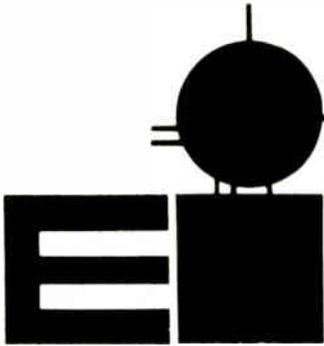


Jan. 1984

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COMMON POINT®

A MONTHLY NEWSLETTER FOR BROADCASTERS

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per copy

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1984 . . . A HAPPY NEW YEAR FOR RADIO

CANADIAN AGREEMENT GIVES GREEN LIGHT, MEXICAN STILL ON RED

Rushing around to wait for what seemed a never ending time agreement by the Canadian Government was finally received early in December permitting AM stations on Class II frequencies to extend their broadcast hours after local sunset.

The enthusiasm shown at first, was considerably dampened when the FCC informed stations specifically what their post sunset hours would be, with authorized powers of less than 2 watts up to just under 100 watts. Some stations angrily replied they would not bother. Jim Wychor, president of the Daytime Broadcasters Association, reported the overall reaction to be very positive with many stations planning to take advantage of the new authority as soon as possible. The major complaint was the delay in receiving the signed agreement from the Canadian Government which precluded many stations from extending their hours this past December with the added revenue from pre Christmas advertising.

SOUTH OF THE BORDER

A somewhat disappointed FCC contingent returned to Washington just before Christmas after seeing what they anticipated to be an agreement with the Mexican government slip from their grasp and fade away. Essentially, the agreement, based on criteria similar to that established with Canada, would have given the green light to Class II and Class III stations for extended coverage now. While other issues were finalized into a single bi-lateral agreement subject

(cont. on page 13)

I THINK HARRIS THE BEST ROUTE

I've read the premature reports of the end of the Harris stereo system, and I for one would be sad to see Harris leave the "marketplace." After all we broadcasters, and more importantly we engineers are now the undisputed marketplace.



Fred Baumgartner
Badger Broadcasting

Yes I know that GM says they will go with Motorola, but you can bet that their marketing people won't let a single system receiver fly. You just can't have people returning a 10K car for a \$5 chip . . . and they know that. For us the discussion should surround what is best for the future of AM radio. Frankly it is difficult to make a case for anyone doing more for AM transmission than Harris. A good example is the SX series transmitter .

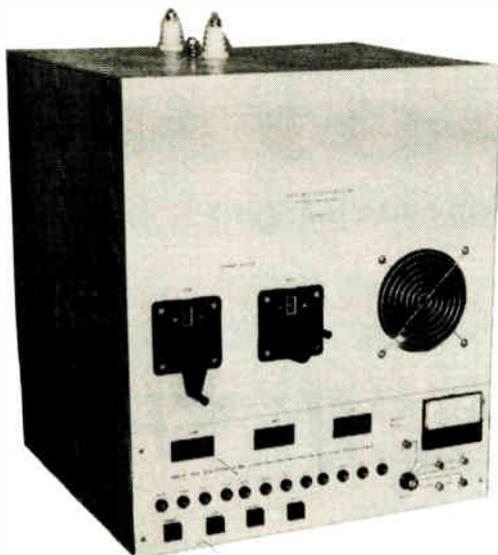
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COMMON POINT READINGS

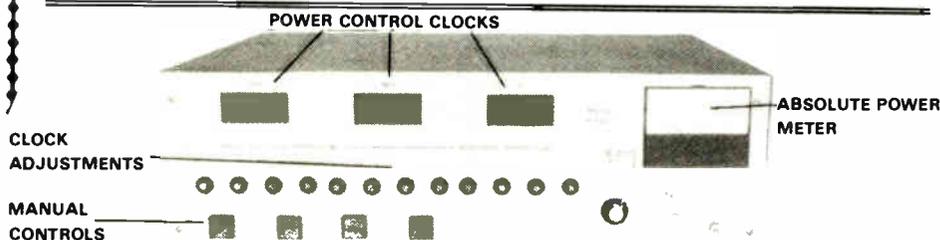
- Page 4 CROSSTALK
by Ed Duellman
- Page 6 SHEPLER SAYS
by John Shepler
- Page 10 MEMO FROM METZ
by Dave Metz
- Page 15 POSTSCRIPTS
by Mark Persons



The Eagle Hill PSA Adapter



- Normal Transmitter Readings
- No Internal Changes Needed
- 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.

The Eagle Hill PSA Adaptor has two time clocks for pre-sunrise and daytime power but is designed for a third clock for post-sunset power which can be added if approved by the Federal Communications Commission.

EAGLE HILL ELECTRONICS, INC.

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Editor's Notebook

January 1984. An interesting year behind us for AM broadcasters with many Class II's and III's picking up their PSSA and extending broadcast hours, plus Class IV's authority to go 1kw full time in most cases. The year ahead will see more FM stations providing the commission gets their budget and other things together.

Caution is the word . . . with many of the rules gone we hear stories some stations have thrown the book away, exceeding licensed power . . . letting extortion get out of line etc. . . . station owners are still responsible, as are station engineers . . . and rumbles we hear are that some stations who are out of line will have the book



Ye Olde Editor

thrown at them with heavy fines. We have been told the FCC will make examples of them. Just make sure you're not an example.

NAB 62nd Annual Convention . . . sched-

uled for April 29th through May 2nd at Las Vegas. If you plan to attend . . . don't put off getting your hotel and flight reservations . . . you might miss out.

