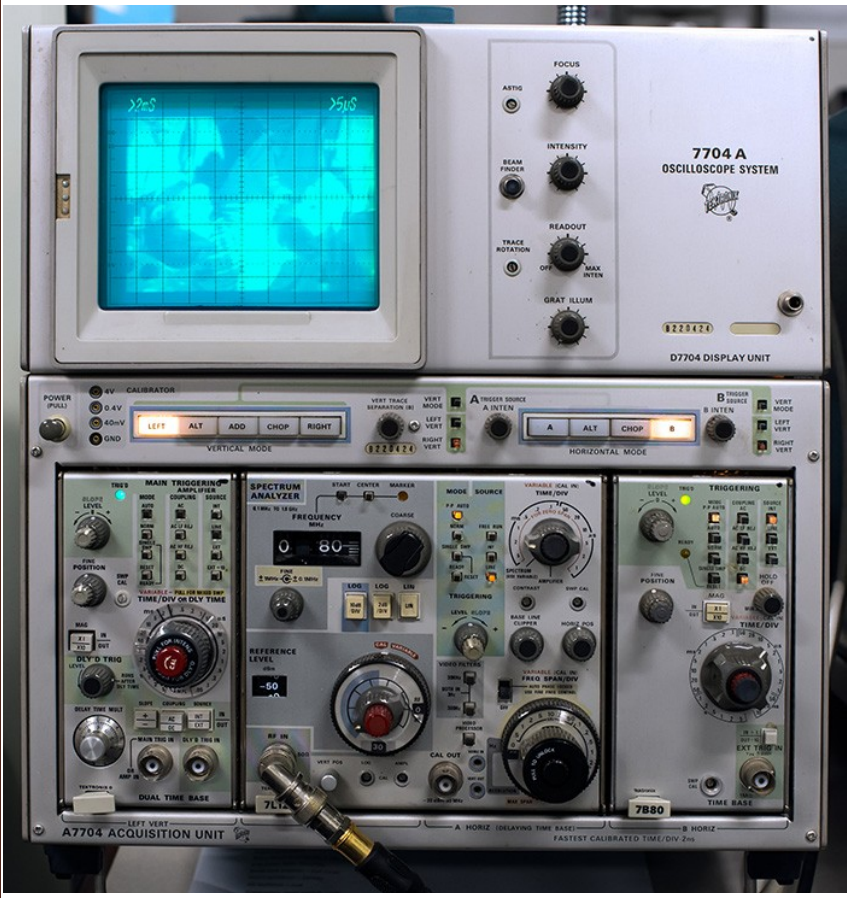
Antique Wireless Association of Southern Africa Newsletter

238 May 2026

Spectrum Analyzer



A spectrum analyzer is a powerful tool used in electronics and telecommunications. It measures the strength of signals across different frequencies. Engineers use it to analyze wireless signals, troubleshoot circuits, and ensure compliance with communication standards.

A spectrum analyzer displays signal strength versus frequency. It helps identify unknown signals, measure interference, and verify signal quality. Unlike an oscilloscope, which shows signals in the time domain, a spectrum analyzer works in the frequency domain.

This device is essential for anyone working with RF (radio frequency) signals. It is widely used in broadcasting, wireless communications, and electronic design.

A spectrum analyzer captures incoming signals and processes them to display their frequency components. The key steps in its operation include signal input, mixing, filtering, and detection.

Signal Input

The analyzer receives signals through an input port. These signals can come from antennas, circuits, or other electronic devices. The input stage ensures the signal is strong enough for analysis.

Mixing and Downconversion

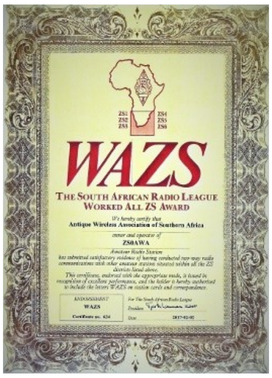
Most spectrum analyzers use a superheterodyne receiver design. The incoming signal mixes with a local oscillator (LO) signal. This process converts high-frequency signals into lower, more manageable frequencies.

