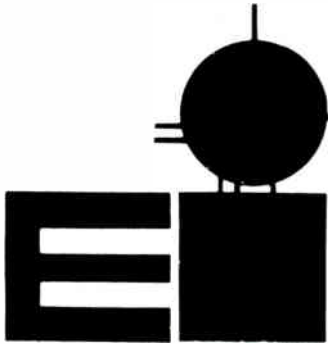


August 1984

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A MONTHLY NEWSLETTER FOR BROADCASTERS

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MORE FLEXIBILITY FOR AM DAYTIMERS!!!

Responding to intense lobbying by the Daytime-only radio stations, the F.C.C. changed its earlier decision of September 9, 1983 in regards to post sunset powers.

It was reported in the May edition of the NAB Engineering Report that the commissions reconsiderations will affect regional channels, (class III daytimers) and clear channels, (class II daytimers).

The class III stations will receive a new power computation for post sunset periods prior to 6 p.m. The before 6 p.m. power levels will be computed in a slightly different manner than the after 6 p.m. levels. Those before six o'clock levels will be computed using the dirunal curves on a sunset plus one-half hour basis. The after six o'clock authorized power levels will be set using the dirunal curves on a sunset plus two hour basis. This means that those levels after 6 p.m. will revert to those originally calculated and distributed earlier in the year. There will also be a minimum 100 watt power level before 6 p.m. Maximum power will remain at 500 watts.

The clear channels, (class II daytimers), will not have their post sunset power prior to 6 p.m. calculated on a sunset plus one hour basis, and will continue to be calculated after 6 p.m. on a sunset plus 2 hour basis. There is no minimum power before 6 p.m.

As before, there will be a mass no-

tification of the new powers and times to daytimers from the commission. The notifications are expected to be issued sometime this summer, in time for winter operation.

In another development, the F.C.C. eliminated the need to place a 25 mv/m signal over the business district of an AM licensee's community of license. This will allow more flexibility to AM broadcasters in locating transmitter sites.

The commission ruled that the 25 mv/m signal requirement which was enacted in 1930 has become obsolete. Many AM stations are located in small communities outside Metropolitan areas, and business districts have been decentralized due to urban sprawl.

The Commission sees the ruling as being helpful to AMers choosing future transmitter sites, and will not prompt licensees into moving existing sites. This ruling will most likely eliminate the possibility of a licensee having to choose an unreasonably costly transmitter site.

In the same ruling the Federal Communications Commission, eliminated the requirement of taking field strength measurements for AM directional licensees. The field strength measurements would show that the business district is indeed being covered by the now defunct 25 mv/m signal.

NAB and NRBA Join Hands

The NAB and NRBA are jointly sponsoring the Radio Convention and Programming Conference to be held in Los Angeles, California, September 16 through the 19. The two events were currently held separately each year. The combined effort of the two associations will include exhibits and separate programs for programmers, engineers, managers and sales people.

Those broadcasters interested in attending the conference should pre-register by August 15. Reports from the two groups point out that the demand has been greater than they had expected.

Since the NRBA has been familiar with planning technical sessions in past conventions, that organization will be coordinating the sessions and the exhibit area to be hosted by the Westin Bonaventure Hotel.

The NAB is spearheading the programmers sessions and the hospitality suites which will be hosted by the Biltmore Hotel.

The two organizations realize that this is really a combination of two conferences which have been in existence for some time, and until a joint effort is analyzed, they are going to be relying on past separate experiences.

THE PIONEER RT-909

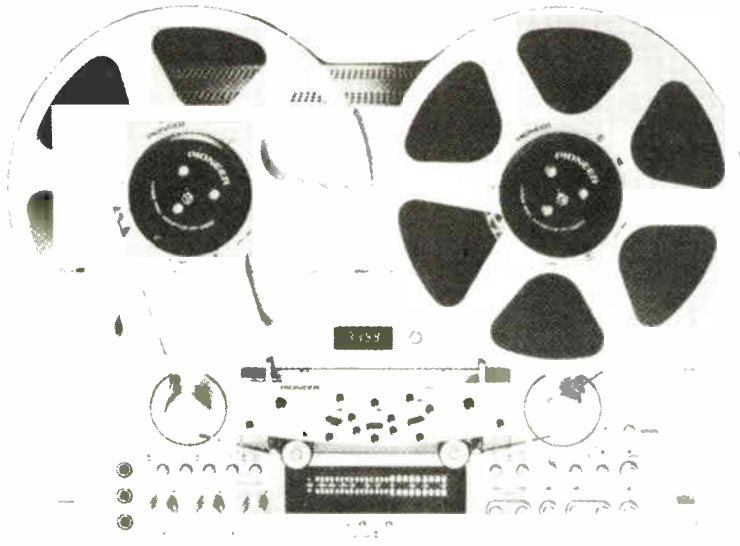
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Editor's Notebook

It seems so impossible that most of the summer had passed us by already. No complaints about those dog days though. Come January we will all wish it was August.



Ye Olde Editor

REMINDER . . . that all product evaluations are viewpoints from individuals who have conducted those in the field examinations. They are not commercially sponsored. If you would like to contribute to *Common Point* in this or any other

manner, send us the information . . . name, calls and if you're bold enough a snapshot of your person. We certainly will consider printing it.