Attention station managers and program directors . . . every station has good announcers . . . those who think they're good . . . those who hurt. "the program skimmer" . . . a device that picks up just the announcer whether its the "on air man" . . . "the local news man" . . . or your "talk show host". The "program skimmer" picks up just his or her voice . . . records it . . . keeps it under lock and key for later review either with you or by themselves. A great way to improve your air sound. Interested?? Let me know.

New from Orban . . . and available a little later this year . . . the 412A compressor/limiter . . . and the programmable parametric equalizer. Be sure to watch for times and prices. You'll like 'em . . . you'll like 'em both.

PACIFIC BROADCASTING — A STORY FROM THE FAR EAST

by Darrel Gander

Having circled the globe courtesy of the Navy during the Korean War, when I hear about radio in a foreign country I always think of the old Armed Forces Radio. There has been many changes in the past 30 years. This story from Darrel Gander tells about these changes.

— Editor

Last June, it was a delight to be in Tokyo to help set up the new studios and control rooms for the Pacific Broadcasting Association, a missionary organization which records Christian programs for use on Japanese radio stations.

Moving the operation from the old location to the 7th floor of a new building a few blocks away was a challenge but it was all very well planned by PBA Director, Steve Tygert, and by Graham Whitehead, an engineer on leave from the Australian Broadcasting Company. The two new mixing consoles and some of the associated equipment were in place and operational before the actual move took place, thus minimizing lost production time.

The production area consisted of two control rooms, three studios and a dubbing room. A 16 in and 4 out Shindenshi mixer was installed in control room "B" for use with 4 real to reel machines, 2 turntables, a cassette deck and several mics from studios "B" and "C". A smaller 8 in and 3 out Shindenshi was installed in control room "A" for use with studio "A". Some extra switching was installed to handle more than 8 inputs.



The two control rooms were interconnected so that the four tape machines in each control room could be used simultaneously for making high quality multiple tape copies. (Seven machines recording and one playing the master). The reverb unit was common to both control rooms and could be switched to either one. Most of the equipment was Japanese made with the JBL studio monitors being a notable exception.

The Shindenshi mixers were not perfect but the service was excellent. A crosstalk problem developed in the large mixer and one monitor channel went out in the smaller unit. The company was notified and responded by sending out some engineers from



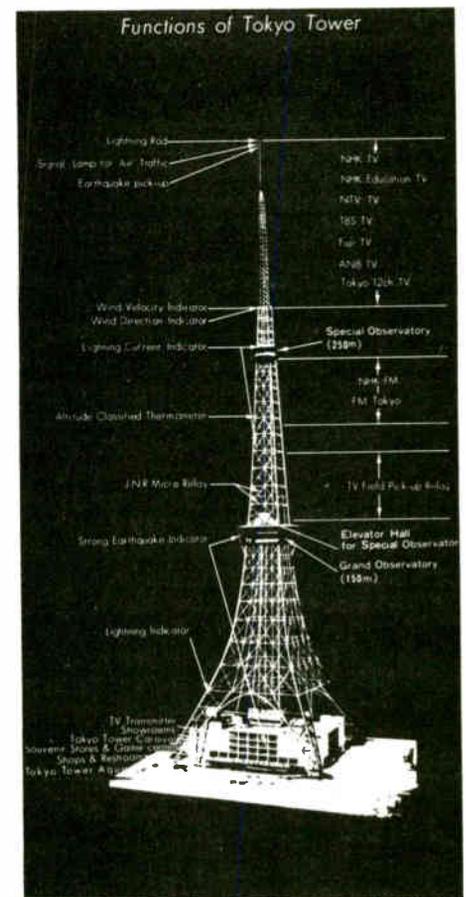
the factory. They worked on the mixers for most of the day until they had them operating properly. U.S. manufacturers, please note!

Any connectors, switches, cables or other parts needed were readily available at Akihabara, the electronics district in Tokyo, about 15 minutes walk from the studios. This electronic buyers' paradise has shop after shop selling electronic parts, test equipment, radios, TV, etc. all at very competitive prices. Many of the vendors are very specialized. One sells only switches and lights, another connectors and his neighbor stocks only a variety of resistors. Most of the sales people know a little English, but if not, the merchandise is displayed so that it is easy to find what you want and electronic terminology is mostly the same in Japanese and English. If you ever go to Tokyo, don't miss Akihabara, just two stops North of Tokyo Station on the Yamanoti (green) train.

Since this publication is directed toward broadcasters, maybe some words should be added concerning broadcasting in Japan. The industry is divided between the government NHK network and the privately owned stations. The emphasis is on quality rather than quantity. As you tune across the AM or FM band in Tokyo there would seem to be far fewer stations than you would expect in such a large metropolitan area. The commercial AM band covers about the same portion of the spectrum as ours. The FM band runs from about 76 MHz to 94 MHz with the TV channels beginning at that point. The Japanese have had multiplex TV for a

few years now. This is used mainly for bi-lingual transmissions but is also used for stereo sound (either but not both at once).

Seven on the Tokyo TV stations have their antennas mounted on the 333 meter Tokyo Tower. Built in 1958 in the style of the Eiffel Tower, this major tourist attraction has elevators to the two observations decks. The lower one at about 450 ft. has two floors of shops and displays. The upper deck at about 800 ft. is much smaller. Besides TV the tower is used for FM and various meteorological observations. It's another "must see" for anyone visiting Tokyo.



Crosstalk...



by ED
DUELLMAN

I have received questions lately to the effect; can I use the dish that Joe's surplus is selling, or will a home TVRO dish that the local dealer will trade out be made to work? Hopefully I can answer those questions, better yet after you read this you can answer them yourself. I take it you are looking to save some bucks, maybe and maybe not. Here's why.

