^\circ$

9—F—The current in the reactive branches will lead or lag the respective branch currents.  
 10—F—Apparent power is equal to the input voltage multiplied by in-put current.  
 11—a  
 12—a  
 13— $Q7 P_{apparent} = 7.104 VA$   
 $P_{true} = 7.104 \times .9865 = 7W$   
 $Q8 P_{apparent} = 0.339A \times 120 = 40.68VA$   
 $P_{true} = 40.68 \times PF = 40.68 \times .708 = 28.8W$   
 14—The hypotenuse should measure 5 lengths for 5 ohms. This is the basic 3-4-5 triangle.  
 15—111.8 $\Omega$   
 16—F—I is limited only by R.  
 17— $E_r = E_g = 50V$   
 $E_L = 100V$   
 $E_C = 100V$   
 $\theta = 0^\circ$   
 18—2.252 mHz

1— $5.7 \times 10^7$   
 2— $6.74 \times 10^3$   
 3— $7.45 \times 10^4$   
 4— $2.7 \times 10^6$   
 5— $4.5 \times 10^5$   
 6— $1 \times 10^{10}$   
 7— $4.83 \times 10^{-3}$   
 8— $5.73 \times 10^{-6}$   
 9— $2 \times 10^{-2}$   
 10— $5.7 \times 10^{-1}$   
 11— $3 \times 10^{-3}$   
 12— $3.06 \times 10^{-8}$   
 13— $1.4356 \times 10^5$   
 14— $5.1975 \times 10^4$

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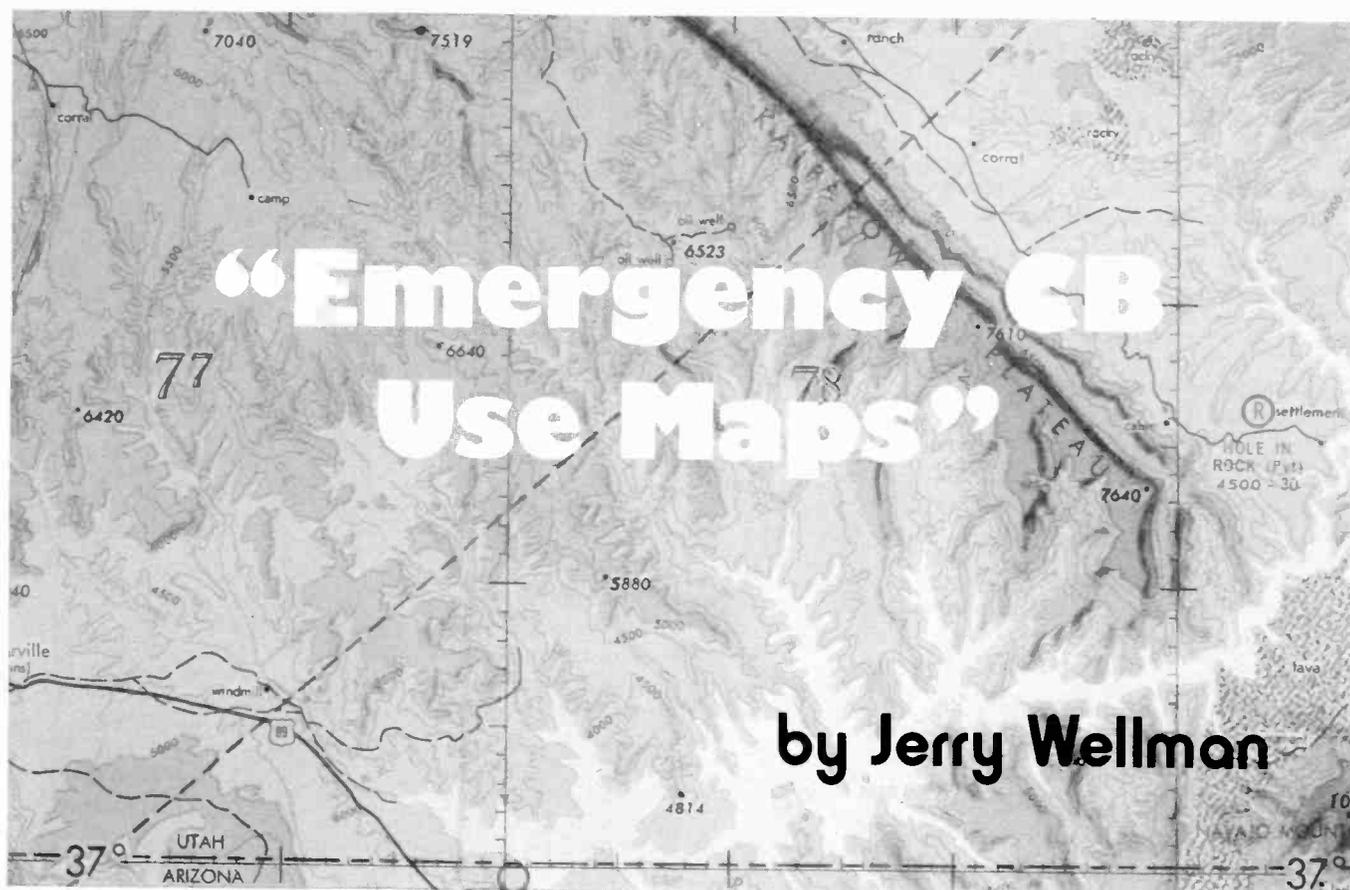
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"About three miles from the intersection where Browns' road and the Old Miller road cross."

"You can't miss us, we're near the cliffs across the valley from the highest mountain."

Almost an hour later the chopper spotted headlights of a sheriff's car and made a chance landing at dusk over unfamiliar territory near the scene of the fall.

What would have been a five minute flight for the chopper became an hour ordeal, looking for a needle in a haystack, for the pilot and victim, while instructions, common to area residents, led the helicopter around a myriad of "high mountain valleys" and "road intersections."

The fault was not the pilot's or even the CBers'. The fault was knowledge.

Knowledge on the part of the CBers unfamiliar that the viewpoint of the pilot included many intersections, valleys and mountains. Knowledge on the part of the pilot who was not familiar with the area and was trying to follow directions as best as he could.

The victim lived, but the story could have had an unhappy ending had the pilot not found the scene and

then chanced a dusk landing. Had the pilot not taken these chances, the victim would not have lived.

Navigation by the chopper was accomplished with an aircraft sectional (map). The CBers were using road maps and common area names.

Had both been using a common map, the rescue would have been quick and highly effective.

It is unrealistic for a pilot to use a highway map, as the road map doesn't have the navigational aids (navaids) needed by the pilot. The air sectional has these navaids on it, and also has roads, terrain features, lakes, and is an excellent map for use to standardize coordinates in emergency operations.

In fact, many rescue organizations (CAP, military, and some sheriff's offices to name a few) use the air sectional chart and incorporate a standard gridding system that enables immediate coordination of locations.

Another benefit of the air sectional is the wide area that the chart covers and the relative low cost for the chart.

The price of the chart falls in the \$1.80 range and is available at airport services vendors, flight schools, and from mail order aviation supply firms.

With an air sectional and an hour's work, you have a gridded chart that is compatible to road maps and air rescue operations.

The sectional unfolds like a road map and all the symbols are explained in the margins. However the chart is divided into latitude and longitude. By using

this latitude and longitude, you can subdivide the sectional, number the resulting rectangles, and have a standard coordination system for locations.

Each chart also has an identifier to designate which U.S. area the map covers. Thus grid CYS 457 is different from grid ATL 457. Each map also has definite gridding boundaries (see gridding chart) and total numbers of grids. The user merely divides the map into 15 minute rectangles (the map already has 30 minute lines) and numbers from left to right only, from top to bottom.

After gridding your map, and implementing the system with local authorities and your own group, you then have a standardized method of coordination that can save time.

"The accident is located in grid STL 045 near the peak of the mountain." The sheriff gives the coordinates to the pilot and the action takes an effective turn.

This grid system can be transferred to highway maps, local geological (USGS) maps, and most all other maps by comparing landmarks and features and then coordinating grid locations. *(continued)*

### SECTIONAL AERONAUTICAL CHART GRIDS

Chart	Identifier	North Grid Limit	South Grid Limit	West Grid Limit	East Grid Limit	Total Grids
Seattle	SEA	49-00N	44-30N	125-00W	117-00W	576
Great Falls	GTF	49-00N	44-30N	117-00W	109-00W	576
Billings	BIL	49-00N	44-30N	109-00W	101-00W	576
Twin Cities	MSP	49-00N	44-30N	101-00W	93-00W	576
Green Bay	GRB	48-15N	44-00N	93-00W	85-00W	544
Lake Huron	LHN	48-00N	44-00N	85-00W	77-00W	512
Montreal	MON	48-00N	44-00N	77-00W	69-00W	512
Halifax	HFX	48-00N	44-00N	69-00W	61-00W	512
Kalmath Falls	LMT	44-30N	40-00N	125-00W	117-00W	576
Salt Lake City	SLC	44-30N	40-00N	117-00W	109-00W	576
Cheyenne	CYS	44-30N	40-00N	109-00W	101-00W	576
Omaha	OMA	44-30N	40-00N	101-00W	93-00W	576
Chicago	ORD	44-00N	40-00N	93-00W	85-00W	512
Detroit	DET	44-00N	40-00N	85-00W	77-00W	512
New York	NYC	44-00N	40-00N	77-00W	69-00W	512
San Francisco	SFO	40-00N	36-00N	125-00W	118-00W	448
Las Vegas	LAS	40-00N	35-45N	118-00W	111-00W	476
Denver	DEN	40-00N	35-45N	111-00W	104-00W	476
Wichita	ICT	40-00N	36-00N	104-00W	97-00W	448
Kansas City	MKC	40-00N	36-00N	97-00W	90-00W	448
St. Louis	STL	40-00N	36-00N	91-00W	84-00W	448
Cincinnati	LUK	40-00N	36-00N	85-00W	78-00W	448
Washington	DCA	40-00N	36-00N	79-00W	72-00W	448
Los Angeles	LAX	36-00N	32-00N	121-30W	115-00W	416
Phoenix	PHX	35-45N	31-15N	116-00W	109-00W	504
Albuquerque	ABQ	36-00N	32-00N	109-00W	102-00W	448
Dallas-Ft. Worth	GSW	36-00N	32-00N	102-00W	95-00W	448
Memphis	MEM	36-00N	32-00N	95-00W	88-00W	448
Atlanta	ATL	36-00N	32-00N	88-00W	81-00W	448
Charlotte	CLT	36-00N	32-00N	81-00W	75-00W	384
El Paso	ELP	32-00N	28-00N	109-00W	103-00W	384
San Antonio	SAT	32-00N	28-00N	103-00W	97-00W	384
Houston	HOU	32-00N	28-00N	97-00W	91-00W	384
New Orleans	MSY	32-00N	28-00N	91-00W	85-00W	384
Jacksonville	JAX	32-00N	28-00N	85-00W	79-00W	384
Brownsville	BRO	28-00N	24-00N	103-00W	97-00W	384
Miami	MIA	28-00N	24-00N	83-00W	77-00W	384

# TAB POPULAR CB BOOKS

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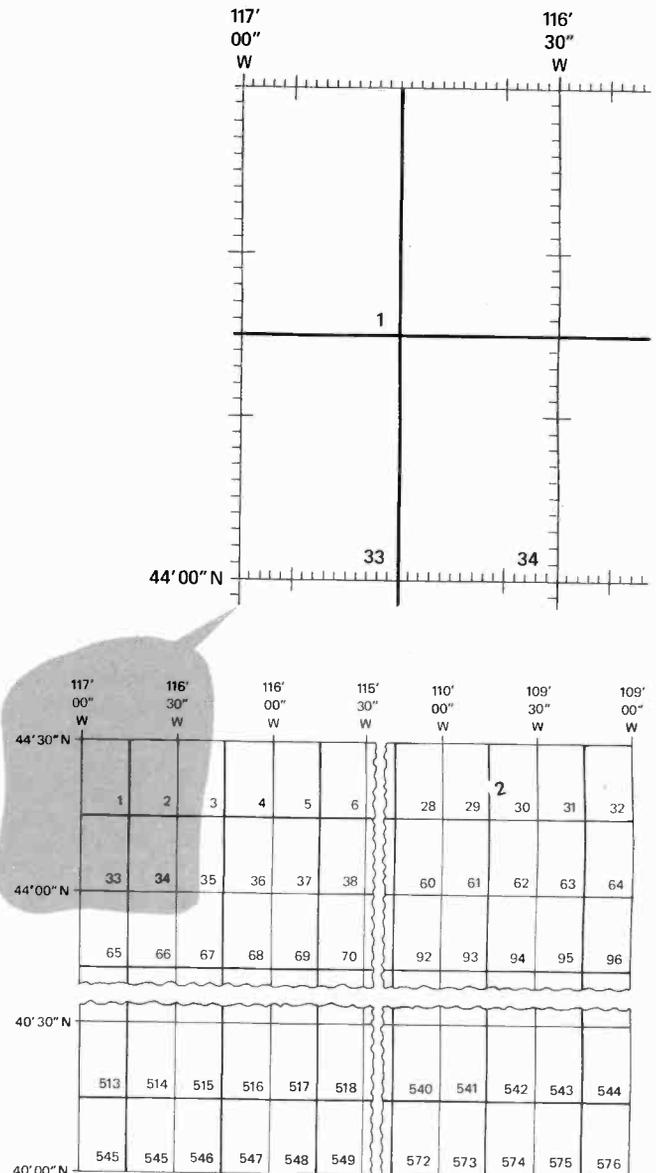
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## EMERGENCY CB USE MAPS (continued)



### NOTES:

Example of the Salt Lake City (SLC) chart. Each 15 minute line has 32 grids. Within the boundary of the chart are 576 total grids. Each sectional is not identical, some have 448 grids, 512 grids, 416 grids, 384 grids, etc.

It is necessary to use the chart to determine how many grids, and the gridding boundary listed on the gridding chart.

Each air sectional overlaps to some degree and if the gridding goes beyond the limits, the maps will be of no use as they will not match each other.

Coordination is many times the key to effective emergency operations, and CBers are often times in the center of the action.

Using the standard grid system, the CB operator can help coordinate efforts in a more professional and expedient manner. The grids have almost unlimited coordination value and can be used by all facets of a rescue operation. The grids can be subdivided into 'A', 'B', 'C', 'D' so that areas may be used as accurate points for search and rescue crews.

As this system becomes recognized by more and more search agencies like Civil Air Patrol (responsible for 80% of air search in the United States) CB operators can become of better service and assistance in times of emergency.

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MESSAGE

CEASE

DESIST

# 5

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6-77



# The Baseball Player Has Ears

By Gary Deckelnick [Baby Bull/KCS-O994]

Contributing Editor

It was a lazy August day and the Philadelphia Phillies baseball team, with the division title all but clinched, were having fun in pre-game practice. Dave Cash, an all-star second baseman two consecutive years, was trying his hand at shortstop while a newspaperman interviewed Larry Bowa, the team's regular shortstop.

Terry Harmon, a utility infielder, was the hitter and he lofted a towering fly somewhere near third base. Mike Schmidt, who plays third, and Cash converged until Schmidt called for the ball. Cash's reply caused some smiles among the writers close enough to hear him. "Ten-four, goodbuddy," answered Cash as he backed off the ball.

His reply should not have surprised anyone because Cash, like many other members of the Phillies\* and like many professional baseball players, is a CB bug. But playing with CB radio just happens to be a little more difficult if you also play for a major league baseball team.

"My first handle was the Baseball Player," recalls Cash. "But people asked me if I really was one and I would tell them. It got so there was a lot of kids trying

*\*This season Cash is with the Montreal Expo's, but he's still CB'ing.*



to talk to me and it wasn't fair to other people who wanted to use the channel. So I changed it."

His second handle was Captain Hook, a baseball term used to describe a manager who changes pitchers frequently. It's the nickname of Sparky Anderson, the manager of the Cincinnati Reds but also could apply to Danny Ozark, who pilots the Phillies.

By the time this is in print, however, Cash's name will be changed again. That is getting fairly well known and if Cash is anything, it's courteous to other CBers who want to use the airways.

"It's hard to keep it a secret because I use the radio so much," explains the second-baseman. He automatically turns it on during the 15 minute drive from his home in Cherry Hill, N.J., to Veterans Stadium in Philadelphia.

When he's at the park, of course, he can't be on the air but his 8-year-old daughter, Carmen, uses the set at home. And she is not shy about telling listeners who her famous daddy is.

Cash is not only famous, he is the spiritual leader of the Phillies. He was acquired from the Pittsburgh Pirates in 1973 for pitcher Ken Brett, a local hero. His first problem was overcoming the wrath of fans angered by the trade.

During the 1974 and 1975 seasons, he played in every game and batted at least .300, the standard of excellence for major league ball players. But that was not his real value. He had come from Pittsburgh, a team used to winning, to Philadelphia, a team that had never won a world series and which had won only two pennants, the last in 1950.

"He taught us how to win," said Larry Bowa, the once moody shortstop who has become almost inseparable from Cash. After the trade was made, Cash called Bowa and the two agreed to meet in spring training early to practice making double plays. In the two years before Cash arrived, Bowa hit .250 and .211, the



last mark well under adequate even for a shortstop. After Cash came, Bowa hit .275 and .305.

"I got my 1,000 hit the other day," recalled Bowa on that sultry August day. "When I first got to the big leagues, they were saying I wouldn't even get 1,000 at bats. That man right there has been the big difference," he said, pointing at Cash.

Cash coined the saying, "Yes, We Can," which became the Phillies password of confidence. By believing in himself, he taught his teammates to believe in themselves. So, it was natural that when Cash went to CB, his teammates followed.

"We can't talk to each other from our homes," he said. "We live too far apart for that. But we get each other on the way to the ballpark."

Not every Phillie has a set, of course, but if the team wanted to have a meeting on the air, they wouldn't have trouble getting together. Among the regulars with sets are Schmidt, Cash, Bowa and outfielder Garry Maddox. Greg Luzinski had a set but he changed cars. A new one may be in the works.

Among the Phillies who had a set before Cash is pitcher Tug McGraw, a star with the New York Mets before he became a star in Philadelphia. But the Tugger saves his CB for long-distance trips, seldom talking near Philadelphia.

His problem is his handle, Scroogie, after the famous cartoon character he created. He likes it and he won't change. But in the east, it's an instant invitation to a crowded channel.

"On the cross country trips, I have no problem with it," he says. "They don't pick it up as fast. I give my

handle and they say, 'What's that, come back again.'"

Scroogie is not a common term. For those CBers who are not baseball fans, scroogie is the nickname for a screwball, one of the most difficult pitches to throw. It's a pitch that breaks the opposite direction from a curveball and it's thrown by twisting the wrist and elbow hard toward one's body as the ball is released.

Arms were not made to twist that way so not too many pitchers throw the pitch. But it's Tug McGraw's stock in trade.

Cash isn't so enamored with his handle. He changes it and keeps on modulating. Like everyone else, he has had the common uses, for directions and the like. But he has also used it to make friends.

"There are two people I talk with around home all the time," says Cash, who uses channel 19 when he's driving and channel 22 or 23 when he's stationary. "One is P. J. and the other is Big Beaver."

Dave seldom has a chance to meet any of the people he's modulating with but once in a while, things change. On a cross-country trip last year, he stopped for coffee with the Kentucky Colonel, a friendly jockey of an 18-wheeler.

"That may have been my brother, Bill," said Phillies pitcher Jim Katt, whose brother is a long distance truck driver and who has been using CB for years. "He told me he was talking with you."

Like others using CBs, the Phils have problems with thefts. Maddox's set was stolen from his car while it was parked at the ballpark and Cash's antenna was ripped off from the same spot.

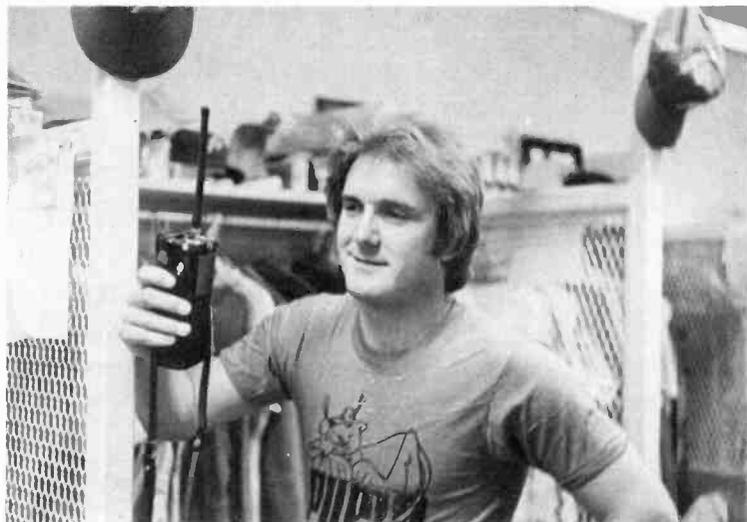
Now, the Phils use slide mounts and it's not too unusual to see a CB set in a Veterans Stadium locker room.

When the players depart, their sets go back in the car.

Like other CBers, the ballplayers are friendly and easy to talk to. Cash suggests trying them between 3 and 4 p.m. on days when the Phils have night games. They are on their way to the ballpark then and they are always on the air.

They may have new handles by then but some judicious listening should enable a CBER to pick them right up. No matter what handles, they are using, the ballplayers have ears.

Seventy-thirds, Captain Hook.



