acc notes

The DVR Is Here! Our new Digital Voice Recorder is now available. It has lots to offer your repeater system, by allowing you to remotely <u>record</u> any of the repeater's programmable messages – IDs, tail messages, emergency autodial responses, bulletin boards, alarms, courtesy tones, etc. In addition, it's Touch-Tone activated voice mailbox lets you leave recorded voice messages for other users.

The DVR's direct digital recording technique gives you the outstanding "no compromise" audio quality you want on your repeater. In the high quality level mode, what you hear isn't a fuzzy rendition of the person who spoke – the recording sounds indistinguishable from the original.

To conserve memory and extend recording time, two additional quality level modes are available. These trade off audio quality vs. the amount of memory used up for each recording. The full inflection and recognizability are preserved – the distortion is simply increased somewhat.

Use the highest quality level for frequently played messages, and the lower quality levels for long or infrequently used messages. Total recording time available depends on the mix of quality levels of each recording and total memory installed, but ranges between 2 minutes (all highest quality) and 6 minutes (all lowest quality) when fully stuffed with 256K memory chips.

The DVR currently uses up to 32 64K or 256K dynamic RAM chips, in "rows" of eight. For example, when stuffed with one row of 64K chips, it offers 8 to 24 seconds of recording time. Four rows of 64K chips offer 32 to 90 seconds. Four rows of 256K chips (32 chips, two to six minutes) can now be bought from a computer store for under $100, so we expect that everyone will quickly upgrade to the full six minutes.

Like the RC-850 controller, the DVR is architected for the future, with its hardware and software designed to accomodate 1 megabit RAM chips when they're available inexpensively in quantity.

The DVR is available with one, two, or three independent record/playback channels, which means that one DVR can service <u>three repeaters</u> at your site, or two repeaters and the phone line.

Although you'll get the most out of your DVR in conjunction with your RC-85 or RC-850 controller, it's usable standalone as well.

For more details, the manual is available for $5 postpaid. We should clear out our existing backlog during March and April, and ship against new orders starting in May.

The DVR is available from $849.

The Limerick Contest, and Shack-Master.

From an article in RADIOSPORTING, March, 1986 on the Kansas DX and Poetry Society...

"The next contestant to recite was obviously a technically oriented ham as he had 3 hand-helds and numerous wires draped all over his body. Yet, his limerick was of the highest quality and hit close to home for many of us:

> Ham radio caused great family strife,
> And put pressure on his married life,
> It was a disaster!
> So he bought a ShackMaster,
> And he ended up remoting his wife!

Loud applause immediately followed his presentation, especially from a number of the henpecked hams present. Several divorced members rose to give him a standing ovation."

RADIOSPORTING is an international monthly magazine "by and for active radioamateurs", published by RADIOSPORTING, Box 65, Don Mills, ON, Canada, M3C 2R6. Twelve issue subscription in the U.S. is $16. Single copy is $2.

ID of the Month.

Last time we weren't sure who phoned in the winning ID, and sure enough everyone came forward wanting to claim credit. But the real winner was Bruce Larner, WB6CDN. His <u>real</u> ID was ... "I am under computer control, and I will not fail. This is the WB6CDN repeater, repeater, repeater, (pause) repeater (explosion)."

This month's winner ... "The machine over one hundred radio operators call home, WA4TEM repeater."

101 Things To Do With Your New DVR.

With programmable IDs, tail messages, bulletin boards, courtesy tones, event messages, and with voice mail, your DVR lets you...

- Welcome a new user to your repeater.
- Congratulate a user for upgrading his license.
- Use a "ho-ho-ho" courtesy tone for Christmas.
- Provide instructions for visiting users.
- Use a "champagne cork pop" courtesy tone on New Year's.
- Remind users to drive safely.
- Announce intruder with "Help, help, call the police".
- Remind users of an upcoming flea market.
- Provide talk-in information for your hamfest.
- Solicit volunteers for your bike-a-thon.
- Record remote base memory names with QTH of system.
- Advise users of the status of an emergency situation.
- Announce new technical additions to the repeater system.
- Warn users of weather advisories.
- Check out the audio on your new handheld.
- Wish a user "happy birthday".
- Use a "firecracker" courtesy tone on July 4th.
- Use a "gobble-gobble" courtesy tone on Thanksgiving.
- Feature a celebrity voice for your repeater's ID.
- Custom tailor emergency autodial response messages.
- Provide instructions on how to use the repeater.
- Announce the code practice schedule.
- Distribute system information to control operators.
- Replay bits of interest from the Westlink broadcast.
- Tell a friend you can't make the meeting.
- Announce the call sign slots of new users.
- Let new users introduce themselves.
- Check out the audio quality on your new mobile mic.
- Use "thunder-clap" courtesy tone during wx emergency.
- Provide a brief club meeting directory.
- Congratulate a new ham for getting his license.
- Ask a friend how he likes his new rig.
- Encourage users to respond to open FCC matters.
- Remind users what to bring on field day.
- Provide directions to the field day site.
- Do a sample FD QSO so users know what to expect.
- Announce field day results.
- Provide a local net directory.
- ID your repeater using your favorite sexy voice.
- Provide a short "repeater directory" for your area.
- Solicit volunteers for your walk-a-thon.
- Remind users of proper repeater procedure.
- Provide info about repeater's facilities and coverage.
- Announce availability of a new repeater in the area.
- Put a siren on the alarm message.
- Rent a DVR channel to a commercial site user.
- Offer holiday greetings to your users.
- Play an alarm clock sound when the repeater signs on.
- Remind all of the upcoming repeater coordination meeting.
- Ask scanner listeners to call you for info on being a ham.
- Thank a friend for doing you a favor.
- Announce the results of your club's election.
- Welcome your new club president and cabinet.
- Remind users of ARRL sponsored events.
- Ask another repeater user to give you a call.
- Announce when club owned gear is available for loan.
- Tell a friend about a new circuit you found.
- Use a "sleigh-bell" courtesy tone on Christmas.
- Leave a message for your wife to pick up from the phone.
- Include your repeater's location in its IDs.
- Include the name of your repeater organization in the IDs.
- Round up a group interested in getting on ATV.
- Have rptr say "Brrr, it's cold up here" after first snow.
- Notify users of the latest info on the local packet board.
- Leave a phone number and time for someone to call you.