The dish that is setting down at Joe's surplus is a neat nine and a half foot job and that is the size of the one that comes with the Scientific Atlanta equipment for network reception. Now you rush over and get that good deal for \$200.00 and rush it back to the station before Joe realizes that you just took him to the cleaners. You make a few slick buys on a LNA and feedhorn from the local TVRO dealer. The boss will be real pleased at the money you saved, right? Well that's the maybe part. One thing that you have to do to get this thing working is run down to the hardware store and get some aluminum tubing to make up a mount for the feed horn and get the positioned out in front of the dish. All is done and now for the big moment, antenna lined up by the numbers and nothing, check all connections, aiming, and called the guy across town to see that he gave you the right measurements on the distance from the feed to the center of the dish (He has the S.A. dish), still doesn't work . . . The maybe not!! Now let's find out why this dish doesn't work.

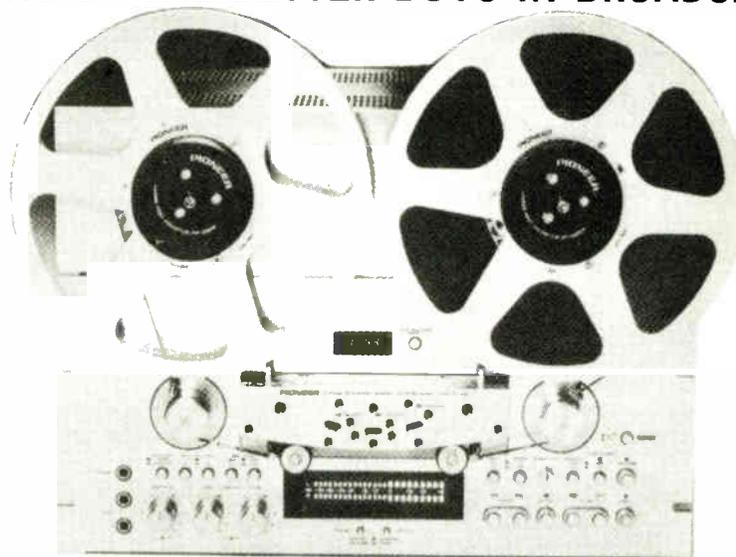
We will assume that everything is connected correctly, the antenna aimed, and the LNA and receiver are working. What we could have here is a dish and feedhorn that are not compatible. So; how you going to solve this one wise guy?? Easy, get out your calculator and I'll show you.

(cont. on page 13)

THE PIONEER RT-909

- LIVE ASSIST
- CONTROL ROOM
- PRODUCTION ROOM
- AUTOMATION

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- CLOSED LOOP DUAL CAPSTAN TAPE TRANSPORT (3 $\frac{3}{4}$ & 7 $\frac{1}{2}$ IPS)
- FREQUENCY RESPONSE 20 - 30 KHZ AT 7 $\frac{1}{2}$ IPS
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- INDEPENDENT LEFT/RIGHT RECORDING MODE SWITCH
- OUTPUT LEVEL CONTROL
- PITCH CONTROL ($\pm 6\%$) IN PLAYBACK MODE
- "LITE-TOUCH" ELECTRONIC TRANSPORT SWITCHES
- TAPE HEADS—NORMALLY 4 TRACK—EASILY CONVERTIBLE TO 2 TRACK WITH TOUGH NORTRONIC HEADS
- CONVERTED TO 1/2 TRACK RECORD/PLAYBACK SINGLE DIRECTION FOR PRODUCTION ROOM — INCLUDING LONG LASTING NORTRONIC HEADS AND BALANCED OUTPUTS . . . \$1295.00
- FOR 1-7/8 AND 3-3/4 IPS ADD \$65.00
- CONVERTED TO 1/2 TRACK PLAYBACK ONLY FOR AUTOMATION SYSTEM . . . \$875.00

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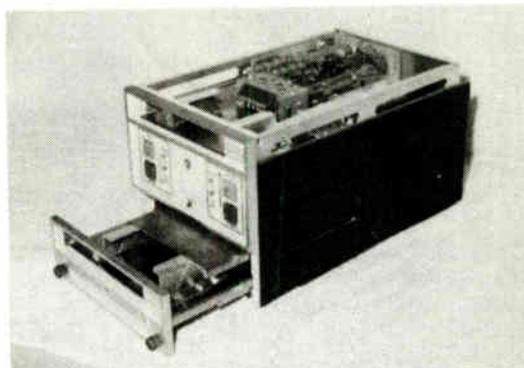
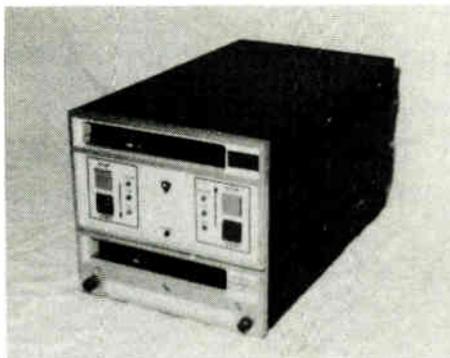
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TWIN DECK 'S' SERIES PLAYBACK, TDS SERIES - Available January 1984



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AT LAST WE USED THE OTHER END OF THE MOTOR IN THE ECONOMICAL NEW TDS SERIES—a sensible and simple machine which utilizes a double ended hysteresis synchronous motor made by Nidec for Audi-Cord. Only the low field-lo heat design of these established superior motors make possible this very practical design.