TRIBUTE . . . The radio world was stunned upon the news of the tragic and sudden death of a comrade. Rest well, Alan Berg.

AM STEREO . . . Has the war been declared a draw? Has interest declined or was it a bad idea from the start?

LOST & FOUND . . . Many engineers have expressed interest in a contact for NARTE, the National Association of Radio Telecommunications Engineers. Here it is: Ray Thrower, P.O. Box 15029, Salem, OR 97309.

COMMON POINT READINGS

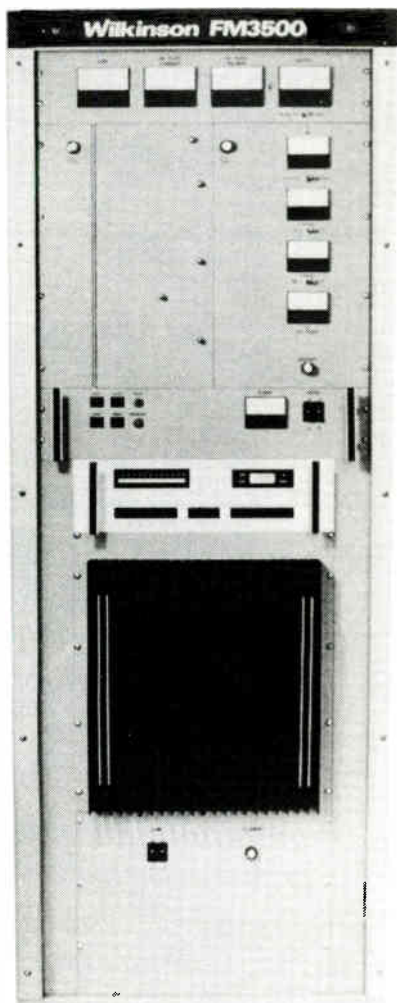
- Page 6 Memo From Metz
- Page 8 Shepler Says
- Page 10 Crosstalk by Ed Duellman
- Page 12 Talkback
- Page 15 Persons' Post Scripts



THE WILKINSON FM 3500

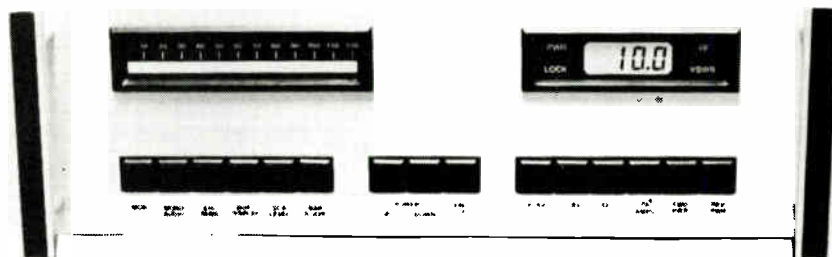
CLASS "A" WORKHORSE WITH MUSCLE . . .

INTRODUCED AT THE NAB CONVENTION, THE WILKINSON RADIO DIVISION OF TELEVISION TECHNOLOGY CORPORATION ANNOUNCED THE NEW FM3500 F.M. STEREO BROADCAST TRANSMITTER . . .



THE SOLID STATE FM 700J IPA IS A NEW GENERATION, DEVELOPED BY T.T.C., PROVIDES THE MUSCLE TAKEN FROM FIELD-PROVEN DESIGN AND PERFORMANCE. THE FM700J SHOWS GREAT PROMISE FOR INCLUSION IN OTHER MODELS OF THE F.M. LINE . . .

BACKED BY THE PROVEN FME-10 F.M. EXCITER, PROVIDING THE HIGHEST DEGREE OF COST EFFECTIVENESS IN THE INDUSTRY, AND THE NEW SYNTHESIZED FME-15 (PICTURED BELOW).



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FME-15 — NEW APPROACH TO SYNTHESIZED F.M. EXCITER DESIGN. OFFERING IMPROVED PERFORMANCE AT A COMPETITIVE PRICE. FRONT PANEL SWITCH POSITIONS AND REAR CONNECTORS PROVIDED IN QUANTITY AND AT PROPER CIRCUIT POINTS TO RENDER THE FME-15 THE MOST VERSATILE AND "ENGINEER FRIENDLY" SUCH DEVICE AVAILABLE.

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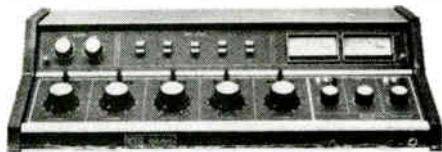
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Common Point/August 1984
Page 5

MEMO FROM METZ



by
David L. Metz

MORE THOUGHTS ON TOWER MAINTENANCE

Light bulbs can be a real source of tower aggravation. Years ago I had an engineer tell me of an AM tower where the lighting circuit consisted of a run of romex up the leg of the tower held on with nylon-ty-wraps. The first winter the ty-wraps all broke and the romex blew off. Then they put up conduit held on with bailing wire. The next winter the rusted bailing wire started breaking and the conduit started flapping in the wind. Then water got in the sockets and they all corroded and burned out. All through this the station owner bragged about how much money he was saving on maintenance. Or at least til he got fined for repeated violations of tower lighting regulations.