- Announce presence of a rare DX station on 20 meters.
- Announce current propagation conditions.
- Announce upcoming OSCAR passes.
- Remind users about an upcoming contest.
- Announce roads washed out during a storm.
- Direct users to other repeaters during an emergency.
- Ask a friend when he'll be on the air.
- Congratulate a user for getting married.
- Congratulate a user on having a baby.
- Remind users of an upcoming club meeting.
- Promote the speaker for your next club meeting.
- Let the speaker for your next meeting promote himself!
- Provide directions to your club meeting place.
- Provide minutes of your last club meeting.
- Provide a brief report from your club's officers.
- Remind users that it's time to pay club dues.
- Announce the results of your club's contest.
- Thank a club member for his equipment donation.
- Praise members for donated time on club projects.
- Have a rooster crow when the repeater signs on.
- Tell a friend you're done using his wattmeter.
- Solicit volunteers to teach the ham classes.
- Provide a schedule of ham classes.
- Congratulate the graduates of your ham classes.
- Provide announcements of other club's activities.
- Announce equipment for sale (careful, no prices).
- Remind users about your weekly swap net.
- Solicit volunteers for an antenna work party.
- Tell users where and when to look for Halley's comet.
- Provide the digipeater path for a new packet link.
- Provide info to users about a new FCC rules change.
- Give up-to-date info about the status of the brush fire.
- Thank the users who helped put up the new tower.
- Describe the equipment making up your repeater.
- Tell users of other repeaters sponsored by your group.
- Announce the presence of the new DVR on your repeater!

Well, there's 101 ideas. No doubt you'll think of lots more, so please send them in!

The DVR is another important step in making your amateur repeater an _information center_. Just remember – no music; third-party traffic shouldn't be business related, just like the autopatch; to be safe for now, a control op should be around during mailbox operations; and QST type information should be limited to that of direct interest to the amateur service and not the general public. But no one said there's a law against having fun!

Packet vs. Voice Bulletin Boards.

Packet is ham radio's hottest new mode. It can be used for keyboard-to-keyboard QSOs, for passing traffic, and for shipping computer files back and forth. From our experience operating packet, the best of what it has to offer is its electronic mail capability, and the variety of information available to be picked off the local bulletin boards. That's just what the Digital Voice Recorder offers, except that instead of using your computer, you talk and listen, with your handheld, from anywhere!

V3 Hints For Your '850. When installing V3, write an empty speech message into the Courtesy Tones to restore original tone sets if they've disappeared... If you use the Spare Audio 1 function, be sure to assign it (Prog. Ref. 15-2)... Same with control receiver. If using Spare Audio 1, select Link 3 COS to be "low true" (Prog. Ref. 10-1)... Courtesy tones 11 and 12 must be programmed if you're using Link/RB 3 and 4. Tone 13 (link transmit) must be programmed if you use any links in transmit mode (Prog. Ref. chapter 6). The old tone, which was fixed in firmware, was a brief, low pitch tone with a delay to segment 1 of about 300 ms... Bank 2 Autodial numbers are protected from phone number readback... If you don't have the expanded E^{2}PROM, loading or erasing autodial phone numbers in bank 1 will result in "ER" response, along with acknowledgement - that just means that it's stored in RAM, rather than in E^{2}PROM... Be sure to map all the phone lines - to Local Phone Line #1 if you're not using multiple lines. Do it now so you won't have trouble later if you decide to use the secondary and tertiary patch prefixes (Prog. Ref. 14-3)... For the Pad Test to function, you must program the Pad Test message, which lets you define the response for each key (Prog. Ref. 3-10)... The Store Macro Set command is correct on Prog. Ref. 12-1, but the examples on 12-5 are not - 5901-5909 should be 59_1_1-59_1_9.

If You're Connected To a PBX. Your RC-850 controller has new provisions which are aimed at making life easier if your repeater is connected to a PBX extension. From your repeater's extension, you want to be able to make in-house calls, as well as access several outside lines. Version 3 software makes this simple, and transparent to the user.

The controller's three "logical phone lines" each can have a different autopatch command, and each can automatically dial a specified prefix before dialing the phone number. Autodial numbers may also be automatically directed to one of the three lines.

As a simple example, your three autopatch commands could be 9, 8, and *, for access to an outside line, a tie line, and to in-house extensions respectively. Program the primary, secondary, and tertiary autopatch command prefixes to these values. (Actually these commands could be programmed to be anything.)