The lower deck is a slide out assembly with precise adjustment positioning with respect to the motor and a side azimuth head mount, adjustable when the deck is in place and operating, making this deck a true "twin" in performance with the fixed upper deck.

The electronics are plug-in re-packaged from the premium "S" Series single decks now established as superior performers. The program and cue cards are identical and interchangeable. The balanced transformer audio outputs and remote control are independent. Only the control logic and power supply cards are common.

The dimensions are 8 1/4" W x 7 1/2" H x 14" L overall. Two units will readily fit in an optional rack shelf and use only 8 3/4" of panel space.

Two standard desk cabinet models: (AA and BB size cartridges)

Model TDS-1 Monophonic w/3 NAB tones	\$1499.00
Model TDS-6 Stereophonic w/3 NAB tones	\$1679.00

Initial quantities may be limited due to parts availability.

BUILT BY



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Shepler Says.



by John Q. Shepler
Technical Consultant

DANGERS OF DEREGULATION

The recent waves of FCC deregulation may seem like sunshine after a storm to radio broadcasters bogged down by heavy competition and a struggling economy. The urge to loosen up and take it easy is strong indeed. Beware though, there is trouble abrew.

Deregulation was never intended as a license to run wild. The technical requirements are still there. The difference is that the FCC has stopped being a watchful parent. No longer are they going to spell out exactly how you go about staying legal.

The burden of technical deregulation is likely to fall on the shoulders of the station engineer. Most managers and station owners are not technically inclined and look to their chief engineers for advice on technical matters. They depend on you to keep the operation running smooth and legal.

In years past, there was never a question about whether a piece of monitoring equipment was suitable. It had to be type approved to be legal. The same was true of people who operated the equipment. They had to have a license and sign their name to the measurements they took. You may have had to keep after the announcers to fill out these logs, but at least you had some hard evidence when the inspector walked in.

Things are not so black and white any more. Logging regulations are relaxed, but who guarantees that the station is still operating legally? Type approval isn't necessary for modulation monitors, but who guarantees that the rules are still being met?

The sad truth is that the station engineer is probably the only person who will know when the transmitter meters aren't right or what monitoring equipment will do the job. You may find yourself spending more time double-checking meter readings. You may also spend a lot of time

(cont. on page 13)



RS SERIES—AUDIO ROUTING SWITCHERS

Switching systems of up to 64 stereo inputs x 32 stereo outputs can be easily configured from standard plug-in RS family components. Ask for a factory quote.

MODELS

100RS—

\$1500

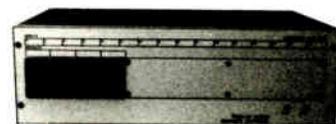
- ★ 16 in by 12 outputs mono
- ★ 8 in by 12 outputs stereo
- ★ Control-by twelve 16 position thumbwheels. One per output
- ★ Size - 5 1/4" x 19" rack mount
- ★ Expandable - more outputs only, no additional inputs
- ★ Remote control - 4 bit binary



1100A-RS

\$995

- ★ 16 in by 4 outputs stereo
- ★ Control-by four 16 position binary thumbwheels. One per output
- ★ Size - 5 1/4 x 9" rack mount
- ★ Expandable - yes, in and out
- ★ Remote control - 4 bit binary plus enable



1100B-RS

\$1695

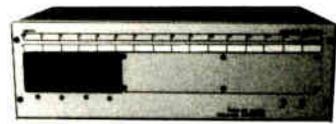
- ★ 16 in by 8 outputs stereo
- ★ Control - by eight 16 position thumbwheels. One per output.
- ★ Size - 5 1/4" x 19" rack mount
- ★ Expandable - yes, in and out
- ★ Remote control - 4 bit binary plus enable



2100A-RS

\$1695

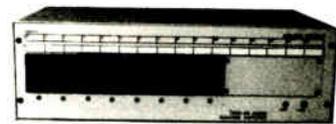
- ★ 32 in by 4 outputs stereo
- ★ Control - by four 16 position thumbwheels and four A/B select switches. One each per output
- ★ Size - 5 1/4" x 19" rack mount
- ★ Expandable - yes, in and out
- ★ Remote control - 4 bit binary plus enable.



2100B-RS

\$3495

- ★ 32 in by 8 outputs stereo
- ★ Control - by eight 16 position thumbwheels and eight A/B select switches. One each per output.
- ★ Size - 10 1/4" x 19" rack mount
- ★ Remote control - 4 bit binary plus enable.



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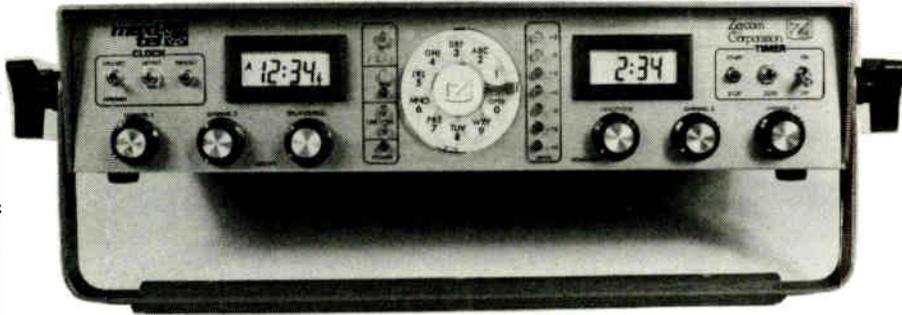
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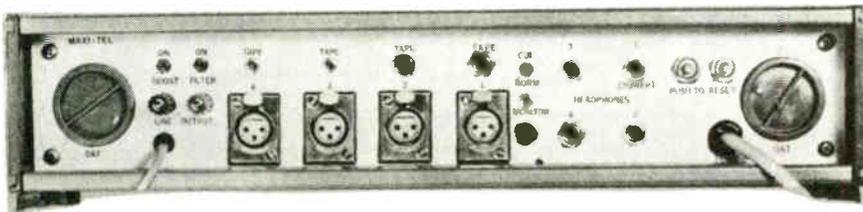
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- Up to four tape inputs, both miniature and standard jacks to fit any tape system that you may want to use in the field.
- A monitor input so you can monitor off air along with your program output.
- Built in telephone complete with a dial that works with your standard headphone and microphones.
- Record output so you can tape any event for future use or feed a PA system.
- A Hi/low boost function to compensate for those long phone lines.
- A super sharp notch filter to prevent spurious crowd noises from disconnecting you when you are on a long distance line.
- A cue circuit for both tape and microphone.



