



Antique Wireless Association of Southern Africa Newsletter



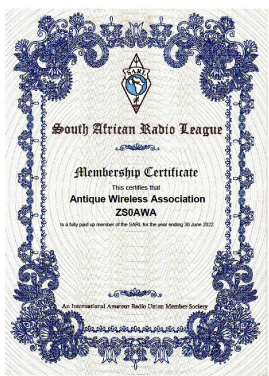
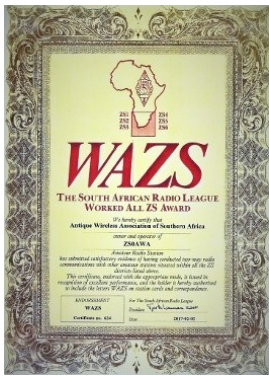
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June 2026



Jackson 650A

Capacitor tester. It has a test range of 10pf to 1000uf, up to 500 volts. Surprisingly it is very accurate, I checked it against my Sencore Z-Meter and found the results virtually identical. The 1941 price for this set was \$29.95.



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Reflections:

Before we could even wipe the dust out of our eyes, the middle of the year is upon us. The Winter solstice will be one of these days and the change of times back towards summer will be on its way.

I can't say we have had a terribly exciting year so far, time just seems to have flown past to some forgotten place without any major events having taken place. The bands have been terrible, so much for the predictions, but the AWA has been running its course as usual and keeping all informed through various topics.

I really think that the hams starting out today have such an advantage over us old timers. The radio's that are available on the market these days are just amazing. Costly, but amazing.

When I first started out it was a case of finding a good second hand radio that you may have to fix yourself to get it up and running. In my case it was valve radio. There were the new modern Yaesu and Icoms around, but I could not afford one then.

The most modern piece of radio equipment was my Phillips 40 channel SSB CB. Of course, they were still fairly cheap back then. It was mounted in my Ford Cortina station wagon. (Remember the old adage of one litre brandy, two litre coke and three litre Cortina...Hi). Well the brandy wasn't of much concern to me, but the other two worked well.

I then got hold of a 100w linear amplifier and mounted it under the seat of the car. I had most of the illegal things those days. A 5/8 helically wound antenna sat in the middle of the roof mounted on the roof rack.

The first time I tried it out, I had the car parked in the middle of the garden, turned on the linear and called the equivalent of CQ in CB ... "enige maatjie vir n praatjie". For those non conversant in Afrikaans... "Any good buddies out there on channel". A friend in Kimberley, 165km away came back to me and gave me a 5/5 report. We didn't know about 5/9 then. It wasn't in the CB'ers code.

I was mid way through giving him my report when the XYL came tearing out

the front door shouting at me something about what was I doing and I was destroying the TV signal.

Well I quickly switched off, took the antenna off and moved the car quietly back in to the garage before the neighbours came to find out what was happening.

If anyone were to question me, I would have denied all knowledge of the affair.

I am sure there are many similar stories out there of happenings with CB. It was such great fun and on 20w on a horizontal Yagi, one could achieve some outstanding results. It just seemed that the rules were there to be broken. I must say though, the PO inspectors were very active in the Northern Cape and I had many of my friends lose their rigs through confiscation for being "out of spec".

In those days, rules were rules and if you wanted to step out of the circle, you had to be prepared to suffer the consequences if you got caught. And there were a lot who were.

I still have QSL cards and paraphernalia received from DX contacts made on that radio. But then the bands were really good then. Many times I heard the saying of tuning up a wet shoestring, that's how good the bands were. But alas, those times are gone.

Now, in my old age, I look back on those days with a smile on my face and a happy heart, that I could do those things and get away with them. Of course I would never dream of doing things like that as an amateur. After all, I'm a responsible person now.

Happy thoughts, as I am sure many of you will be thinking of the good old days and how so many of us defied the rules and regulations to make contacts.

Best 73

Andy ZS6ADY

Chris's Musings

In a previous column I talked about the differences between the Apollo and Artemis moon missions. Though Artemis is a marvel of technology compared to Apollo in exploratory terms, is its basic exploratory function any more than Apollo? According to the AWA definition of antique, could Apollo be classified Antique? Many collectors consider anything 50 years and older antique, whereas the purists insist it should be 100 years or older. Vintage is 20 years or older.

Another marvel of space exploration is the Voyager programme, now 47 years on. NASA originally expected the twin Voyager probes to last just four to five years, with the primary goal of exploring Jupiter and Saturn. Because both spacecraft vastly outperformed the initial engineering expectations, they received multiple mission extensions to tour the outer planets and journey into deep space,

The probes are slowly running out of power as their nuclear batteries (Radioisotope Thermoelectric Generators) decay. NASA engineers are carefully shutting down individual scientific instruments to preserve power and keep the probes functioning into the 2030s.

Both probes are now approximately 166.3 Astronomical Units (AU = 150 million km) from earth. What is interesting is that no modern rocket technology could have made them travel any faster. Ion drives seem to offer the best hope, but they are not yet a viable technology.