The dialing prefixes automatically sent by the controller before the phone number might need to be (9 pause), (76 pause), and (nothing), to direct the PBX properly. Program the primary, secondary, and tertiary patch dialing prefixes with speech messages "Nine (pause)", "Seven six (pause)", and "(empty)". (Program an empty message by selecting the message, then simply "writing" it.) Be sure the phone number macros and leading "1" override are empty. Map all the logical phone lines to "Local Line #1".

Autodial numbers directed to the tie-line and in-house extensions would be stored with a leading Touch-Tone "B" and "C" respectively.

Autodialer Expanded to 250 Numbers. The 850's user loadable autodialer has two added banks of numbers stored in non-volatile memory. Bank 1 provides 100 slots at 11 digits per slot, while bank 2 provides 50 slots with 35 digits per slot.

Using MCI and Sprint Through Your Autopatch. At times, your users might like to make calls outside the normal dialing area of your repeater's phone line. If they want to use MCI or Sprint, or their credit card, the 850's Version 3 makes it easy. Fifty new autodial locations can store up to 35 digits each, allowing room for an MCI/Sprint access number, access code, and destination phone number - all in one autodial slot. Or if you'd like, the access number and code may be in one slot, then any number may be dialed from the autopatch or autodialer.

For security, bank 2 autodial numbers (the 35 digit slots) are protected from phone number readback, regardless of the user loadable autodialer readback setting. If you want the DTMF signalling muted so it can't be decoded by someone over the air, use the control selection "mute patch dial tone and signalling".

A change in Version 3 is that another autopatch or autodial call can be initiated during a call. That means that one autodial slot can get MCI/Sprint and send the access code, then you can activate the autopatch to any phone number, or activate any autodial slot through MCI or Sprint.

Remember that with the autopatch or numbers in the autodialers, the * key generates a 1.5 second pause, so insert one or two pauses between the access phone number and the access code to wait for secondary dial tone.

Keep Tabs on the Action. Several of the new "meter faces" in the RC-850 controller Version 3 software provide running tabs of repeater activity. They allow Touch-Tone commanded voice readback, or inclusion of the information in any programmable messages. Running totals of the period the repeater transmitter has been on (transmitter odometer, or "todometer"), the number of keyups, the number of patches, command accesses, and mailbox accesses are available. From time to time, you may want to check on these numbers to log the level of activity on the repeater. The running totals can be cleared to zero, either manually, or regularly by the scheduler (such as once a week or so).

Crystal Filter For Your Receiver.

If you've just put a lot of money into a hot new receiver, but it responds to strong signals on nearby channels, there's a way out. If the receiver uses a couple of MRF 901 transistors in the front end, they're susceptible to front end overload, and the helical resonators and selective i.f. filtering won't help against nearby signals in the amateur band.

Rich Roosevelt, K1DR, suffered from interference from a repeater 85 kHz off his repeater's input frequency, 3 miles away running 100 watts into a gain antenna. He first proved that the spurious reception wasn't caused by external mixing – a monolithic crystal filter between the antenna and the receiver cleaned it right up. That meant front end overload. (His repeater is a split site system, so he doesn't have a duplexer in the line, but a duplexer wouldn't help in his situation.)
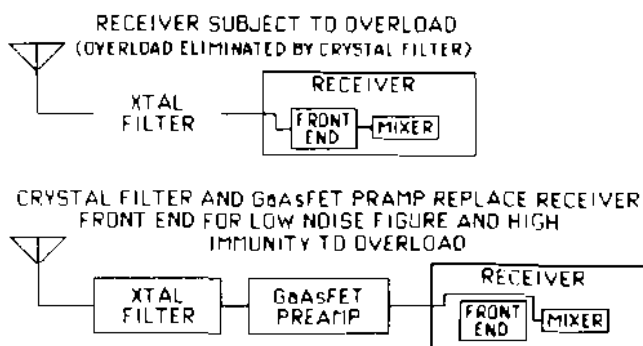
His ultimate solution, which resulted in a true high performance, state-of-the-art receiver, is blocked out below.

The antenna feeds a Piezo Technology four pole monolithic crystal filter cut to the repeater input frequency (2 pole filter should work about as well), which feeds an Advanced Receiver Research GaAsFET preamp. The preamp has enough gain to bypass the receiver's front end entirely. Rich runs the preamp's output directly to the receiver's double balanced mixer. The combination gives him .12 uV sensitivity at 12 dB SINAD measured with an IFR service monitor, and the overload problem is gone.

Rich doesn't recommend his approach unless you have a problem with an existing receiver. In general, look for a GaAsFET front end on a state-of-the-art receiver, both for the lowest noise figure, and for highest immunity to overload. And remember that helical resonators help only against out-of-band signals.

Advanced Receiver Research, P.O. Box 1242, Burlington, CT 06013 (203) 582-9409

Piezo Technology, P.O. Box 7859, Orlando, FL 32854 (305) 298-2000

RECEIVER SUBJECT TO OVERLOAD
(OVERLOAD ELIMINATED BY CRYSTAL FILTER)

CRYSTAL FILTER AND GaAsFET PRAMP REPLACE RECEIVER FRONT END FOR LOW NOISE FIGURE AND HIGH IMMUNITY TO OVERLOAD

Be Fair To Your Receiver.