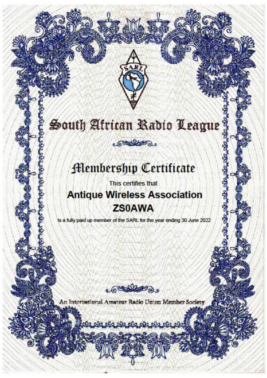
Filtering and Resolution

The intermediate frequency (IF) stage filters the signal. A narrow resolution bandwidth (RBW) filter helps separate closely spaced frequencies. Adjusting the RBW improves frequency resolution.

Detection and Display

The filtered signal passes through a detector. It measures the signal's amplitude at different frequencies. The results are displayed on a screen as a graph, with frequency on the X-axis and amplitude on the Y-axis.





Inside this issue:

AWA Committee:

* President—Chris ZS6GM
* Vice President—
* Technical Advisor—Rad ZS6RAD
* Secretary/PRO—Andy ZS6ADY
* KZN—Don ZS5DR
* WC—John ZS1WJ
* Historian— Louis ZS6SK
* Members—Renato ZS6REN Wally ZS6WLY

Reflections:

The AWA Valve QSO party was started in, according to the earliest records I have, May of 2012.

It was started originally to try and encourage the use of Valve radio's as opposed to the many contests and QSO parties that were being run, and were sttended mostly by people with the latest Solid State radios. There were of course those with older radios, but still solid state.

In the beginning there was the AM QSO party on the Saturday and then the SSB on the Sunday. At first, things went slowly, especially with the AM side of things and even then, the majority of stations taking part were SS radios. People wanting to see if they could do AM even with a SS radio. We never heard of any blow ups or radio failures using the SS radios on AM, but we did make a point of warning those taking part with SS radios they should be wary of power output as finals could be stressed.

Unfortunately the number of participants in the AM field dropped so low and for only receiving one or two logs each time, that it was decided to remove it from the calendar. (So sorry Ludwig, we did well when it worked though).

In order to encourage the use of valve radios, the scoring system always favoured them, much to the mumbling of those using SS radios. We were often reminded of the fact there were SS radios as old as some of the valve radios in use, actually the hybrids, so age should be the consideration. But we felt there were enough contests and QSO parties that the SS guys could participate in, so we favoured the valves. After all, that's what the AWA was about.

Early days would bring in about 70+ participants, which was fantastic. The problem was getting people to submit their log sheets. It would vary. Some years we had good turnouts, others, not so good. The strangest thing was that the majority of participants were not even AWA members. It's like the YL contest being won by an ancient Om. (no disrespect meant)

People asked, "Why can't we use linears ?" Simple answer, if you use a linear, then it's not your restored valve radio that is getting you the contacts, but your linear amplifier. You're using a valve radio with 20w output into a SS linear amplifier that gives you 1Kw and you're claiming points for an all valve radio. Not fair to those who work barefoot.

Still we had complaints about the scoring system and how it was unfair to the guys not using valve radio's. It's like entering a potjie competition and cooking wors on a braai for the judges and then wondering why the guys who made potjie got higher points. (I jest of course)

But anyway, we took the complaints seriously and eventually found a way around it all. Four categories to satisfy everyone's needs and entering in the category your radio belongs in. Now it is an SSB QSO Party sponsored by the AWA. We still get our name out there and you get to join in.

Hopefully now we have put that one to bed.

Did we see any change. Yes, there were a larde number of participants this year again and a large number of logs that were sent in.

The number of SS radio's still outnumber the All Valve and the Hybrids, but people are now competing on a level playing field.

Lets hope that for the October party, we can increase the numbers again and have a few more participants.

One of the categories was SS pre 1970, of which there were no entries. Were there any SS radios made pre 1970, or should we change that to pre and post 1980 ? Would appreciate any thoughts on that one. I could not find any ham listings of SS radios pre 1970. There were of course some commercial radios.

A full list of results can be found in this issue. (That's why it's late)

Best 73

Andy ZS6ADY

Chris's Musings

There was a recent discussion on the AWA net about the value of Valve/Tube power amplifiers vs Solid State. The first solid state transmitters made their appearance in the late 1960s in commercial two way radio equipment. Motorola, Pye Telecom, Philips and GE all produced solid state transmitters to replace valves. Those early devices were very sensitive to mismatch and over voltage and reliability was not great and it was only by the mid 1970s that more rugged devices became available. HF radios were a little late on the scene. The late Dave Larsen, ZS6DN when technical director at Racal Electronics was one of the world leaders in pioneering solid state in HF military radios. He figured that if television 'sweep tubes' could be used as HF power amplifiers, then why not sweep transistors. The TR-28 manpack used sweep transistors as did the TR15 tank radio. And they were rugged; the only challenge was to provide an efficient 50 Volt power supply. Another early pioneer of transistorised PAs was Ten Tec. The Argonaut 50 Watt amplifier used a pair of Philips VHF BLY60c which proved very reliable and rugged.