15 16 17

S9's Monthly Column for Sidebanders

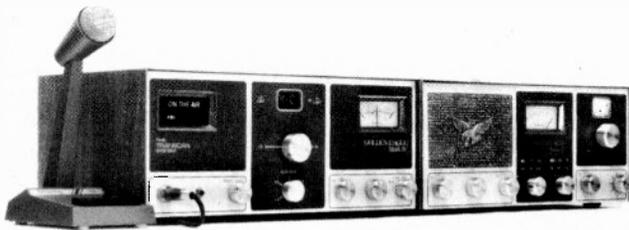
by Bill Sanders,

SSB-295  
KW-5304

## ON THE SIDE.....

### FIXEM-UP DEPT.: SIDEBAND ID NUMBERS

Single Sideband operators don't use AM type handles or unit numbers for identification purposes. Instead they use special Sideband ID numbers. Those many readers who have written to us asking about how they may obtain a set of these numbers are advised that we recommend joining the SSB Network, which is the nation's oldest and largest group of Sidebanders. A self-addressed stamped envelope sent to the Sidebanders' Service Bureau, P.O. Box 381-R, Smithtown, N.Y. 11787, will bring you information telling how you can become a part of this vast network. Their national "SSB" ID numbers can be obtained without cost or fee. We suggest that all Sidebanders avail themselves of this opportunity to join this network—even if you are a future Sidebander, or an old-timer who already has "local" numbers.



### BROWNING DOES IT AGAIN!

If you sat there drooling with envy over the 23-channel version of the Browning Golden Eagle Mark IV, you are going to have your mind blown away by the new 40-channel version. The rig has been totally redesigned inside and also given an exterior facelift. In addition to features such as an LED digital readout, it also has something called the *Transcan System* which lets you turn a knob and electronically sweep all frequencies. As expected from Browning, it's top drawer all the way!

### AM ON THE SIDEBAND FREQUENCIES

A frequently heard complaint from fellow sidebanders seems to be concerned with AM communications taking place on, and since this appears to be of

such interest, I thought that we would kick it around a bit.

There seems to be several factors involved with this problem, and they all interplay with one another. For instance, the way the FCC has set up the service, there is no "legal" distinction between so-called AM-only and SSB-only channels or frequencies. This goof is the fault of the FCC who is apparently so far removed from understanding what's happening (despite their Personal Use Radio Advisory Committee which is supposed to be telling them) that they think it's OK for AM and SSB to co-exist. So be it—we're stuck with this until someone gets on the stick in Washington (don't hold your breath). So we then are faced with the fact that, for all intents and purposes, we have the "legal" right to operate on any CB channel, and so do the AM'ers.

Sidebanders have traditionally congregated on certain frequencies, in an attempt to stick to ourselves, avoid causing QRM to AM'ers, and to avoid AM QRM to our own communications. In most areas of the country, these frequencies seem to be most common between Channels 15 to 18, although they vary from place to place. Our mail indicates that nationally the two most popular "sideband frequencies" are Channel 16 and 18, with 16 being generally used for calling purposes only. There is now sideband activity on some of the new frequencies, mostly from .365 (Channel 36) to .405 (Channel 40)—although there has also been some sideband activity noted from .315 or .325 on upwards.

From the FCC's point of view, these frequencies don't exist as "sideband frequencies." Unfortunately, the ability of these or any frequencies to exist for Sidebanders only has been left on a helter skelter basis.

As a result, it's been touch and go. It's caused by lack of information given to the AM operators, or their lack of willingness to cooperate. Sideband operators are therefore frequently faced with AM'ers using or attempting to get dreaded radio checks, Smokey reports, 10-36's and the like through on those frequencies we like to think of as sideband frequencies!

If it's a simple matter of a new operator who wasn't aware of the fact that there were "sideband channels" and that AM and SSB is a poor marriage on the same channel (why don't dealers tell their customers?)—

well, this is usually cured by a Sidebander switching over to AM and politely explaining the situation. In the majority of instances this works, the new AM'er is happy to get the information and is never heard from again using AM on a sideband frequency.

The problems seem to be when AM'ers who know full well that it's a Sidebanders frequency pop up. As much as I have been a supporter of the good work done by many young CB'ers, I must confess that *most* (not all) of the many instances I have personally witnessed of *deliberate* AM and use of sideband frequencies seems to be teen age operation. Asking these stations nicely to move off and find another channel *usually* bring no results—it's probably something in the mental composition of those who deliberately do this that makes any reasonable appeal to them all the more frustrating. They know full well that they are on a sideband frequency, and that's probably the very reason they are operating there in the first place! Showing any sign of annoyance at their tactics only seems to encourage them to continue their operations, and return again the next day for more. In the instances of teenagers, it says a lot for their upbringing.

I think that, taking into account that those who deliberately do this may not be playing with a full deck, there are certain factors which have perhaps activated them in these activities—and perhaps we can control this to some extent.

For one thing, I have been monitoring a sideband frequency which has been quiet for a few minutes. Then next thing I hear is an AM'er there—"C'mon, c'mon LIVER LIPS, ya got THE CLEARASIL CLOWN here—let's use this channel, when the Sidebanders want to use it they'll tell us to move off." So, a dead sideband frequency, especially one in an area where AM channels are crowded, seems to be a definite lure and invitation for AM use. Keep those channels going—nobody says that it has to be the Lincoln-Douglas debates, but generally *any* sign of sideband activity will help to keep many AM'ers off the frequency. If you hear an AM'er start up with the words just described, click over to AM and politely tell the AM'er that the Sidebanders *are* using it, and AM use of the frequency is causing interference.

Next, I would say that those who deliberately use AM on a SSB frequency have some kind of a head problem with dealing with authority. It may very well be that their continued use of AM on the sideband frequencies is not only deliberate, but is working off some kind of psychological vendetta against all sidebanders because—maybe 6 months earlier, when he was a new CB'er he got on a sideband frequency when he really didn't know any better—some Sidebander gave him both barrels, you know what I mean—"Hey you stupid imbecile, what the hell is the matter with you? Don't you numbskull AM'ers know that One Six is a sideband frequency? Now why don't you run off and play somewhere else?"

I cannot deny that the temptation to say this might be very great at times, however I am firmly convinced that such an oration only makes matters worse in the long run. My suggestion is to keep this in mind the next time you are going to attempt to handle any AM operator popping upon a Sideband frequency.

One message I heard used by a Sidebander in the midwest seemed to say it aptly, and it worked. It was something like: "Sideband operators in this area normally operate on only two frequencies, Channels 16 and 17. We do this so as not to cause or receive interference from AM transmissions, which cannot function easily at the same time on the same frequencies. We have only two channels for sideband, you have all of the rest of them, and there are a lot of sideband operators whose efforts to use only these two frequencies would be made much easier if you could move over to one of the channels used for regular AM operation."

In this particular case, the AM'er said he had been on the air for only a few days and didn't even know what the word *sideband* meant—or that there were special channels for its use. The Sidebander told the AM'er that he would meet him on an AM channel and explain it all. They then met on an AM channel and the explanation was given. There were several other AM'ers on that channel reading the mail—and each had a few *good* questions about sideband. All were given answers, and I think that the area Sidebanders gained many points that day!

One tactic we have witnessed which does *not* seem to work is to become so annoyed by a few AM'ers on the sideband frequency, that several (or many) Sidebanders QSY to the AM channels and "teach them a lesson." All this does is to irritate those "innocent" AM'ers who were correctly using the AM channels. It does nothing towards correcting the AM'ers who were on the sideband frequencies, it possibly causes sufficient anger in AM'ers who were minding their own business on their own channels do decide to retaliate. Two wrongs don't make a right, it has been truly said!

Of course, if sideband frequencies are in use by Sidebanders, then the possibilities for the invasion of AM'ers is considerably reduced.

Look, the name of the game is that today's AM'ers are tomorrow's Sidebanders. There really is no constructive purpose to establish a permanent "adversary" relationship with all AM'ers, to think of them as *the enemy*. Sure there are *some* who are off the wall, but there are some Sidebanders who could possibly be considered likewise. Mostly, I think that we should work towards cooperation and education; in fact this will work 100-fold more effectively than a brickbat or a foul mouth. Let's face it, we are going to have to reconcile ourselves to the fact that, on some people *no* approach will work; but let's not make the situation any worse by alienating those AM'ers who *can* and *will* cooperate.

Going further, Sidebanders might take several steps to further protect their few frequencies from erosion.

Local sideband clubs can set up "watch" stations which monitor all of the local sideband frequencies, spending a few minutes checking out each area frequency for the sole purpose of reminding any stray AM'ers of the situation. Stations doing this can take shifts, most needed hours would be noon to 11 PM. Clubs should also encourage their members to make full use of all sideband frequencies, to talk *more!* All members should be instructed in the best manner of handling a "situation" of AM'ers on local sideband frequencies, it's a good topic for open discussion at your club meeting, or for an on-the-air discussion in your area network session.

Your sideband club might also try to get into a cooperative relationship with area AM clubs, send a speaker to address their members, perhaps establish an AM-liason officer whose function is to coordinate all of these efforts and to organize measures looking towards keeping sideband frequencies "clean." You might also ask area AM clubs to send representatives or liasons to some of your meetings. *Sit down and talk*—it's amazing how much can be accomplished by 2 or 3 operators sitting down over a cup of coffee and spending an hour or two; a lot more than 100 operators wasting 10 frequencies for 2 or 3 months!

Then, start making the rounds of your area CB sales and service shops—talk to the owners, managers, sales people. Explain to them that their cooperation in telling new and old customers about sideband frequencies would be appreciated. Mention how many members you have in your club, how many Sidebanders there are in the area—that you will make certain that their cooperative efforts will be known and appreciated by these people. Guy won't cooperate? Let him know that you'll pass it along! Many CB shops have a bulletin board—here's another aid. *The SSB Network* has available mini-posters just made for hanging on bulletin boards and anywhere else that AM'ers are liable to see them—they are very eye-catching and will let AM'ers know the facts about which channels are used in your area for Sidebanding (you fill in appropriate frequencies on each poster, a marking pen works great). They can also be put around at CB Jamborees, coffee breaks, etc. There is no charge or cost for these, however if you want some you'll have to supply a return envelope including at least 24¢ (U.S. postage stamps only) for a batch of 10 of these mini-posters. I would suggest providing a brown 9 by 12 inch envelope for these to be returned to you. The mini-posters have been *extremely* effective wherever they have been introduced.

If you want 10 of them, send your large return stamped, self-addressed envelope to the Frequency Committee, SSB Network, P.O. Box 381, Smithtown, N.Y. 11787. If you think you'll need more than 10 of these, they will include further information when you send for your first 10 as described above. We suggest that all interested, concerned, and serious sideband enthusiasts, individuals, clubs, equipment dealers, take

advantage of this positive and clever approach to retaining the integrity of sideband frequencies. And we congratulate the *SSB Network* folks for their unique, innovative, tireless, and generous work in fighting for the betterment of Sidebanders' operating conditions—something which has been of benefit to the entire Sidebanding movement since 1964!

Want to do something about AM'ers on our frequencies—well, here's your chance!

### OVERWHELMING REQUESTS

I think that one of the most popular things we ever ran here was the *SIDEBANDERS' CREED* (March issue). It was written and conceived by the *SSB Network*, who were kind enough to let us run it in our pages. When we ran it last March we included a blurb that any Sidebanders who wanted a free reprint of the *SIDEBANDERS' CREED* should send a stamped-self addressed envelope to the *SSB Network* to get one. They were absolutely *overwhelmed* with requests for single copies, and also with letters from local and regional sideband clubs seeking copies for all of their members. Their entire supply was exhausted *the first week* the issue came out, and they had to print up additional copies. They were so good natured about all of this, that I'm again taking the liberty of offering my readers who missed out on this to get a copy of the *SIDEBANDERS' CREED*—the reprint is quite a bit fancier than we ran in the March issue. It is on colored stock, has a fancy border, is printed on one side—and would look nifty on the wall of any Sideband radio room. And, most of all, it outlines a set of basic beliefs that are common to all Sidebanders who wish to maintain sideband as an effective and useful communications tool. We suggest *you* get one, all you have to do is send a stamped self-addressed return envelope (send a #10 envelope, one of those long 4 by 9½ inch jobs) to *The SSB Network*, P.O. Box 381-SC, Smithtown, N.Y. 11787. These are available to *all* sidebanders, but *if* you are a member of the *SSB Network*, please mention your SSB ID number! By the way, the last time the *Sidebanders' Creeds* were offered, some of those who requested them forgot to include the self-addressed stamped return envelope—unfortunately they didn't receive the requested material in return.

### TECH TIPS

Sandro, SSB-25, of Sandro's Electronics in Bayshore, N.Y., tells me that some Sidebanders have said that sometimes it's difficult to get another station clarified-in while also trying to devote attention to driving a vehicle. Problem is that if you clarify a fraction of a hairbreadth to one side of the other off the other station you've lost the voice quality you need for good copy, but with the car itself bouncing it's extra tricky. Sandro suggests that those who have faced this problem might try pulling the existing clarifier control knob off its shaft and replacing it with a larger size knob, the largest size which will fit without hitting into the other

controls on the panel of the rig. The larger knob will give you considerably more control over fine-tuning the clarifier with ease!

From another operator who wishes to remain anonymous, we have a tip for those Sidebanders who found that their SWR was a little too high for comfort when trying to operate on newly allocated frequencies above the old 23 channels. If you have a "23 channel" mobile whip with an adjustable tuning tip, re-adjust it for maximum resonance (lowest SWR) on .285 (Channel 28), this is midway between Channels 16 and 40 and should give you a better shot at the high end frequencies than when you were peaked up in the middle of the old 23-channel band, or on Channel 16. And, to the many readers who have asked about how to check out SWR with a sideband rig, because there is no carrier present, you'll have to switch over to AM-side. But don't make a federal production out of this stunt on sideband frequencies or you'll risk the ire of your friends!

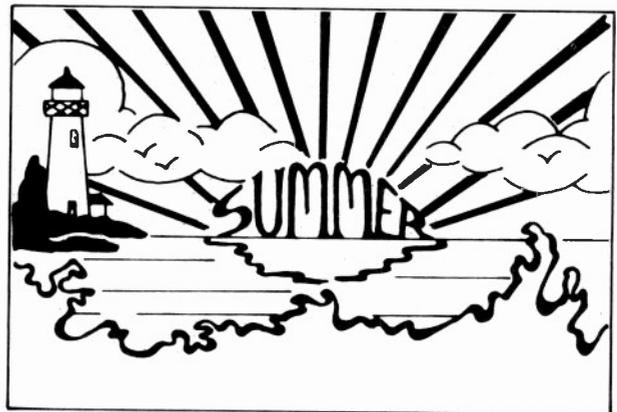
### ALPHABETS

Several letters have come in regarding the use of phonetic alphabets with a request that we publish one—seems to become confusion as to whether one phonetic alphabet is better than the other. Several are in use, but the one we seem to hear used most often is a mixture of several. It is:

A Alpha	N November
B Bravo or Baker	O Oscar
C Charlie	P Papa
D Delta	Q Quebec (Kay-bek)
E Echo	R Romeo
F Foxtrot	S Sierra
G Gulf or Golf	T Tango
H Hotel	U Uniform
I India	V Victor
J Japan	W Whiskey
K Kilo (Key-lo)	X R-Ray
L Lima (Leema)	Y Yankee
M Mike	Z Zebra or Zulu (or Zed)

Take your choice!

See you next month! Bill, SSB-295.



### THE CONNECTOR WITHOUT GRIEF

(continued from page 47)

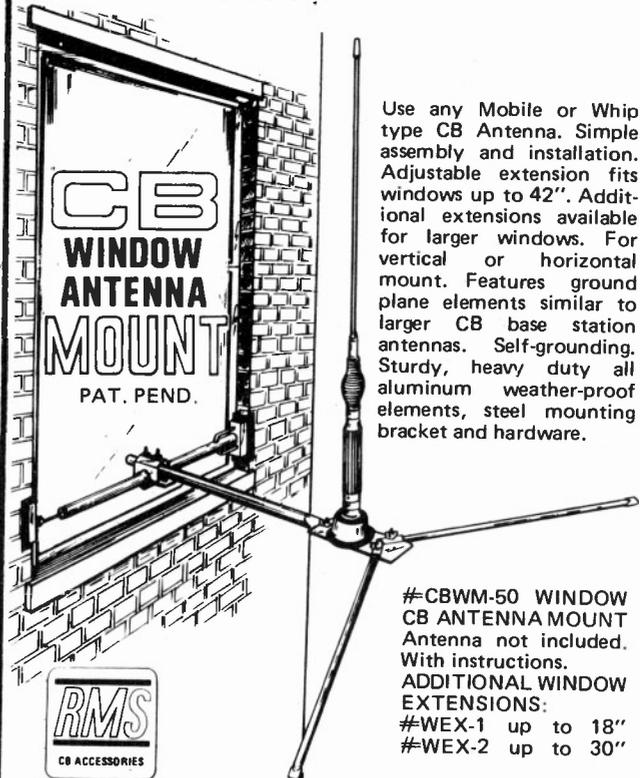
The connector assembly is then placed over the center conductor so that the support sleeve slides under the braid. The center contact is then crimped using either a hand crimping tool or a pair of pliers. The shell is then pressed over the braid to butt against the shell. For optimum performance, the collar should be firmly seated against the mating jack.

Because no heat is used in this connection, there need be no fear of hidden contact between the braid and the center conductor. Each step of the assembly leaves the cable visible for easy inspection. Also, should a problem arise, the connector can be disassembled for inspection and then reassembled without disturbing the center conductor termination.

Even in those instances where connectors have been installed at the factory, the same circumstances apply. The soldering of coaxial cable connectors is a hand operation and therefore subject to human error. However, factory crimped connections are generally performed by semi-or fully automatic crimping machines where cable stripping and crimping pressures are precisely controlled for long-term reliability.

Properly installed, solid state CB equipment should last for years without the need for service or repair. The attention given to the details in the beginning combined with a little patience will pay off with many hours of carefree and reliable operation.

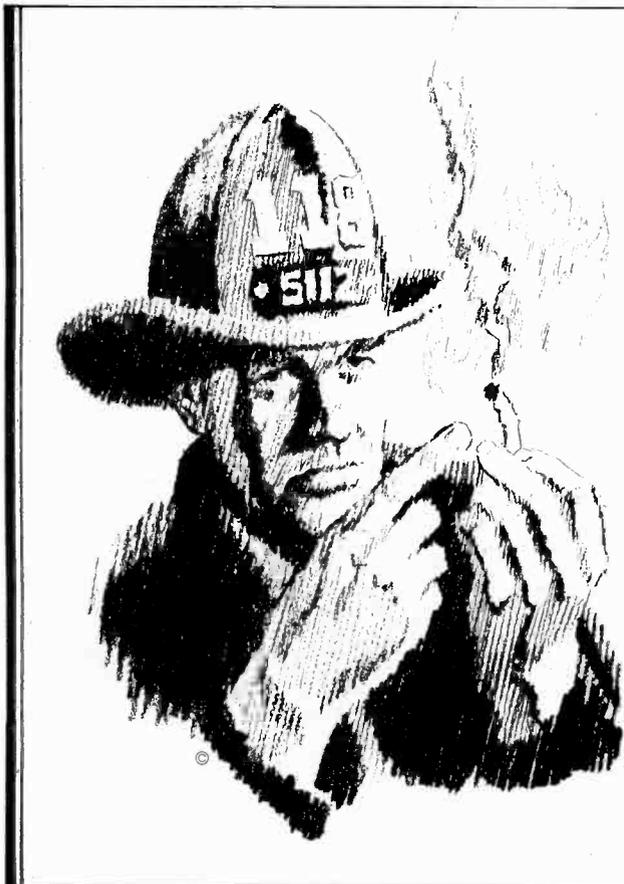
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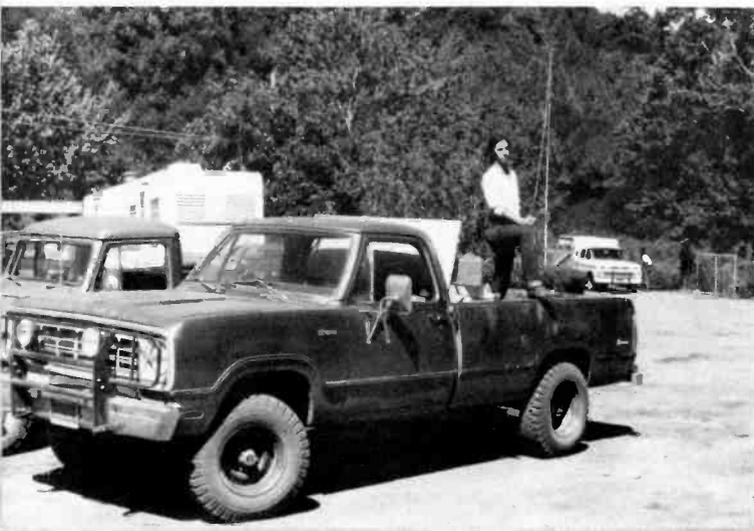


# CB Smoke Eaters!

**F**IRE suppression is emphasized as the chief responsibility of the Big Sur Volunteer Fire Brigade. This includes the monitoring of conditions detrimental to safety, and to take the necessary action in responding to emergency conditions. Communication is vital to effectively combat emergencies, when preventative measures have failed. The Big Sur Fire Brigade, with the accession of CB transceivers in their operations, has cut valuable time in fire prevention to a minimum.

The community of Big Sur, California, is a linear community, stretching approximately 30 miles along a two-lane state highway. Dense brush and forest surround the many homes and businesses throughout this picturesque, seaside town. The geography of this community makes fire protection a serious problem.

One of the Big Sur Fire Brigade's trucks fully equipped with Craig CB communication. This vehicle carries various tools and extra supplies and is positioned at the fire scene to assist all members of the Brigade.



To supplement this basic service, the Volunteer Brigade was formed and all facilities are totally manned and serviced by volunteers.