Apart from true receiver limitations as described above, if you use a GaAsFET preamp ahead of your receiver (intact), you may subject the receiver to overload due to the preamp's high gain. A GaAsFET preamp is primarily intended to lower your system's noise floor. It inevitably adds lots of gain, however, as well. Your receiver probably doesn't need the additional 20 db gain, so place an attenuator between the preamp output and the receiver input. A 10 db pad can help avoid overwhelming your receiver.

Finding a COS For ShackMaster.

We strongly recommend connecting a COS (carrier-operated-switch) signal from your control radio – it makes operation easier since ShackMaster knows exactly when you've grabbed the control window, rather than relying on you to trip its VOX detector during the window. It's particularly important when you're first learning how to use ShackMaster's many features – the fewer the variables the better.

While an acceptable COS signal is available from virtually any radio, ICOM makes it particularly easy on some of their radios – a COS (or SQL) signal is brought to pin 4 of the mic jack. Check the schematic to see if it's there on your radio. In the case of the IC-27/37/47, pin 4 is left unconnected, but it's easy to bring the SQL signal to it. On the IC-37A, it appears at the anode (non-banded side) of D11. From the bottom side of the radio, tack a short wire (like a piece of #30 wire-wrap wire) from D11 anode to the pin 4 pad on the small pc board attached to the mic jack. Then you can get all your ShackMaster connections (including speaker audio, pin 8) at the mic jack!

Many modern FM transceivers use a Motorola MC3357 or MC3359 chip in the i.f. strip. Each chip has a "scan control" output which is essentially a low true COS signal. The output may not be used in your transceiver – the audio may be squelch gated using the chip's other functions. In any case, the scan control signal should be usable as a COS. Since one of the applications of the chip is scanners, the signal is intended to indicate to the scanning logic to stop when coming across a channel with a signal present.

The block diagram of the 3357 is shown below. The scan control "COS" signal appears at pin 13 of the 3357, and pin 15 of the 3359.
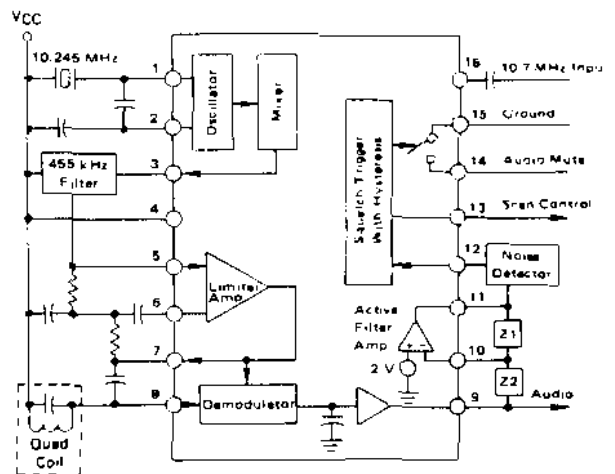
Wayne Greene Is Back! Love him or hate him, W2NSD/1 is back at the helm at 73 Magazine. Being controversial is just Wayne's way of getting your ATTENTION – he loves ham radio, always has something interesting to say, and is amateur radio's most insightful visionary. We're particularly indebted to him because he has contributed more than anyone to making FM and repeaters the popular mode that they are today. If you haven't seen 73 Magazine lately, pick up a copy. Then subscribe. 73. And welcome back, Wayne Green!

Courtesy Tone Specs. Here are the parameters of the RC-850 courtesy tones as shipped from the factory. Of course, they're fully programmable by you (1 Hz, 1 ms resolutions), but we get many requests about their original settings. Courtesy tone design offers you an opportunity for creativity and originality on your repeater!

#	Segment	Delay	F1	F2	Duration
1	A	640 ms	330 Hz	330 Hz	100 ms
	B	0	495 Hz	495 Hz	100 ms
	C	0	660 Hz	660 Hz	100 ms
2	A	640 ms	330 Hz	330 Hz	75 ms
	B	0	495 Hz	495 Hz	75 ms
	C	0	660 Hz	660 Hz	75 ms
3	A	640 ms	660 Hz	880 Hz	100 ms
	B	0			0
	C	0			0
4	"Explosion"				
5	"Tic toc"				
6	Morse "K"				
7	Morse "N"				
8	Morse "R"				

Tone sets 4-8 are covered by the above "messages". If the messages are emptied, the following tone parameters appear:

#	Segment	Delay	F1	F2	Duration
	A	640 ms	660 Hz	660 Hz	580 ms
	B	0			0
	C	0			0
9	A	640 ms	660 Hz	660 Hz	120 ms
(Link 1)	B	0			0
	C	0			0
10	A	640 ms	660 Hz	250 Hz	100 ms
(Link 2)	B	0			0
	C	0			0

11-13 empty

Courtesy tones 1-8 are automatically selected based on hardware logic inputs (for telemetry) or by control op selection. Sets 9-12 identify signals entering from the links, while set 13 indicates link transmit mode on. Courtesy tone messages (such as Morse code characters or sound effects) can take the place of the tone parameters.

Monitor the Power Line Voltage. Repeater sites often have less than optimum ac power because of their remote locations. A new 0-256 volt meter face, and stored low and high readings make it convenient to keep tabs on line voltage, brownouts, and overall power line quality with your '850 controller.

To monitor power line voltage, simply connect a low voltage transformer, with a rectifier and filter capacitor, to the wall socket. Scale the voltage down with a pot to match the meter face, and connect it to a controller analog input.