High Power broadcasting transmitters still use vacuum tubes for output power levels in excess of 50kW and many satellites use travelling wave tubes which are a form of vacuum tube because high power solid state does not provide the performance and reliability needed in the harsh space environment.

One of the oldest forms of vacuum tube — the X-ray tube — has been around since the late 19th century. Besides the obvious application of medical imaging, X-ray tubes are used today for security scanners, food inspection systems, thickness gauges, welding inspection and more.

Vacuum tubes are also still useful as detectors for x-rays and other ionising radiation, one being the Geiger Müller tube which is at the heart of a Geiger counter. Scintillation detectors use photo multiplier tubes to detect the tiny flashes of light that occur when radiation strikes a radio luminescent crystal. Guitar amplifiers is another application where valves still reign supreme but even they may be superseded. Peavey engineers have studied gain, response, compression, and several other factors that create the "tube sound" and have come up with a line of "TransTube" all solid-state amplifiers.

Will vacuum tubes be with us forever? It's not that simple. Many applications are slowly but surely being overtaken by solid-state devices.

There are a number of solid-state alternatives to TWT transmitters for satellite links, though they are generally much lower power than their TWT ancestors — transistors are still not good for high power levels at microwave frequencies — but for satellite Earth stations, the gain of a 10 meter dish obviates the need for lots of power.

But there are still some applications that are safe for the foreseeable future. Nobody has come up with an X-ray LED. And it's hard to imagine how a solid-state replacement, even if one existed, could be simpler or more reliable than the magnetron in your microwave oven.

In my view, vacuum tubes are going to be around with us for the foreseeable future.

THE ACCENT IS ON VALUE... A LOW PRICED GENERAL COVERAGE RECEIVER

A new low-priced general coverage receiver featuring smart, modern styling.

Receiver is directly calibrated for the four general coverage ranges and five bandspread ranges for the amateur bands (80-10 meters).

Covers 540 KC to 40 MCS. Voice or CW.

FEATURES:

- ★ Calibrated bandspread for 10, 11, 15, 20, 40 and 80 meter amateur bands. Separate tuning capacitors, knobs, and scales for general coverage and bandspread.
- ★ Large easy-to-read 12 inch slide-rule dial with combination edge and backlighting. Has large tuning knobs with two pointers for two scales; general coverage and bandspread.
- ★ Adequate over-all selectivity with nine miniature tubes including rectifier.
- ★ Has gang-tuned RF amplifier stage for increased sensitivity and image rejection.
- ★ Covers 540 KC to 40 MC in four bands.
- ★ Two IF amplifier stages and two audio stages with tone control.
- ★ Separate antenna trimmer on front panel.
- ★ Separate High Frequency oscillator tube for increased stability. Oscillator is temperature compensated and ventilated for increased stability.
- ★ Separate RF and AF gain controls.
- ★ Series type automatic noise limiter.
- ★ Receives AM, CW and SSB signals. BFO provided for CW and SSB.
- ★ Has "S" meter on front panel for signal strength indication and more accurate tuning.
- ★ Provision for balanced or unbalanced antenna input at 50 to 300 ohms.
- ★ Handsome two-tone gray cabinet.

COVERAGE:

BAND	GENERAL COVERAGE	BANDSPREAD
A	.54-1.6 MC	
B	1.6-4.7 MC	3.5-4.0 MC (80 meters)
C	4.7-15 MC	6.9-7.30 MC (40 meters)
D	14.0-40 MC	14.0-14.35 MC (20 meters)
		20.4-21.5 MC (15 meters)
		27.0-30 MC (10/11 meters)

TUNING SYSTEM: Separate general coverage and bandspread tuning capacitors connected in parallel on all bands. Bandspread, used primarily for tuning the amateur bands, can be used as vernier for general coverage use. Separate antenna trimmer control.