Walter Trotter, Fire Chief, and Gary Koeppel, Foreman, are directly responsible for obtaining and maintaining the equipment. Koeppel states that, "Before the Brigade's inception, there was not a single instance, because of distance, when a structure did not burn to the ground. During winter, the closest fire station has an approximate response time of 60 minutes, and during the summer months C.D.F. (California Division of Forestry) provides 'non-priority' structural protection."

The Big Sur Volunteer Fire Brigade was formed as a non-profit charitable association to function primarily as a fire protection service and secondarily as a supple-

A member of the Big Sur Fire Brigade communicating on his Craig CB at the scene of a fire.



mental backup for the California Division of Forestry whose responsibility is brush and forest fire suppression.

Occupations of the men range from carpenters to ranchers, highway workmen to gallery owner. Total support is received from the community, including a variety of fund raising activities such as raffles, plays, wishing wells and dinners.

In addition to a mandatory program of bi-monthly training sessions, each of the fifteen man crew has received 96 hours of accredited training through the supervision of the California Division of Forestry and U.S. Forestry Service. The bi-monthly meetings range from serious discussions to periodic "roasting" of individual members. Fines are imposed for procedural mistakes and attendance is mandatory.

A Class "A" hose and ladder pumper was purchased from the State of California at the Brigades inception. Additional pieces of equipment came from donations, purchases, or the repairing of damaged equipment. Their most important piece of equipment is the eight fast-attack "slip-on" pumper units which were built by members of the brigade. These pumper units are quickly mounted on the volunteers own four-wheel-drive pickup trucks when a fire call comes in. Each has a 140 gallon-capacity water tank, gas powered motor and 200 feet of hose. The tanks are always full. The trucks simply back under the "slip-on" (which is quickly lowered on to the truck bed) and are secured: the rig is ready to go. Each of the fifteen men is equipped with a complete set of turn-out gear (helmet, coat, pants and gloves), three hand tools (shovel, Bulaski and McCloud), and a ten pound all-purpose chemical fire extinguisher.

Chief Walter Trotter designed a total fire suppression system featuring "slip-on" fire vehicles and the addition of citizens band transceivers which greatly reduce response time and enhance on site communications.

Craig Corporation made available twelve Model 4102 Mobile CB units and a Model 4201 CB Base Station. Antenna Specialists donated an M400 Starduster Base Station Antenna for the Brigade's use.

"The mobile units have been placed in the member's vehicles," said Koeppel, "with the base station placed on Post Hill, which is the highest and most centrally-located point in our community. There are four "slip-ons" at each side of Post Hill, with members working and living nearby.

During the day, the members continually monitor their CBs and the base station is manned by an auxiliary volunteer. A dispatch service utilizing the volunteers' wives, is used at right. Messages coming from the police emergency number (911) are relayed by the wives who each call volunteers about the fire.

"Now, with the CBs," said Koeppel, "motorists driving along the highway can report a fire and, since someone is always monitoring Channel 17, response time is greatly cut."

On the air they have colorful handles, with the Chief (Walt Trotter) being "Papa Bear," the Foreman "Mama



The Big Sur Brigade's Class A pumper truck is equipped with a Craig CB radio. The truck is completely serviced and maintained by members of the Brigade.

Bear," Assistant Chief "Baby Bear," Captain "Goldilocks" and others, including "Stone Cutter," "Trash Collector," "Gray Fox" and "Noodle Man."

The Brigade rolls on all calls, even highway accidents where a gas wash might be needed. Some of the members have first-aid experience and have been directly involved with the volunteer ambulance program. The ambulance also is equipped with a Craig CB transceiver and now rolls on all fire calls, in case assistance is needed.

The innovation of Fire Prevention aided by CB's was discussed and several dramatic instances were cited by Mr. Koeppel. During the summer months when a fire call comes in, the California Division of Forestry, based in Monterey, automatically dispatches fire-fighting apparatus. This includes bulldozers, fire crews and numerous fire vehicles. The C.D.F. foreman has included a CB in his lead truck and now, when only 6 miles out of Monterey, can pick up the Brigade's transmissions. If the fire situation is under control the C.D.F. crew and equipment can turn around, without the waste of a 58 mile round trip, thus saving taxpayers' dollars and equipment wear and tear. In a brush fire the Brigade will throw up lines around a

Foreman, Gary Koeppel, using a Craig CB for fire perimeter communications. Shown in the bed of his pick-up is one of the "slip-on" fire fighting units built by members of the Brigade. The "slip-on" can also be attached to an existing water supply such as a pond, river or municipal water system.



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fire and can be in constant communication with other members around the perimeter.

The Navy Base at Point Sur, which is between Big Sur and Monterey, also monitors Channel 17. The closest hospital to Big Sur is in Monterey, 35 miles away. Mr. Koepfel told of a motorcycle accident in which the driver was thrown over a cliff. Being in great pain it would have been difficult to attempt the long ambulance ride. One of the Brigade members reached the Navy Base on Channel 17, and a Medi-Evac helicopter was dispatched. "A great deal of time, and perhaps even the injured driver's life, was saved."

"During one fire call," explained Koepfel, "I was driving toward the fire when I received a call on my CB that more water was needed. I turned around and headed for the closest "slip-on". I found myself driving behind a camper-trailer rig on a winding two-lane road. Unable to pass, I tried honking but was totally ignored. I noticed that the camper-trailer had a CB antenna and finally raised the driver on my CB. I explained I was on emergency status and the other driver quickly pulled over. The CB has proved helpful in getting to the equipment quickly and also keeping the road open."

The Brigade's suppression of numerous fires has saved thousands of dollars and lives. Chief Trotter has felt all along that with combined efforts, supported by both time and money, a lot more can be done with a lot less. As Chief Trotter puts it, "The Brigade's purpose is representation without taxation."



# S9 LAB REPORTS

The equipments shown here were put through their paces by Larry Friedman. Included along the battery of test gear employed is a B&K #2040 Signal Generator, Bird wattmeters, Tektronix RF spectrum analyzer, several regulated power supplies, and DB meters. Equipments selected for testing and review

have unusual features, features which might be of high interest to a specific CB communications need, or overall performance of unusually high quality. Manufacturers wishing to submit transceivers and other equipment for testing and review in this column should contact the Editor.

## • PEARCE-SIMPSON LION 40

**Description:** A 40 channel AM transceiver for mobile, and P.A. operation. Requires a power source of 12 to 13.8 VDC with negative or positive ground. Overall dimensions are 7 1/8-in. wide x 2 1/2-in. high x 9 1/2-in. deep.

Features include double conversion, a remote speaker jack, a P.A. speaker jack, L.E.D. channel indicator, S/RF/SWR meter, noise blanker, delta tuning, RF gain control, tone control, and CB monitoring through the PA speaker.

There are front panel controls and switches for: Channel selection, volume, squelch, S/RF/SWR meter, ANL, noise blanker, PA/CB, and CB monitoring through PA speaker.

Standard equipment includes a microphone, mobile mounting bracket and a DC power cable.



### Receiver Test:

AM input sensitivity	0.6 $\mu$ V
Adjacent channel rejection	62 dB
AGC action	9 dB
Input level for S9 meter reading	300 $\mu$ V
Fine tuning range	+1.5/-1 KHz

### Transmitter Test:

AM RF output into 50 ohms	3.7 watts
85% modulation sensitivity (0 dB is average)	+12 dB

Modulation limited to 100%      yes

**Editorial Comments:** Built in SWR meter insures optimum performance from the antenna system. The tone control does a good job at reducing the background grind.

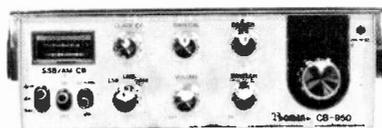
## • BOWMAN CB-950

**Description:** A 40 channel AM/SSB transceiver for mobile, and P.A. operation. Requires a power source of 12 to 13.8 VDC with negative or positive ground. Overall dimensions are 7 1/2-in. wide x 2 1/2-in. high x 11-in. deep.

Features include double conversion, a remote speaker jack, a P.A. speaker jack, L.E.D. digital channel indicator, continuously variable L.E.D. dimmer, S/RF/SWR meter, RF gain defeat, and fine tuning (clarifier).

There are front panel controls and switches for: Channel selection, volume, squelch/PA, clarifier, SWR calibrate, L.E.D. dimmer, LSB/USB/AM mode, RF gain off, noise blanker, meter function.

Standard equipment includes a microphone, mobile mounting bracket and a DC power cable.



### Receiver Test:

AM input sensitivity	0.5 $\mu$ V
Adjacent channel rejection	73 dB
SSB opposite sideband rejection	50 +dB
AGC action	7.0 dB
Input level for S9 meter reading	60.0 $\mu$ V
Clarifier tuning range	+1.2/-1.6 KHz

### Transmitter Test:

AM RF output into 50 ohms	3.5 watts
SSB RF output into 50 ohms	12.0 watts P.E.P.
85% modulation sensitivity (0 dB is average)	+12 dB
Modulation limited to 100%	yes

**Editorial Comments:** This transceiver features unusually crisp, clean modulation, both AM and SSB.

## • EBC RT-40

**Description:** A 40 channel AM transceiver for mobile, and P.A. operation. Requires a power source of 12 to 13.8 VDC with negative or positive ground. Overall dimensions are 7 13/16-in. wide x 2 5/8-in. high x 10 1/2-in. deep.

Features include double conversion, a remote speaker jack, a P.A. speaker jack, L.E.D. digital channel indicator, 8 step L.E.D. S/RF indicator, noise blanker, and fine tuning.

There are front panel controls and switches for: Channel selection, volume, squelch, power, noise blanker, and PA/CB.

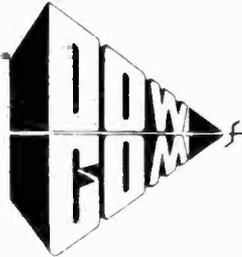
Standard equipment includes a microphone, mobile mounting bracket and a DC power cable.      (continued)

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### S9 LAB REPORTS (continued)



#### Receiver Test:

- |                                  |               |
|----------------------------------|---------------|
| AM input sensitivity             | 0.5 $\mu$ V   |
| Adjacent channel rejection       | 50 dB         |
| AGC action                       | 5 dB          |
| Input level for S9 meter reading | 10 $\mu$ V    |
| Fine tuning range                | +3.6/-1.1 KHz |

#### Transmitter Test:

- |                            |           |
|----------------------------|-----------|
| AM RF output into 50 ohms  | 4.0 watts |
| 85% modulation sensitivity |           |
| (0 dB is average)          | +12 dB    |
| Modulation limited to 100% | yes       |

**Editorial Comments:** This rig features an unusually bright channel indicator. The L.E.D. S/R/F meter provides easily seen indicators at night.

John Q

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# The Gemini CB Personality

MAY 21-JUNE 21  
BY PAPERDOLL—KMI-4549

**M**ERCI sakes alive! Motor mountin, tongue twisting Geminis never wait for a break—nor do they give one. They naturally have the floor during their waking hours—sometimes even when they're catching some Z's. Their super gift of glib gab and adaptability to almost any given situation are priceless assets to their normally lucky lives and enable them to teach with interest, politic with flair, entertain with humor and deceive without detection. Fast talkin, fast walkin (try and keep up with them) Geminis are always on the by—either rolling down the boulevard or hoofing it for a breath of fresh air. They're cleverly adept with their hands and make the best magicians. Avid bookworms, they just have to quickly scan the pages of a book to absorb its entirety. They know a little about a lot, can speak on almost any subject and would like they've studied it for years. Geminis have an insatiable thirst for knowledge. The idealists of the horoscope, they can sometimes be astutely critical of their good buddies and kinfolk, none of whom can ever quite measure up to what Gemini would like them to be. Because of their quick tongue, sharp wit, ability to mimic anyone, and their great sense of humor they also become the most well-known actors and comedians. Typical Gemini handles might be: The Hiker, Jawbreaker, Rolling Writer, Houdini, Mr. Peepers, Double Trouble.



## JUNE STARCHHECK

**GEMINI**—A word to the wise Gemini for June 1st is to put your tongue on hold for awhile even though you may want to verbally avenge the evil gossip you just heard. The rest of June blooms for you. Secrets are entrusted to you by a good buddy and a loved one. June 20th keep the channel clear for some front page good news. End of month vacation activity is definitely foreseeable.

**CANCER**—Beginning of June has Cancerians a bit depressed as they asked to work overtime and be of extra service. Energies are depleted till mid-June when sunny strength is revived and super unexpected surprises are revealed. New friends made on the 6th share happy dreams that are finally coming true.

**LEO**—June 1st and 29th are days to take extra caution on or near the water, especially where children are concerned. New life's schemes are conjured up this month sending you off after some winning but realistic goals. On the 20th you may meet an influential good buddy who will back you all the way. Interesting transmissions and contacts evolve for the rest of June.

**VIRGO**—The beginning of June starts out on a watery note for fastidious Virgoans who may find themselves madly mopping up a long neglected problem. Home 20 needs a cure, for sure. Thinking cap is on and working on the 17th when you astound superiors with a major revision in company policy. Bonus greenstamps and backpatting are the order of the day. Piggybank begins to overflow the end of June.

**LIBRA**—Libra's mighty mobile requires assistance June 1st when planetary aspects cause strange mechanical problems. Don't be caught short without your CB radio or you'll be 10-7 for sure. June 6th promises to be a very exciting day for love and romance. Plans for a long distance trip to skipland are made on the 20th.

**SCORPIO**—Holes in your pocket may not be the only reason for the loss of lettuce June 1st. Greenstamp transactions should not be made on that date. Better to wait till after the 16th. Single Scorpio's soulmate arrives on the 6th for a love at first sight excursion. Possessive Scorpio marrieds keep each other within eyesight all month. By mid-month conflicts arise if better half gets cabin fever.

**SAGITTARIUS**—June brides and grooms who are tying the knot this month are comprised of a majority of Sagittarians who've opted for the domestic scene. Spendthrift Sagittarians have the grandest of weddings and skipland honeymoons. Two co-workers lend a helping hand while you make your plans. Already married YL's and buffalos work together on new expansive project which adds extra comfort and luxury to life.

**CAPRICORN**—Watch your diet on June 1st. Overindulgence may upset you. You must be at your best on the 6th when a super new attraction spirits your psyche and breaks down your "cool." This could be the beginning of a serious relationship. Snags at work 20 finally get ironed out after 21st and your progress in the right direction resumes.

**AQUARIUS**—June 1st is not the best day for that long distance travel. Love life might get a little flaky that day. Good to go 10-7 on the world for a short. June 6th promises to be somewhat better for you what with the arrival of some new guests. The 20th brings about an eyeball with someone whose being magnetizes you.

**PISCES**—Pisces feels strong need to get away from it all beginning of June and takes to the super slab. You rev up your normally quiet facade and do some continuous channel breaking this month. You may even meet and bring home a couple of good buddies. Many new and exciting things begin to unfold around you after the 16th.

**ARIES**—Blunt Aries should not speak impulsively June 1st or misconstrued modulations which cannot be redirected may cause some grief. Other than that, the June sun should shine brightly on all aspects of your life. You're doing more travel than ever these days. Just keep your ears on June 20th for some good news. Better half even seems to do a bounce around for the better.

**TAURUS**—Keep all financial business deals off the June 1st agenda. Resume after the 16th. June 20th is an excellent day for signing or completing those long range plans that will keep you in heavenly comfort for some time to come. Someone from the past is pleasantly heard from on the 6th. You manage to run an exhausting schedule keeping up with them.

73's and 88's  
till next month

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### SIDEBAND ID NUMBERS?

They don't use "handles" to ID on the sideband channels, stations use "Sideband ID Numbers." If you're an active Sidebander you may already have several local or regional group ID numbers—if you're a newcomer or a future Sidebander, you may not have any Sideband ID numbers at all! Whether you have a dozen numbers or none at all, it's easy and important to you to get yourself a set of national ID numbers from the SSB Network, the oldest (1964) and most prominent national sideband group. Old timers, newcomers, and future Sidebanders should obtain information and an application for national SSB Network numbers by sending a self-addressed stamped envelope to: Sidebanders' Service Bureau, P.O. Box 381-XF, Smithtown, NY 11787.



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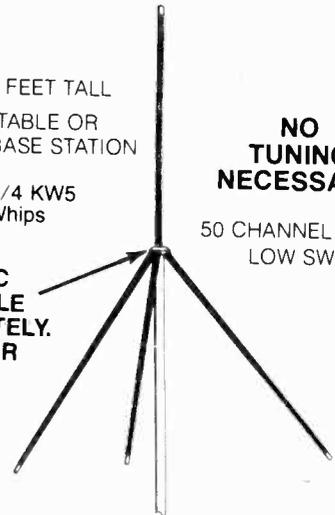
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# Bill Orr on Antennas

## PART 16: MORE ABOUT CB MARINE ANTENNAS

LAST month's column discussed some of the problems of CB marine antennas, and this column will continue that discussion.

Of paramount importance to *any* user of marine radio is corrosion. While you are enjoying the pleasures of boating, you'll encounter two phenomena which may be new to you but are "old hat" to a seasoned sailor: (1) *Electrolytic corrosion*, and (2) *Galvanic corrosion*. Both of these two destructive actions can (and will) take place in your radio system unless you do something about them.

Electrolytic corrosion is the destruction of metals immersed in (or exposed to) salt water. The corrosion results from an external electric current—usually from the boat's battery or electric system—coming into contact with metal surfaces.

Galvanic corrosion results when two metals of different composition are immersed in (or exposed to) salt water. They generate a small electric current between them, even though no external current is applied to either metal.

Both electrolytic and galvanic corrosion eat away metallic surfaces, both underwater, and above water. The action is quite rapid. Small metallic particles actually become detached from the metal and pass into the sea water with the result that the metal becomes pockmarked, gets holes in it, and ultimately is eaten away.

Some metals deteriorate faster than others when subjected to corrosive currents, or even to salt-laden air. The best marine fittings are made of stainless steel, monel or bronze, which keeps corrosion at a minimum. Marine radio antennas are sometimes made of stainless steel and are often protected against corrosion by a plastic coating or by marine paint.

The point is that the life of the usual CB antenna, designed for land operation, is quite short when subjected to the rigors of marine operation. Marine antennas, specially built for the job, are designed to reduce corrosion to a minimum. They are made of non-corrosive (or low-corrosive) materials and are properly protected against salt spray.

Here is a list of metals in order of *increasing* susceptibility to galvanic corrosion:

- |                    |                      |
|--------------------|----------------------|
| 1. Stainless steel | 7. Steel             |
| 2. Monel           | 8. Iron              |
| 3. Bronze          | 9. Aluminum          |
| 4. Copper          | 10. Galvanized steel |
| 5. Brass           | 11. Galvanized iron  |
| 6. Lead            | 12. Zinc             |

Thus, the run-of-the-mill CB antenna made of aluminum tubing with galvanized iron fittings is a bad choice when the matter of corrosion is uppermost. Stainless steel resists corrosion best, but how many CB antennas are completely made of that material?

### How To Take Protective Steps

As mentioned, marine antennas can be protected with a plastic coating, or with marine paint, taking care not to coat the insulators, or the base connection (which should be thoroughly water-proofed with caulking).

The following serve to retard marine corrosion:

1—Paint all underwater hardware, metal fittings and surfaces with high quality, antifouling marine paint (which often costs more than bonded bourbon!) It may be necessary to scrape, sand and repaint twice a sea-

*(continued)*

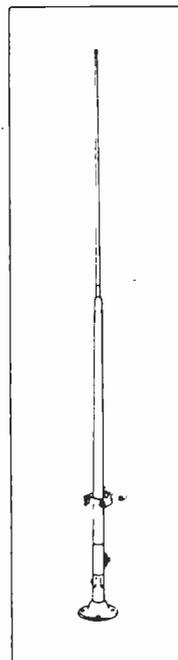


Fig. 1—The rugged marine antenna is built to withstand salt spray, vibration and rough weather. Base of the antenna is securely fastened to the deck or other surface by means of a metal flange. A swivel joint above the flange allows the antenna to be lowered to the deck to pass under bridges or other obstacles. The whip antenna is fastened to the superstructure by a special U-clamp which may be removed quickly. The whip itself is made in two sections of heavy wall, tapered tubing which is given a coat of weatherproofing epoxy to protect the metal from the salt spray. Antenna tip is covered with plastic-coated ball to reduce corona discharge. CB and HF antennas for marine service are built in this fashion for long life and to make sure the antenna works when you want it to! (Illustration from "The Truth About CB Antennas", Radio Publications, Inc., Box 149, Wilton, CT 06897. Price \$5.95 plus 35c handling and postage).

## BILL ORR ON ANTENNAS (continued)

son depending upon the water in which the boat operates.

2—All through-hull fittings, chain plates, rigging, metal masts, engine and underwater ground plate should be connected together with heavy copper wire (#8 or larger). This places all these metal parts at the same electrical potential and greatly reduces or eliminates corrosive action. (Note: boats with all-metal hulls present special problems which are beyond the scope of this discussion).

3—Sometimes special zinc underwater fittings are installed on a boat with the knowledge that they will corrode away much faster than fittings of other metals (true), can be replaced when they are badly corroded (true), and that this protects the other underwater metal parts (true). A zinc collar on a propeller shaft is an example you'll see quite often; certain outboard motors have small zinc parts with this theory in mind.

### Other Important Points

1—When a boat docks at a marina and its electrical system is plugged into shore power, it is important to get the connections (sometimes termed *polarity*) right, that is, be certain that the boat's ground connection is the same as the ground connection in the shore power line plug. Failure to do this may result in severe electrical shock.

2—In a marina, if you are unlucky enough to be tied up next to a boat with a fouled-up electrical system—and there are more around than you might think—it is possible for his mixed-up system to give you some surprises aboard your vessel. The solution? Help him to solve his problem.