So how did space engineers manage to achieve these exceptional speeds? They used a technique called gravitational slingshot. As the spacecraft approaches a large planet, the planet's massive gravitational pull accelerates the spacecraft. By flying just behind the planet in its orbit, the spacecraft "steals" a portion of the planet's orbital momentum and is flung away at a much higher speed than it had when it arrived. Voyager 1 received boosts from both Jupiter and Saturn, while Voyager 2 received assists from Jupiter, Saturn, and Uranus. The gravitational assists were made possible by a rare alignment of the outer planets (Jupiter, Saturn, Uranus, and Neptune) that occurs only once every 175 years. Because space is a near-total vacuum, there is no air resistance or friction to slow the spacecraft down so according to the laws of inertia, once the probes gained that massive speed from the planets, they continued to move indefinitely without needing to burn any fuel. One can only marvel at what engineers could achieve using technology considered ancient by contemporary standards. So it all goes to show, it's not the underlying technology we use, it's how we use it!

So don't dismiss those antique radios just yet. If they are still valuable to NASA then why not us?

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.

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

SINCE 1914

National COMPANY, INC.,

tuned to tomorrow

Malden 48, Mass.

For further information, check number 2 on page 126.

THE DECADE OF THE HYBRIDS

By Paul ZS6PMS

Hybrids have revolutionized amateur radio worldwide. Yeasu and Kenwood sold 392,000 of these transceivers in a 10-year timeframe of which 175,000 in the first 5 years. On top of that a minor part being 44,800 in the eighties. Recently, ICOM reported proudly they sold 100,000 of their IC7300/7300 Mk2's but that was only to be materialized over 10 years. Please keep in mind that the amateur community is now four times larger than in 1970. So, something fundamental must have happened during that decade of the last century. To understand their rise and incredible success, we must go back to the 1970's more than fifty years ago. We must place this phenomenon within the historical context in which it occurred, and therefore also look to the past before this decade to explain its rise and success.

The design of the SB-33 included a number of spectacular innovations never seen before, including the doubler/tripler method of doing selectable sidebands, the bilateral amplifiers (currently seen in the μ BITX) to name a few. The PL-500 Philips/Mullard TV horizontal sweeping valve had never been used as an HF power amplifier before but the valve would become infamous later in illegal CB band "afterburners". There are only three frequency-dependent tuned circuits in addition to the pi-network output: two on the receive side and one on the driver. These are quite remarkable innovations for the half-cubic foot sized radio with PCB modules on a bus for power, interconnections and signal. PCB instead of the laborious hand-wired, point-to-point construction used by Collins Radio, Drake and others was an eye-opener in 1963.

Admittedly, the radio used germanium transistors. These were actually noise generators with a low f_T and a wide spread of the (hFE) gain within the type, but nothing else was available at the time. Unfortunately, Faust could not grasp the fruits of his invention. He passed away in November 1963 at the age of 43. This remarkable SBE hybrid came on the market 7 years before Yeasu and 10 years before Kenwood made their mark.

SB
33

ONE OF THE BIGGEST VALUES EVER!



Entirely New! Outstanding! Dynamic!
SB-33 transceiver... dynamic product of solid-state electronics and advanced electro-mechanical design! Exceptionally small—less than one-half cubic foot including built-in AC supply and weighing only 15 pounds! Powerful... 135 watts P.E.P. input. Four-bands, 80-40-20-15 meters. Upper or lower sideband selectable by panel switch and without carrier or dial shift! Collins mechanical filter. Very low frequency drift. Check the specs... compare prices. This has to be one of the biggest values ever! Available at your SBE distributor during February 1963. Write today for complete specifications.

SIZE: 5 $\frac{1}{2}$ "H, 11 $\frac{1}{2}$ "W, 10 $\frac{1}{2}$ "D. Weight 15# (approx.)
FREQUENCY RANGE: Band 1: 3.8-4.0 mc.
Band 2: 7.1-7.3 mc. Band 3: 14.2-14.4 mc.
Band 4: 21.25-21.45 mc.

TRANSMITTER
POWER INPUT: 135 watts P.E.P. max. (Speech waveform.)
DISTORTION PRODUCTS: Down at least 25 db.
CARRIER SUPPRESSION: -50 db.
SIDE-BAND SELECTION: Upper or lower sideband selectable by panel switch.
UNWANTED SIDE-BAND: -40 db.
OUTPUT IMPEDANCE: 40-100 ohms unbalanced.

RECEIVER
SENSITIVITY: Better than 1 μ V for 10 db signal/noise ratio.
SELECTIVITY: 21 kc @ 6 db, 5.3 kc @ 60 db.
SPEECH RESPONSE: Images and LF response down at least 40 db.
STABILITY: Less than 100 cps drift in any 30 minute period in any normal ambient temp. condition.
AUDIO OUTPUT: 2.0 watts @ 10% distortion.
TUNING RATE: 30 kc per revolution.
POWER SUPPLY: 117V AC POWER SUPPLY IS BUILT IN.
POWER CONSUMPTION: AC operation. Receive 35 watts.
Transmit: 165 watts (single tone).
DC operation through vibrator or transistorized inverter.

TUBE AND SEMI-CONDUCTOR COMPLEMENT:
2-PL500 beam power tetrodes, PA, 1-12DQ7 driver,
12-transistors, 12-diodes, 1-gener diode.

OPTIONS: Several options are separately available including VOX and Callibrator unit with provisions for mounting on rear of transceiver. Internal power supply provides operating power. Rear connections are brought out for linear amplifier.