AUDIO SYSTEM: Two-stage audio amplifier with single 6AQ5 output tube provides 1.5 watts at less than 10% distortion. A handsomely styled accessory speaker is available. Phone jack.

SENSITIVITY: Under 2.5 microvolts (10 DB signal/noise ratio).

SELECTIVITY	NORMAL
6 DB	5.2 kc
60 DB	22 kc

CONTROLS: Main tuning; bandspread tuning; antenna trimmer; band selector switch; RF gain control; AC ON/OFF and AF gain control; stand-by-receive switch; noise limiter switch; tone control switch; BFO pitch control; AM/CW switch.

TUBE COMPLEMENT:

RF Amp.	6BA6	2nd IF Amp.	6BA6
Freq. Conv.	6BE6	Det, AVC and ANL	6AL5
HF Osc.	6C4	1st AF and BFO	12AT7
1st IF Amp.	6BA6	AF Output	6AQ5
		Rectifier	5Y3GT

OTHER SPECIFICATIONS:

Antenna Input: 50-300 Ohms, Balanced or unbalanced.
Size: 16-13/16" Wide x 10" High x 10-7/8" Deep.
Finish: Handsome two-tone gray wrinkle finish.
Shipping Weight: Approx. 35 lbs.
Optional Accessories: Matching Speaker.

Only $15.95* down
Up to 20 months to pay at most Receiver Distributors.
*Suggested Price: 159.95**
**Prices slightly higher west of Rockies and outside U. S. A.

NC-188

Eight out of 10 U.S. Navy ships use National receivers

tuned to tomorrow

SINCE 1914 **National** COMPANY, INC., **Malden 48, Mass.**

For further information, check number 2 on page 126.

The GM Pole Antenna

Chris Turner, ZS6GM

For most of my working life I have lived in places not conducive to the installation of antennas for the HF amateur bands. One of my favourite activities, professionally and amateur is antenna experimentation so I treated every antenna installation as a challenge to get the most out of my antenna systems, no matter the circumstances or environment.

When I was living the UK, my back garden was a postage stamp with neighbours on three sides. I tried zig zag wire antennas, loaded wire antennas, end fed wire antennas, you name them, I tried almost every trick in the book. I even tried a 14AVQ trapped vertical ground mounted antenna with the recommended 2 radials per band. Reception was great but I could not get anyone to hear me using my 100 Watt transmitter. It was time to do some reading.

Firstly, the 14AVQ only used the full height as a radiator on 40m. On all other frequencies, the upper parts were effectively disconnected by the various traps. What a waste of antenna length!

Secondly, because the ground is very lossy, and the other half of the antenna, the image, is in the ground, half the power was going to keep earth worms warm in winter. And, what's more, the antenna tuning and efficiency changed with the seasons and whether it was raining or not.

I set myself two challenges.

- Design a multi-band ground mounted antenna that would work on the 40 to 10 metre bands without needing traps or an expensive automatic tuner, and;
- Reduce ground losses to a minimum.

Challenge one.

Despite the common 'belief', a self resonant antenna is not needed for maximum antenna efficiency, it simply makes feeding the antenna easy, as in the case of the simple half wave dipole. What is important, is to feed the antenna such that all the available current flows in the antenna and therefore is radiated. While so called take-off angle is an important consideration, it becomes less significant where the antenna operates in a cluttered environment of buildings, trees and other obstacles.

A vertical, or monopole, when ground mounted, will have its major radiation lobe at some elevation determined by the electrical length of the radiator, its environment and nearby clutter. Simulation suggests an elevation between thirty and sixty degrees.

Back to challenge one. What height monopole when operated over a good ground will present an impedance that's easy to match and at the same time has a radiation pattern suitable for operating at medium to long distances?

It turns out that a monopole, 7.4 metres high is 3/8 λ on 14.2 MHz, providing excellent low angle radiation and works as an extended 3/4 λ on 10 metres. Matching on 40, 17, 15 and 12 metres is easy using a simple L matching network.

I later shortened the antenna to 7.1 metres to add the WARC frequencies. This length works as a 1/4 λ on 30 metres and provides a better match on 10m. There was no noticeable difference in 20 m performance at the slightly shorter length.

Original measurements were made with a Palomar Engineers Noise bridge which allowed me to design a relay switched matching network. Later measurements were made with an N2PK network analyser.