### The Counterpoise Ground

And now to get to some more specific aspects of marine radio operation. One of the big problems is establishing *radio ground* on the boat, in spite of the fact that the boat is surrounded by water, this is not an easy task. Alert readers of this column will remember discussions of the half-wavelength and five-eighths wavelength vertical antennas, which can operate without radials, or a ground connection. Such antennas, when used for marine service, are very efficient. Quarter-wavelength antennas, on the other hand, require some form of ground or radial system for proper operation. Unfortunately, the longer antennas won't fit on many small craft, leaving the owner no choice of antenna—it is the quarter-wavelength antenna or nothing (Figure 1).

The quarter-wave whip (sometimes referred to as the 102 whip, as it is about 102 inches long) can be operated with a *counterpoise* ground, which is simply two or more insulated wires about 108 inches long placed at the base of the antenna (Figure 2). The wires are strung out horizontally over the superstructure of the boat and are attached to the outer braid of the coaxial line at the point the inner conductor of

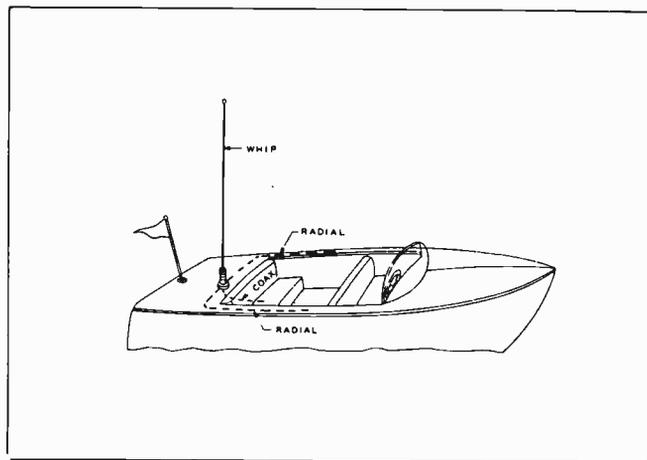


Fig. 2—A counterpoise ground may be installed on a boat for proper operation of quarter-wavelength CB whip antenna. Two or more insulated wires are connected to the outer shield braid of the coaxial line at the base of the antenna. Wires are about 108 inches long and run along deck of the boat, or are strung along the superstructure. The counterpoise wires should run in a horizontal plane and are moved about experimentally until lowest SWR is observed on coaxial line to CB equipment. (Drawing courtesy Radio Publications, Inc.)

the line is fastened to the antenna. If the hull of the boat is wood or Fiberglass, the insulated radial wires may be conveniently taped to the boat's deck or superstructure, or laced to convenient points with twine. Care must be taken to keep the radial wires out of the way of the passengers and crew so that no one will trip over a radial wire and perhaps injure themselves or fall overboard. At the antenna base, the radial wires are connected to the outer braid of the coaxial feedline of the CB installation.

Placement of the radial wires is not critical, and they may be suspended in air or taped to the deck in an out-of-the-way location. The wires need not run in a straight line, nor need they run in an exact horizontal plane. Moving the wires about while watching the SWR meter in the transmission line to the CB set will quickly show optimum placement of the radials that make up the counterpoise ground. Here, as with every type of antenna, your objective is to achieve the lowest possible reading of reflected power from the antenna back into your transmitter. When reflected power is at a minimum (as close to one, or unity, as you can get it), maximum power is being transferred from the transmitter to the antenna. Moving the radials about a bit may lower the SWR reading on the meter, and this should be tried when the installation is first made.

### A Marine Ground Connection

Most marine radio installations, particularly the HF radio systems, use a *marine ground* which consists of a large copper ground plate fastened to the outside of the hull, below the waterline. While essential for HF radio (2 to 16 MHz), the marine ground installation is rarely needed either for CB or VHF radio installations. When used, the marine ground consists of the ground plate, plus a heavy insulated wire or strap that runs from the plate to the ground connection of the HF radio. Inboard boats sometimes use the engine and

drive system for a marine ground (which is not ideal). The CB marine radio may be attached to the marine ground, if desired, by a short, heavy lead but use of such a ground is not essential and rarely helps the operation of the CB radio afloat because the ground lead is quite long in terms of the CB radio wavelength. To be effective, the lead from the CB radio to the marine ground plate should be very short—less than a foot or two in length, and this is difficult to achieve on most boats.

### What Antenna to Use?

Because of the infinite variety of rigging on pleasure craft, the choice of CB antenna must be left up to the individual boat owner. Generally speaking, the best radio range will be obtained either with a half-wavelength or five-eighths wavelength whip antenna mounted high on a mast and as clear of the boat's rigging as possible. A quarter-wavelength whip, mounted atop the mast, with two or three insulated radial wires drooping down into the rigging makes a good antenna, too. A short, coil-loaded mini-whip mounted on the hull of the boat will provide the shortest radio range because of its limited height and low electrical efficiency. However, for operation in intracoastal waterways, lakes and close to shore, it does a good job over short ranges.

### Lightning Protection

Regardless of antenna choice, the boat (like your house) must be protected from an accidental hit by a lightning bolt. Some boat owners install a lightning rod or pointed wire about one foot above the top of the highest mast with a heavy copper wire running from the rod to the underwater marine ground plate on the hull of the boat.

Your marine CB antenna, if the highest point on the boat, may serve as a lightning rod if the braided outer conductor of the coaxial line is connected to the marine ground plate with a short, heavy wire (Figure 3). Incorporation of a lightning arrestor in the line is a good safety precaution, too. *(continued)*

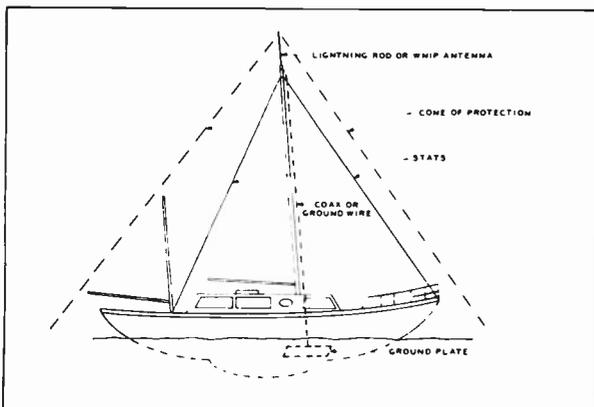


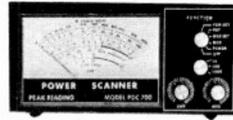
Fig.3—Your CB marine antenna serves as a lightning rod if a lightning arrestor is placed in the coaxial line and the outer conductor of the line is connected to the marine ground plate with a short, heavy copper strap. A "cone of protection" about the antenna lessens the chance of a direct hit by lightning. The antenna should be disconnected from the CB equipment during a storm to protect the gear from static discharges. (Drawing courtesy Radio Publications, Inc.)

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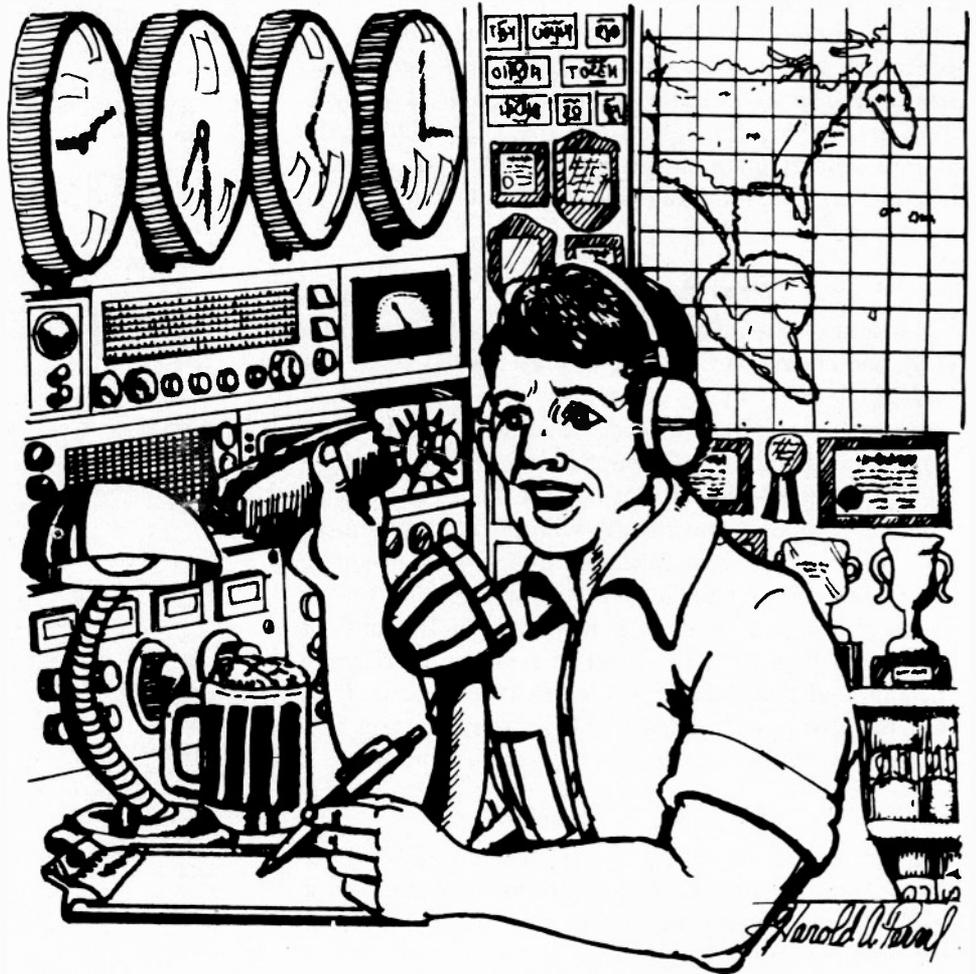
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## BILL ORR ON ANTENNAS (continued)

Common sense indicates that the marine CB antenna should be *disconnected* from the equipment to prevent damaging it during a lightning storm, and those aboard should stand clear of antenna and lead-in during the storm.

### CB Radio Afloat

There's a definite place for CB communications aboard boats of all types—from rowboats to stately yachts—to add pleasure and safety afloat. However, the problems of installation and maintenance are different from land-based stations and the special precautions covered in this column should be taken to insure reliable communications.

To summarize: larger craft should not rely only upon CB radio for safety; they should also have installed regular VHF or HF equipment which covers the distress channels monitored night and day by the U.S. Coast Guard and by vessels at sea. In some places, the Coast Guard monitors the CB emergency channel, but you can't really count on it without prior investigation. Using the regular marine channels, help can be summoned more quickly and reliably using one of the regular safety frequencies; however, in the case of smaller craft without more elaborate radio gear, CB radio can spell the difference between safety and tragedy at sea, and on inland rivers and lakes. CB radio is also valuable back-up equipment in case the regular marine radio equipment konks out at a critical time. And, as so often stressed in this column, the CB antenna is the key to better and more reliable communications, just as its land-based counterpart.

### Your Marine Radio Range

Under normal radio conditions, your marine radio range is limited by your *radio horizon*. This is the distance measured along the surface of the earth. The horizon is determined principally by antenna height and is the distance that two stations can "see" one another's antennas in a radio sense. Because the atmosphere exerts a slight bending effect, the ground

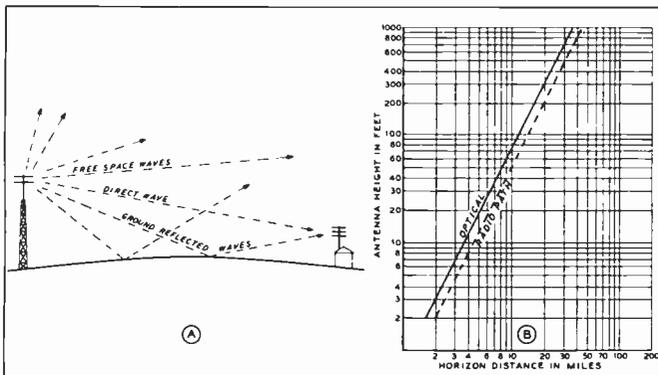


Fig. 4—The CB radio range can be pictured as a combination of a free space wave, a direct wave, and a reflected wave. In marine CB service, the reflected wave is water-reflected. The direct wave is useful over "line of sight" paths and combines with the reflected wave to provide areas of reception at distances somewhat greater than the "radio horizon" chart predicts. As antenna height is increased, the "radio horizon" expands. (Drawing courtesy Radio Publications, Inc.)

wave communication range is about 1.3 times greater than the optical horizon (Figure 4). The radio range between two stations located "in the clear" is therefore the sum of the radio horizon distance of each station.

In the case of a marine CB station, the radio range is quite limited due to restricted antenna height. An antenna atop a 30 foot mast, for example, has a radio horizon of about 8 miles. The same antenna on the deck (a few feet above the waterline) has a radio horizon of only 2 or 3 miles.

The *practical* radio range over seawater, however, has been found to be in excess of these figures in many instances. And if the base station has a good, high antenna, his radio range is added to yours. Marine-to-shore communication up to 30 or 40 miles is often possible on the CB channels.

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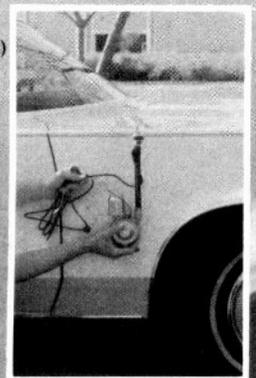
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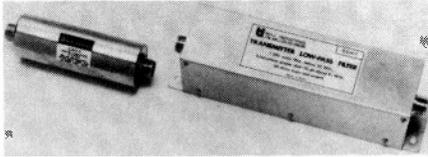
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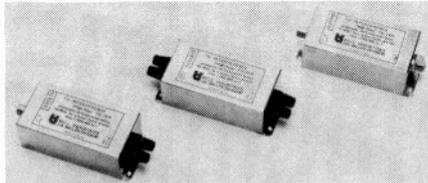
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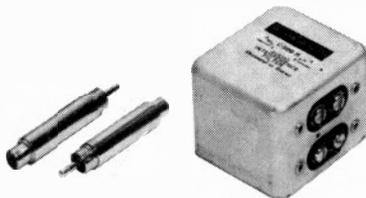
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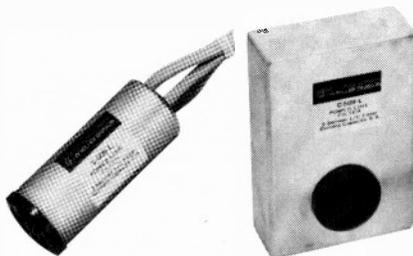
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# WASHINGTON OUTLOOK

### FCC Cracks Down on CB Operators

Crackdowns on Citizens Band licenses in three states following investigations by the Federal Communications Commission have led to the confiscation of illegal equipment valued at more than \$18,000, four convictions, and fines.

Three Syracuse, N.Y., CB operators pleaded guilty in U.S. Magistrate's Court there to a total of 15 counts of using illegal equipment—linear amplifiers in two of the cases. All involved illegal amateur type transmitters, according to engineers of the FCC's Buffalo District Office.

The operators were fined \$10 each by U.S. Magistrate Edward Conan, and waived possession of their illegal transmitting equipment, valued at approximately \$2,000.

The cases were prosecuted by Assistant U.S. Attorneys Joseph Parvone and John McCann of the Northern District of New York.

In Birmingham, Ala., Dennis W. Sullivan pleaded guilty to four counts of operating an illegal overpowered linear amplifier. He was fined \$100 by U.S. Magistrate Edwin L. Nelson and waived possession of the illegal equipment, valued at close to \$1,000.

The case developed from an extensive investigation by engineers of the FCC's Atlanta District Office following complaints of television interference by Sullivan's neighbors.

The case was presented by Assistant U.S. Attorney Bill L. Barnett.

For the second time in three months, Federal attorneys in the Columbus, Ga., Phoenix City, Ala., area cracked down on CB operators and seized illegal equipment valued at more than \$15,000. No arrests have yet been made.

The actions followed numerous complaints of interference by television viewers and other CB users. Search warrants issued by U.S. Magistrates M. Lewis Gwaltney of Montgomery, Ala., and William L. Slaughter of Columbus, were served February 9 and 10 by U.S. Marshals from Macon, Ga.,

and Montgomery, Ala., accompanied by FCC agents.

The marshals seized illegal transmitters and linear amplifiers.

Extensive investigations into the operations of illegal over power CB equipment were conducted by FCC agents from the Atlanta District Office and Savannah, Ga., and Tampa, Fla., sub-offices. The probe was under the direction of Assistant U.S. Attorneys Robert C. Watson of Montgomery and Joseph Lawless of Macon, operating under U.S. Attorneys Charles T. Irion of the middle District of Georgia and Ira DeMent of the Middle District of Alabama.

The Communications Act provides a maximum penalty of \$10,000 fine and/or one year in prison for operators of unlicensed stations and \$500 a day maximum for those who violate FCC regulations.

### Gets Prison Term for CB Violations

An Indianapolis man has been sentenced to a year in prison for transmitting obscene language on his Citizens Band radio and six months for illegal operation of the set, the FCC announced. The sentences are to be served concurrently.

Lewis L. Simpson was convicted by a U.S. District Court jury November 17. He was sentenced January 20 by Chief Justice William Steckler.

Simpson's arrest resulted from investigations by agents from the Indianapolis office of the Federal Bureau of Investigation and engineers from the Chicago office of the FCC. The probe followed complaints of interference and illegal use of CB by Simpson's neighbors and other CB radio users, the FCC said.

The case was prosecuted by Assistant U.S. Attorney John Hudgins under the direction of James B. Young, U.S. Attorney for the Southern District of Indiana.

The obscenity conviction involved violation of Title 18, Section 1464, of the Criminal Code, and the CB case

violation of Section 301 of the Communications Act.

#### Transmitter I.D. Card Discontinued

The Commission has deleted the use of Form 452-C, the Transmitter Identification Card, in the Personal Radio Services.

The posting of the form was a requirement for all mobile station transmitters and certain fixed transmitters. The form also served to show that transmitters capable of transmitting on frequencies outside the Citizens Band range had been authorized by the Commission.

The FCC said requiring the posting of Form 452-C had proved to be of little enforcement value and deletion would be in line with the Commission policy of deregulation in the Personal Radio Services.

The Commission noted that even after deletion of the Form 452-C the rules regarding the posting of station licenses will remain the same.

#### FCC Receives Record Number of CB Applications

A record number of CB applications—980,253—were received during January, 1977. This is the highest number of applications filed during any 1 month period in the Commission's history. Actually, more applications were received during the first 5 days than for the entire year of 1973.

Some of the reasons for this increase may be due to:

- The suspension of CB license fees on January 1.
- The increase in channels from 23 to 40.
- The availability of new 40 channel sets.
- The Christmas rush.
- Increased public awareness of CB.

A total of 504,484 new CB licenses were issued during January, boosting the number of licensed CBers to 8,159,176.

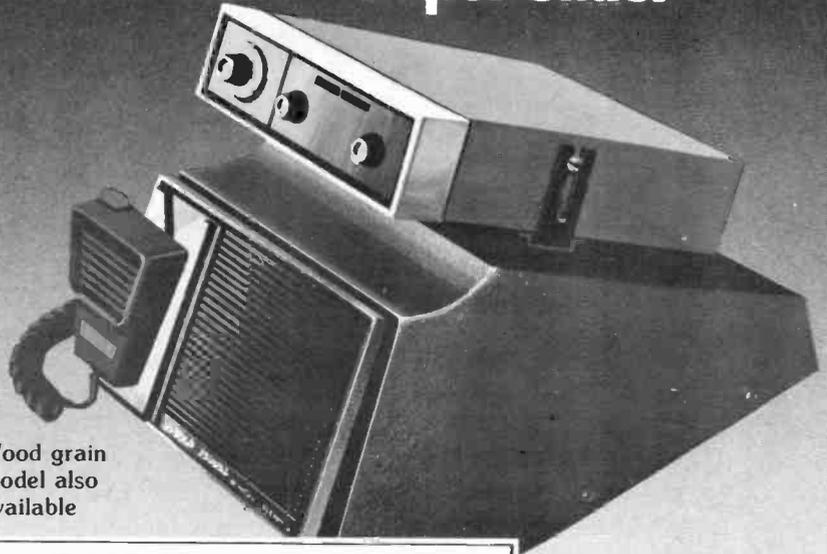
#### CB Channel 9—The Emergency Channel

Channel 9 is the "Emergency Channel" for the Citizens Band (CB) Radio Service. It is monitored in many states 24 hours a day by hundreds of volunteer public service groups, local law enforcement agencies and individual citizens. Experience has demonstrated that Channel 9 can be effective in bringing help to emergency situations involving personal safety and the protection of property. Newspapers and magazines frequently report stories that illustrate the value of Channel 9.

The Commission wishes to remind the public that this valuable public service can continue only if CB operators voluntarily limit their transmissions on Channel 9 to those involving

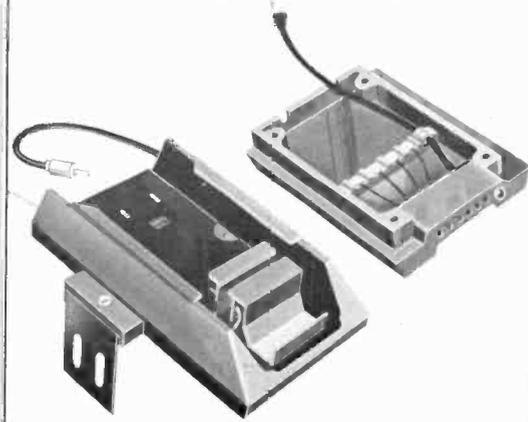
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## The world's classiest hump mount now has the best slide mount. Super Slide.