Under the best possible conditions beacon lamps will last for as long as three years. But on some towers they last barely a year. And, as we all know, relamping is not cheap, especially in winter when they always seem to burn out.

Bulbs should be replaced in the fall. That's a good time to have the tower crew in anyway. It's important to have the guy wires properly tensioned before the winter ice load hits. During the winter the thermal cycling of the lamp is at its worst, thus you need a fresh lamp to get through this period of stress.

Make sure you're getting lamps designed for beacon service. Ordinary lamps just won't cut it. GE, Westinghouse, Sylvania, and Duro Test all make good lamps. There doesn't seem to be any difference between brands. Check the base position rating of the lamps. Some lamps are rated to operate only in one position (normally base down) if mounted re-



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STL-10 Transmitter

. . . . **BEATS**
the **HIGH-PRICED** competition

Specifications and prices as of February 1984	MARTI STL 10 Dual System	Brand X Composite	Brand Y Composite
Distortion	0.25% or less	0.20% or less*	0.30% or less*
Response	±0.25 db	+0.10 db	±0.10 db
Noise	75 db	75 db	72 db
Stereo Separation	-72 db	-50 db	-48 db
Receiver sensitivity for 60 db of Quieting	14 uV	60 uV	150 uV
List. Stereo System	\$5,795	\$7,375	\$8,995
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Why pay more for an STL?

Buy **MARTI!**

All prices listed may be subject to change without notice.

*Base band

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EQUIPMENT EVALUATION

by Pete Rondello

ZERCOM MAXI-TWO REMOTE CONSOLE

With Fall sports comes the time when most of us conscientious engineers and operators begin to think about dusting off the old remote console, charging up the batteries, and making sure the cords on the headsets are "short-free". If the "Booster" spots sell well this year...you might be ready to check into the specifics of the newer sports remote consoles that have appeared on the scene. If so...consider the Maxi-Two from Zercom...the new little brother to the Maxi-Tel.

For most sports and remote broadcasts, it's got just what you need. First off...it's a nice looking piece of gear. The main cabinet is a brushed, bronze colored heavy gauge aluminum. The unit has a matching color carrying handle that doubles as a stand to help "prop-up" the console for better viewing. The size is practical...(exterior dimensions are 13" long, 7" wide, 3 1/2" high)...making it handy for tight broadcast booth situations, and for easier packing. Controls are simple...and laid out nicely for ease of operation...or, as the folks at Zercom like to say: "Human Engineered for Easy Control".

Speaking of controls...except for the telephone dial, there are only three. One pot controls the volume level for Mic No. 1, or main mic. The second, lower pot varies Mic. No. 2 level, or can be used to mix a tape program, which is fed through one of the rear panel jacks. The middle pot turns the power on and off, and controls the headphone monitor level. The Maxi-Two uses a conventional dial type phone circuit for compatibility with most systems.

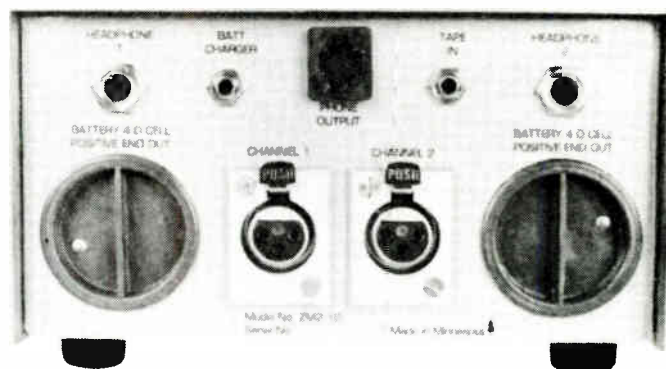
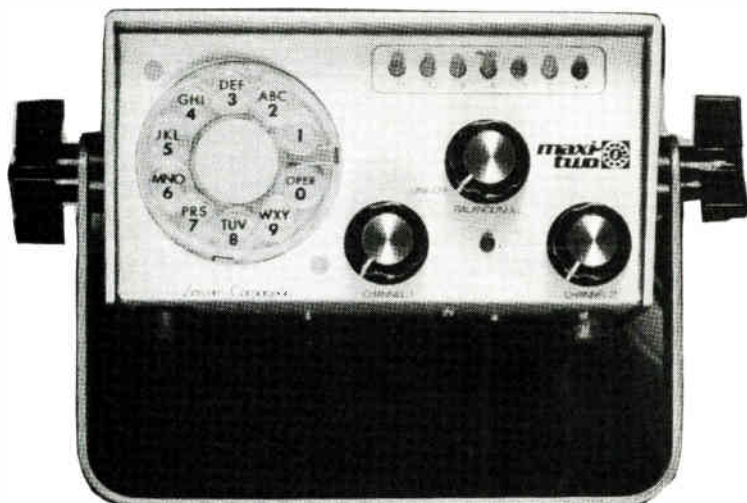
Audio metering is accomplished with an LED type VU meter. The meter has excellent ballistics: with rapid rise, and slightly damped decline. It's also easier to see than conventional meters (during night broadcasts especially). Front mounted low battery indicator flashes as battery life becomes critical. Rear panel inputs/outputs are designed for easy hook-up. The batteries are loaded into the Maxi-Two at the rear

(Cont. on page 12)

Solve Those Remote Broadcast Blues Now With MAXI-TWO by ZERCOM

Exclusive Features:

- Human Engineering Designed System for Easy Control
- Ladder Logarithmic VU Indicator
- AC or DC Battery Operation



INDICATORS:

VISUAL: Low battery LED begins to flash with 8 hours of life left and flashes faster as time reduces.