389.50

LOCKING-TYPE MOBILE MOUNTING BASE 12.50
SPECIAL INVERTER, 12V DC-115V AC... \$9.50

SBE

Sideband Engineers, Inc.
Rancho Santa Fe, California.

Gonset's advert in the 73 February 1963 issue

Faust Gonsett born March 16th 1916 was no stranger to the amateur radio world, nor was he an insignificant figure. His father Robert W6FV, an emigrant from Ukraine, founded Gonset Inc in Burbank CA, but the company really took off when Faust got involved. In the 1950s and early 1960s interesting products were launched, such as the famous *Communicator* a VHF AM transceiver that found also wide use with the civil defense. A converter for receiving amateur bands on a car radio and the G-76 AM/CW HF transceiver with SSB reception is a rare collector's item today.



The SBE SB-34 1966 the improved SB-33



Signal One SX 7 (1970)

The Zeitgeist in 1970

There is a major difference compared to the situation in Europe and the US.

The United States came out of the Second World War as the only victor who earned money with the war and more importantly on top of that a position as a world super power.

In Europe, it was a totally different piece of cake altogether. The consequences of the Second World War were still being felt, whereas the US already showed a long period of expansion and wealth.

Do-it-yourself was king and WW2 surplus was emperor. A typical HF-station would be a surplus receiver like an AR88 or HRO and a homebrew transmitter all band for AM/CW. For SSB one built "One-Banders" with homebrew xtal-filters in the 4-5 MHz range with FT-243 crystals edged or polished to frequency. There was no money around for expensive hobbies, be it that Western Germany experienced a spectacular economic growth: the "*Wirtschaftswunder*", but they had to start from zero in 1945. Some "Sommerkamp" equipment was around in the German speaking countries. This was in fact Yaesu who gave the exclusive rights to a Swiss company to sell Yaesu equipment under their own brand. The amount of surplus seemed to be endless and availability persisted well into the nineties. So home brewing stayed the art of the day.

Heathkit was well established, with local branches all over the continent. They provided good service for their clients and adequate help with kit-building. So, Heath was the only real viable alternative for home brewing from a zero start.

The Heath SB101/102 transceiver including HP23a power supply, SB600 speaker and microphone were \$ 481.40 as a kit. For



PA0BRM (SK) my radio friend Bram Bottema with his 160-10m SSB/AM/CW DIY Rig in 1967

a good do-it-yourselfer who knew what he was doing this was about 100 hours of work. The price amounted to a low middle-class month's wage. For a Collins KWM2-A, one had to pay up \$ 1755, and that was reserved only for the very wealthy. I remember as if it were yesterday that in 1968, during the Christmas season, we went with the entire local club to look at an OM's Collins S-line in full operation. It was a 1.5 hour drive because so few were around. We all found it just as magical as the Christ Child himself. We went home with a sublime feeling. We had been allowed to behold the Holy Grail, unreachable for ordinary mortals. Of course, this is portrayed in an exaggerated and surreal way but it indicates how rare and exclusive Collins was. By the way, a KWM2 is simply a very good transceiver for SSB (for CW it is useless), built with first-class parts and well-documented. It just has a nameplate, which is magical to many, and for that last part, there are people willing to pay a lot for it.

The Japanese Economic Miracle

Japan's rise to economic power after World War II was driven by a combination of rapid industrial modernization, strategic U.S. intervention, and unique domestic business structures. Despite losing almost all of its national wealth during the war, Japan became the world's second-largest economy by 1968. The

Dodge Line (1949): A rigorous austerity program led by Joseph Dodge balanced the national budget and fixed the exchange rate at 360 yen to 1 USD. This undervalued yen made Japanese exports highly competitive globally. In the 1960s, Prime Minister Hayato Ikeda implemented a plan to double the national income in a decade, which fueled domestic consumption and further industrial expansion. Japan's growth was steered by a high degree of cooperation between the state and the private sector.

Japan's dominance was built by three main companies started by "tinkerers" that transitioned from small-scale radio experiments in garage boxes to mass production:

ICOM (founded 1954 as Inoue Communication Equipment): Founded by Tokuzo Inoue in Osaka. Initially focused on test equipment, ICOM shifted heavily into ham gear in the late 1950s among these the IC700T/IC700R (1967) HF transmitter/receiver set. The design was a mixed bag of semiconductors and valves and therefore not a hybrid in the sense of the definition given above. ICOM never produced Hybrids but decided to keep its powder dry and wait to see how things would unfold. Instead, they launched an all-transistor HF transceiver in 1978 the IC701 claiming to be the world first and solidifying ICOM's entry into HF equipment.

The First to hit the market in 1970

Yaesu engineers and marketing people knew that the Hybrid would be a temporary solution altogether. Semiconductors were now better suited for the application than in the early sixties. However, only to be used in the receiver and the early transmitter stages. Used in the receiver they would allow complicated circuits like active filters, memories to store frequencies, faze lock loops, synthesizers and digital frequency read outs. These were impossible to build with valves. The transmitter driver and finals had to be equipped with valves since no suitable economical viable semiconductors for 100W+ SSB/CW output were available at least for now in 1970. On top of that valves had a better linearity and IMD, could better withstand overloading and a mismatch of 3:1 VSWR and tuned with a simple pi-filter to achieve harmonic suppression and match to the antenna. They believed the "Tuning Experience" of their clients still used to operate a valve transmitter would work to their advantage and they were right.