Wood grain model also available

### "SUPER SLIDE™"



Super Slide is available separately in CB, amateur radio and car stereo models

**SOUND MOUNT** How do you develop quality? We gave our designers 55 tough requirements. They gave us the Sound Mount—a tough, classy hump mount that not only looks great but does everything a mount should do. Then we added the Super Slide, the greatest advance in slide mount technology. The radio can be detached easily. Controls and mike are visible from the normal driving position. A communications speaker directs sound at the driver, not the floor. It can be mounted to the hump or roof. With the Sound Mount your radio will sound better, look better and won't be stolen. You can take it with you.

**SUPER SLIDE** It's more than a slide mount. It's a precision instrument, developed in conjunction with a highly regarded engineering firm. It has BNC type coaxial antenna connectors and pin-and-socket connectors for power, ground and extension speaker. No power reaches the radio until all other contacts are engaged. Thus no final stage burnouts. Insertion and removal are easy and smooth. An independent test report calls it "far superior to competitive models tested... no SWR loss." Standard on all Sound Mounts and also available separately.

## GAMBER-JOHNSON, INC.

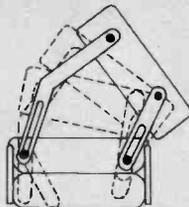
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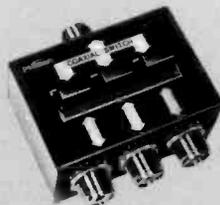
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the immediate safety of life or protection of property or assistance to motorists. Communications should be kept as short as possible. If extended communications are necessary, transfer to one of the other CB Channels. This will allow other emergency messages to be transmitted on Channel 9.

### FCC Has Not Changed 40-Channel CB Power Limits

The Commission affirmed that it had not changed the power limitations on the new 40-channel Citizens Band radio sets.

The power limits for the 40-channel sets remain the same as those for 23-channel sets, the FCC said. That means that transmitter output power limits stay at 4 watts (carrier power) for conventional AM sets and 12 watts (peak envelope power for single sideband sets).

The FCC noted that since retail stores had begun selling the 40-channel sets on January 1, some public confusion had developed over power limits.

It recommended that persons interested in determining the exact power output of a particular CB set contact the radio equipment manufacturer or retail dealer, or review the manufacturer's technical specifications.

### "AFCB" Club

The FCC designated for hearing the application of the American Federation of CB'ers (AFCB) for a Class D Citizens radio station license to determine the effect of the prior Commission decision revoking the license of George Bennett and the court orders and conviction directed against George Bennett and the United CB'ers of America, on the qualifications of AFCB; the relationship between George Bennett and AFCB; the relationship between the United CB'ers of America and AFCB; whether AFCB possesses the requisite qualifications to be a licensee of the Commission; the manner in which AFCB will utilize the 5,000 transmitters specified in its application; and whether the public interest, convenience and necessity would be served by a grant of the application.

### SHOW CAUSE NOTICES

The Commission ordered the following licensees to show cause why their licenses should not be revoked for violation of Section 301 of the Communications Act of 1934:

Lake Havasu City, Ariz., Arthur Galvez, KFW-0744.

Arleta, Calif., Donald W. Earley, KIX-1353.

Chula Vista, Calif., Stuart A. Cole, KZC-7409.

Sacramento, Calif., Charles W. Wilson, Jr., KDZ-0878.  
 Simi, Calif., Kenneth K. Marshall, KES-6085.  
 Vallejo, Calif., Raymond C. Standing, KSP-5493.  
 Fern Park, Fla., Horace A. Landry, KGP-4639.  
 Orlando, Fla., Samuel E. Branch, KYU-1956.  
 Lewiston, Mont., Allison E. Beyer, KIR-8934.  
 Eugene, Oregon  
 Walter J. Taubenkrau, KXY-5242.  
 Bruce E. Smith, KHS-7552.  
 Walling's Floor Service, KHL-3763.  
 Salem, Oregon  
 Phillip M. Schiller, KKF-4756.  
 Ronald E. Brunk, KND-4719.  
 Springfield, Oregon  
 Robert H. Juzelin, KSN-3321.  
 Howard P. Benjamin, KGR-2158.  
 Veneta, Ore., Bernard E. Manchester, KSD-7372.  
 Harlingen, Tex., Randy L. Ovenden, KTH-8768.  
 Houston, Tex., Ronald F. Going, KYZ-7313.  
 Spokane, Wash., Ramax Printing Service, KHL-3763.

The Commission ordered the following licensees to show cause why their licenses should not be revoked for violation of Section 1.89 of the rules by failing to respond to official communications:

San Francisco, Calif., Larry Espinosa, KHf-7209.  
 Casselberry, Fla., John M. Klele, KGI-5136.  
 Ship radio station WYP-8719 aboard the vessel CISALGO II.  
 Ocala, Fla., Robert J. Roberts, KLR-6020.  
 Detroit, Mich., Tommie L. Brown, KGR-2672.  
 Eugene, Ore., Walling's Floor Service, KQQ-9124.  
 Los Angeles, Calif., Ali Hassan, KFN-4952. Ordered that the licensee show cause why its license should not be revoked for willful violation of various sections of Part 95 of the Commission's Rules including Section 95.41 for communicating with another station on a frequency then reserved for intrastation communications.

#### REVOKED

The Commission ordered that the following licenses be revoked for violation of Section 1.89 of the rules by failing to respond to official communications:

Oakland, Calif., Jimmie L. Wilkins, KGT-7353.  
 West Hollywood, Fla., Glulio L. Nardi, KYN-3025.  
 (continued)

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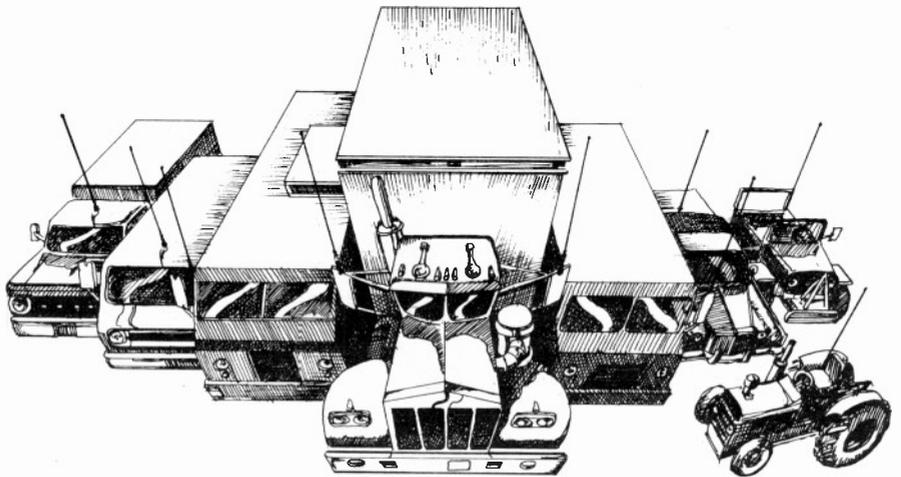
FOR BARGAIN CB CATALOG!

# HENSHAW'S

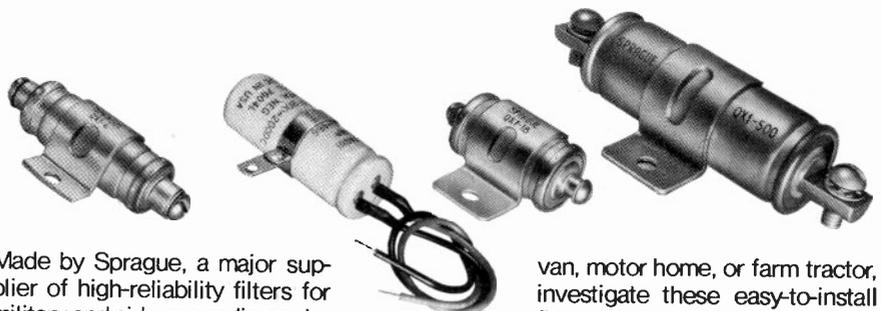
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For the Sprague distributor or dealer nearest you, write to Joe Cronin, Sprague Products Co., 663 Marshall St., North Adams, Mass. 01247.



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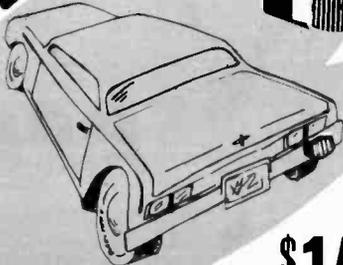
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Kansas City, Mo., Dennis P. Paice, KTV-2657.

Saint Joseph, Mo., BeGverly A. Beckwith, KJL-9765.

San Bernardino, Calif., Richard R. Jennings, KXV-0415.

Branford, Conn., Richard L. Crouch, KBV-3107.

Philadelphia, Pa., Edward Butler, KGL-1020.

Hazel Park, Mich., Michael W. Wells, KIR-1630. Ordered that the license be revoked for willful violation of various section of Part 95 of the rules including Section 95.95(c) which requires that all transmissions from each unit of a Citizens radio station be identified by the transmission of its assigned call sign at the beginning and end of each transmission or series of transmissions.

Portland, Ore., Robert E. Plaschka, KGO-6927. Ordered that the license be revoked for willful violation of various sections of Part 95 of the rules including Section 95.91(b) which requires a five-minute silent period between contacts.

Oxon Hill, Md., Robert L. Niess, KER-2684. Ordered that the license be revoked, effective February 18, for willful violation of various sections of Part 95 of the Commission's Rules including Section 95.103 for refusing to make his radio station available for inspection upon the request of an authorized representative of the Commission.

### NOTICES OF APPARENT MONETARY LIABILITY

The Commission issued Notices of Apparent Liability to Monetary Forfeiture on various dates to the following radio station licensees in the Citizens Radio Service for willful violation of various sections contained in Part 95 or a repeated violation of Sec. 1.89 of the Commission's Rules:

Kenai, Alaska, Dan's TV Service, \$50, KYO-9876.

Pomona, Calif., Duane M. Ankeney, \$100, KHH-6193.

Concord, Calif., Karen A. Scott, \$50, KAFU-9067.

Daly City, Calif., Dan Franco, \$100, KPV-6369.

Haywood, Calif., Frank T. Baughman, \$50, KNC-6435.

San Francisco, California

Nick P. Triantus, \$100, KADE-6154.

Sam K. Wong, \$100, KACW-8557.

Tampa, Florida

Donald L. Geary, \$100, KLI-2745.

Robert R. Scott, Jr., \$50, KAHR-1828.

Kenner, Louisiana

Albert Rose, Jr., \$50, KPP-3699.

Essie L. Toler, \$50, KET-70062.

New Orleans, Louisiana  
 J. D. Mills, \$100, KRB-0020.  
 Arthur L. Walker, \$50, KJS-5123.

Amesbury, Mass., Anthony J. Wallaga,  
 \$50, KFM-8588.

Methuen, Massachusetts  
 Frederick H. Eudenbach, \$50, KAGD-2753.  
 Williard P. Farrell, \$50, KIJ-1467.  
 Carol A. Landry, \$50, KQP-1249.

North Andover, Mass., James L. Fazio,  
 \$50, KJF-01845.

Baltimore, Md., Bessie M. Carter, \$50,  
 KQZ-2554.

Rochester, N.Y., Willie C. Harvey, \$50,  
 KZH-6769.

Rio Piedras, P.R., Gilberto Vera, \$100,  
 KACW-8648.

Saluda, Va., Marcellus E. Johnson, \$50,  
 KAHB-2373.

West Point, Virginia  
 McArthur Chamberlain, \$50, KAAL-8149.  
 Robert C. Ronk, \$50, KMY-7935.

Napa, Calif., Robert R. Covington, \$50,  
 KAFA-2444.

Chicago, Illinois  
 Jerome J. Sackeck, \$50, KAAH-0533.  
 Julie M. Morrow, \$50, KWQ-9785.

Hanover Park, Ill., Gilbert L. Carlson,  
 \$50, KACZ-6303.

Streamwood, Ill., Raymond E. Olson,  
 \$100, KDA-5530.

North Tonawanda, N.Y., Charles V. Slack,  
 \$50, KGR-7551.

Palisades Park, N.J., Louis Tonachio,  
 \$50, KLT-07650.

Anasco, P.R., Isidro Mandez, \$50, KIM-00610.

Houston, Texas  
 Geoffrey B. Owon, \$100, KSC-5300.  
 Paul E. Reagan, \$100, KABX-3243.

Norfolk, Va., Larry D. Lynch, \$50,  
 KAHH-6906.

Whittier, Calif., Hugh D. Woodward, Jr.,  
 \$50, KCL-4529.

Albuquerque, N.M., Julian Romero,  
 \$50, KJR-87110.

Fort Wayne, Indiana  
 Willis L. Bolin, \$50, KGL-4843.  
 John L. Deturk, \$100, KIH-2754.  
 Russell C. Dugan, \$50, KYD-8535.  
 Porter M. McDowell, \$150, KCL-9518.  
 Richard D. Spice, \$150, KTW-0323.

Akron, Ohio, Nantha L. Keesler, \$50,  
 KWN-6682.

Baltimore, Maryland  
 Sylvester C. Jones, \$50, KIY-1590.  
 Hayward Lewis, \$50, KQQ-1659.

Glen Burnie, Md., Rufus M. Williams,  
 \$50, KEZ-1310.

Portland, Maine  
 Morton D. Bentley, \$50, KAHV-4255.  
 Burton C. Laskey, \$50, KDA-4426.  
 Charles W. Weaver III, \$50, KBR-7485.

South Portland, Maine  
 Walter W. Brown, \$50, KFW-6968.



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Medallion—a Division of Midland International, makers of America's best-selling CB radios—has put together a great new family of In-Dash CB-AM/FM Stereo Combos—both 40 channel and 23 channel. They're compact, high-performance, sharp looking and about as theftproof as your speedometer. They're great ideas... that's why you, and your car, deserve one.

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- Richard W. Kennedy, \$50, KDD-3036.  
Edward P. Killinger, \$50, KNG-5880.  
Dodge Center, Minn., Larry Narveson, \$50, KBH-6613.  
Philadelphia, Pa., Lewis E. Crosby, \$50, KXP-3677.  
Atlanta, Ga., Dallas F. Johnson, \$50, KAHU-7621.  
Buford, Ga., Larry P. Bailey, \$150, KWQ-8645.  
Chattanooga, Tenn., Ronald J. Johnson, \$100, KKK-8373.  
Dallas, Tex., Joyce A. Lindley, \$50, licensee of Citizens radio station KADC-6539. For violation of Section 95.95(c) of the Commission's Rules by failing to identify radio station by the assigned call sign.  
Shelbyville, Tex., John P. Whittington, \$150, licensee of Citizens radio station KXQ-4366. For violation of Section 95.41(d) of the Commission's Rules by operating radio station on a frequency not authorized by the Commission for use by such station, Section 95.95(c) of the Commission's Rules by failing to identify radio station by the assigned call sign, and Section 95.83(b) of the Commission's Rules by communicating, or attempting to communicate, with a unit of the same station or another Citizens radio station over a distance of more than 150 miles.

## Interference MANUAL

A while back S9 put out a dandy (and handy) manual about detecting and eliminating TV Interference, Power Line Interference, Mobile Noise. It was a smash success and we sold out the print run in short order—we thought! A recent inventory of our stock room disclosed that we still had one half of a precious carton of these books remaining. So, hop to it all you who have been bugging us about this book—here's your chance to snap up the few remaining copies of this publication, which has now become a rare classic! Pre-inflation prices, too. *Only \$1, plus 25 cents postage—first come, first served, while they last!*

**NOISE ELIMINATION MANUAL**  
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## COMING EVENTS

(continued from page 71)

### AUGUST

**Bakersfield, Calif.** 1st Annual Jamboree of the Golden Empire Sideband Assoc. August 5-7th. At Kern Co. Fairgrounds, Union Ave. (Old Highway 99) and Ming Ave. For more info write: G.E.S.A. Inc., P.O. Box 967, Bakersfield, Calif 93302 or call 805-399-1321.

**Jacksonville, Florida.** 1st Annual Jamboree of American Eagle CB Club. August 6-7th at Phillips Mall, Phillips Highway. For more info write club at P.O. Box 7205, Jacksonville, Florida 32210 or call John Hollingsworth, 904-737-9527 after 5 pm.

**Alexandria, La.** 12th Annual CB Jamboree of Mid-State CB Radio Club, Inc., August 6 & 7th at the Rapides Parish Coliseum. For information write: Mid State CB Club, P.O. Box 1945, Alexandria, La.

**Logan, W. Virginia.** Jamboree of Logan County Citizens Band Radio Club. August 6 & 7th, at Logan Memorial Fieldhouse. For more info write Chairman at P.O. Box 364, Logan, W. Va. 25601.

**Alexander, New York.** 3rd Annual Coffee Break of the Friendly Group CB Club. August 14th at the Alexander Firemens Park, Rt. 98, 1/2 mile south U.S. 20. Proceeds go to Burn Treatment Center of Western New York. Contact Ann Cory, Secretary at 5849 Broadway, Lancaster, N.Y. 14086.

**Morgantown, West Virginia.** 5th Annual Jamboree of Mon-Valley React Club 2209. August 26-28th at Chestnut Ridge Camp Grounds. Coopers Rock exit off U.S. Route 48 to Rt. 73 & follow jamboree signs. For more info contact Eugene Fullmer-President, P.O. Box 1005, Morgantown, W. Va. 26505.

**Baton Rouge, La.** 7th Annual Jamboree and Dance. August 27 & 28th at L.S.U. Assembly Center. Sponsored by the L.A. Capital City Area C.B. Ass'n, P.O. Box 15464, Baton Rouge, La. 70895. Phone (504) 261-3179.

### SEPTEMBER

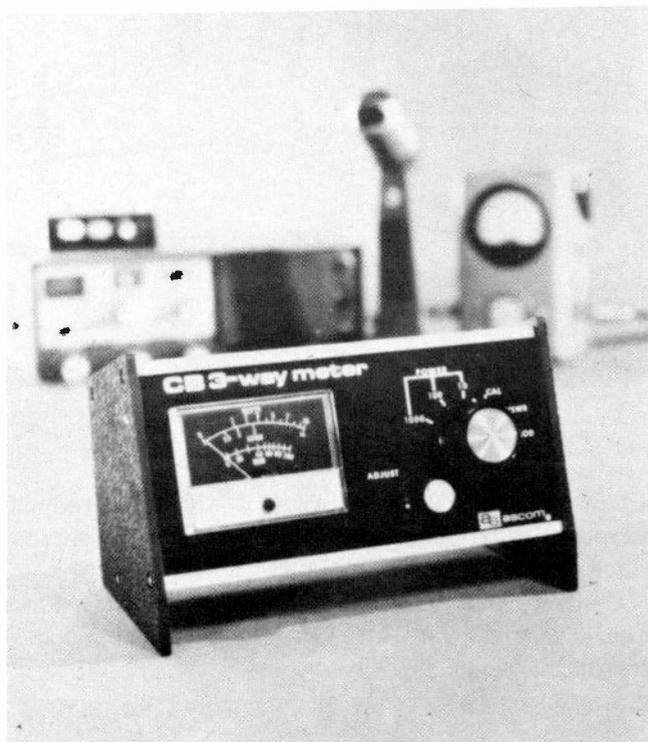
**Webster, Mass.** 12th Annual Jamboree of Southern New England Citizens Radio Ass'n. Sept. 11th at Point Breeze, just off Rt. 193. For more info contact Bess Stevens, A. F. Putnam Rd., Charlton, Mass. 01507. (617) 248-5288.

**West Deering, New Hampshire.** 3rd Annual Coffee Break, September 18th at Deering Fish & Game Grounds. Monitor Channel 14, KAFX-9379. For more information contact Sunshine CB Club, R.F.D. #2, Hillsboro, N.H. 03244.

**Lake Havasu City, Arizona.** Jamboree Sept. 23-25th at Crazy Horse Campgrounds. For more info write Jamboree Secretary, Box 582, Lake Havasu City, Arizona 86403. Bucket Seat, Secretary.

## ON THE COUNTERS

(continued from page 56)



### NEW 3 IN 1 CB METER

A new three way meter that provides accurate measurement of CB system performance, model M-272, is now available from The Antenna Specialists Co. Combining three CB test instruments into one compact case, the M-272 serves as a watt meter, a modulation bridge, and a VSWR bridge. Separate scales are provided for each function with a tri-level watt meter scale for 10/100/1000.

The manufacturer's suggested list price is \$59.95. For further specifications contact: The Antenna Specialists Co., 12435 Euclid Avenue, Cleveland, Ohio 44106, or mark number F05 on Reader Service Card.

### OFFICIAL CB BOARDS

Aero Products Research, Inc., has announced production of a line of *Official CB Boards*; handy car desks adapted from the kneeboards used by pilots. Quoting APR's president, Leonard Wilstein, "This is an item no CBER on the move can be without. Mobile CBERs need a stable writing surface to keep pad and pencil at their fingertips. The *Official CB Board* is a desk that straps right to the thigh."

Made of sturdy anodized aluminum, the CB Boards feature comfortable, fully adjustable leg straps, non-slip cushion backing, and a strong low-profile spring clip. All common CB words and phrases, an abbreviated list of CB 10 codes, and channel procedures are printed on the face of the *Official CB Board*.

Already considered one of the hottest items in the CB market, the CB Board is also available in two alternate versions. The *Lady Breaker Board* is printed in lavender with a picture of a pretty lady breaker and,



to add an additional feminine touch, the leg strap is a fancy garter. The *Good Buddy Board* has a picture of that traditional good buddy every CBER knows.