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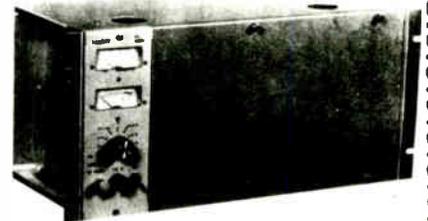
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- Test Meter Built in
- Proven Reliability in thousands of installations world wide
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SPECIFICATIONS - STEREO

Stereo Cross Talk -65 DB
Noise -65 DB or less
Response ±0.5 DB 30-15000 Hz.
Distortion Less than 0.5%

STL-8 ACCESSORIES

- RMC-15 Digital Remote Control
- SCG-8 SubCarrier Generator
- SCR-8 SubCarrier Receiver
- CLA-40A Compressor/Limiter
- HRC-8A Transmitter Combiner
- Complete Antenna Systems

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The Otari 5050B-II With The Proof Of Performance

New Features.

- Transformerless balanced microphone inputs with switchable 20 dB pad and mute.
- Transformerless balanced line inputs and outputs.

- Variable low frequency reproduce equalization (switch defeatable).
- Microprocessor-controlled, real-time counter with Memory Rewind and L.E.D. display.

- Dual frequency oscillator (1 & 10 kHz).
- Front panel record level indicators (185, 250, & 320 nWb/m).
- Front panel equalization indicators (IEC/NAB).



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Page 8

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Based On Technology You Can Trust

5050B-II Features.

1. D.C. capstan, servo-controlled.
2. Switch selectable 1/4 track or 1/2 track playback head.
3. Positive-locking NAB hub adapters.
4. Variable speed control ($\pm 7\%$).
5. Hinged head cover with integral tape splicing block.
6. Plug-in four head design; Perm-alloy for optimum head life and maximum output.
7. Adjustable Cue control (tape lifter defeat).
8. Microprocessor-controlled, real-time counter with Memory Rewind and Reset.
9. Reel size compensation switch.
10. Speed select (chooses high or low speed of internally selected speed pair).
11. Dump edit switch (spills tape between capstan and take-up reel).
12. Transport controls with full motion-sensing logic.
13. Microphone and Line input mixing on each channel.
14. Safe/Ready switch for each channel (with L.E.D. indicators).
15. Selective Reproduce for overdubbing.
16. Front panel record calibration adjustments.
17. Lighted V.U. meters with L.E.D. peak indicators.
18. Headphone jack.
19. Tape or Source monitor select.
20. Output level control.
21. SRL select switch with L.E.D. indicator (switchable between variable output and Standard Reference Level).



Tape accurate at all speeds, a microprocessor-controlled real-time counter features a Memory Rewind and L.E.D. display in hours, minutes and seconds.

New! A Feature That Removes The Guesswork.

The new B-II now includes a microprocessor chip that accurately counts elapsed time in hours, minutes and seconds. Tape accurate at all speeds, it has a multi-digit L.E.D. display with both positive and negative domain. This feature is extremely helpful in situations such as spot production where an accurate measure of program time is critical.

When you need to play and repeat a section continuously, we've given you a feature we call Memory Rewind. You'll call it great. With the Memory button depressed, the transport will enter the Stop mode when rewinding past "0.00.00". The Reset button returns the real-time display to "0.00.00" regardless of actual tape location.

The Electronics: New And Improved!

Now, here's where the new B-II leaps ahead of the other guys' "Hi-Fi" heritage.

Concentric Mic/Line Input level controls for each channel permit you to mix on the machine if you wish. For added versatility when using preamplifiers or high output microphones, a rear panel switch inserts a 20 dB pad on each channel.

The microphone inputs are balanced and transformerless to put as little as possible between the sound and the tape. The line inputs and outputs are also balanced and transformerless to achieve the lowest noise figures, highest fidelity and professional flexibility. Optional transformers are available should your application require them.

Next to the input level controls are two large, easy-to-read lighted V.U. meters with peak-responding L.E.D.'s. Factory calibrated to +9dB, a different threshold may be user adjusted for this important feature. Concentric output level controls are adjacent to the meters. Below these controls is a switch for selection of Standard Reference Level (SRL) or a variable output position. Normally +4 dBm for a balanced 600 ohm line, the output of the B-II may be changed to -10 dBV by a rear panel switch to facilitate the interface with low-level mixers or peripheral equipment.

To optimize performance with tapes which have been recorded at another facility, there's a Ref Flux switch that will give you a choice of three reference fluxivity levels: 185, 250 & 320 nWb/m. (The latter being the IEC and DIN standard). This same flexibility allows you to choose how "hot" a recorded level gets put on tape. Front panel L.E.D. indicators report the selection of the chosen calibration level.