The Yeasu FT-101 launching model of 1970 causing an earthquake in the market

The Yaesu FT-101 series had numerous numbers of variants, sub-models, and running changes between 1970 and 1986, with over 10 distinct major models (not including individual MK versions) produced.

FT-101 (Early/Mk I & II): 1970/71, original model, 80-10m, 130W PEP with a pair of 6JS6C 's. These suffered

childhood diseases some minor some more severe like strong receiver overload, TX spurs and audio problems.

FT-101 (Late): 1972, major updates to receiver IF and audio.

FT-101B: 1973 160m and improved boards added.

FT-101BS: 1973, 50-watt version for Japan.

FT-101E: 1975-1986, RF speech processor added. This version is the pinnacle of the FT-101 series and all childhood diseases were being solved. Produced until 1986. Many of the Japanese FT-101E'S were fitted with a second 6JS6C and re-tagged E in order to match the overwhelming demand.

FT-101EE: 1976-1979, "Economy" version of E (no processor).

FT-101EX: 1976-1979, "Extreme Economy" version of E (no processor, no DC convertor, limited accessories).

FT-101F: 1977, upgraded Noise Blanker and Processor.

FT-101FE: "Economy" version of F.

FT-101FX: "Extreme Economy" version of F.

FT-101ES: 50-watt E model for Japan.

FT-101F: 1977, upgraded Noise Blanker and Processor.

FT-101FE: "Economy" version of F.

FT-101FX: "Extreme Economy" version of F.

FT-101Z: 1978, this transceiver was a completely different rig, using 6146B finals and a 9 MHz IF, but sadly engineered much more cheaply than the original FT101 series, for example no plug-in boards, no DC converter, etc etc.

FT-101ZD: 1980 with the WARC bands added with digital readout and selectable AM or FM included. This model was produced until 1985 and was the last of the Yaesu FT-101 series which ceased production in 1986.



The FT-902DM the flagship of the Yaesu Hybrid Transceivers

In 1978 Yaesu launched a completely new model the FT-901 and a new line of appliances that went with it. We are left in the dark as to why this happened, especially since the FT-101 was still showing very good sales results. In 1981, the FT 901 was already replaced by the FT902. This can be explained by the fear that the Kenwood TS830S, which also came onto the market in 1981, would achieve better sales results, and that action had to be taken in response.



The Yaesu FT-102 from 1981 this is my Top Hybrid of all Hybrids

I did a lot of research to finally compile this article, but I couldn't find a single reason in any document why Yaesu released this fantastic hybrid along with the FT-902DM in 1981/82. Because it has three 6146's in the PA and the radio easily puts out 150W+? Mine did eventually develop the well-known "relay problem".

Kenwood (founded 1946 as Kasuga Radio): Originally a manufacturer of radio components and test equipment under the "Trio" brand. They adopted the Kenwood name for international marketing in the 1960's to compete with Western brands. The TS-520 Hybrid (1974) and later the TS-530, TS-820 and 830, which were known for their high-quality audio on RX and TX.

Kenwood only started making Hybrids in 1974. They had several reasons for this. Firstly, they witnessed closely the (near) disaster of the launch with childhood diseases of Yaesu's early FT-101's and took lessons out of this. Secondly, they wished to profile themselves in another market segment: "The Professionals" to be defined as "puritans" who wished to distinguish themselves from "Watt's for the Dollar" people soaking 140W out of their FT-101 till the 6JS6A's glowed cherry red. So, Kenwood offered them a TS-520 with S2000A's (=6146B) in the PA perfectly designed for linearity and just offering 100W with real transmitting valves designed for the purpose and no "TV surplus" as they propagated around loudly.



Kenwood's answer to the FT-101 in 1974 the TS-520

TS-520 Series: The first TS-520 was introduced around 1973-1974 being Kenwood's entry in the Hybrid market, this included the TS-520, TS-520S 1977, and TS-520SE, which were very popular and maintained long-term popularity and all around praised for its beautiful audio both on RX and TX..

TS-820 Series: Launched in 1976, offering improved performance over the 520, including models like the TS-820 1976 and TS-820S with digital readout from 1977 onwards.

TS-530 Series: Successor to the 520, including the TS-530S 1981- and TS-530SP - 1988.

TS-830 Series: Successor to the 820, including the TS-830S,

which is considered by many to be the pinnacle of their hybrid line.

Finally, Kenwood also produced other related hybrid/hybrid-like models. These include the TS-900 (1973) and the 599. But just a very small number were produced.



The Kenwood TS-830S flagship for many the pinnacle of Hybrids. Produced 1981-1988

Why Japanese Gear won the Market so decisively?

There are multiple reasons that played a role simultaneously.

Yaesu and Kenwood had acquired MITI's Quality Control. The Japanese government (MITI) actually restricted exports of low-quality goods. Only the best firms could export to the U.S., which flipped the "Made in Japan" reputation from "Low Quality and Shabby" to high industrial standard.

They had developed a business and revenue plan for the long term. The Japanese automotive and hi-fi industries had led the way in this.