Metering the power line lets you check the line voltage at any time. More importantly, the controller will keep track of low and high line voltage conditions, and when they occured. If you suspect there was a brownout, you can find out how low the voltage dropped and when. Or if line voltage can rise unusually high, again you'll know how high, and when.

LINE VOLTAGE MONITORING CIRCUIT
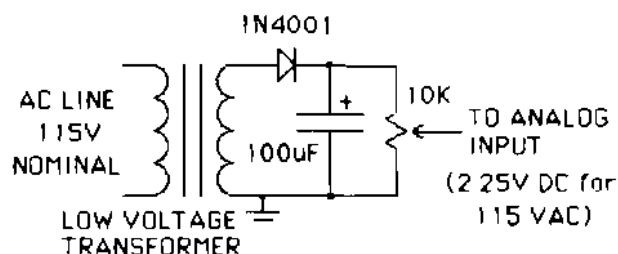
Leave a Frequency in the Mailbox. The RC-850 controller's mailbox is enhanced to allow appending up to 15 digits to canned messages, for leaving phone numbers, etc. ("Call me at " "7498330"). In addition to digits, the words "mega" and "Hertz" can be included – mega is Touch-Tone B, and Hertz is *. To append a canned message such as "Call me on ..." with a frequency, add a string such as "14652B*". It'll say "Call me on 146 52 mega Hertz".

Robin Rumbolt, WA4TEM offers another idea on appending digits to a mailbox message. He's made up message lists containing the ARRL numbered radiograms along with a few others. Appending the radiogram number to a canned "See repeater message number ..." allows expansion to any number of messages desired.

Hang the Hang. Many of the newer handheld radios keep the transmitter keyed several seconds after sending Touch-Tone sequences. We're not sure why this is considered a "feature", but if you're like us, it's really more of a bother than a feature. Andy Feldman, WB2FXN, tells us how to defeat the transmit hang time in the Kenwood TR-2600A. Capacitor C86, a 22 uF electrolytic is the culprit, and can be changed to a lower value or clipped out. It's on the RX Unit pc board, in the corner near the keyboard assembly connector.

Safety While Driving. Concerns have been raised about the safety of having cellular phones in cars, where drivers can be distracted from their principal responsibility of driving while placing calls, holding the phone, taking notes, etc. An article in the December, 1985 issue of Personal Communications Technology magazine explores the issue. The overall conclusion from industry conducted surveys was (naturally) that those with cellular phones are generally safer drivers than the average.

One suggestion received from a reader to improve safety was "A voice synthesizer to 'read' back a number to the driver after a memory location has been selected. This would eliminate the need to look at the display panel." Our repeater controllers have always read back in synthesized speech the autodial location and phone numbers for patches placed. There's really no display panel to look at on your radio, but you can activate the patch knowing that if you make a mistake, you'll be aware of it before the call is placed and it's easy to cancel it.

New Two-Tone Decoder. Our RC-850 and RC-85 repeater controllers include selective call "paging" capabilities. Comm-Spec has introduced a new two-tone sequential paging decoder. The tiny SD-1000 allows DIP switch programming of the two-tone decode frequencies (unlike the older SD-1A which requires unique ceramic resonators for each frequency). The SD-1000 also encodes PL, and installs in a transceiver similar to a PL encoder/decoder, which makes it easy to build PL encoding and selective call decoding into your radio. It also supports two-tone group call, which can be particularly valuable for emergency groups.

If you want to use the PL encode feature, specify the desired PL frequency when ordering from Comm-Spec. The SD-1000 will only encode one factory programmed frequency.

The SD-1000 makes it even easier to use the paging capabilities of your controller. Order the SD-1000A or B for use with your RC-85 controller, or A, B, or D with your RC-850. And be sure to specify PL encode frequency if you want to use it for PL encode. Price is $59.95.

Communications Specialists, Inc., 426 Taft Ave., Orange, CA 92665-4296. (800) 854-0547.

Dual-Band Antenna With Duplexer. John Andrews points out a new Kenwood 2 meter and 440 MHz dual-band mobile antenna – the MA-4000. It's particularly interesting in that it includes a duplexer, so that you can transmit and receive at the same time. If the auxiliary operation rules are changed, you'll be able to operate HF through ShackMaster full duplex on 2 meters and 440 MHz with the single antenna.

New HSC Display Pager. A second manufacturer plans to join Standard in offering an HSC format numeric display pager. Maxon has introduced its HSC-6000 series for 150-174 MHz and 450-470 MHz. They resemble Motorola's OPTRX pagers in form factor, and have a 12 digit display with 72 character memory.

Bill Strack, WA6ZTJ, reports that HSC paging is working well, even better than earlier during beta test periods. We've extended the tone durations slightly and de-emphasized the higher frequency tones to improve the reception signal-to-noise performance. Several '850 groups are using the display pagers.

The pagers combine tone, voice and numeric display paging in a compact unit. Display paging in the amateur service is analogous to the old RTTY autostart, allowing an emateur, or the repeater system, to dump a message into your unit for review when it's convenient.

Check out the article about HSC paging in the March, 1986 issue of Communications Magazine, entitled "Analog in a Digital World".

Maxon Electronics, Airworld Center Complex, 10723 Ambassador Drive, Kansas City, MO 64153 (816) 891-6320

Repeater Goodies. Bruce Wachtell, K7IJ, points out a couple of useful parts readily available from Dick Smith Electronics. They offer 12 volt gel cells, 3AH at $13.95, and 1.2 AH at $7.95. They also carry LM335 temperature sensors – plastic at $1.29, and metal can at $3.90. The metal package is best for sensing temperature of things like heat sinks, while the plastic package is fine for sensing air temperature (with your RC-850 controller).