AURAL: Telephone ringer

POWER REQUIREMENTS:

8 standard "D" cells for 60 hours of broadcast or 120 VAC [120 VAC adaptor/charger standard equipment].

HEAD ROOM:

25 db at rated output

INPUT LEVEL:

- 50 dbm at 150 ohms

OUTPUT LEVEL:

- 9 dbm at 900 ohms

MISC:

AGC/Dimensions: 13" x 7" x 3½"
Shipping Weight: 6 lbs.

INPUTS:

MICROPHONES: Two
TAPE: One miniature jack

OUTPUTS:

Two headphone jacks
One telephone line jack - modular
120 VAC/12 VDC adapter

CONTROLS:

One, Mic 1/Volume
One, Mic 2/Cassette/Volume
One, On-Off/Headphone Volume
One, Telephone Dialer

METERING:

7 step logarithmic LED VU from
- 15 dbm to + 3 dbm

SIGNAL TO NOISE RATIO:

Better than 55 dbm

never before has so much cost so little . . .

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MAXI-TWO

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Shepler Says.



by John Q. Shepler
Technical Consultant

POINT OF REFERENCE

The hardest part of improving your station's sound is knowing where you really are now.

For instance, say you are trying to increase your modulation level while keeping the signal audibly clean. Your success can be very dependent on how well you can hear and measure the results while you tinker with the audio processing.

If your modulation monitor cannot handle sharp audio waveforms without overshooting, the peak lights will flash even though there is no real over-modulation. You may wind up having to limit excessively or roll off the high end just to satisfy a finicky meter. The other unacceptable alternative is to live with a low modulation level and corresponding weak sound.

The only good way out of this unfortunate situation is to find out what is really wrong in your system and then get rid of the troublemaker. That sounds easy, but it is often hard to know whether your intuition is right or your instruments are.

Modulation monitors can be very sneaky. They can appear to calibrate correctly and even proof out well on sine waves. Yet, complex program material doesn't get measured accurately.

If you suspect that you have a fibbing mod monitor, the easiest test may be to try a new unit on loan. If the modulation level is considerably different, you certainly have a problem. But, which monitor is right?

On AM, you can tie scope into the RF pickup and watch the modulation envelope. Those negative peaks should just hit the zero line without breaking it. Your negative peak flasher should come on whenever the scope shows a trough that breaks the line.

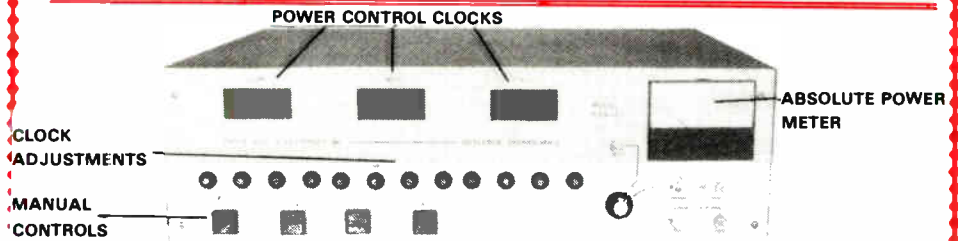
Meter reading will depend on the ballistics of the meter. Newer monitors have fast characteristics and show higher modulation levels than older, slower, meters. It's just an

(cont. on page 14)

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- Normal Monitor Readings
Plus FCC Required Readings
for Absolute Power
- Operate With Authorized
Power As Low As One Watt
- FCC Authorized And Field
Proven For Over A Year
- Adds Up To 150 Hours
"Prime" Time Each Year



- PSA-1 Capable of three-level power control with completely automatic clock control. Clocks have to be adjusted monthly for local sunrise - local sunset per station. License Power Control up to 1,000 watts **\$3,995.**
- PSA-2 Same as PSA-1 except controls are set up to work push button or through station Remote Control System **\$2,995.**
- PSA-3 Single manual cutback to power levels below that available on transmitter. Can be set up to work through Remote Control System **\$1,695.**
- PSA-5 For stations with power up to 5 KW **\$4,495.**