A suggested retail price of \$9.95 includes a 156-page *Complete CB Dictionary* explaining all CB words and phrases, all CB and police 10 codes, FCC CB regulations, the international phonetic alphabet, the international time system and Q codes.

For dealer and distributor information contact Aero Products Research, Inc., 11201 Hindry Avenue, Los Angeles, CA 90045, or mark number F14 on Reader Service Card.

### IN-DASH 40-CHANNEL CB WITH AM/FM/MPX RADIO

The Medallion Division of Midland International Corporation is introducing a new Model 63-240 which combines a high performance 40-channel Citizens Band transceiver with pushbutton AM/FM/MPX radio in one in-dash component.

The CB in Model 63-240 features full legal power transmitter, dual conversion superheterodyne receiver with automatic gain control and variable squelch, and lighted signal/power meter. A dual-color L.E.D. signals red for transmit, green for receive.

The AM/FM/MPX radio has 5-pushbutton tuning, local DX switch and tone and fader controls. Stereo delivers 4 watts RMS per channel.

A convenient CB monitor switch permits standby CB while AM/FM radio is operating.

For information on the complete Medallion line of car sound products, write to: Medallion, Division of Midland International Corporation, P.O. Box 1903, Kansas City, Mo. 64141, or mark number F11 on Reader Service Card.

### NEW LOW-PROFILE CB ANTENNA

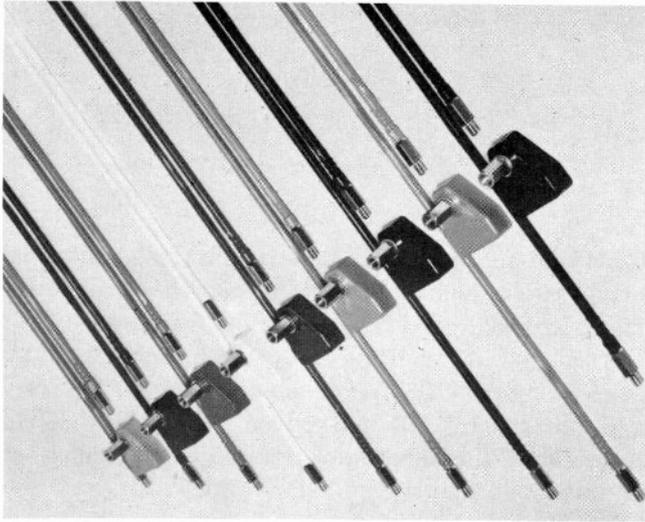
Mercury Antenna Company has introduced a totally new CB antenna designed particularly for recreational vehicles. Model RA-101.

The antenna, only 5 inches in height works like a

whip with SWR of 1.5:1 or less. It receives & transmits on 40 channels and can be used on metallic or non-metallic surfaces. It is easily installed for portability or permanence.

The RA-101 series are provided with 18 feet of coaxial cable and are factory pretuned.

The Mercury Antenna Company, Sales Div. is located at 1736 E. Sunshine, Springfield, Missouri 65804, or mark number F23 on Reader Service Card.



### "COLORWHIP"

You can get a CB whip to match you car, whether it's red, blue, white, tan, black, brown, gray, green, or yellow! And trunk mount to match!

The "ColorWhip" antennas and mounts may be purchased in matching or mixed colors. This permits matching or contrasting the car colors, or mixing them to match two-tone cars.

Top-quality throughout, the patented new antennas are fiberglass whips (4' or 6' lengths) with top-loaded helically wound radiators, plastic static sheaths, and chrome-plated  $\frac{3}{8}$ -24 brass ferrules. The 4' ColorWhip antennas retail for \$10.25, the 6' antennas are \$11.25.

The rugged new MayCom no-drilling trunk mounts (model GW-7) also are available in colors to match the ColorWhip antennas. And they're so rugged, they are guaranteed—MayCom will replace them if they break. The mounts are priced at \$13.45 retail and are packaged for pegboard display. MayCom also offers packaged combinations of trunk mounts and 4' antennas in various colors.

Contact MayCom, Stevensville, Michigan, 49127, or mark number F12 on Reader Service Card.

### CONNECTOR KIT

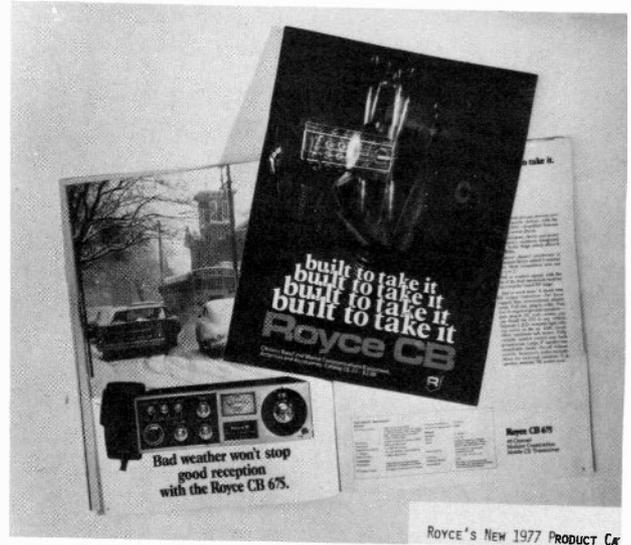
Arco Electronics has assembled a design/service kit of popular receptacles, adapters and plugs used in lower frequency applications (up to 300mc) in CB, marine and mobile two-way communications. Units are plated with new, non-tarnish ULTRALLOY™ finish.

Kit contents: 2—SO-239 panel receptacles, 1—PL-258 straight adapter, 1—M-358 tee adapter, 1—M-359 angle



adapter, 4—PL-259 straight plug, 4—UG175/U reducing adapter. Units are packed in plastic storage container. Limited offer special sale \$11.95.

Contact Arco Electronics, Inc., Community Drive, Great Neck, New York 11022, or mark number F28 on Reader Service Card.



### ROYCE ANNOUNCES CATALOG

Royce Electronics Corporation, has announced the release of their full line product catalog.

The 40-page full-color catalog contains Royce's entire new line of 40-channel AM and SSB CB transceivers, hand-helds, marine communications equipment, and their full line of antennas and accessories.

Featured items are: Royce's one base and five mobile CB's with solid state modular chassis construction; a new 40-channel in-dash unit with an AM/FM stereo entertainment radio and LED channel readout; and a new line of antennas and several new accessories.

The catalog is useful to dealers as a guide to Royce's complete line of products, and as a customer sales tool.

To receive the new catalog, send \$2.00 to Gary Miller, Advertising Manager, Royce Electronics Corporation, 1746 Levee Road, North Kansas City, Missouri 64116, or mark number F19 on Reader Service Card.

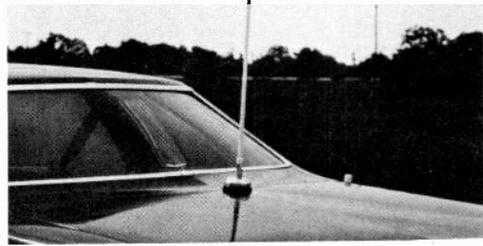
## CB ANTENNA THAT DOESN'T LOOK LIKE

"The Little Fooler", the new AM/FM/CB antenna by Anixter-Mark, deters theft simply because it doesn't look like a CB antenna. It looks like an ordinary three-section telescopic antenna that extends from 22" to 57".

This disguised CB antenna also delivers unique performance. It transmits and receives CB simultaneously with AM and FM. There is no distortion or loss of reception on the AM/FM band, while punching out a clear CB signal.

"The Little Fooler" covers all the channels on the CB band, plus easy coupler adjustments allow new channels to be tuned-in (VSWR of 1.2 to 1 on any of the 40 channels.)

Mark number F30 on Reader Service Card.



## VENDETTA

This is not just another fiberglass antenna. This is the Vendetta Antenna featuring the unique V-load design. The V-load design completely eliminates inefficient loading coils. In fact there are no windings at all. This antenna is continuously loaded to greatly increase transmission power. R F energy is controlled to provide a signal path parallel to the horizon.

The Vendetta Antenna increases signal output by providing more power to the antenna. Vendetta's broad response permits a lower SWR over all present and proposed CB channels.

The Vendetta Antenna features a rigid steelweave

fiberglass rod with vinyl covering and an adjustable stainless steel tip rod. This construction is very effective in reducing the, until now, universal problem of antenna sway and fade out.

The fittings are heavy-duty chrome plated brass and the stud fits all standard mounts. Available mountings include trunk lip, body mount, single mirror and dual co-phase mirror mount.

All Vendetta Antennas are protected by an unconditional six month guarantee.

For further information contact Eagle Electronics, 2714 Louisiana, Houston, Texas 77006, or mark number F29 on Reader Service Card.

## CB SPECIALS-R.F. DRIVERS-R.F. POWER OUTPUTS-FETS

2SC481	1.85	2SC767	15.75	2SC866	5.85	2SC1449-1	1.60	40081	1.50
2SC482	1.75	2SC773	.85	2SC1013	1.50	2SC1475	1.50	40082	3.00
2SC495	1.10	2SC774	1.75	2SC1014	1.50	2SC1678	5.50	2SC608	4.85
2SC502	3.75	2SC775	2.75	2SC1017	1.50	2SC1679	4.75	SK3046	2.15
2SC517	4.75	2SC776	3.00	2SC1018	1.50	2SC1728	2.15	SK3047	3.75
2SC614	3.80	2SC777	4.75	2SC1173	1.25	2SC1760	2.15	SK2095	3.50
2SC615	3.90	2SC778	3.25	2SC1226A	1.25	2SC1816	5.50	SK3048	3.25
2SC616	4.15	2SC797	2.50	2SC1237	4.50	2SC1908	.70	SK3054	1.25
2SC617	4.25	2SC798	3.10	2SC1239	3.50	2SC1957	1.50		
2SC699	4.75	2SC781	3.00	2SC1243	1.50	2SF8	3.00	2SK19	1.75
2SC710	.70	2SC789	1.00	2SC1306	4.75	HEP-S 3001	3.25	2SK30	1.00
2SC711	.70	2SC796	3.15	2SC1306-1	4.75	2SD235	1.00	2SK33	1.20
2SC735	.70	2SC799	4.25	2SC1307	5.75	MRF8004	3.00		
2SC756	3.00	2SC802	3.75	2SC1307-1	6.00	4004	3.00	3SK40	2.75
2SC765	9.50	2SC803	4.00	2SC1377	5.50	4005	3.00	3SK45	2.75
2SC766	10.15	2SC839	.85	2SC1449	1.30	40080	1.25	3SK49	2.75

## JAPANESE TRANSISTORS

2SA52	.60	2SB187	.60	2SC458	.70	2SC815	.75	2SC1569	1.25
2SA316	.75	2SB235	1.75	2SC460	.70	2SC828	.75	2SC1756	1.25
2SA473	.75	2SB303	.65	2SC478	.80	2SC829	.75		
2SA483	1.95	2SB324	1.00	2SC491	2.50	2SC830	1.60	2SD30	.95
2SA489	.80	2SB337	2.10	2SC497	1.60	2SC839	.85	2SD45	2.00
2SA490	.70	2SB367	1.60	2SC515	.80	2SC845	.65	2SD65	.75
2SA505	.70	2SB370	.65	2SC535	.75	2SC1010	.80	2SD68	.90
2SA564	.50	2SB405	.85	2SC536	.65	2SC1012	.80	2SD72	1.00
2SA628	.65	2SB407	1.65	2SC537	.70	2SC1051	2.50	2SD88	1.50
2SA643	.85	2SB415	.85	2SC563	2.50	2SC1061	1.65	2SD151	2.25
2SA647	2.75	2SB461	1.25	2SC605	1.00	2SC1079	3.75	2SD170	2.00
2SA673	.85	2SB463	1.65	2SC620	.80	2SC1096	1.20	2SD180	2.75
2SA679	3.75	2SB471	1.75	2SC627	1.75	2SC1098	1.15	2SD201	1.95
2SA682	.85	2SB474	1.50	2SC642	3.50	2SC1115	2.75	2SD218	4.75
2SA689	1.30	2SB476	1.25	2SC643	3.75	2SC1166	7.0	2SD300	2.50
2SA699A	1.75	2SB481	2.10	2SC644	.70	2SC1170	4.00	2SD313	1.10
2SA705	.55	2SB492	1.25	2SC681	2.50	2SC1172B	4.25	2SD315	.75
2SA815	.85	2SB495	.95	2SC684	2.10	2SC1209	.55	2SD318	.95
2SA816	.85	2SB507	.90	2SC687	2.50	2SC1213	.75	2SD341	.95
		2SB511	.70	2SC696	2.35	2SC1226	1.25	2SD350	3.25
				2SC712	.70	2SC1243	1.50	2SD352	.80
2SB22	.65			2SC713	.70	2SC1293	.85	2SD380	5.70
2SB54	.70	2SC206	1.00	2SC732	.70	2SC1308	4.75	2SD389	.90
2SB56	.70	2SC240	1.10	2SC733	.70	2SC1347	.80	2SD390	.75
2SB77	.70	2SC261	.65	2SC733	.70	2SC1383	.75	2SD437	5.50
2SB128	2.25	2SC291	.65	2SC739	.70	2SC1409	1.25	MPS-U31	
2SB135	.95	2SC320	2.00	2SC715	1.75	2SC1410	1.25	MPS 8000	at 4.00 ea.
2SB152	4.50	2SC352	.75	2SC762	1.90	2SC1447	1.25		at 1.25 ea.
2SB173	.55	2SC353	.75	2SC783	1.00	2SC1448	1.25		
2SB175	.55	2SC371	.70	2SC784	.70	2SC1507	1.25		
2SB178	1.00	2SC372	.70	2SC785	1.00	2SC1509	1.25		
2SB186	.60	2SC394	.70	2SC793	2.50				

## POWER-TRANSISTORS HIGH-VOLT. TV. TYPE

BUZ04	1300V	3.90	BUZ07	1300V	5.40	2SC1172B	1100V	4.25
BUZ05	1500V	4.70	BUZ08	1500V	6.25	2SC1308	1100V	4.95
BUZ06	1700V	5.90	2SC1170	1100V	4.00	2SC1325	1100V	4.95

... Use S9 READER SERVICE.

## OEM SPECIALS

1N270	.10	2N960	.55	2N2219A	.30	2N2913	.75	2N3740	1.00	2N4401	.20
1N914	.10	2N962	.40	2N2221	.25	2N2914	1.20	2N3771	1.75	2N4402	.20
		2N967	.50	2N2221A	.30	2N2916A	3.65	2N3772	1.90	2N4403	.20
2N173	1.75	2N1136	1.35	2N2222	.25	2N3019	.50	2N3773	3.00	2N4409	.20
2N178	.90	2N1142	2.25	2N2222A	.30	2N3053	.30	2N3819	.32	2N4410	.25
2N327A	1.15	2N1302	.25	2N2270	.40	2N3054	.70	2N3823	.70	2N4416	.75
2N334	1.20	2N1305	.30	2N2322	1.00	2N3055	.75	2N3856	.20	2N4441	.85
2N336	.90	2N1377	.75	2N2323	1.00	2N3227	1.00	2N3866	.85	2N4442	.90
2N338A	1.05	2N1420	.20	2N2324	1.35	2N3247	3.40	2N3903	.20	2N4443	1.20
2N398B	.90	2N1483	.95	2N2325	2.00	2N3250	.50	2N3904	.20	2N4452	.55
2N404	.30	2N1540	.90	2N2326	2.85	2N3375	6.50	2N3905	.20	2N5061	.30
2N443	1.75	2N1543	2.70	2N2327	3.80	2N3393	.20	2N3906	.25	2N5064	.50
2N456	1.10	2N1544	.80	2N2328	4.20	2N3394	.17	2N3925	3.75	2N5130	.20
2N501A	3.00	2N1549	1.25	2N2329	4.75	2N3414	.17	2N3954	3.50	2N5133	.15
2N508A	.45	2N1551	2.50	2N2368	.25	2N3415	.18	2N3954A	3.75	2N5138	.15
2N555	.45	2N1552	3.25	2N2369	.25	2N3416	.19	2N3955	2.45	2N5198	3.75
2N652A	.85	2N1554	1.25	2N2484	.32	2N3417	.20	2N3957	1.25	2N5294	.50
2N677C	6.00	2N1557	1.15	2N2712	.18	2N3442	1.85	2N3958	1.20	2N5296	.50
2N706	.25	2N1560	2.80	2N2894	.40	2N3553	1.50	2N4037	.60	2N5306	.20
2N706B	.40	2N1605	.35	2N2903	3.30	2N3563	.20	2N4093	.85	2N5354	.20
2N711	.50	2N1613	.30	2N2904	.25	2N3565	.20	2N4124	.20	2N5369	.20
2N718	.60	2N1711	.30	2N2904A	.30	2N3638	.20	2N4126	.20	2N5400	.40
2N718	.25	2N1907	4.10	2N2905	.25	2N3642	.20	2N4141	.20	2N5401	.50
2N718A	.30	2N2060	1.85	2N2905A	.30	2N3643	.15	2N4142	.20	2N5457	.35
2N720A	.50	2N2102	.40	2N2906	.25	2N3645	.15	2N4143	.20	2N5458	.30
2N918	.35	2N2218	.25	2N2906A	.30	2N3646	.14	2N4220A	.45	C103y	.25
2N930	.25	2N2218A	.30	2N2907	.25	2N3730	1.50	2N4234	.95	C103d	.40
2N956	.30	2N2219	.25	2N2907A	.30	2N3731	2.75	2N4400	.20	C106b1	.50
										C106di	.75

## SILICON UNIUNIONS

2N2646	.50	2N4871	.50
2N2647	.60	2N4891	.50
2N6027	.55	2N4892	.50
2N6028	.70	2N4893	.50
D5E37	.25	2N4894	.50
2N2160	.65	MU10	.40
2N4870	.50		

## INTEGRATED CIRC.

UA703C	.40
709C OP. AMP.	.25
741C OP. AMP.	.25
7400	.15
TA7061P	at 3.50 ea.
TA7205P	at 10.00 ea.
UPC100H2	at 6.00 ea.
NE555	at 1.25 ea.

## RECTIFIERS

	10	100
IN4001	.60	5.00
IN4002	.70	6.00
IN4003	.80	7.00
IN4004	.90	8.00
IN4005	1.00	9.00
IN4006	1.10	10.00
IN4007	1.20	11.00



New-Tone Electronics  
P.O. Box 1738 A  
Bloomfield, N.J. 07003  
Phone: (201) 748-6171

748-6172  
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N.J. residents add 5% sales tax. Minimum order \$5.00. All orders add \$1.00 postage. Dealers write or phone for discount prices.



### STEREO PHONO-INPUT INTERFERENCE FILTER

A newly designed Stereo Interference Filter has been introduced by Electronic Specialists. CB transmissions often enter a stereo or hi-fi system through the phono or cassette input cables.

Designed to plug directly into the amplifier input jack, a filter in each amplifier input will greatly reduce or eliminate phono-input interference.

Electronics Specialists, Box 122, Natick, Mass. 01760, or mark number F32 on Reader Service Card.



### SERIES OF CASSETTE TAPES

A new series of children's "Know About" cassettes has been produced for retail sales by Soundex Distributing, Inc., Milwaukee, WI. The cassette tapes come packaged with a read along book for children to follow the story. Written and recorded for children and adults. Six tapes and books now available and include "CB Radio". Cassettes and books are designed to help children learn through both reading and hearing actual sounds. "Know About" cassette tapes and books are attractively packaged. Contact: Soundex Distributing, Inc., 4307 W. Vliet Street, Milwaukee, WI 53208, or mark number F33 on Reader Service Card.



### FREQUENCY COUNTER

VIZ Test Instruments Group of VIZ Mfg. Co., Philadelphia, Pa., has introduced a frequency counter to its growing line of test instruments. The WD-752A counter is designed for making frequency measurements between 10Hz and 6MHz in audio, video, CB ham radio and other communications equipment.

A unique feature of the counter is its 1kHz audible side tone with separate on-off volume control. The 1kHz tone is valuable in modulating single-sideband transceivers for carrier-frequency measurement. The counter has a selectable input sensitivity of either 10 or 100mV; the lower sensitivity is valuable when considerable noise is present with the signal.

The counter uses a carefully selected 10.000MHz crystal to create an extremely accurate time base, ensuring the accuracy of the 10, 100, and 1000-millisecond gate signals and logic control. The measuring circuit is composed of a six-state IC counter which feeds into a very bright readout made up of six 0.3" seven-segment LEDs. The frequency, decimal point, and range (either MHz or kHz) are all displayed automatically. A signal lamp indicates when the signal is sufficiently strong to be counted and indicates when the higher-sensitivity input is required. An overflow lamp indicates a signal that exceeds 1MHz when using the 1-second fixed gate.

The BNC input is compatible with most standard broadband oscilloscope probes. When making measurements of transmitter or transceiver AM frequencies, the counter is positioned near the transmitter and a one-meter cable attached to the input serves as a pickup antenna. The counter can also be attached directly to a transmitter or transceiver with a directional coupler and dummy load.

The counter operates on 115V  $\pm$  10V, 50/60Hz. The unit is extremely compact, measuring only 2 $\frac{5}{8}$ " x 5 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ ", and weighs only 4 lbs. The dealer-optional price is \$255.00.

Further information on the WD-752A frequency counter is available from VIZ Test Instruments Group, VIZ Mfg. Co., 335 E. Price St., Philadelphia, PA 19144, or mark number F34 on Reader Service Card.