The performance of the Hybrid was thereby enriched with memories, band pass tuning, RIT, speech processing, adjustable output power, calibrated attenuators, noise blankers and preamplifiers. Japan used the "Hybrid" era as a tactical bridge. The Hybrid is the classic example it offered solid-state reliability for the low-level circuits but kept tubes in the back where hams felt safe. Japan's obsession with *kei haku tan shō* ("light, thin, short, small") allowed them to produce portable, desk-friendly rigs that made the "heavy metal" U.S. rigs look like museum pieces. But above all: junk to "cutting-edge" in under a decade

Why U.S. Vendors Lost

At companies like Drake and Collins, leadership changes led to a move away from amateur radio toward commercial satellite, marine gear (Drake) and avionics (Rockwell-Collins). Many U.S. radio companies were essentially military contractors. When the Vietnam War-era budgets shifted, they didn't have the commercial "DNA" to compete with the rapid consumer-facing innovation of Yaesu and Kenwood.

Competing U.S. gear often required buying a separate external power supply/speaker console (like the Drake AC-4), which added cost, bulk, and complexity. The Hybrid was a "buy it and get on the air" solution. The fixed exchange rate of ¥360 to \$1 USD, and this got fortified when the Dollar strengthened in the seventies considerably against all currencies, meant Yaesu and Kenwood could use high-quality mechanical components and heavy metal

chassis while still undercutting U.S. manufacturers on price. Early buyers knew that if a board failed, they could simply unplug it and mail it to a dealer for a replacement. While the FT-101 was a high-end ham rig, its early sales were massive in the U.S. partly because of its 11-meter (CB) capability. During the 1970s CB craze, Hybrids were highly sought after by CB-ers looking for an illegal "base station" that performed significantly better than legal 4-watt CB rigs. Sales to this segment provided the cash flow that allowed Yaesu to fund the R&D for the eventual FT-101E. The 6JS6C sweep tubes used in the FT-101 could glow cherry red, take a massive beating from a mismatched antenna, and still survive. For a ham transitioning from old-school gear, this "ruggedness" was a safety net. Valves are inherently more linear than early transistors. By using a valve PA, Japanese engineers ensured that even if the internal solid-state VFO was a bit "dirty" or "phase noisy" the final output was a high-quality, clean SSB signal that wouldn't bleed all over the neighbor's TV. Japan cleverly used "sweep tubes" valves originally designed for the high-voltage deflection circuits in color televisions. Because they were being mass-produced for the TV industry, they were incredibly cheap, abundant, and capable of handling high peak voltages.

The Psychological Bridge and this is the "circumstance" that matters most.

In 1970, many hams still didn't trust "sand" (transistors) to do the heavy lifting. The Hybrid design solid-state "brains" and valve "muscles" offered the best of both worlds. Hams liked the ritual of "dipping the plate and loading the load." It gave them a sense of control over the rig that a fully "no-tune" solid-state box (which came later) didn't provide. For companies like Yaesu, the 6JS6C sweep tube was not an "alternative" component; it was a primary commodity.

Japanese electronics giants like Toshiba and NEC were churning these out by the millions. While U.S. vendors faced rising labor and component costs, Yaesu and Kenwood benefited from a domestic supply chain where sweep tubes were dirt cheap compared to dedicated RF tubes like the 6146B. Yaesu and Kenwood utilized individually built, plug-in circuit boards. This allowed them to iterate and fix bugs faster than U.S. firms using traditional chassis wiring. If a Yaesu/Kenwood circuit was "dirty," they could redesign just that board and drop it into production in weeks.

In short, while Yaesu won the "value and power" war with sweep tubes, Kenwood won the "reliability and quality" war with the 6146B. The TS-520 represents the moment the Japanese industry proved it could out-engineer the U.S. even on "traditional" terms.

The End of the Hybrid's

The era of hybrid transceiver production largely ended for Kenwood around April 1983, when the company launched the fully solid-state TS-120S (1979) and the TS430S in 1983. However small series of their "Top Model" TS-830S were still produced till May 1988 and a small batch of TS-530SP was also produced during that last year. This had to do with the production similarity between the types and interchangeability of parts already in stock.

The end of era for Yaesu was significantly different. They considered the TS820/S far superior to their own FT-101 line and the appearance of the TS-830S made them shiver even more. Apparently, their "Top Model" the FT-901 was not superior enough to convince the market and the expected "final push" measured in sales figures did not materialize. So, two measures were taken simultaneously: 1. Replace the FT-901 with the FT-902. The later one had a proven better receiver and 2. Prolongue the life of the FT-102.