Dick Smith Electronics, P.O. Box 8021, Redwood City, CA 94063 (800) 332-5373.

User Programmable Radios May Be Nixed. You may have heard of the new ham HTs, which, if you clip the right jumper, can transmit, yes transmit, over a wide frequency range, including police and fire frequencies. Well, it seems that the FCC is concerned in general about a new generation of land mobile synthesized radios which can be keyboard programmed by end users to operate outside their authorized frequencies. Somehow, of course, this information which should be confidential to dealers, gets to the end user, and becomes a problem. The FCC's concern doesn't extend to amateur equipment at the moment. But when manufacturers and users don't act responsibly, the FCC gets involved.

Stoner Petition. A petition has been filed with the FCC by Donald Stoner, W6TNS, to create a new Public Digital Radio Service. The service would be allocated 52-54 MHz, currently assigned to amateur radio. It would allow home computer owners to tie into a packet-like network of other computer users and bulletin boards through radio modems, operating on a single channel at a rate of 2 megabaud, forming a low power local area network. The general idea is to have telephone modem type communications and Compuserve-like bulletin boards and data bases, but without the costs of telephone lines and Compuserve.

We believe that there may be merit to developing such a service, particularly for local "wireline" replacement for communications between computers. Such activities already take place on 72 MHz and other frequencies using packet radio techniques. But it's difficult to see how the service as proposed (1 watt max., digipeated through nearby units) would be capable of providing anything approaching the level of service offered by telephone lines, and on-line services such as Compuserve.

In any case, six meters doesn't appear to be an appropriate home for the service. Stoner claims that no TVI to channel 2 would occur, since units would be limited to 1 watt, and amplifiers would be prohibited. But we think that users without nearby stations to digipeat through would likely resort to tacking on external amplifiers to reach someone that could digipeat. Nothing in the radio modem can prevent addition of external equipment. For that reason, we can't believe that TV channel 2 owners around the country would let such a service spring up adjacent to their allocation.

Amateur six meter users have learned to use the band with care, due to TVI potential. Where there's a local channel 2, hams generally avoid it. And that's for good reason, since six meter operation can cause interference to reception of channel 2 due to fundamental overload of consumer TV sets. The six meter amateur band exists as a buffer for channel 2.

We think that any amateur opposition to reallocation of six meters is moot - amateur opposition would be insignificant compared to the opposition of major broadcasting empires which own channel 2 outlets.

Stoner's proposal is fundamentally flawed in several ways. Selection of six meters is the most obvious. The only evidence offered for a need for such a system is the size of the installed base of telephone modems. However, we think that the level of service offered to users wouldn't compare to that of phone lines, and that it wouldn't be adequate to attract a wide range of users. The system is based on having very nearby users to act as digipeaters - without them the radio modem is totally useless. A "chicken and egg" situation will cause the service to have difficulty establishing itself. A sparse population of users in some areas will lead to high power operation and outside antennas which will result in TVI to channel 2.

What the proposal _does_ do is open for discussion the general merits of a digital radio service for the general public. The technical characteristics and location in the spectrum are far from clear.

Comments on the original petition were due January 6. If the proposal makes it to the NPRM stage, there will be plenty of time to comment.

902 MHz Radios. If you're interested in equipment for the new 902-928 MHz amateur band, we've come across a flier from Pacific Microwave Corp., offering a 900 MHz FM transceiver. We don't know anything except what we've read from the flier, so if you're interested, contact them about the model PM-900M 33cm Band Mobile Transceiver.

Don't forget that equipment for the 1200 MHz amateur band is already available as well, from both ICOM and Kenwood. There may already be 1200 MHz activity in your area. We've heard that there may be a 1200 MHz handheld introduced later this year. We'll all have to wait to find out.

Pacific Microwave Corp., Amateur Radio Products Division, 555 Pligrim Drive, Suite B, Foster City, CA 94404.

Listen to Your Site. The RC-850 and RC-85 controllers have a "Spare Audio" input, which can be commanded up by a Touch-Tone command. If NOAA weather radios on repeaters were permitted, they would be a great application, but they're not. David Bly, WD6EYM brings to our attention another good application - a microphone at the site, which can allow you to listen to what's going on. Combine it with a remotely controlled local speaker on/off (simply a relay connected to a remote control output), and you can talk back and forth with anyone at the site.

Dave used a Radio Shack "Listening Aid System" (33-1091, $19.95). He modified it by summing the two (stereo) audio outputs onto one of the 3 conductor miniature plug lines, and brought in power on the line freed up. Internally, he combined the external power source and the internal battery with two diodes, so that the internal battery acted as a backup in case of ac power failure. He took the audio output directly into the controller's Spare Audio 1 Input.

Automatic Control. Some time ago, the League petitioned the FCC to permit automatic control of amateur stations transmitting digital communications above 50 MHz. In response, the FCC issued a notice of proposed rulemaking to permit such activity. The NPRM had some flaws relating to third party traffic, which the League pointed out in its original comments. However, the report and order was issued with the flaws still present in the rules to take effect March 14.