### HI FI FOR YOUR CB!

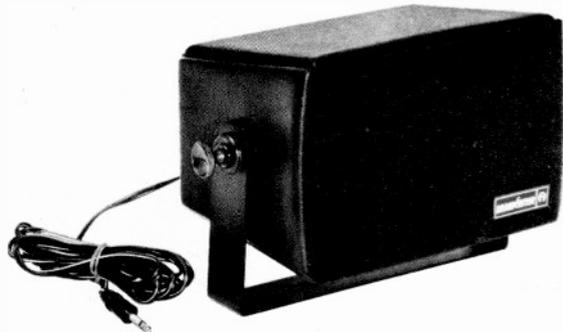
Those clever people at Glatzer Industries have done it again. They call it a Wireless CB Speaker. Of course everybody knows that CB radios have lousy audio, mostly due to the fact that the little 2" or 3" speaker is not exactly hi fi, and the set often has to be located in a bad spot, acoustically speaking. So, of course, there is a big market in external speakers and there are all sizes and shapes that you can buy. BUT, the problem is (a) where do you mount it, and (b) none of them really look very good. When you stop to think about it, where is the best place to mount the speaker for really clear hi fi listening? You guessed it . . . where your car radio speakers are already mounted. But you cannot use them easily. For one thing, the people that build and install auto radios usually make it impossible to find the wires and tap in to them without removing everything that is already installed in your car (must be some kind of job security). And, worse yet, if you are finally able to find the place to make the connection, chances are the audio from the CB can feed back and damage that expensive car radio. **DON'T GIVE UP.** The Glatzer Wireless CB Speaker is the answer. It is actually a miniature AM broadcast transmitter that easily hooks between your car radio and car radio antenna and its plug plugs into the standard external speaker output on the back of your CB set. It comes factory tuned for 540 KHz (for the low end of the AM dial). A screwdriver adjustment can vary the frequency if required (strong local station on 540). Easy to use, turn the unit on, the verify light reminds you it is on. Tune your radio to 540 (most people set a pushbutton for 540) and operate your CB set in the normal manner. The results are truly amazing. You now have your car radio's high quality amplifier and tone control and built-in speakers working to give you truly hi fi reception. In fact, the first thing we noticed was that some stations were really clear and clean and others had quite a bit of distortion. At first we thought there was something wrong with the GWS-19, but then we realized that the audio quality was now so improved that we could actually hear the difference. Before, without the GWS-

19 Wireless CB Speaker, EVERYBODY sounded a little distorted. We had just gotten used to it.

Available now from Glatzer Industries Corp., 268 Huguenot Street, New Rochelle, New York 10801, or mark number F26 on Reader Service Card.

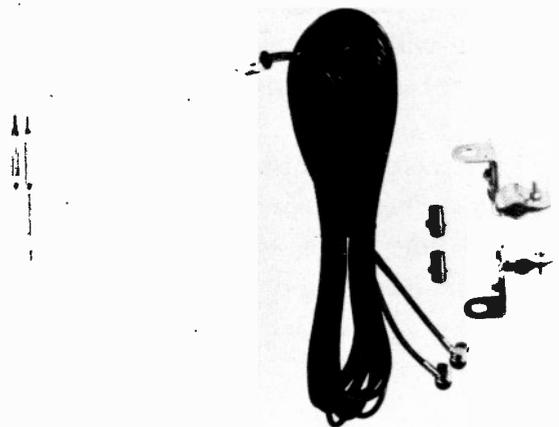
### "BROADCASTER"

Electronic Industries "Broadcaster" extension speaker features a deluxe leather grain enclosure with a weather resistant voice balanced 3x5" speaker. 3 oz. ceramic magnet—8 ohm impedance. Metal mounting bracket with detente lock knobs. With foam grills. Self displayed in full view deluxe package. Also available in plain carton as model 101A.



Model 101C provides high quality voice reception. Acoustically engineered housing aids voice amplification. Special foam grille allows full sound passage without restriction.

For complete literature and the name of Electronics Industries representative in your area, write Electronics Industries, Inc., 333 Taft Drive, South Holland, Illinois 60473, or mark number F01 on Reader Service Card.



### TWIN TRUCK ANTENNA

Sparkomatic Corporation, Milford, Pa., has introduced a new Citizens Band Twin Trucker Antenna, Model SA-25, known as "The Long Ranger". It is a co-phased

# Readers... We need your help!

In addition to S9, we also publish a trade magazine for CB dealers. It's very important to us to have this magazine reach every CB dealer in the country, no matter how large or small.

We'd like you to help us by filling in the names and addresses of every CB dealer that you know about. In return for your time and effort, we'll extend your subscription to S9 by one month for every new dealer name you send us that isn't already on our list.

If you're not a regular subscriber, or if the names you send us are already on the list, we'll still send you a gift in appreciation of your efforts.

The dealers names you send need not be exclusively CB stores. They can be department stores with CB departments, or any other type of store that retails CB equipment.

The accompanying card next to this message requires no postage. Be certain that you include your name and address fully so your gift will reach you properly.

Tnx and best 73's.



Dick Cowan  
Publisher, CB Radio/S9

twin mirror mount antenna for 27 MHz citizens band transceivers.

The new unit includes stainless steel whips, water-proof PVC coil covers and chrome plated fittings. A long life RG-59/U cable provides for lowest possible power loss and the antenna is easily mounted on all truck mirror brackets. It is adaptable for use on RV's, campers and pick-up trucks. It is tunable for lowest SWR and the overall length is 54 inches. Mark number F02 on Reader Service Card.

## A MOBILE CB ANTENNA THAT'S DIFFERENT

Anixter-Mark introduces "The Champ"—an adjustable, top loaded CB antenna. Although it looks like no other antenna, it gives a quality performance similar to Anixter-Mark's renown "Heliwhip."

"The Champ" compliments even the sportiest automobile with its sleek, professional look. It's unlike any CB antenna on the road. It's top loaded with the loading coil wound on a high quality fiberglass whip attached to a heavy chrome plated metal mast and sturdy spring.

It's designed for easy installation, with no drilling required. Mount and cable pig-tail install to trunk lip simply by tightening two set screws. Then cable attaches to mount/pig-tail with unique pull-away connection. This 18 foot cable assembly attaches to the transceiver with PL-259 connector.

"The Champ" offers top performance on all channels, even new ones as they are released. Maximum height: 54". Mark number F03 on Reader Service Card.

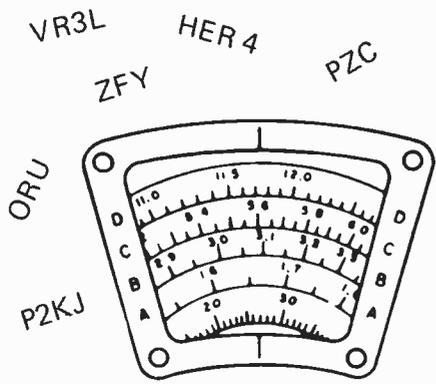
## MAGNETS ARE ATTRACTIVE!

A magnetic mount mobile CB antenna has been introduced by Blazer Communications, Inc. of Fort Myers, Florida, a subsidiary of the Texas-based Communications Industries, Inc.

Called E-Z Hide because of the simple and quick removal for hidden storage in the vehicle when not in use, this antenna can provide security against would-be thieves. Security in use is assured by the quality 70 pound pull magnet located in the base which holds tight even with high speeds or high winds.

Blazer's E-Z Hide is available with either base or center loaded coil. Mounting can utilize spring or swivel. In keeping with Blazer's high quality standards, all components are made and assembled in U.S.A.

Additional information on the complete line of Blazer vehicle CB antennas for AM or SSB is available from distributors or writing to 34 Mildred Drive, Fort Myers, Fla. 33901, or mark number F31 on Reader Service Card.



# DX Korner

Send SWL reports to:  
c/o CB Radio/S9 Magazine  
14 Vanderventer Ave.  
Port Washington, NY 11050

● NE of the very first shortwave stations a brand new shortwave listener (SWL) is apt to hear is the British Broadcasting Corporation.

Auntie Beeb, as the BBC is sometimes called, has been around for some 55 years and in that time she has earned quite a reputation for herself. Virtually no fair minded person will dispute that the BBC news broadcasts are as full and factual as any to be found anywhere.

Things have come a long way since the days of yore when the BBC's newreaders were attired in formal dress as they sat before the microphone, tricked out in tuxedos that the listening audiences would never see.

Things aren't that stodgy at Bush House, headquarters of the BBC in London, these days. But, to be honest, the programs are not as freewheeling and innovative as those offered, say, by the Swedes and the Finns on shortwave. Nor are they as lighthearted—generally speaking—as some of the programs produced by the Dutch and Swiss shortwave services.

There are, however, a lot of listeners who tune the BBC every day. While many SWLs tune in regularly, many are just not aware of how widespread a broadcasting operation the BBC is. In addition to five different transmitter sites in Great Britain, there are BBC programs relayed from other shortwave station sites around the world.

Broadcasting in Great Britain began in November 1927, with experimental transmissions by the Marconi Company from Chelmsford, England. Five years later the regular Empire Service, with English language programs for Commonwealth nations, territories, colonies and protectorates around the globe began from a transmitter site at Daventry in Central England. The Empire Service later became known as the General Overseas Service, and today is called the World Service. The empire, it seems is long gone. But the Daventry shortwave site remains, with four 250 kilowatt shortwave transmitters and even of 100 kilowatts.

A second BBC transmitter site at Rampisham in southern England took to the air in 1941, early in

World War II. It continues to operate today, though the transmitting equipment has been improved and replaced, with four 250 kw'ers and a pair of 100 kilowatt shortwave transmitters.

A third BBC shortwave site in England was also a wartime baby, starting up in 1943. This site was Skelton, in Cumberland in northern England. It operates in the 1970's with a half dozen 250 kw. outlets and a baker's dozen of the 100 kw. units.

Near the border of Wales are located six 250 kw. transmitters at a place called Woofferton. This long has been used to relay the Voice of America broadcasts to eastern Europe. The BBC, on the other hand, uses California facilities of the VOA to relay some of its broadcasts.

The fifth shortwave transmitter site in Great Britain is Crowborough, not too far from London. There are a pair of 100 kw. shortwave units at Crowborough.

As early as the late 1930's, the BBC powers-that-were realized that even powerful transmitters in Great Britain were no guarantee that solid signals could be regularly heard around the world. Thus was born the overseas relay station.

First of the foreign relays was a low powered transmitter established at Singapore in 1939. Programs from London were picked up, then as now, and they were retransmitted. At first the Singapore station was owned by the British Malaya Broadcasting Company. Later the Foreign Office operated the British Far East Broadcasting Service, which relayed the BBC broadcasts. Until 1950, the transmitters were located on the island of Singapore. Since that time the BBC Far Eastern Service has operated transmitters at Tebrau in Malaysia.

The British Broadcasting Corporation's East Mediterranean relay station began transmitting on shortwave from Cyprus during the Suez crisis in 1956. There was a British-sponsored, Arabic-speaking station on Cyprus known as Sharq-al-Adna. The station was taken over openly and it began relaying BBC transmissions. Later the station was transferred to Zyyi on the opposite coast of Cyprus. It operates from the island today with four 100 kw'ers, two 20 kilowatt units and a pair of 7.5 kw. stations on shortwave.

The BBC's Atlantic Relay station on the island of Ascension in the South Atlantic was begun in 1964

at English Bay, in one of the island's volcanic craters. The first of four 250 kw. shortwave transmitters went on the air in July 1966.

Money became a problem for many broadcasters as the century entered its seventh decade. The BBC was no exception. Still interested in improving its coverage in the western hemisphere, a Caribbean Relay was needed. But the costs were considered prohibitive.

The answer, it turned out, was to enter into a joint venture with the West Germans, who had similar goals for their Deutsche Welle shortwave station. The new relay station, used by both the BBC and the German's DW, went on the air from the island of Antigua late in 1976.

By the time you read this, another BBC/DW relay operation on the island of Montserrat, not far from Antigua, should be on the air. Also announced has been another shortwave relay on Masirah island off Oman in the Indian Ocean. The latter's on-the-air-date isn't certain.

Quite an operation, that BBC!

### WHAT'S NEW

The brand new, 31st edition of **WORLD RADIO TV HANDBOOK** is now available. This book, billed as a complete directory of international radio and television, is a must for serious DXers. In addition to worldwide program schedules and frequencies, stat-

tion personalities and addresses, it is packed with other information of interest to the shortwave, medium wave, long wave, TV and FM DXers. The price this year is \$10.95. It is available from Gilfer Associates Inc., P.O. Box 239, Park Ridge, NJ 07656, or Glen Mueller, Billboard Publications Inc., 2160 Paterson Street, Cincinnati, OH 45124.

**SENATOR FROM BENTON HARBOR?** Many SWL's know Barry Goldwater, one-time nominee for president and presently senator from Arizona, is an active radio amateur. What may not be as well known is the fact that the senator is also a nut about electronic gadgetry of all types. The dashboard of his 1969 American Motors limited production auto, an AMX, is said to look like it belongs in the cockpit of a 747 jet plane. Packed into the dash area are a Heathkit two-meter ham transceiver, a Heathkit VHF police and weather monitor receiver, a Heathkit digital clock, a Heathkit tachometer, a Heathkit windshield wiper delay and a Heathkit "siren."

**TERRORISM ON SHORTWAVE.** No claims are made for the accuracy of this information but a West German SWL, reporting to the DXers program, Sweden Calling DXers, says listeners may hear transmissions of Mid-East terrorists. According to the information, the infamous Black September group uses 20 meter band ham frequencies, 14,290, 14,128 and channels between 14,338 and 14,348 kHz for single sideband communications. The call sign consists of two or three

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figures, supposedly. These, presumably, would be coded messages rather than propaganda broadcasts.

**LINGO PROBLEMS?** Are you having trouble telling one foreign language from another when you tune the non-English speaking shortwave stations? You need some help in recognizing those languages . . . no, you don't need to be a linguist, all you have to do is recognize the language and, hopefully, spot some key words. A taped Foreign Language Recognition Course is available. There is a charge for this, but the proceeds go to help handicapped DXers in Canada, the U.S. and elsewhere. For details, write Ian McFarland, Radio Canada International, P.O. Box 6000, Montreal, P.Q., Canada.

#### IN THE MAILBAG

John Easterly, Glendale, CA, has been an SWL since 1956, and now uses a Heathkit SB-313 receiver "hooked up to a 50-foot Windom antenna." John harks back to the days in the 1950's and 1960's when another magazine, "Popular Electronics" had a monthly column for SWLs. John says he's glad S-9 hasn't left the SWL in the lurch!

He also wonders if S-9 is considering a program to issue SWL call signs and awards.

Well, John, there's nothing on the drawing board at this time. I feel that with CBer's "handles" the big rage now, there probably isn't a ground swell of interest in some set of unofficial, so-called SWL call letters.

Awards for SWLing achievements would probably be more popular with listeners but a number of the DX clubs already have full-fledged award programs for their members.

"Here are a few tuning tips for S-9 readers," John adds.

"Radio Tahiti on 15,170 kHz is heard with English daily at 1900 GMT. And Radio Australia has a 'Musical Countdown' program on 5,995 kHz daily after 0900 GMT."

John's tip leads right into the next letter, this one from Jack Kowalski of Orlando, Fla.

"I know this ought to be an SWL report," Jack writes, "but I don't understand about G.M.T. time. Would you please send me the GMT versions of 1:00, 2:00, 3:00 p.m. and so on?"

Okay, Jack, there are two basic propositions to consider here. The first is that G.M.T., which stands for Greenwich Mean Time, is a standard time reference and is the time at zero degrees longitude, which happens to run through Greenwich, England. Being to the east of the U.S., G.M.T. is a number of hours ahead of time in North America. It is, in fact, five hours ahead of Eastern Standard Time, six hours in front of C.S.T., seven hours ahead of M.S.T. and eight hours ahead of P.S.T. (During periods of Daylight Savings Time in the U.S., subtract an hour from each of those differences.)

*(continued)*

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## DX KORNER (continued)

So, when it is 2 a.m. in Orlando (on Eastern Standard time) it is five hours ahead of that or 7 a.m. on the zero or Greenwich Meridian.

The second factor to consider is the use of the 24-hour-clock system which eliminates the need for and the possible confusion of a.m. and p.m. references. Under a 24-hour system the hours between midnight and noon, 1 a.m., 2 a.m., 3 a.m., become 0100, 0200, 0300 and so on. And the p.m. hours continue from 1300 to past 2300 hours. One p.m. becomes, of course, 1300, 2 p.m. is 1400, up to 11 p.m. equaling 2300.

Here are a few examples:

Ten minutes past midnight is 0010.

3:25 a.m. is written as 0325.

Half past 12 noon is 1230.

6:45 p.m. is 1845 hours.

And one minute before the midnight witching hour is 2359.

So, when it is 1 p.m. in Orlando, assuming E.S.T., GMT is 1 p.m. plus five hours, 6 p.m., or, properly, 1800 GMT.

Got that gang? Good!

## DOWN THE DIAL

ANTIGUA—Have you been looking for the Caribbean Relay of the BBC, which I mentioned earlier? As of this writing this powerful West Indian relay sta-

tion could be heard on 6,175 kHz around 0430 to 0730 GMT.

JAPAN—A standard time and frequency station not as familiar to SWLs as WWV, has been reported by west coast listeners on 8,000 kHz. The station is JG2AE and it has been heard about 0900 GMT with "pip" tones marking the seconds, a longer tone on the minute and Morse Code and voice identification on the hour, according to Larry Brookwell, Cal.

INDIA—All India Radio features English news from Delho at 2300 GMT, on 9,590 kHz, according to SWL reports from Australia.

POLAND—Signals may not be up to par, but that's because the programs in English from Polish Radio are beamed to Africa at 1630 GMT. They have been logged in North America, however, on 11,840 kHz.

(Credits—Terry Kruger, Fla.; Larry Brookwell, Cal.; M. Dalrymple, Australia; Michael Camillo, N.Y.; North American SW Association, Box 13, Liberty, Ind. 47353).

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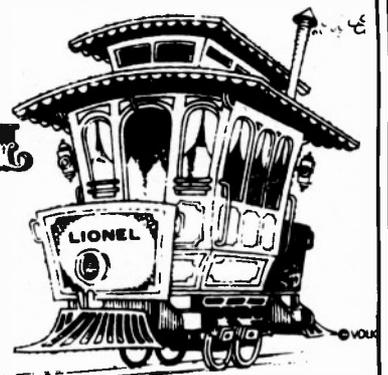
Return with us now to those days of yesteryear, to some of those countries which no longer exist and happier times by quickly taking advantage of our Hammond World Atlas Sale. We have, direct to you, both the Hammond Medallion and Hammond Ambassador Editions for the ridiculously low price of \$6.00 each post-paid. These fine vintage volumes (circa early 60s') sold for much much more and will enhance any coffee table. They're brand new, sealed in cartons. You can always scotch-tape some of the new names onto the maps. Rest assured though, most of the world including the U. S. has remained intact through these times.

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These trains will be for my personal collection. For that reason I can offer top cash or great swaps in radio equipment. Certain accessories bring mucho money. For example, the Lionel Industrial Power Station, Hell Gate Bridge, Scenic Park, etc.

I don't collect American Flyer or Lionel "O 27" gauge, but I will pay extra premiums for Ives models. Don't be bashful. Those old clunkers in your basement or attic will look great on my den walls.

Please write: **DICK COWAN**, Publisher S9,  
14 Vanderventer Avenue, Port Washington, New York 11050

Better still, call collect, if you're not certain what you have.

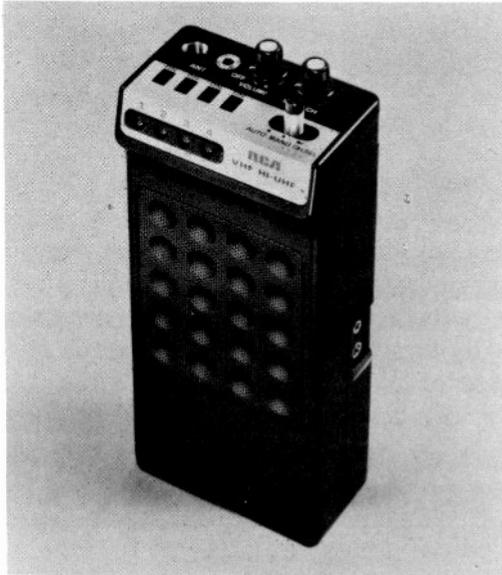
516/883-6200



# The Monitor Post

by Rick Maslau, KNY2GL

Aire Distributor or write to RCA Distributor & Special Products Division, Deptford, NJ 08096, attention: Sales Promotion Services.



## POCKETTE MONITOR

RCA's new Pockette Scanning Monitor, model 16S150, operates on the two most used bands. VHF-Hi, 150-174 MHz and UHF, 450-470 MHz.

This FM scanning monitor is a crystal controlled receiver with an automatic scan circuit that, sequentially, activates selected frequencies on the Public Service Broadcast frequency spectrum. It locks onto a frequency in action and keeps the receiver accurately tuned in so long as the signal remains on the air.

The RCA Scan-Aire, model 16S150, is 100 percent solid state with integrated circuits. It has separate lock-out switches for each of its four channels, squelch control, volume control, automatic/manual scan control, built-in speaker, telescoping antenna, and LED channel indicators.

This unit operates on four AA size batteries (not included)—standard or rechargeable—and can also be used on optional RCA 120 Volt adapter for charging or AC operation. It has a built-in battery charging selector switch that keeps the unit from being inadvertently damaged when AC operated with non-chargeable batteries. Dimensions are 2 $\frac{3}{4}$ " (W) x 6-5/16" (H) x 1 $\frac{5}{8}$ " (D). It weighs 14 ounces. Suggested retail price is \$142.95.