EQUIPMENT		Price	
Japanese Hybrids	Launched	Launched	Manufactured
FT-101 all flavours	1970/71	\$ 499.95	244000
FT-101ZD all flavours	1980	\$ 795.00	20000
FT-901/902 Price is for 902 in 1982	1978/1981	\$ 1,459.00	8000
FT-102 3 x 6146B 150W PEP output	1981	\$ 1,399.00	4600
TS-520 all flavours	1974	\$ 599.00	95000
TS-530 all flavours	1981	\$ 799.00	6000
TS-820	1976	\$ 749.00	8000
TS-820S	1977	\$ 1,048.00	36000
TS-830S	1980	\$ 1,149.00	12000
		Total :	433600
US Make For Reference 1959 - 1980			
Collins KWM2(a) *	1959	\$ 1,150.00	28000
Drake TR3/4 all flavours	1963/64	\$ 585.00	30000
Drake TR4 -CW/RIT	1975	\$ 649.00	1000
Drake 4-Line "Twins" all flavours	1965	\$ 1,025.00	40000
Drake TR7	1978	\$ 1,275.00	10500
Drake TR7A	1980	\$ 1,365.00	2700
Hallicrafters SR all flavours **	1961	\$ 650.00	6000
Signal One all flavours ***	1970	\$ 2,395.00	1152
Swan 350	1964	\$ 395.00	28000
Swan 500 500W PEP Input	1967	\$ 495.00	22000
Swan 240/400	1963	\$ 320.00	10000
Swan 700CX **** 700W PEP Input!	1973	\$ 569.00	8000
Swan Cygnet Series	1969	\$ 525.00	10000
Galaxy III	1963	\$ 349.95	4000
Galaxy V	1964	\$ 399.95	8000
Galaxy V -II-III ****	1966	\$ 420.00	12000
National NCX-3	1963	\$ 369.00	6000
National NCX-5	1964/65	\$ 585.00	2500
National NCX5=5 Mk 2	1965	\$ 585.00	3500
National NCX 1000 ****	1969	\$ 1,095.00	450
Heathkit HW101 (kit)	1970	\$ 275.00	40000
Heathkit SB101 (kit)	1967	\$ 380.00	10000
Heathkit SB102 (kit)	1970	\$ 380.00	25000
		Total :	308802
* 41000 more were made for the US military to be used in the 1st Gulf War and Vietnam.			
** Price and year are for a SR150. A Cyclone puts out 400W PEP!!			
*** These are US hybrids			
**** These tabletop Giant Beasts put out 550-1000W PEP!!			
Drawn by Paul ZS6PMS		Date :	May 16 2026

YEAR	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
Yaesu																			
FT101(Mk1&2)	█	█	█																
FT101B			█	█															
FT101E					█	█	█	█	█	█	█	█	█	█	█	█	█		
FT101EE						█	█	█	█										
FT101EX						█	█	█	█										
FT101F								█	█	█									
FT101ZD Mk "1"											█								
FT101ZD Mk "2"												█	█						
FT101ZD Mk "3"													█	█	█	█	█		
FT901 D & DM									█	█	█								
FT902 D & DM												█	█						
FT102												█	█	█					
Kenwood																			
TS520				█	█	█	█												
TS520S								█											
TS530S												█							
TS530SP																			█
TS820							█												
TS820S								█	█	█	█	█							
TS830S												█	█	█	█	█	█	█	█
	Main Production Window of the Japanese Hybrids. 392,000 were sold in the 70's																		
	Hybrids were still made next to Yaesu's and Kenwood's Solid State Lines in far lower quantities																		

Which Hybrid is the best?

This question is impossible to answer. The same applies to "Which Car is the best?" I like German cars. For me Mercedes is "Fantastic", Audi is "Good" and BMW is "Useless over engineered junk". Same applies to transceivers with me: Kenwood is "Fantastic", Yaesu is "Good" and Icom is "Flimsy useess crap". So, all of this has to do with 80% Emotion and 20% Technical. So, no objective answer can be given, or is there any factual answer to this Gordian Knot ? Bob Sherwood spent almost 30 years to present his constantly up-dating "Receiver Performance List". I made an extract of it. Take it for what it is for you.

BOB SHERWOOD'S LIST Summary			Noise Floor (dBm)	100kHz	Sensitivity (micro V)	Dynamic Range Wide (dB) 20 or 50 kHz ***	Dynamic Range Narrow (dB) 2 or 4 kHz***
Ranking	Position	EQUIPMENT		Blocking (dB)**			
1	101	Yesu FT-901DM*	-135	124	0.15	87	80
2	98	Collins R-390A ****	-137	130	0.2	81	79
3	92	Kenwood TS-820S	-137	115	0.2	79	78
4	81	Drake 2B ****	-136	130	0.34	91	75
5	73	Collins 75-S3B ****	-146	122	0.1	88	74
6	67	Collins 75-S3C ****	-141	121	0.14	85	72
7	54	Kenwood TS-830S	-136	122	0.1	84	70
8	23	Collins KWM-380	-127	123	0.3	94	64
9	18	Kenwood TS-520	-139	116	0.15	63	63
10	16	Collins 75-S3 Wing	-145	105	0.1	75	63
11	10	Collins 51S1	-134	117	0.13	84 at 100kHz!	60
12	8	Yesu FT-101E	-141	102	0.15	60	59

“The Position” is from the bottom of the list: being "the worst equipment"- upwards

* FT902DM and FT102 are not tested

** 3 dB blocking (gain compression) done at 100 kHz to eliminate phase noise interaction.

*** Dynamic Ranges taken at different bandwidths due to different practice's by Bob during the creation of this list.

**** This equipment has no phase noise (all are valve rigs without synthesizer or phase lock loops) including the Collins 75-S3 Wing

Created by Paul Aerts ZS6PMS from Bob Sherwood's list

Date: 3-May-26

DRAKE 2-B

2-B Receiver
\$279.95
amateur net

2-BQ
Q-Multiplier/Speaker
\$39.95 amateur net

For more information ask your distributor or write us for brochure with complete specifications and schematic.

“The most talked about HAM RECEIVER”



The Drake 1-A Sideband Receiver was introduced in 1958. The 2-A with improvements for all modes followed in early 1960. The present Model 2-B with improved selectivity for SSB, CW and AM was announced in April 1961.