Table 1 below shows the measured impedances and EZNEC simulation for comparison.

f MHz	7.8 m	7.2 m	7.2 m EZNEC	
3.6	23-j549	10-j375	3.3-j453	
7.1	18-j100	19-J120	14.4-j143	
10.1	81+j25	66+j0	38+j9	
14.1	111+j210		330+j242	143+j213
18.1	26-j130	54+j185	706+j264	
21.2	14-j85	25+j119	446-j466	
24.5	10-j45	17-J65	106-J279	
28.5	74+j13	102+j0	44-J78	

Table 1. Measured impedance of monopole

To match the impedance of the antenna to the feedline, a simple L network is adequate. On 40m, a capacitor input network is required and on 20m an inductor input network is used. On 30m the antenna works as a 1/4λ and so no matching is required and on 17m, only an inductance is required to extend the electrical length to provide a match. A matching network could have been used but proved in practice to be unnecessary.

Fig. 1 is the final circuit diagram for my relay switched matching unit, which in mounted in a water proof enclosure at the base of the antenna. A combination of relays is used to choose the correct network values for each amateur band. Standard single pole changeover automotive relays are cheap and readily available. With the values calculated, the SWR is under 2:1 on all the amateur bands.

I tried adding additional matching in the box for 80m but the very high voltages present caused flashover and corona discharge.
The solution was to install an air spaced loading coil between the base of the antenna and the antenna terminal on the matching box and short circuit the coil when not on 80m.

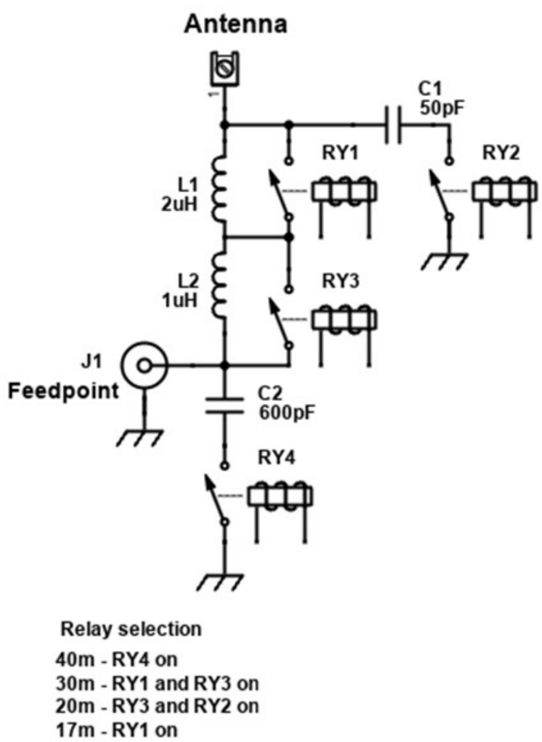


Fig.1 – Antenna matching unit.

Fig. 2 shows the mounting configuration using hydraulic clamps and the matching unit. CAT-5 Ethernet cable is used to control the relays from the shack.

The antenna was constructed using three lengths of telescoping aluminium tubing. The lower (outer) tube is 25.4 mm diameter.

Two hydraulic clamps are used for mounting to a plate with U bolts attaching the plate onto a 2 inch steel pipe driven into the ground.

Fig. 2 – Antenna base showing clamps, mounting plate and weatherproof box containing the matching circuits and relays

Challenge 2, reducing ground losses.

As I have previously mentioned in many of my antenna articles, the efficiency of any end fed antenna, no matter whether it is self-resonant or not, or whether it has loading or matching circuits, depends on having a low loss ground system into which the ground current can be driven. Imagine a light bulb and battery. I you connect one pole of the battery to the bulb, it does nothing. Connect the second pole to the other side of the bulb and it lights. A go and return are required to drive current into an antenna. That return in the case of an end fed is the ground [plane].

Experiments over the years have shown two to three radials hardly reduce ground losses. Eight radials start to show a significant improvement while 16 radials are even better. Once the radial count reaches 32, incremental improvement is negligible.

Tuned radials are not necessary. In fact the radials need be no longer than the physical height of the antenna. If there is insufficient space, then radials of any length are effective. Two thirds of antenna current flows in the first third of the radiator (and ground system) so for a radiator 7 metres high, radials as short as 2 metres can be very effective. They may be buried a cm or less in the ground and need not be insulated. In fact I use 1mm bare copper wire. They don't need to be straight but can zig zag in the cracks of paving, or around obstacles in the garden.