For further information contact your local RCA Scan-

## THE BEARCAT 210

Communications Electronics has introduced its new 5-band, push button, programmable, crystal-less super synthesized scanner. Named the Bearcat 210, this unique scanning instrument gives the user push-button access to more than 16,000 different frequencies including 2 meters and the entire  $\frac{3}{4}$  meter amateur band.

The Communications Electronics Bearcat 210 features exclusive space age electronic advancements and features. Completely synthesized circuitry, including Bearcat custom designed integrated circuits, make possible lower costs and higher reliability.

The synthesizer circuitry permits one to enter or change any ten frequencies in a matter of seconds. The unit will then scan those frequencies at a rate of 20 channels per second. A large digital input and readout display allows the operator to *see* the frequencies he has selected, as well as the frequencies currently being broadcast. Rolling zeros on the large LED display, a Bearcat exclusive, also indicate channels being scanned.

The *search* feature on the Bearcat 210 lets you locate and identify the frequencies that are currently in use by reading the frequency directly from the seven-segment LED readout. This makes this scanner ideal for discovering unknown frequencies.



In addition to an automatic frequency search feature which allows the operator to listen to *selected* segments of the different frequency bands, there is a selectable two-second scan delay that permits the listener to hear all the excitement and prevent missing transmissions when "calls" and "answers" are on the same frequency. A push-button lock-out feature allows selective skipping of those channels not of current interest. Other features include 117V A.C. or 13.8V D.C., large front speaker with 2 watts rms output, slope front for easy programming and vehicular use, patented track tuning, tone by-pass, and many of the traditional features that have made Bearcat scanners the most sophisticated scanner at Communications Electronics. The Bearcat 210 covers 32-50 MHz, 146-174 MHz and 416-512 MHz., with a sensitivity of 0.6 uv for 12dB SINAD on low and high bands.

For a free four page full color brochure describing the Bearcat 210 write: Communications Electronics, P.O. Box 1002, Dept. RS1, Ann Arbor, Michigan 48106 U.S.A.

**155.16 GETS CONFUSING**

For a long time now the frequency 155.16 MHz has been used exclusively by search and rescue operators. It appears that this era is coming to a close, even though S/R people will be able to use the frequency, they will also be allowing certain local governmental

agencies to use the frequency for local emergencies. Sounds like things are going to get even more congested on 155.16!



**THE BIG EAVESDROP**

There are some *great* doings on the VHF communication bands—buried away on several groups of frequencies there are *real* telephone conversations taking place. By firing up a monitor receiver on one or more of these channels assigned to your area you might possibly overhear a conversation with Jerry Lewis (call-

*New mobile telephones permit you to dial calls, just like at home—but since cars don't carry telephone books, many users end up calling the Operator.*

John Q

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Grant



"Yes, Gertrude, looks like I'll be tied up in this conference until too late to make it home tonight."

sign KG-8105), Dan Rowan (KL-8343), David Janssen (KK-2949), John Wayne (KK-6267), Dick Smothers (KL-8258), Jimmie Rodgers (KJ-9989), the Mayor of New York City (KL6667), or assorted other political figures, TV and film personalities, business tycoons, sports figures, "Jet setters," and other familiar folk—even some of your neighbors and local businessmen!

Well I didn't believe that there was such a thing until I took a ride with an acquaintance of mine a while back; he had a mobile telephone in his car. We went for a spin and he flipped the set on and lo and behold, there it was—instant eavesdropping! It was a whole new world for me; here were people placing and receiving telephone calls, talking to the operator, getting busy signals, jabbering away with some downright interesting conversations. It was like I had an extension telephone (or *wiretap!*) to the nation. It was a party line telephone such as you might come up in a science fiction dream—except it wasn't a dream, I was really hearing it with my own ears!



A key lock prevents unauthorized use of the equipment—I suppose they could install a pay phone if the problem really got bad.

Here were some pretty interesting people doing things like calling home to say that they'd be late for dinner, making business deals and appointments, dates and (some x-rated) social engagements, and the like.

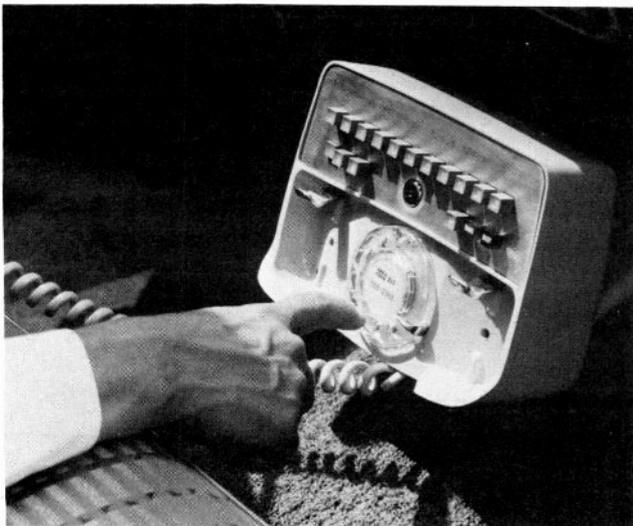
I suppose that anybody could get one of these gadgets installed under their dashboards if they felt like spending the money—as much as \$100 a month to rent it, *plus* the charges for the calls. If you have a need for two-way communications it's worth the price—or you can buy the equipment outright, but still it amounts to more than I cared to spend (or could afford) for the honor of simply eavesdropping on this service; I had no particular need to *talk* over the thing! Oh well, maybe there was a way of wracking my brain to find a way of being part of this scene at *very* little expense! And I found it, too!

## RESEARCHING

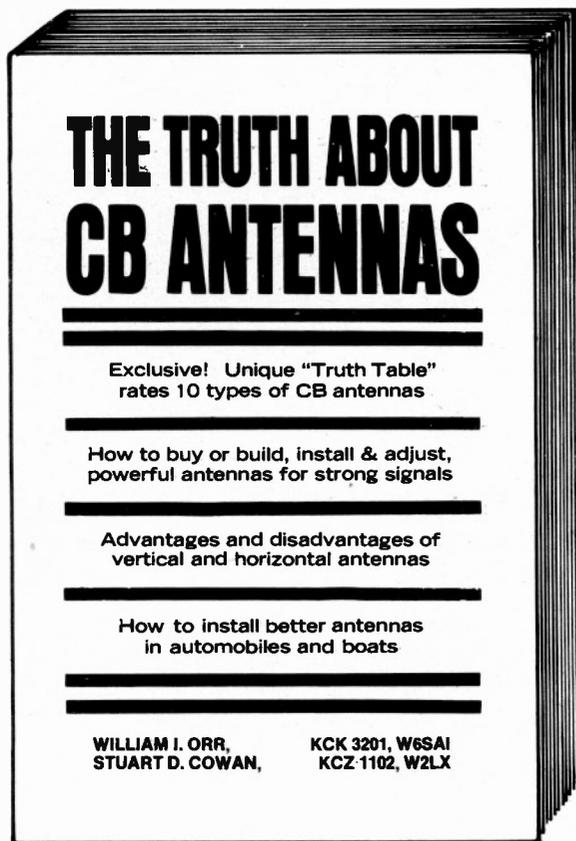
After my test drive in the car with the telephone, I embarked upon a project to dig up some facts on the massive party line.

I learned that the telephone company (and several independent communications companies), in a two-fold effort to serve the public and increase revenues, provide facilities—so that those folks who feel that they must be 'in touch' at all times with civilization can have that potential. Today, thousands of telephone calls are made daily to and from mobile units installed in cars, boats, busses, aircraft, passenger trains, and the like. You can even get one installed in a brief case (in case you get an urge to call somebody while you are walking).

More than 60 channels are in use for the communications, and these are sprinkled through the low (30 to 50 MHz), high (152 to 174 MHz), and UHF (450 to 470 MHz) bands. The most popularly used channels seem to be in the 152 to 174 MHz band; in most areas the 30 to 50 MHz channels are falling into disuse. UHF is being added to high band channels in some major metropolitan areas. Major population areas are often



Most mobile telephone consist of remote control "heads" which mount near the driver; the bulk of the gear is in the trunk.



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assigned a whole slew of channels (which can buzz away with conversations day and night), although even in remote rural areas there is usually *at least* one channel within reception range.

Most mobile telephone equipment capable of communication with a telephone company base can operate on several channels so that if one channel is busy the caller can flip over to another unused channel authorized for use by that particular base station. If a mobile station is to be used in several geographic areas, or travel across country (like truck) there will almost always be a base station within range on at least one channel.

There are hundreds and hundreds of base stations, those operated by the telephone company itself, and also some independent companies which have contract arrangements with Ma Bell to hook into the lines. The mobile units are assigned telephone numbers, similar to home land-line telephones. Some of the newer equipment permits the mobile user to dial direct from the car, truck, boat, train, or aircraft. Calls from land line telephones usually go through the operator, who can actually "ring" the phone in the mobile unit via means of coded tones.

The base stations are quite powerful and can be heard over a wide area. Those used by the telephone company use wide band-FM. When monitoring a station operated by the telephone company it is necessary to listen in on only one channel (the base) since the base station is actually a repeater and rebroadcasts signals from the mobile units (which operate on another channel), so you can listen in on both sides of the conversation by tuning only one frequency.

While stations aboard boats still use push-to-talk, most other telephone company bases utilize full duplex which permits conversations without PTT interruptions.

A recent innovation which has been noted in a *few* areas is something called IMTS (Improved Mobile Telephone Service). The base station transmits something which sounds like a dial tone (a high pitched whine, in fact) when there *isn't* a call taking place on the channel. What this does is to let the users know that the channel is available for calls.

Although transmitted in full, unscrambled, modulation—many of the users do not *seem* to realize that their words are going out over the airways because if they did they would probably not discuss many of the things they do, and they might also watch their choice of words. Apparently the FCC does not do much enforcement on these channels and they *really* swing.

After my survey, I then decided that it would definitely be of interest to listen in on such a channel—and why not by using my monitor receiver? On the home set there were several relatively quiet channels which I would have been just as happy to dump if I could find something to better occupy them. In the mobile monitor, there were two open crystal positions which had been a total waste because I had never made use of them.

Obtaining facts concerning which one of the dozens of telephone channels used throughout the U.S. was within range of my equipment was another story. It seems that the telephone company isn't gung-ho about folks such as you and I *wireless* tapping their services—let's say that they *haven't* embarked on a major national publicity campaign to pass this information around to the general public. In fact, I found that the information seems to be guarded rather carefully.

All is not lost, I found there *is* a listing of these stations, one showing locations and frequencies used.

There are about 4,200 listings covering all 50 United States, then a special section lists 400 mobile telephone stations in Canada! This fantastic publication is called TELECOMM-1, it is invaluable to tracking-down these stations, in some areas it lists a dozen or more frequencies! Just about every area of the country is within receiving range of at least one station. Best of all, TELECOMM-1 is inexpensive—only \$3, ppd. It is available from CRB Research, Inc., P.O. Box 56-MP, Com-mack, N.Y. 11725.

### MANY HAPPY HOURS

As it turned out, I learned that there were *two* channels authorized within the range of my station. As soon as the crystals went into the sockets I was immediately thrust into the scene. It was (and is) *fantastic!* There are hours of absolutely fascinating listening each day! If, like me, you dig "just reading the mail," it beats CB listening by a mile!

Without going into details of any specific conversations I've heard, I can tell you that on many occasions I have been reduced to tears of laughter, and I've heard more than a few little domestic dramas played out that would make Mary Hartman, Mary Hartman look like a Sunday school play by comparison!

C'mon, join the giant party line—read the mail on the "Party Line Telephone of the Nation."

### PROPOSED FREQUENCY FOR FIRE SERVICE DENIED

The FCC has denied a petition by the International Municipal Signal Association, Inc. (IMSA) requesting allocation of four pairs of 450 MHz band frequencies to the Fire Radio Service for use as voice fire radio call box channels.

IMSA sought allocation of the paired channels 453.025/458.025, 453.075/458.075, 453.125/458.125 and 453.175/458.175 MHz. These frequencies currently are allocated for highway radio call voice and non-voice uses in the Local Government Radio Service. In addition, subsequent to the filing of IMSA's petition, these 458 MHz band frequencies were allocated to the Special Emergency Radio Service for bio-medical telemetry communications between portable units and medical-care facilities.

In support of its petition, IMSA contended that the use of voice fire alarm boxes would "maximize information as to the nature and extent of the fire, its



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location and duration," and would provide "some kind of assurance to the caller that his message is being received." It also asserted that use of two-way voice fire alarm communications "may well reduce the amazing percentage of false alarms that are occurring throughout the country."

Several parties opposed the utilization of the highway call box frequencies for the fire call box function, arguing primarily that this additional use would place too great a demand on the few frequencies involved.

In examining the issue of whether use of the four frequency pairs at 450 MHz for the fire radio alarm function would be feasible, the Commission recognized that to date there had not been extensive development of the use of these frequencies for highway radio call box systems. This factor, it pointed out, had been one of the major considerations involved in its determination to permit additional use of these frequencies for biomedical telemetry operations.

Although the problem of allocating these frequencies for highway call boxes might require re-examination, the Commission said it did not follow that the frequencies should be allocated for fire radio call box operations.

The FCC found that the limited spectrum involved would not be adequate to accommodate the proposed fire alarm voice functions, since the operation of fire call boxes in most communities that would likely employ such radio systems could be expected to involve many hundreds, and even thousands, of call box installations. Obviously, it said, such two-way voice transmission requirements were beyond the capacity of the requested four frequency pairs.

In addition, the Commission noted that IMSA's proposal would cause a compatibility problem with respect to bio-medical telemetry operations.

For these reasons, the Commission said it could not find that allowing use of the 450 MHz band frequencies for fire radio call box systems would be feasible, adding that it seriously doubted whether city governments ought to look to radio for replacement of existing fire call box systems because the amount of spectrum that would be needed for voice operations was very large and simply was not readily assignable.

#### **VHF MARINE CHANNEL 17 FOR STATE CONTROL INTERSHIP**

The Commission has amended its rules to make marine VHF Channel 17 (156.850 MHz) available for ship to ship State Control communications, in addition to the previously authorized use for ship to coast State Control communications.

The action was proposed in a rulemaking notice released August 5, 1976. The only comments filed were by the California State Communications Division, which fully supported the proposal.

The Commission said it believed the rule amendment would provide for closer coordination among state boats and related shore stations resulting in an improvement

to safety, law enforcement activities, and search and rescue operations in state waterways.

#### **WIRELESS MICROPHONE ON VHF TV CHANNELS**

The Commission had adopted rules to permit the use of low-power (50 mW) wireless microphones on unassigned television channels 7 through 13 (174-216 MHz).

The action, which amends Parts 2 and 74 of the rules, is the finalization of a rulemaking inquiry adopted September 19, 1974, on request of Vega Electronics, a manufacturer of wireless microphones.

In adopting the rulemaking inquiry, the Commission noted that there were many areas in AM, FM and TV broadcasting where wireless microphones could be used effectively. Broadcast use of these microphones, however, requires freedom from interference and an adequate spectrum allocation. Frequencies allocated in the rules at that time did not satisfy these requirements, the FCC noted.

Based on its review of the comments, reply comments, and related technical data, the Commission said it was persuaded that wireless microphone operations in the 174-216 MHz band could be permitted without significantly increasing the potential for or the degree of interference to existing services. Under the technical criteria adopted, the wireless microphone user would have an adequate spectrum allocation of essentially interference-free frequencies.

Eligibility for use of the wireless microphones will be extended to broadcast licensees, certain network entities, cable television operators who maintain origination equipment, and motion picture and television program producers. Motion picture and television producers were granted eligibility since their wireless microphone requirements were similar to those of broadcast licensees.

The operations of wireless microphones were authorized on a secondary, non-interfering basis to television operations on these frequencies at locations outside the Grade B contour of co-channel stations.

#### **EXPERIMENTS OF INTEREST**

KG2XJZ, TOMMY J. LAWLEY, Arlington, Texas. Experimental research station to operate on 452.0 and 453.0 MHz to conduct experimentation required by a contract with the U.S. Government.

KG2XKF BIRSACH & NIEDERMEYER COMPANY, Mequon, Wisconsin. Experimental research station to operate on 151.50 and 27.252 MHz for testing radio controlled signaling equipment system for use in Saudi Arabia.

KG2XKG, BIRSACH & NIEDERMEYER CO., Mequon, Wisconsin. Experimental research station to operate on 151.50 and 27.252 MHz for testing radio controlled signaling equipment for use in Saudi Arabia.

*(continued)*

KG2XKH, ELECTRONIC SERVICES, INC., Washington, D.C. Experimental developmental station to demonstrate equipment for sales purposes and making field strength surveys using frequencies specified in Parts 81, 83 and 85 of the Commission's Rules.

KG2XKJ, HOFFMAN ELECTRONICS CORPORATION, El Monte, California. Experimental developmental station to operate on 457.700 MHz for development of a radio security system for use on truck fleets.

KG2XKK, HOFFMAN ELECTRONICS CORP., El Monte, Calif. Experimental developmental station to operate on 457.700 MHz for development of a radio security system for use on truck fleets.

The Experimental Radio Service has further granted the following earth stations for the purpose of conducting communication experiments in conjunction with the Application Technology Satellite Series.

KE2XEO, APPALACHIAN REGIONAL COMMISSION, Lexington, Ky. on frequencies 149.195 and 149.245 MHz.

KE2XEZ, APPALACHIAN REGIONAL COMMISSION, Cresaptown, Md. on frequency 149.22 MHz.

KE2XFA, APPALACHIA REGIONAL COMMISSION, Norton, Va., on 149.22 MHz.

KE2XFC, APPALACHIAN REGIONAL COMMISSION, Huntsville, Ala. on 149.22 MHz.

KE2XEY, APPALACHIAN REGIONAL COMMISSION, Fredonia, N.Y. on 149.22 MHz.

KE2XFB, APPALACHIAN REGIONAL COMMISSION, LaFollette, Tenn. on 149.22 MHz.

### FREQUENCIES FOR OIL SPILL CLEANUP OPERATIONS DENIED

The Commission has denied the request of the American Petroleum Institute (API) for a second pair of UHF channels for oil cleanup operations.

On May 28, 1975, in response to a petition by API, the Commission amended Parts 2 and 91 of the rules to provide 2 government and 5 non-government channels for oil spill cleanup operations. This included three frequency pairs, one of which was in the UHF portion of the spectrum.

The order discussed the possible reallocation of a second UHF pair.

The Commission noted that even though these channels have been available for 18 months, only 17 licenses have been granted on the non-government channels, and only five of these specified the VHF frequencies. Therefore, the FCC noted, the UHF channel pair now assigned for oil spill cleanup operations will be sufficient for the foreseeable future.

It also added that the petroleum industry has a large number of VHF and UHF mobile channels available to it which can be used for oil spill cleanup operations if required.

## Dealer Business Card Advertisement

*This advertising section is reserved exclusively for CB dealers who wish to keep their name in front of their local customers, but who would otherwise not advertise in a national publication. The ads included are limited to one column inch; advertising copy is limited to non-mail-order type. The costs for business card ads are \$45.00 prepaid. In addition to the ad in the business card section, each dealer participating receives twenty five copies of the issue containing his ad, to sell or pass out in his store. For further information, dealers should contact the publisher, S9 Magazine, 14 Vandeventer Ave., Port Washington, NY 11050. Phone: 516/883-6200.*

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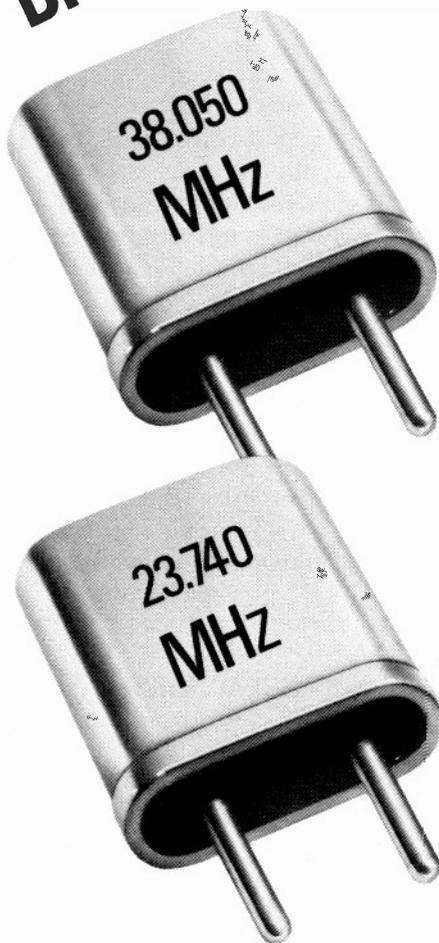
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design of this patented antenna gives long range, noise free performance.

The result of years of research & development, the ASTRO PLANE has top radiation which means that your signal gets out from the highest part of your antenna. Your signal radiates about 15 feet higher than with other antennas which radiate near the bottom.

The ASTRO PLANE has a lower angle of radiation which makes more efficient use of the radiated signal by allowing it to hug the curvature of the earth instead of shooting your power up into the sky.

The ASTRO PLANE has 4.46 db gain over isotropic which gives you a stronger signal and better, clearer reception.

You'll get long lasting, trouble free performance because it is compact in design — without long drooping radials, without coils to burn or short out, and with direct ground construction to help dissipate static charges and lightning.

- Stainless steel radials concentrate signal power on top
- Rigid heavy-duty aluminum tubing
- No long drooping radials to ice up or break off
- So unique it's backed by a U.S. patent (Patent #3587109)
- No coils to burn out or detune
- Easy assembly
- Lightweight — easy to install on simple pipe mast



Ordinary collinear or ground plane antenna signals are blocked...they radiate from the bottom.



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Total Length — 12 feet

Weight — 4 lbs.

Power Gain — 4.46 db

Impedance — 50-52 ohms

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SWR — Pre-tuned — Less

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