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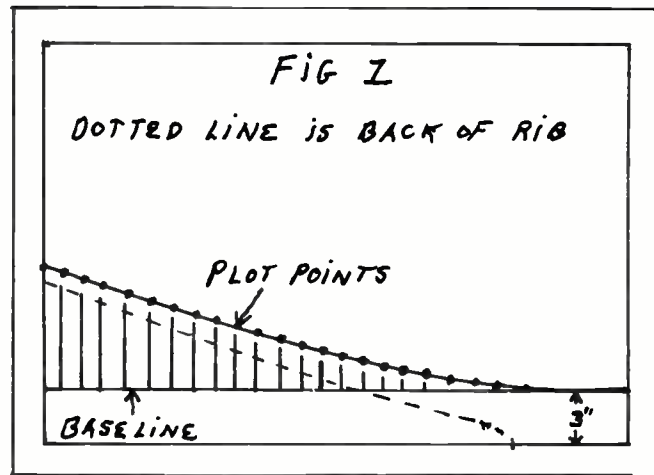
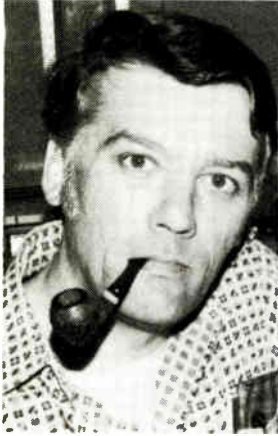
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Crosstalk...

by ED
DUELLMAN



Show and tell time, here are the results of the dish building project, I managed to win the battle with the camera. The reflector is constructed from plywood ribs that are glued and screwed to a plywood base plate. The base plate has a one eighth inch piece of aluminum epoxy glued to the back of it. This helps keep the base from warping and gives a more ridged mount for the polar mount hardware. The LNA and feedhorn mount is formed from 3/4 inch conduit. Something a little more ridged here would be better, but the conduit works ok and you can stuff the wires from the LNA and feedhorn rotor down it.

The construction of the ribs starts with a pattern drawn and cut from the poster board. The pattern that you draw (see fig. 1) is generated from the dish design computer program published in the February 1984 issue of Common Point. The poster board pattern is traced on the plywood and then cut out, I used a saber saw, ya, all 12 of the little darlings. After the ribs are all cut out it will probably be necessary to sand them so they are all exactly alike and match the poster board pattern. After the wood parts are all assembled paint is next, I used a good grade marine paint. The rim around the outside of the dish is 1/8 by 3/4 inch aluminum strap and is attached with screws in the end of each rib.

The screen covering is the last step. The dish pictured is seven feet in diameter and I used 18 feet of 1/8 inch

(cont. on page 14)

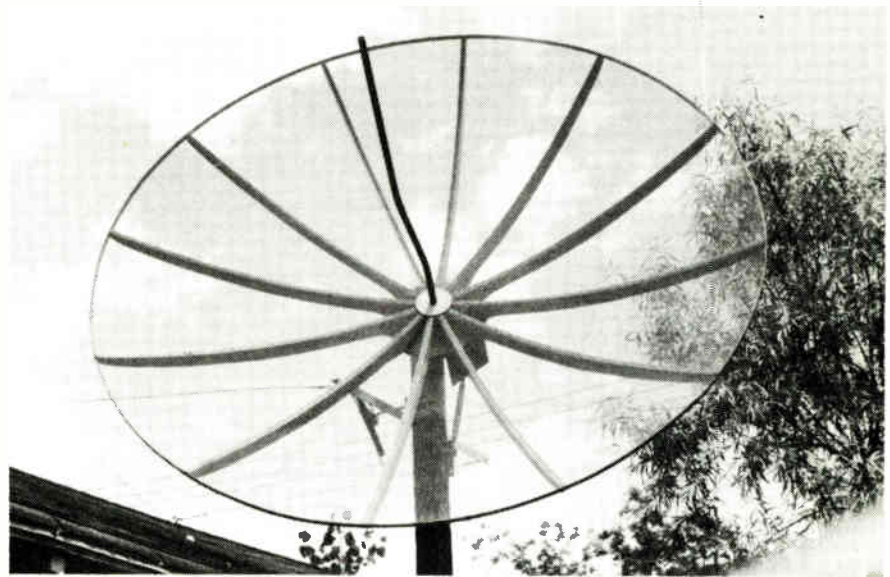


PHOTO 1 - COMPLETED DISH. LNA & FEED NOT YET ATTACHED.

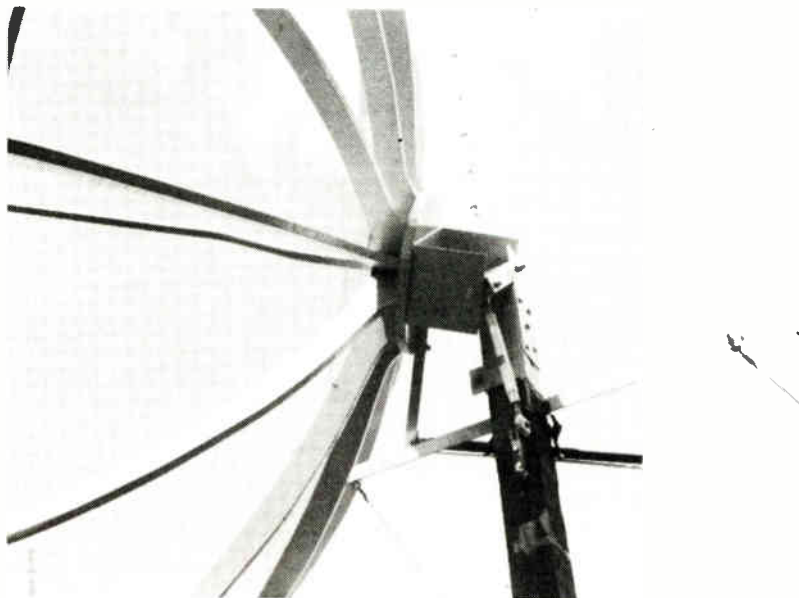


PHOTO 2 - BACK VIEW OF DISH SHOWING BASE PLATE & POLAR MOUNT.

versed they burn out quickly.