MEMO FROM METZ



by
David L. Metz

WHAT TO DO WHEN THE TOWER FALLS DOWN

I had always worried about having a tower collapse at KWPC. With only one tower for the daytime AM that also supported the antennas for a fulltime FM, you have nothing to fall back on.

KWPC's/KFMH's tower did collapse in a freak winter wind and rain storm late in December 1982. Thanks to a little planning, KWPC lost no air time even though its tower was completely destroyed. I didn't even have the use of the base tuner.

At hamfests and surplus stores I had collected an odd assortment of "parts" that I thought someday might be usefull. I had a 500 foot roll of #12 wire, a box of assorted mica transmitting capacitors, a huge air wound coil and a World War II RF ammeter. This and some scraps of rope would keep KWPC on the air for the next 30 days. The first job was to string the random wire antenna. Our 100 foot Rohn 25G tower that held our VHF antennas was still standing. A line was rigged to pull the middle of the wire to the top of the tower. Then the end was strung to the limb of an Oak tree to keep it away from the tower. From the tree it went into the station to the transmitter. The other end of the wire, about 350', slanted across the yard to a fence. Truly a random wire!

This is one of the few times it will be to your advantage to have an old vacuum tube final transmitter. At three in the morning I had no idea what the impedence of my wire antenna was nor any means to measure it. Needless to say, the transmitter refused to load at all. One of the virtues of the Pi-net output circuit is that with proper component values it will match any load between 50 to 600 ohms.

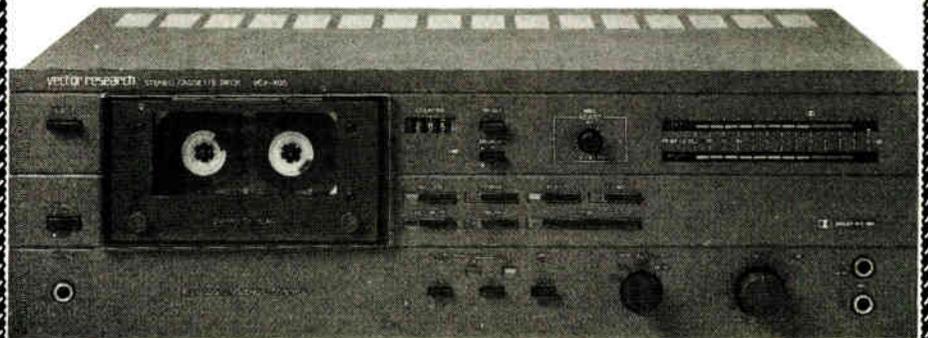
In order to tune the transmitter without damaging the output tubes,

(cont. on page 14)

vector research

**THE CASSETTE DECK
YOU'VE BEEN WAITING FOR!**

- **SOLENOID-CONTROLLED
TRANSPORT**
- **RACK MOUNT**
- **REMOTE CONTROL**



STANDARD UNIT **\$350.00**

RACK MOUNT **\$35.00**

REMOTE CONTROL **\$85.00**

It's great news from Vector Research — the VCX-400. More than just a basic performer, this cassette deck offers outstanding reproduction quality with a host of convenience and control features that just aren't supposed to be on a deck with this kind of price tag. State-of-the-art technology, quality construction and human-engineering make the VCX-400 a standout performer.

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LET YOUR WEATHER RADAR PAY FOR ITSELF!

WHEN SEASONAL WEATHER BRINGS STORMS TO YOUR AREA,
FULL COLOR WEATHER RADAR WILL MAKE YOU THE WEATHER CENTER FOR YOUR AREA



SI-TEX WEATHER RADAR

FEATURES:

- Variable gain controls adjusts receiver sensitivity for maximum discrimination and clarity.
- 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.
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HARRIS...The Best Route
(cont. from page 1)

... 5 years ago you would be hard pressed to find an FM system that could outperform an SX today.

It would seem to me that what we want here is to come up with a system that will in the mind of the listener perform as well as an FM system. Even the TV guys want that.

What AM stereo should be is a vehicle to improve overall AM performance. As I see it we are down to 2-1/2 systems . . . Motorola Harris and Kahn.

I suspect that Kahn has reached his peak. While the Kahn system is elegantly simple and its chief proponent is loud, it offers little overall performance advantages. Didn't you kind of assume that anyone who suggested mistuning two AM receivers to "enjoy the stereo image" might have missed the goal.

As for Motorola and Harris, it is interesting to note that both of the giants (Annual sales for Harris are 1.2B and 4B for Motorola) chose

remarkably similar methods. The Harris system is more expensive because it compensates for more of the inherent AM deficiencies. Each has an irrelevant fault, Harris can't produce separation below 200 Hz where there isn't any and Motorola prevents you from exceeding -95% modulation depth and thus lose a couple of theoretical feet of fringe coverage.

Harris however is a linear system, which means that it encourages synchronous detectors. Motorola can use a synchronous detector to recover L-R alone. To save AM radio we have got to get rid of those diode, envelope detectors. A fully synchronous detect has some real advantages . . . greatly lower distortion and reduction of impulse noise, effects of selective fading, mistuning and some IF distortions.