The aim is to install as much wire in or on the ground, as close to the base of the antenna as possible. More shorter radials definitely work better than fewer long ones.

Wrap Up

Living in a community or house with limited space need not prevent HF operation. A ground mounted multi-band vertical antenna can be very effect on air, and reasonably cheap to build using locally available components. This design provides multi-band operation on all the usual HF bands with performance comparable to that of stealth wire antennas.

The benefit of this design is that the whole length of the antenna radiates, unlike trapped antennas which disconnect parts of the antenna on higher frequencies.

AWA SSB QSO PARTY May 2026 Results

There was a total of 80 Participants in the QSO Party and a total of 15 logs submitted.

Congratulations to all those who took the time to participate.

All Valve	Daniel ZS5JR	55	Trio TS510
	Mario ZS6MAR	30	FT400dx
	Ludwig ZS5CN	23	Hallicrafters Cyclone
	Paul ZS6PMS	11	KWM2-A
Hybrid	Helge ZS6HB	60	TS830s
	Nico ZS4N	55	FT101
	Wayne ZS6ORB	40	FT101z
Pre 1970			
Post 1970	Keith ZS6HI	38	IC7300
	Mickey ZS5QB	34	TS120s
	Jadranko ZS6DJA	32	IC707
	Kobus ZS6KBS	24	TS120v
	Theunis ZS2EC	19	TS570s
	Chris ZS6GM	19	FT990
	SP Van Blerk ZS1SPB	11	IC726
	Mark ZS6MDX	11	Xiegu G90
	Bruce ZS6BK	5	IC7300
	Andy ZS0AWA	37	FT990

All Valve

Solid State

Hybrid

Mac's Service Shop: Solid-State Service Instruments June 1968 Electronics World

The debate about upgrading electronics service shop equipment from vacuum tube to solid-state instruments was raging in the late 1960s, when this Mac's Service Shop story appeared in *Electronics World* magazine. Barney is querying Mac regarding FET-based VOM performance specifications he is considering to replace a VTVM. He covets the Hewlett-Packard 217A square -wave generator, delivering clean 1 Hz-10 MHz waves with 5-ns rise time and scope triggering, justifying its $300-$400 cost for precise scope testing. An electronic counter for 5 Hz-10 MHz frequencies, with four- or six-digit readouts and line- or crystal-gated accuracy, tempts at $350-$700. Barney wants a $125 Model 1110 secondary standard for WWV-calibrated precision. Benefits of solid-state include compactness, portability, ruggedness, and reliability over tube gear, though repair challenges from ICs, obsolescence, and parts scarcity loomed. Ultimately, they resolved to embrace progress while fixing sets with old tools as prudence dictated.

By John T. Frye

"Hey Boss," Barney said to Mac, his employer, you've been mooning over that catalogue for a good half hour. Sure and I know your name's McGregor, but is the prospect of having to turn loose of a few bucks all that painful to a Scotsman ?"

"Keep a civil tongue in your head, you Black Irishman!" Mac retorted with a fierce scowl. "It's not giving up the money that hurts; it's just that we canny Scots like to do the best we can. I want to order some new service equipment, and I find there are a lot of ways to go. Solid-state devices have invaded the service instrument field, just as they have clone in almost every other electronics field; and this has sort of muddied the water. I used to know the specs of most popular service instruments by heart, but now I find it's a whole new horse race - if you don't mind my mixing a few metaphors!"

"I don't mind; I'm used to it; but what kind of instruments are you thinking of buying?"

"Well, for one thing, we need a new v.t.v.m., or equivalent, for use in making outside calls. I'm wondering if one of those new solid-state v.o.m.'s might not be a better buy. Thanks to the use of FET's, such a v.o.m. achieves an input resistance at least as high as the 11-megohm input of a conventional v.t.v.m. One of those I've been looking at has a built-in power supply for working off the line or it can be switched to self-contained batteries. That would make it handy for working on equipment where there's no convenient a.c. outlet for plugging in the instrument; yet we could conserve the batteries when this feature isn't needed."

"How about accuracy?"