As a final attempt to get the FCC to reconsider, 19 individuals and groups filed petitions for reconsideration. Most of these petitions pointed out the effects on the development of packet radio. Below is the text of ours, which emphasizes the effect on existing voice repeater operation. At press time, the new third-party restrictions have been temporarily weived at the League's request for packet operation only pending action on the petitions late this summer.

"CBMS", or "computer based message systems", is the jargon for keyboard/CRT type digital communications and computer bulletin boards.

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
Amendment of Part 97 of the)
Commission's rules to permit) PR Docket No. 85-105
automatic control of amateur) RM-4879
radio stations.)

To: The Commission

PETITION FOR PARTIAL RECONSIDERATION FROM ADVANCED COMPUTER CONTROLS, INC.

Advanced Computer Controls, Inc., is a manufacturer of amateur radio repeater and remote base control equipment. I have been licensed since 1967, and hold the Amateur Extra Class license.

INTRODUCTION

In its Notice of Proposed Rulemaking, the Commission proposed to expand the use of automatic control for amateur radio stations. However, the practical effect of the Report and Order is to restrict its use. In fact, while automatic control was previously permitted for stations in repeater, beacon, and certain forms of auxiliary operation, following the Report and Order, automatic control is no longer feasible for stations in repeater or auxiliary operation.

EFFECT ON EXISTING REPEATER OPERATION

The new restrictions result from the Commission's addition of §97.80(b), which states that "no amateur station may be operated under automatic control while transmitting third-party traffic". This is a new and highly restrictive addition to the regulations. Prior to the R&O, automatic control was prohibited (where otherwise permitted) only when a third-party was participating in amateur communications, either by talking directly over the station microphone, or while interconnected from the phone line (§97.79(d)).

Third-party participation, referenced in §97.79(d), is a subset of third-party traffic. Other forms of third-party traffic include messages originated for someone other than the control operators and transmitted by amateur radio, live or delayed. It appears from the Notice of Proposed Rulemaking and Report and Order that the Commission expanded the restriction present in §97.79(d) from third-party participation to include all third-party traffic.

Prior to the R&O, repeater users could exchange third-party messages among themselves, with the messages being (re)transmitted by a repeater, without the repeater control operator being present. This is (1) reasonable, since the repeater is simply a relay station, while control operators are available at both stations handling the traffic; and (2) in the public interest, since emergency and priority traffic handling is part of the basis and purpose of amateur radio.

Automatic control is no longer feasible for repeater stations, since a repeater station trustee, desiring to operate his repeater under automatic control, has no effective way of enforcing a ban on formal or informal third-party message handling by his users when he is not present.

Since many repeater trustees cannot be at a control point, or ensure that a designee is at a control point 24 hours a day, an effect of the R&O will be to cause many repeaters to operate with limited service hours. Should a repeater be operated under automatic control, it would not be available for handling third-party messages, including emergency and priority communications in the public interest.

EFFECT ON COMPUTER BASED MESSAGE SYSTEMS

While we do not currently manufacture amateur CBMSs, we agree with the Commission that it is in the public interest for the amateur community to develop such systems. One of the purposes of amateur radio, as stated in §97.1, is "recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications".

We recognize the Commission's concern that amateur radio, not being a common carrier, must carefully regulate non-amateur third-party traffic handled throughout a network. However, there are practical technological solutions to the problem. Technological solutions are available for flagging non amateur-to-amateur third-party traffic, and illegal traffic introduced into the network by non-amateurs. Control operator screening of these special cases approaches being feasible, although it would seem reasonable that traffic known to have been screened by an amateur control operator on entry into the network would not need to be re-screened. Provisions should be included in networks to guard against non-amateur origination of traffic into the network – this can be handled by user registration and special software on CBMSs to verify a legitimate amateur user.

Requiring a control operator to manually continuously screen high volumes of traffic passing through a network node is simply not feasible. The purpose of developing automated networks is to eliminate the need for people to attend to them. Thus, the Commission's requirement negates the advantages of using computers to develop such a system. Technological rather than manual solutions are available.

Further, it appears that the definition of third-party traffic should be reviewed. Messages originated by

and for, and whose destination are domestic amateur station licensees should not be considered third-party traffic, but rather a delayed form of amateur radio communications.

REQUEST FOR RECONSIDERATION

The Commission, in its attempt to ensure that control operators monitor the third-party traffic being passed through automated digital networks, has developed regulations which had unintended effects, such as on existing repeater operation. Other intended effects, such as requiring a control operator to screen traffic at each relay point in an automated network, appear to negate the original intents of the docket – permitting the amateur radio service to keep abreast of, and help develop new technology. Since it does not appear to have been the intent of the Commission to restrict, rather than broaden, the use of automatic control, we respectfully request the Commission to:

- Stay the effective date of the rule ammendments to permit a full review of the consequences of the R&O.
- Delete the added S97.60(b) and S97.114(b)(4). Third-party participation while a station is operated under automatic control is already prohibited by S97.79(d). Alternatively, exempt repeaters (voice, digital, CBMS non-real time) from the restriction on transmitting third-party traffic. Place the responsibility for screening traffic at the entry and destination points along the network – not on intermediate relay stations (real or non-real time).
- Redefine third-party traffic to exclude communications originated by and for, and addressed to domestic amateur station licensees.

CONCLUSION

We'd like to commend the Commission for its efforts at deregulation, and for removing unnecessary restrictions on amateur operation. The Automatic Control Docket was a large step in the right direction by permitting automatic control for stations transmitting digital communications above 50 MHz.