Further, receivers have to be of the variable bandwidth variety. Your city grade folks should see 15Khz with

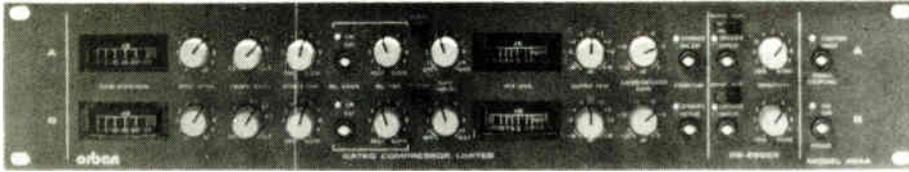
noise and adjacent channel at 50 db or less. On the fringe you lose response and signal to noise . . . on the other hand the FM drops stereo and pumps up noise and multipath distortion. In order to do this trick to best advantage it is necessary to conserve spectrum space . . . again its Harris.

From this vantage point, knowing that we are the marketplace and it is our duty to fix AM or turn it into voice grade forever, and comparing the propaganda from all sides (dropping the insignificant) I think Harris is the best route. I do know that all of the systems work and produce real stereo, and all would be adequate selections as far as a stereo goes, but we have to consider the future.

It is also time we stop waiting to be dragged by the market to our decision and start acting like the market . . . sell me on the best system . . . whoever it belongs to.

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TALKBACK

IOWA . . . as far as I'm concerned the FCC did not do broadcasters any great favors with the low PSSA. We're a 250 watt daytimer on a Canadian clear. The FCC authorized 16.3 watts which in Dec. is doubtful would make it to the studio two miles away . . . the DBA is taking credit for the relief of daytime broadcasters saying some relief is better than none . . . when in fact it is the equivalent of none.

TEXAS . . . Thanks for great mag. I'm young engineer (22) not in it for the money . . . have turned down \$20K jobs to do what I want. Really like little guys . . . string 6 each month. Keep up Person's Column.

COLORADO . . . Re Editor's Notebook . . . "and then there was none" . . . If right opportunity opened up I would leave too. Why work 50-60 hour weeks on call 24 hrs. for \$19K when industry is paying \$23K up for 40 hours plus bennies?? . . . Yes there are some trade offs for working small town and small station but temptation seems to be getting bigger to move to industry.

OREGON . . . Keep current authors happy . . . it is great to have something of this nature again after several years absence from trade pubs. Ed Dudlman's thoughts might be more easily implemented in engineers would pass on whatever they find helpful. Have been at this for 30 years and have been glad to report.

NEBRASKA . . . Anybody else have a Sony AM stereo? Heard good stereo from Chicago, Detroit but wide bandwidth switch unusable even on our 1kw station 3 miles across town . . . 10khz whistles. That's with antenna oriented properly . . . makes us wonder if better freq response with AM is practical.

ILLINOIS . . . Article on ham radio by Ed Duellman (Oct 83) very much to the point. I teach short courses in radio broadcasting to (Chicago) inner city youth and AM appalled by their complete lack of anything technical or scientific. Often wonder what kind of world they will create for their future when us, the old and old old timers are gone?

MICHIGAN . . . Really enjoy the Ham column. Can relate well to your comments. You just aren't an engineer unless you're a Ham.

D.E.W8GCW

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CROSSTALK (cont. from page 4)

First we get some sort of a straight edge and a ruler, lay the straight edge across the face of the dish and measure to the center. This thing is 25 and 5/8 inches deep, now what? We are going to calculate the F/D ratio of the dish and see if it matches our feedhorn. The formula for doing this is $F = D^2 / 16C$. F = focal length, the distance from the feedhorn to the center of the dish, D = the diameter of the dish, 114 inches. C = the depth of the dish. Now let's plug those numbers into the formula. We find that the focal length is about 31.697 inches. Divide the focal length of the dish by the diameter and we get .278, that's the F/D ratio of the beast in the back yard. Now let's look in the book that came with the feedhorn that we have and find out if this dish was a bargain or an expensive bird bath. Well like most of the feedhorns on the market this one is intended to be used with a dish with an F/D ratio of about .4. So go point that thing straight up and fill it with water!!

The bottom line of the problem is all the signal being gathered by the dish is not being reflected into the feedhorn and to the actual antenna that is in the LNA waveguide opening. Actually the dish used in the example probably would have produced some signal, but not what we are looking for. In months to come we will get into more of the why's and theory of how the dish works, and some tricks on selecting a dish that will do the job.

CANADIAN AGREEMENT (cont. from page 1)

to ratification by the Mexican Congress in the fall of 1984.

It would appear now all changes made will be held up subject to action by the Mexican government. It was pointed out that Canadian agreement took 2 years and based on the same schedule, this would place the Mexican agreement late in 1985.

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SHEPLER SAYS... (cont. from page 6)

hounding operators to keep the transmitter power within limits and the modulation monitor calibrated.

What about new monitoring equipment? You will probably spend more time digging into the specs and testing various models to make sure that the claims are valid. If other rules are relaxed, you might have to look hard to make sure that a transmitter will run legally.

Now is a time for more vigilance, not less. The relief that management and programming get from technical deregulation really means work for the engineer if the station is to remain legal. Management should realize that it is only a sharp engineer that stands between them and big trouble.

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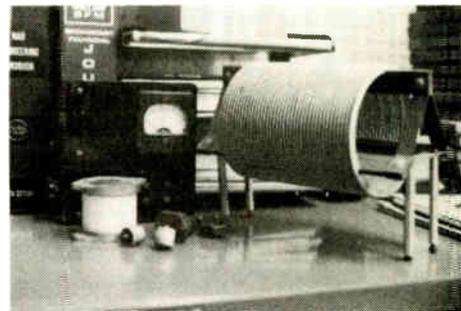
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MEMO FROM METZ...
(cont. from page 10)



Parts for AM Random Wire Tuner

the plate voltage was reduced by changing the taps on the plate transformer. The transmitter was fired up and a small amount of output was noted. But the plate tune control was at zero and the load at max. The tank coil was then tapped down until resonance was achieved. The loading control was the main problem. It had a range of only 250PF and was in parallel with a 1500PF mica cap! Out came the junk box of mica capacitors. Various series parallel combinations were tried to raise the shunt capacitance across the variable in 250PF increments. The new value of shunt capacitance was found to be 2,250PF. Two very old TV door knob capacitors were seried to obtain the last 250PF! The old RF ammeter was used as a relative power output meter. All transmitter meters read normally and no problems were had with the transmitter.