In this short time the Drake Receiver has become the most popular and talked about receiver on the ham bands. Whether you are a Novice or 60 wpm operator, a beginner AM or experienced SSB'er you will discover the 2-B has been engineered for all your receiver needs.

Just ask the ham who owns one.

A DIY RF Current Probe

Chris Turner, ZS6GM

An RF current probe is one of my most useful troubleshooting tools for tracing common mode noise or interference on a transmission line or power cable. Clamping an RF current probe around a wire or cable will measure the troublesome common mode RF currents flowing in the wire or cable that cause this emission.

A current probe is an RF transformer made of ferrite material, with the wire or cable acting as a single turn primary and the measurement port is the secondary winding. The probe's frequency range and sensitivity depend on the core ferrite material. For amateur radio Fair-Rite 31 or 43 material are the best choice. Professional current probes for laboratory use are calibrated from approximately 10kHz to 200 MHz or more. For amateur use, a calibrated probe is not required because one wants to sense common mode signals, and apply corrective measures. The probe allows the relative improvement to be observed.

Figure 1. shows the schematic operation of a current probe.

When the probe is clamped over the wire in which current is to be measured, the wire forms the primary winding and an 8 to 12 turn winding forms the secondary. Keeping the turns as far apart as possible will reduce inter-winding capacitance and yield better results at the higher frequencies.

The secondary can be terminated in a coaxial connector to allow easy connection to spectrum analyser or high frequency oscilloscope.

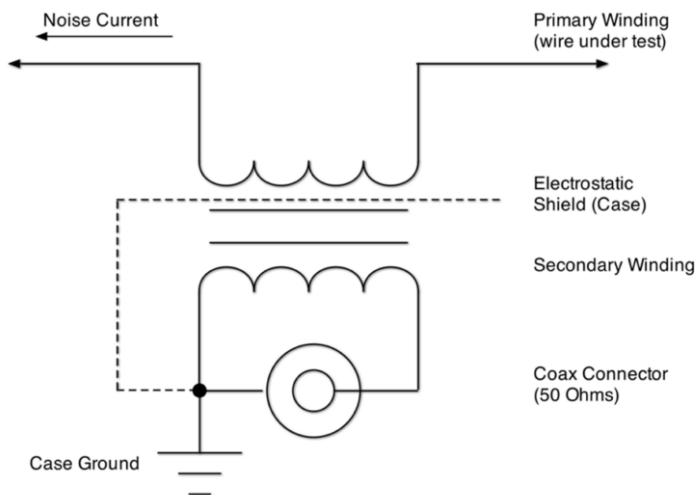


Figure 1. RF current probe

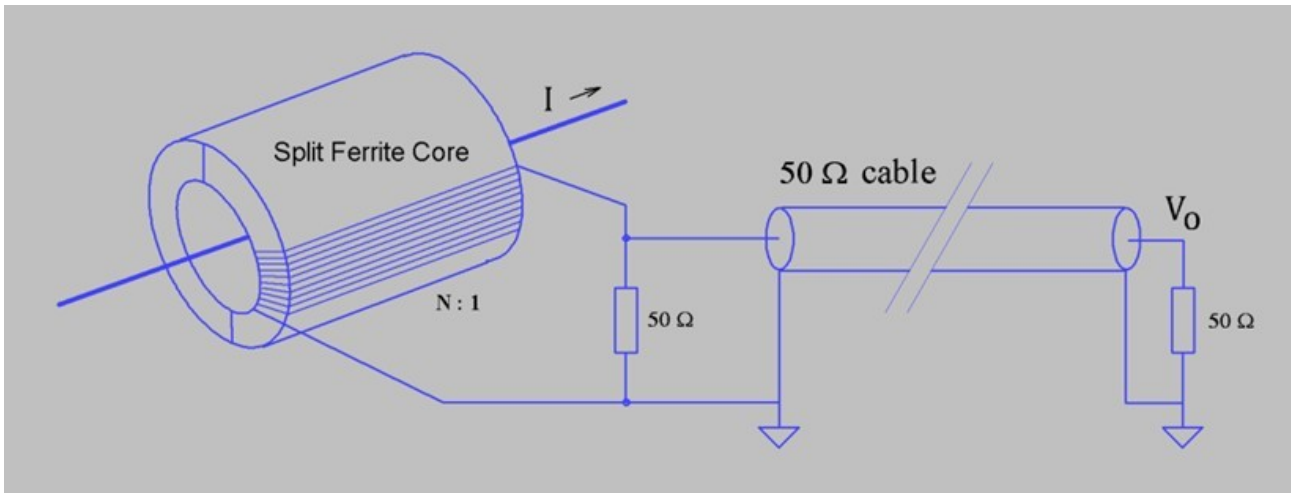


Figure 2. Schematic diagram of a current probe

DIY RF Current Probes

A common “snap-on” ferrite choke may be used as a low-budget RF current probe (Figure 3). Choose a ferrite material that has some impedance in the frequency range of interest (such as Fair-Rite type 31 material) and wind a few turns of wire around one-half. The number of turns is not critical. I generally use 8 to 12 turns.



Figure 3. An example of simple current probes you can make to measure harmonic RF currents in cables.

Connect the wires to an appropriate coaxial connector and then simply clamp the ferrite around the wire or cable to be measured. Because these are not calibrated, they would not be useful for estimating E-field levels, but more than suitable for general relative “before and after” measurements.