However, we do not believe that it was the intent of the Commission to implement rules which placed new restrictions on automatic control, therefore we respectfully request a careful review prior to the new rules taking effect.

Respectfully submitted,

ADVANCED COMPUTER CONTROLS, INC.
Edward J. Ingber WA6AXX
President

February 21, 1986

Pager Speaker.
One of the benefits of paging, or selective call capability on your repeater is that you don't have to listen to all the chatter to be available. You may want to leave the rig on at work, but can't, because the chatter all day long is distracting.

A selective call decoder can be built into a speaker enclosure, which can plug into the speaker jack of your HT. When you come into work, plug your HT into the charger, and the Pager Speaker into the speaker jack. If someone needs to reach you, or there's an emergency or a problem, your Pager Speaker will open and you'll be available.

The diagram for the Pager Speaker is shown below, using our HSC tone decoder board. Supply 12 volts to operate the board – you might be able to borrow it from the charger as shown below. Wire the relay in series to the speaker (common and normally open). A double pole, double throw, center off switch can be added, to bypass the relay for normal listening in one position, and for resetting a call in the other. The switch would best be momentary action for the call reset position.

When a user wants to reach you, he can activate your pager address, as a "voice page". A caller from the phone can generate a canned speech message through your speaker. System generated pages can activate your speaker when the patch is activated, if an alarm goes off, etc., or on a scheduled basis, such as before a net. And, of course, in an emergency, all repeater users can be immediately activated.

The figure below shows an ICOM BC-25U charger powering our HSC decoder board, with power left over to charge an IC2/3/4AT. Any selective call format supported by the controller will work (2 tone, 5 tone sequential, DTMF, CTCSS, HSC, etc.). However, unlike the others, the HSC format offers multiple levels of group call which is ideal for control ops and groups with special interests (such as DXers). Unlike decoders for other formats, it can also be commanded on and off, and we offer a bare pc board and application note to help you implement such a decoder.

Request our bare "HSC Decoder Board" – $25 postpaid. The total cost of the decoder will run about $100. The decoder is useful for other signalling applications as well, including control of remote phone lines. Our detailed application note is free on request.

SPEAKER ENCLOSURE
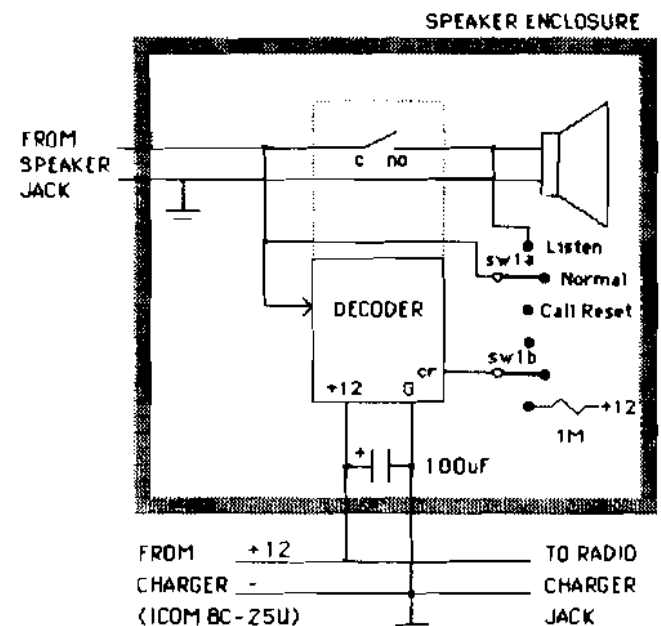
Need a Voter? If you're looking for a voting system for your repeater, we'd like to remind you that Hall Electronics offers a nice, low cost analog voter. It's based on valley detection of in-band audio to determine the channel with the highest signal-to-noise ratio. It has features that let it work nicely with our RC-850 or RC-85 controllers.

Doug Hall's unit is based on several years of optimizing his design in the field. If you don't want to spring for a Motorola or GE voter, check out Doug's unit. It goes for $350 assembled and tested.

Hall Electronics, 815 E. Hudson St., Columbus, OH 43211 (614) 261-8871

About ACC Notes. Our newsletter has been in brief hibernation during the winter so that we could complete development of the products we've promised. We're at the point where we should be able to get back to our intended bimonthly schedule. Please send in ideas, circuits, and other material that may be of interest to ACC Notes readers. Thanks!

Call For Dayton Speakers. Have you done something interesting with your repeater system? Have some ideas to share with other controller owners?

The last several years at Dayton, we've done a Q&A session for our controller owners. This year, we'd like to expand the scope to include your ideas. We'd like several controller owners who have completed interesting projects relating to their repeater systems to give a short informal presentation. There will be time for four 10-15 minute presentations. Anything of interest to other repeater owners would be appropriate – technical or organizational. And it doesn't have to relate specifically to our products. If you'd like to share your ideas and accomplishments with other controller owners, and you're planning to be at Dayton, please send us a summary of what you'd like to talk about. Same time and day as last year – Sunday, April 27th, at 1:15 p.m.

By the way, this year at Dayton we won't be at our old spot. Our booth will be inside the main arena – booth #56, 57, and 58, so please look for us there.

acc advanced computer controls, inc.

10816 Northridge Square
Cupertino, California 95014

**Archive of K6COP
WR6COP Repeater**