If with good lamps you still have burn out problems, check the line voltage with a true RMS AC voltmeter. Especially if you use an isolation transformer on your AM tower. It's not uncommon to find high line voltages. 120 volt lamps won't last long on a 125 volt circuit. Because of this I have always used 130 volt lamps, even in my house!

Wind induced vibration can cause premature lamp failure. If your towers vibrating enough to break lamp filaments, think how the steel must be fatigued! If this is the case, get a good mechanical consulting engineer fast. Something will have to be changed on the tower to break up the resonance.

If the burn out problem is really severe, try pyrex (also called hard glass bulbs). These lamps are designed for operating in extreme temperature variations and are quite resistant to vibration. It helps to keep moisture out of the wiring, too. If water gets into the wiring, you're going to have corrosion, burned out sockets, etc. Our system is all in waterproof conduit with all the boxes and lamp holders gasketed. The conduit is fastened to the tower with stainless steel hose clamps.

At the tower base junction box, the tower AM RF and lighting circuit connection is made with a run of 3/4" copper water pipe brazed to the lighting isolation choke and ATU. I had the copper pipe brazed to the tower below the box to make a good RF connection.

If you relamp yearly, have the tower crew save the old lamps for you. You'll be amazed how long they'll last in your house!

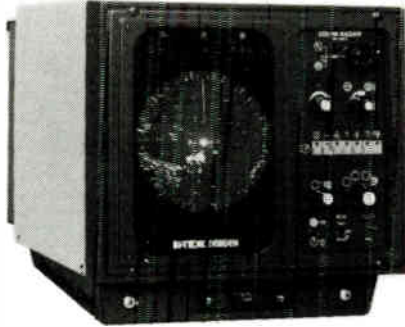
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The multi-format
magnetic tape eraser



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- Push-button range selectors -- 1/2 mile to 64 miles with LED range indicators. Range calibration rings automatically adjust to selected range.
- Main function selector for: radar off, radar standby, radar on with antenna rotating and anti-clutter rain (FTC) on to reduce rain return.
- Variable intensity control adjusts brightness of picture.
- Warns when severe weather approaches.
- Electronic bearing marker (EBM) LED readout showing direction of storm center in relation to station.
- General coverage area displayed in blue.
- Distant and local light rain show on display in green color.
- As storm area intensifies, color changes from blue to yellow.
- Major storm cells on SI-TEX radar indicated in red.

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EQUIPMENT EVALUATION
(cont. from page 6)

also. This unit uses eight "D" size batteries...giving it quite a long operating time on each charge. One problem with this is that the weight of the unit with the batteries installed is substantial. One of few criticisms. Phone line output is modular, and located at the top center of the rear panel. Mic inputs are the Amphenol 3 pin type, and are located below the phone line jack. A submini jack is supplied for use with the AC adaptor/charger. (this is included). A mini phone jack allows use of external tape turntable/linelevel devices. Headphone monitor jacks are typical 1/4" mono phone plugs, one located at each side on the back.

The headphone output on the Maxi-Two is driven by an extremely high quality IC op-amp, the NE-5533. This provides four times the audio power...with very low noise and distortion. In our use of the Maxi-Two, there was ample level to override the crowd noise...with plenty to spare.

For incoming calls, the unit features a loud buzzer type ringer to alert the operator.

Our testing was done in the summer "off-season", so the Maxi-Two was not subjected to the normal rigors of heavy use. The two baseball games that we did use the console behaved quite well... and received high marks from our sports staff for its ease of operation and good sound quality. One incident when we had to use AC power resulted in some 60 cycle hum to the program line...but we decided this was due to a faulty AC adaptor...and not the console. Supply voltage is 12 volts...opening up possibilities for vehicle powered

remotes...or to charge up the unit's batteries "on-the road". In all, we were pleased with the Maxi-Two. With its low price, it is an outstanding value.

Your station may need more inputs and gadgets than the Maxi-Two has. In that case, check out the Maxi-Tel. It has more features...with the same Zercom quality.

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TALKBACK

SOUTH DAKOTA...Radio and T.V. are both broadcasters, but their technologies and interests are quite diverse. (Especially at the studio as opposed to the transmitter).

MICHIGAN...RE: Matrix Processing For AM Stereo...I am saddened that, fidelity takes a backseat once again. (Fidelity to special imaging that this type of processing ruins.) Are gimmicks and compromises on quality the best the Marketplace can do?

WISCONSIN...Good comments from Metz about breadboarding. My

own approach is using the plain .1 spaced Vectorboard with T49 terminals and doing the interconnect with wire wrap.