"It is rated just as good as the tube-type instruments. In fact, I should imagine the long-time accuracy might be better because you wouldn't have the tube-aging factor to contend with. Also, since other components of the instrument will not be subjected to self-generated heat, as they are in a v.t.v.m., these components should last longer. All in all, I shouldn't be at all surprised if this new type of v.o.m. night not eventually put the v.t.v.m., that faithful old work horse of the service technician, out to pasture."

"Kind of sad, ain't it ?" Barney mused. "But I guess that's progress. What other goodies are you contemplating buying?"

"I'd like to have a really good square-wave generator that will have a fast enough rise time to let us take full advantage of the capabilities of our new wide-band, driven-sweep scope. I want something that will produce a good clean square wave up to at least 1 MHz. The Hewlett-Packard Model 217A I've been looking at is typical of a new breed of fully transistorized generators that will easily satisfy such demands. In fact, it will produce square waves from 1 Hz to 10 MHz with a rise time of 5 nanoseconds or better. The 'on' time of the square wave - or the relative length of the 'bottom' horizontal portion of the square wave compared with the 'top' horizontal portion - can be varied between 25% and 75 %. A triggering source for the scope's driven sweep is also provided.

"The $300-$400 price tags on these instruments sound salty when compared with the cost of the usual service - type square-wave generator whose rise time is measured in microseconds or even milliseconds, but the price is still a lot lower than it was before fast-acting solid-state switching devices got into the picture.

"If we're willing to settle for a rise time of ten nanoseconds and dispense with some of the other features, we can get the price down below $200; but I'm inclined to go whole-hog and get the better instrument. Admittedly, that rise time is better than we need with our present scope; but in square-wave testing, if you have to make allowance for the limitations of the scope amplifier and for the limitations of your generator, you end up feeling quite unsure about what you are really seeing on the tube face. How much of the distortion seen there is produced by the amplifier or device being tested, and how much is produced by your equipment? It seems to me the logical place to start upgrading is with the signal source. If you can be certain your generator is producing a clean, fast -rise square wave at a repetition rate in the MHz, you are in a position to evaluate the contribution the scope amplifier makes to the distortion seen. Knowing this, you can then proceed to check the amplifier or delay line with confidence."

"Sounds logical," Barney agreed. "Does that wind up your buying spree, Diamond Jim ?"

"Not quite. For a long, long time I've wanted an electronic counter to measure frequency, and it looks as though the use of transistors and integrated circuits may eventually enable me to satisfy my wish. In fact, I can buy one right now that will count from 5 Hz to 10 MHz for only $350 if I am willing to accept a four-figure readout and a gate based on the power-line frequency. This basic model has gate periods of 1 second and 0.1 second. For $125 more, you get a six-figure readout, which, of course, would be much better for high-frequency measurement."

"How about the accuracy? Doesn't that gate's being keyed to the line frequency impair the accuracy a great deal ?"

"Depends on what you mean by 'a great deal'. The accuracy of the count is the usual plus-or-minus one Hz plus-or-minus the accuracy of the line frequency. In the United States, this accuracy is typically better than 0.1% for commercial power. But if you need greater accuracy, you can get it for about double the money in a counter whose gate is operated by a stable 1-MHz crystal oscillator. This model has gate periods of .01, 0.1, 1, and 10 seconds with a five-figure readout. A six-figure readout is an option. And, of course the counter can be used to measure time intervals from 1 microsecond to 1 second.

"The point I want to stress is that these and similar counters coming on the market from the development labs make extensive use of IC's. This leads to a reduction in size and cost and an improvement in reliability." "Hey, do I get to say anything in this dialogue, or do I have to content myself with being your straight man ?" Barney demanded. "If you really have anything to contribute - which I doubt - I might be persuaded to listen," Mac answered.

"Thanks a great big heap!" Barney retorted. "I was just going to mention that International Crystal has just come out with a Model 1110 transistorized secondary frequency standard with outputs at 1 MHz, 100 kHz, and 10 kHz. Used in conjunction with a general coverage communications receiver, this standard can be calibrated against WWV to provide an accuracy of one part in 10^{11}. The long-term stability of the 1-MHz oscillator is claimed to be plus or minus 10 Hz over a range of 40 °F to 100 °F. While this is not in the league with the counters you were discussing and would require the use of an external receiver and some operating skill to read frequencies accurately, it only costs $125 and would be plenty good enough for most amateur radio or service technician measurements."