Coverage was less than normal, but our main advertising area was covered. Most listeners could tell no difference in our community of license. When the new tower was completed it took only 10 minutes to return the transmitter back to its original values.

Most important, since no air time was lost by being able to rig the emergency antenna, very little advertising revenue was lost. We did get quite a few phone calls from our competition asking how we could be on the air without our tower.

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PERSONS' POST SCRIPTS

by Mark Persons

PSSA

PSSA's (Post SunSet Authorities) for AM stations have been at the top of the list for interest this past month. About ten of our clients are daytime AM operations. All received letters from the FCC giving them operation past sunset at powers from 2.9 watts to 390 watts. Most were in the 50 watt category. The 2.9 watt one was too little to do any good. One of the 50 watt authorizations will not be used because the AM is apart of an AM/FM simulcast operation and the expense of the power cutback did not justify the potential return.

The most commonly asked question was "What kind of coverage will I have with 50 watts?" The answer is "It'll be a lot more than one-tenth of your 500 watt PSA coverage." Signal intensity varies at the square root of the power difference. Assuming operation at the center of the band (1000 KHz) and a ground conductivity of 8, the 25MV/M contour extends four miles at 500 watts and 1.5 miles at 50 watts. The 5MV/M contour is 13 miles at 500 watts and just under 6 miles at 50 watts. So, you see, it's not as bad as it looks. The biggest limiting factor is skywave co-channel interference. This interference will vary from hour to hour inflating and shrinking the station's usable coverage area. What I've been telling our clients is that you'll cover your city of license well and anything else you get is icing on the cake.

There are a number of methods reducing a transmitter's power output. Most transmitters can be cutback to one-tenth of their normal operating power. Below that, you're dealing with a great deal of uncertainty. The chance of maintaining legal audio specs is slight. Signal to noise deteriorates, distortion rises, and carrier shift can go beyond limits.

Some engineers have suggested that the transmitter should be run into a dummy load and the PSSA power be stolen from the transmitter by means of link coupling to a coil in the output network of the transmitter. This

would almost certainly violate the type approval of the transmitter and the RF output will probably be overly rich with RF harmonics violating FCC Rules and Regulations.

By far the best technical approach to reducing RF power below one-tenth of the transmitter's normal output is an RF power reduction box inserted in coaxial line between the transmitter and antenna coupling unit. Each box is a custom tuned arrangement for reducing whatever is the normal low power output of the transmitter to the PSSA power. The box should consist of non-inductive resistors arranged as a voltage divider. The input and output impedances should remain at 50 ohms (assuming the transmission line is 50 ohms) in order to present a good match to both the transmitter and the transmission line. There should probably be a capacitor and/or inductor to wash out miscellaneous reactance of the supposedly non-inductive resistors.

The resistors should be large enough to dissipate the power difference between the transmitters' output and the station's radiated power. Let's look at a typical example. A station runs 5,000 watts day and 500 watts PSA. The PSSA is 50 watts. A power reduction box should be constructed to accept 500 watts input and put out 50 watts. 450 watts must be dissipated in heat in the box. However, modulation on the 450 watts could bring the dissipation to 1.5 times that value or 675 watts. Remember, the box will be dissipating this power on a continuous basis so the resistors can't be run at their full wattage without forced air cooling. Obviously plenty of ventilation is required.

An RF switch, probably a solenoid driven contactor, must be used to switch the RF power reduction box in and out of the coaxial line. There should also be a logic lockout from the RF switch to prevent the transmitter's 5,000 watts from being put into the resistor divider network. You can't rely on a procedure which the operators must follow when changing power modes. Sooner or later someone will make a mistake and fry

the resistors. Instead, a microswitch sensor on the RF contractor should be used to prevent the transmitter from running in the wrong power mode.

Last, but not least, you may need to install an extra RF ammeter in series with the regular one at the tower feedpoint. Remember, the lowest power level (90% of the lowest authorized power level) must register above one-fifth scale on any meter you use. The meter should have a shorting switch to protect it from lightning. In the case where a far more sensitive meter is used for PSSA, then the shorting switch will also protect the meter against excessive RF current as well in higher power modes. Just remember to have the station in the PSSA mode before engaging the meter for weekly checks.

Antenna current is determined by this formula:

$$\sqrt{\frac{\text{Power}}{\text{Antenna}}}$$

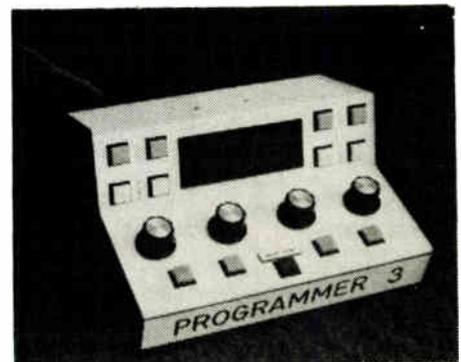
Example:

$$\sqrt{\frac{50 \text{ watts}}{72 \text{ ohms}}} = .83 \text{ amperes}$$

Good luck on your PSSA modifications.

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