KANSAS...Pleased to have C.P. give recognition to Hams. I was Ham years before getting into radio, but have always found combination gratifying and advantageous. Each enhances the other when used properly, ei, the experience gained from VHF and UHF amateur operation...big help in R.P.U. and S.T.L.

NEW MEXICO...RE: Shepler says...Many stations try to use a Mod Monitor for too many purposes. Most were never intended to be used for receivers. You really don't hear what your listeners do and they're the

ones who count.

INDIANA...The Commodore computer programs are great.

MICHIGAN...Appreciate the art on Homebrewing...Too often management does not realize how many goodies engineers put together that save the company dollars. Many custom ideas couldn't be purchased elsewhere for any price.

IDAHO...Thanks to you we'll be saving money using Fidelipac's new dynamax reloading kits for our carts. We'll do the work and save the bucks for other things. Discovered product through your publication.

MISSOURI...RFI tips from Metz article really useful.

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SHEPLER SAYS...
(cont. from page 8)

illusion, though. The modulation level is the same. Only when you increase the output of the processing without flashing the peak indicators do you really get more audio into the signal.

FM stations have it tougher because a normal scope won't show a nice envelope. What you really need is a spectrum analyzer that shows the deviation of your signal. These instruments are expensive to own, but

can be rented for a couple hundred dollars or so if you want to take a peek. Substituting a new monitor may be the less painful approach.

There is also an unofficial test that you can run with a stereo receiver and a good scope. Connect the scope to the tape monitor outputs of the receiver. This is where the audio will be the cleanest.

The 100% modulation point can be found by comparing the demodulated audio of your station to others in the market. Since all stations are peak limited in their processing equipment,

the peak to peak scope voltage should be nearly identical. You can bet that a signal which looks much higher or lower than the others has a modulation problem.

This method certainly won't stand up in court, but it is fair enough for comparisons. It's a fast and easy way to spot check the band and settle those arguments about whether the competition is really overmodulating or just better at the audio game. Simple tests can often provide very good points of reference.

CROSTALK...
(cont. from page 10)

hardware cloth 30 inches wide. The screen (hardware cloth) is cut in pie shape and overlap 3/4 inch at each rib. The screen was attached with staples about every 2 inches along the length of the ribs. The screen is trimmed and bent down around the rim of the dish and fastened with wire ties.

This is not intended to be a construction article, but just to show that with a little time and not much money you can watch Satcom 4 transponder 12. I might add that a few people are about to build a copy of this dish because with careful shopping and a little scrounging it can be one for about \$30.00.

The receiver pictured is also a homebrew project and if any interest is shown I may be persuaded to do a construction article on it. As you can see it produces a pretty good picture. The picture of the TV was taken off Comstar D4 transponder 18. For you observant types, the LNA and feed-horn was not on the dish at the time the photo was taken. So how did I get the picture off the TV when the receiver was apart and the LNA and feed off the dish? Magic!

73
ED K9FWR

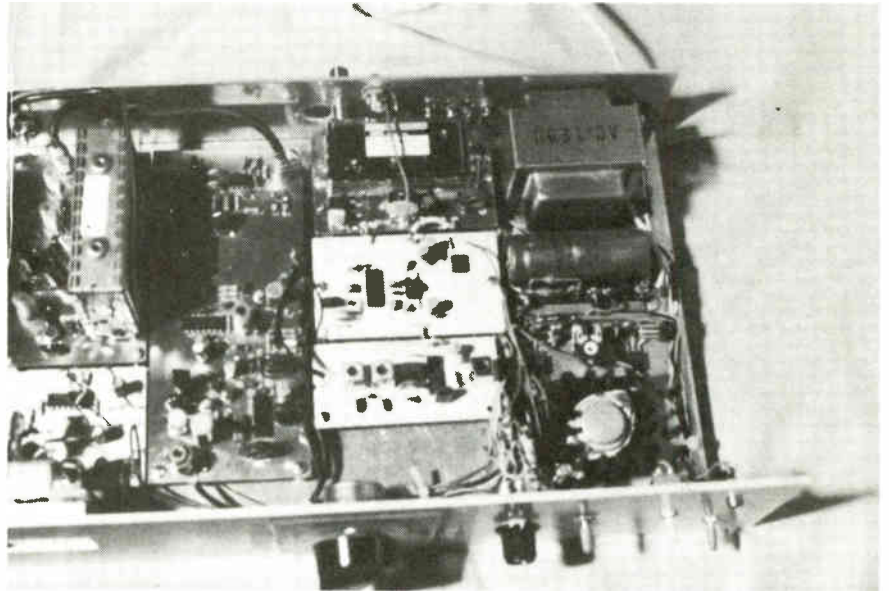
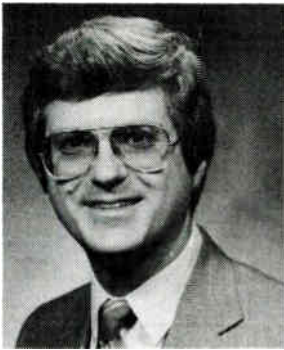


PHOTO 3 - HOME BUILT RECEIVER.