"That is interesting, and I'm going to look into it," Mac promised. "But in our discussion we've just scratched the surface of solid-state applications to service instruments. Digital voltmeters; transistorized scopes; signal, sweep, and marker generators; dot and color bar generators - well, you just name it, and solid-state versions are either on the market or are in R & D laboratories."

"I'm all for it," Barney offered. "For one thing, the use of transistors and IC's produce instruments that are smaller, easier to carry, and that take up less bench room. What's more, they are rugged and not easily damaged by jars or vibration. These things are important in portable instruments you have to lug along on house calls. Finally, from our own experience, we know solid-state devices fail much more rarely than do tubes; so it would seem safe to assume these new instruments will last longer and require less service."

"I agree with everything you say, but that last point brings up one disadvantage of the new instruments: they are not going to be so easy to repair when something floes go wrong with them. IC's are not readily tested % with the equipment and know-how found in the average service shop. Furthermore, changing a critical IC or even a transistor in a service instrument may make recalibration necessary.

"Another thing: there's not as much standardization and stability in the stocking of transistors and IC's as there is in tube stocks. 13v the time one of these solid-state devices hits the market it may be already obsolete because a new and improved type is emerging from its own lab or the labs of competitors. We both know instrument manufacturers stuck pretty close to well-established and popular tubes, avoiding the new and the esoteric; so getting replacement tubes was never a problem. I can't help wondering how true this will be of IC's and transistors. Will we be able to get replacements in five or ten ears ?"

"You've got a point," Barney said; "but I still like transistorized service equipment. Surely the instrument manufacturers will keep a goodly stock of replacement IC's and transistors on hand - or at least the reputable manufacturers will."

"Okay, okay!" Mac said. "I'm not arguing with you. I just wanted to mention what might be a couple of small drawbacks to transistorized service equipment. Like you, I'm still for it because the advantages far outweigh the disadvantages. At any rate, I'm resigned to having everything transistorized. Any day now I expect someone to come out with a transistorized coat-hanger. But now suppose we get busy and see if we can fix some TV sets with our out-of-date tube-type service equipment!"

RCA *specializes* in the production of *"healthy"* tubes. Take the RCA-6AX4-GT, for example. It features important built-in safety factors that minimize internal breakdowns and "arc-over", reducing early-hour failures—while providing reliable performance in TV damper circuits. Here are some of the ways RCA builds this "good health" into the 6AX4-GT:

Heater wire has been specially developed to improve welds, thereby reducing early-hour failures due to an open circuit at the weld point. Heater-spacer assemblies are pre-fired to eliminate leakage-producing contamination during tube production. And micas are specially sprayed to control plate-to-cathode leakage.

These are some of the reasons why many designers and manufacturers of TV sets specify RCA's 6AX4-GT—the very same reasons why you should always ask your RCA Tube Distributor to *"Ship RCA Only"*!

RCA Technical Booklet Available

RCA Receiving Tubes and Picture Tubes for AM, FM, and Television Broadcast (1275-H) ... includes socket information and useful data for more than 700 tube types. Ask your RCA Tube Distributor for your copy today!

RADIO CORPORATION OF AMERICA

Electron Tube Division ***Harrison, N. J.***

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Antique Wireless Association of Southern Africa

Mission Statement

Our aim is to facilitate, generate and maintain an interest in the location, acquisition, repair and use of yester-days radio's and associated equip-ment. To encourage all like minded amateurs to do the same thus ensur-ing the maintenance and preservation of our amateur heritage.

Membership of this group is free and by association. Join by logging in to our website.

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Notices:

Net Times and Frequencies (SAST):
Saturday 07:00 (05:00 UTC) —Western Cape SSB Net —7.140; Every afternoon during the week from 17:00
Saturday 08:30 (06:30 UTC)— National SSB Net— 7.125;
Echolink—ZS0AWA-L;
ZS6STN Sandton repeater—145.700
Kempton Park Repeater—145.6625
Relay on 10.125 and 14.135 (Try all and see what suits you)
Saturday 14:00 (12:00 UTC)— CW Net—7025

AWASA Telegram group:

Should you want to get on the AWA Telegram group where a lot of technical discussion takes place, send a mes-sage to Andy ZS6ADY asking to be placed on the group. This is a no-Nonsense group, only for AWA business. You must download the Telegram App first. …..+27824484368