A NanoVNA may be used to measure the frequency behaviour of the DIY probe.. Exciting the primary and with a short and measuring the output you would expect roughly 10:1 voltage step down.

As can be seen in Figure 4. the frequency response is relatively flat over the HF band.

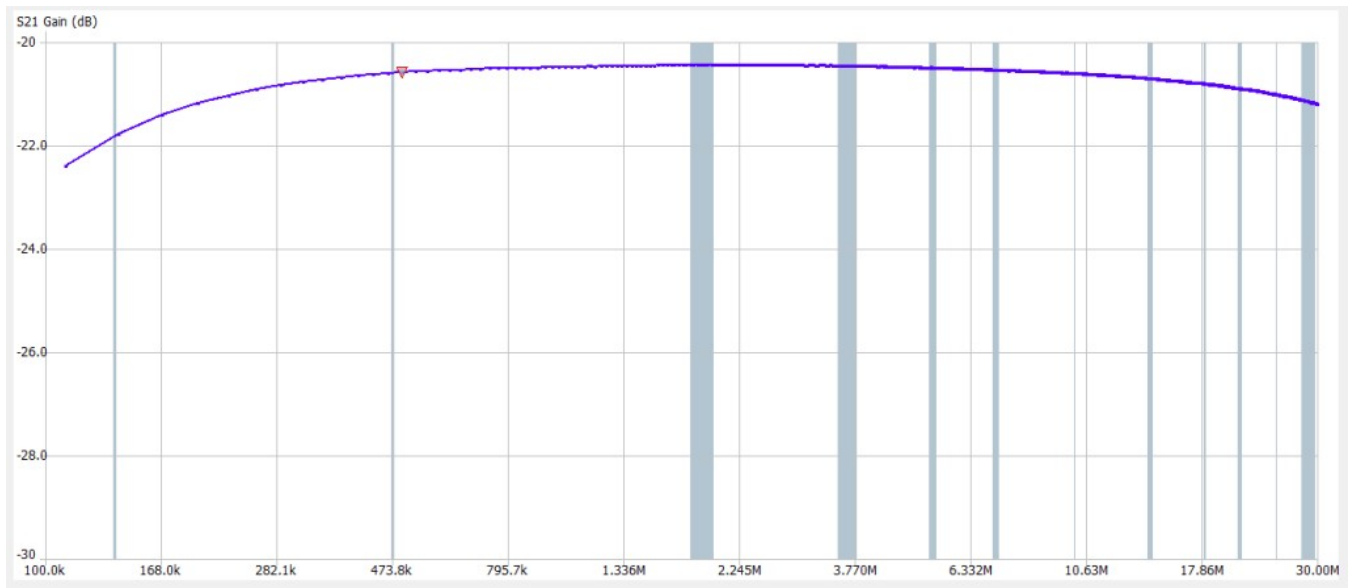


Figure 4. Response from well-below the major ham bands, only beginning to fall off at 30MHz.

Operation

Connect a high frequency oscilloscope, FET VOM with RF probe or spectrum analyser to the coaxial connector. Clamp the probe over the wire or coaxial cable under test and with equipment operating or whilst transmitting measure the amplitude of the detected signal.

Apply corrective measures and repeat the measurement. The improvement should be obvious by a drop in the detected signal.

IMPORTANT NOTE:

When undertaking transmitter measurements, the probe can output fairly high voltages so use adequate attenuation between the probe and the measurement instrument.

References:

GARY RONDEAU; 2023, <https://squashpractice.com/2023/11/06/a-clip-on-rf-current-probe/>

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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 yesterday's radio's and associated equipment. To encourage all like minded amateurs to do the same thus ensuring the maintenance and preservation of our amateur heritage.

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

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 — 7.025

AWASA Telegram group:

Should you want to get on the AWA Telegram group where a lot of technical discussion takes place, send a message 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

FOR SALE**Yaesu FT-101 Transceiver**

(serial seems to place it between 101 and 101B)

Good condition

Original microphone

AC power lead - original

DC power lead – homebrew

FT101 Mobile bracket

Inverter fitted (requires 2 x 2SB206 PNP high power transistors or equivalent)

11m (CB) fitted

160m crystal fitted (for Rallies)

Crystal marker
Receiver working (tested on 40m)
PA NOT TESTED (not wanting to put HT power on)
Original manual
Fox Tango manual prints

Yaesu FR-50B Receiver

Not tested due to age
Excellent condition
RCA socket replaced with SO239 socket by Hamrad Durban
Spare set of valves (ex ZS6KR stocks) packed somewhere!!!

Yaesu FV-50B VFO (for FL-50B transmitter)

Excellent condition
Not tested

TenTec Argonaut

Argonaut 509 (504?) system
Argonaut
Microphone
Argonaut PSU
Argonaut Linear Amplifier (50W with SWR meter)
Audio filter
Connection cable loom
Manuals

REQUIRES USUAL ELASTIC RESTRINGING

Heathkit GR-78 Receiver

Well used condition
Tested on 12V DC
Tested on MW (702kHz)
Crystal markers
Modified
Battery removed
Audio amp replaced with homebrew TDA2003 amp

Contact: Roy ZS6XN; 0835757332
newtrozs@gmail.com