PHOTO 4 - THE PAY OFF - - IT WORKED! LNA IS B5° DRAKE.



PERSONS' POST SCRIPTS

by Mark Persons

Well, it finally happened. I got up the courage to shave off my mustache. That soup strainer was glued to my upper lip for over eight years. Hence the new photo for this column.

I was recently called to repair a Collins 831D-2 2.5KW FM Transmitter. There would be a loud grunt and the high voltage circuit breaker would trip every time the plate-on button was pushed. A good visual inspection of the transmitter revealed nothing unusual.

The rectifiers in the high voltage, screen, and bias supplies all checked good. The high voltage filter capacitor checked OK with an ohmmeter. To check if it was shorting with high voltage, I disconnected it and tried to run the transmitter. The same nasty symptom persisted. Disconnecting the load from the high voltage power supply again gave the same result. At this point, I found the high voltage filter capacitor was charged. This somewhat startling revelation came when I routinely shorted the capacitor with the grounding rod before reaching in to do more work. The loud BANG and flash were enough to make me sit down for a moment and think over the situation.

The PA screen voltage power supply is also connected to the high voltage circuit breaker. I disconnected its primary. Now, only the high voltage power supply was connected. Another test and the breaker tripped again.

Ohmmeter checks showed no power supply components were grounded where they shouldn't be. I removed the secondary leads from the high voltage transformers and was dismayed again to find the problem continued. I jumpered across the high voltage circuit breaker in the transmitter and tried again. This time the breaker in the power mains box tripped. Obviously the circuit breaker in the transmitter was doing its job properly.

What could be drawing so much current? All that was left was an SCR (Silicon Controlled Rectifier) power control circuit and the high voltage

power transformer it controlled. An ohmmeter check of the transformer primary and the SCR's showed no short to ground.

I put jumper wires across anode and cathode of both SCR diodes, turned the power on, and the breaker didn't trip. I had isolated the problem to the SCR diodes or their driving circuit. Since the SCR's checked OK, it had to be the driver. Sure enough, there was an open 200 MFD electrolytic capacitor on the driver card. This capacitor and an identical one on the other side of the card used to drive the gates on the two large power SCR diodes. Only one SCR was being driven. SCR diodes are DC controllers. It takes two to control both sides of an alternating current waveform. You guessed it, the power transformer was getting pulsating DC from one SCR and nothing from the other. The high voltage capacitor managed to charge on the first pulse of DC before the breaker disconnected the transformer. Transformer primaries don't like DC or pulsating DC. They have enough trouble coping with chopped AC from power controllers. This high voltage power transformer's primary impedance drops to just a few ohms when presented with DC.

The final solution to the problem was to replace not one, but both of the 200 MFD capacitors on the power controller card so that the experience would not be repeated in the near future when the remaining original capacitor failed as well.

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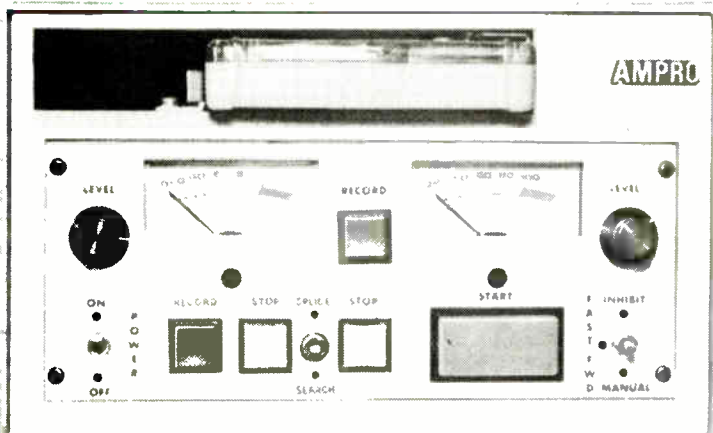
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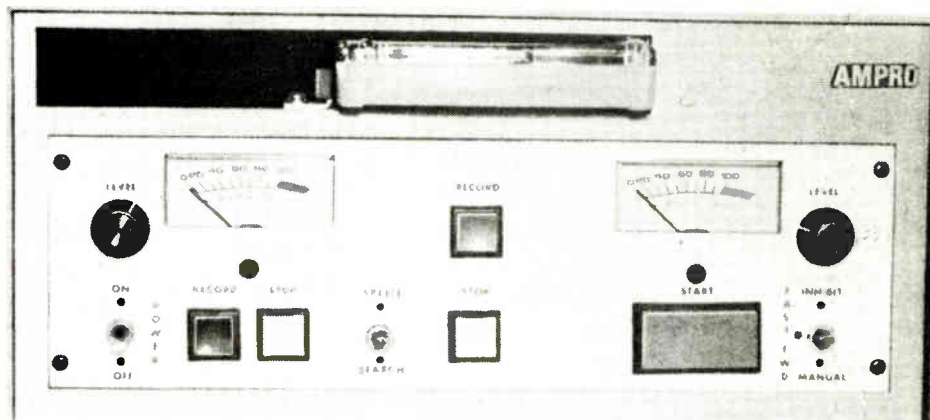
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