

QRM

Amateur
Radio
News



September 1985

Issued by the Tasmanian Division of
the Wireless Institute of Australia

Radiatorial Comment

In this issue of "QRM" we include a complete list of monthly broadcast responsibilities for the WIA branches in Tasmania through to March 1986. And this brings to the fore, once again, the subject of the quality of our Sunday morning broadcasts. With the linking of repeaters on 2m., it is perfectly possible for contributors to take part from different areas of the state. With the setting-up of tele-type equipment, it should be possible for hard copy to be transferred to the broadcast area for the use of the originator. For those who are diffident about coming over "live" on the broadcast, it is quite possible to pre-record a contribution and play it over the air on cue.

Implementing all these possibilities would ease the load on the originator of the broadcast, provide a variety of voices and probably a greater range of more up-to-the-minute news. Technically, all the right facilities are available for a really lively, interesting weekly bulletin. What is lacking? Well, the fact is that the great majority of amateurs do nothing towards preparing an effective news service. The whole set-up revolves around a few people whose efforts, week after week, receive congratulatory lip-service on the call-back. But, let anything go wrong.....!! Where are the offers of support then? The broadcast is - or should be - a vital part of amateur contacts across the state, and yet, quite often events that are published more than once on the broadcast, are not supported because many amateurs never bothered to listen and so were unaware of the function. Why don't we ALL listen, unless of course circumstances make it quite impossible? Is it because we aren't making the content interesting enough to attract listeners? Is it because there isn't enough local news? Is it because we just don't feel involved? Whatever it is, some State-wide action seems justified, and for this to happen, it must come from Divisional level. How about a lead from Council? - a conference at some mutually agreed centre, to include those concerned with the technical side (repeater links, transmission relays), and those compiling the news and sitting in front of the microphone. We MIGHT get to the point where we can say (with some apologies to "The Investigators" on TV) "Can you afford NOT to listen?"

John VK7JK

SOUTHERN BRANCH - CHANGE OF VENUE.

Due to a change in the policy of the State Emergency Service, it has become necessary to find a new meeting place for the W.I.A. Southern Branch in Hobart. From Wednesday, September 4th, the Branch will meet at the Elizabeth Matriculation College in Elizabeth Street, on the corner of Warwick Street. The time remains the same - 8.15 p.m. Parking is available in the streets around the College and the meeting room itself is approached from the Elizabeth Street entrance - the first room on the left along the corridor. After the September meeting, it will be possible to work out in more detail the general organisation, such as the set-up for Executive meetings.

Our thanks are due to the S.E.S. for their acceptance of our meetings in the past, and it is to be hoped that the present amicable relations will continue into the future.

Who's into Gigahertz??

If YOU are into this area of our hobby, you may like to know that VK7ZAL (Bob) is building 10GHz gear and is keen to hear from anyone who is interested in the same. He is QTHR and listens on the 2m. repeater about 7 p.m. on weekdays.

Social Evening.

Those of us who went to the TARC weekend and enjoyed the dinner at the Masonic Club in Macquarie Street, will be pleased to hear that on September 14th., there will be another informal occasion at the same venue, 7.30 p.m. Members and friends are welcome. Just ring the Club, book the number of places that you require (Ph. 235231) and all will be organised. September is a cabaret night, so the set-up will be the same as that of the TARC weekend. Any further questions, contact Lou, VK7LJ, QTHR.

Novice and Morse Training Courses.

Starting this month, it is hoped to open a Novice Course to prepare for the examination in February 1986 and meetings will be held at the Activity Centre, Newtown Road, Hobart.

Morse training will be held as a separate course for the benefit of "Z" call holders wishing to upgrade.

Details of times and dates will be circulated as soon as the level of response is known. Anyone interested in either of the two courses is asked to contact Rai VK7VV. He is QTHR, often is heard on Repeater 2 and his phone number is (002)

Similar courses are running in the N.W. - and it is encouraging to know that support is forthcoming in different parts of the Division. "QRM" would appreciate information on how the schemes are progressing.

ALARA'S CONTRIBUTION FOR THIS MONTH.

As a result of the recent A.G.M., we have some new office bearers, one of whom is Laura, VK7NYL, who becomes the new VK7 State Representative. She would like to hear from any YL's who are interested in joining our Association. Helene is now serving her third and last year as President, so it is pleasing to have two office bearers from VK7 on the Committee.

In view of the recent RD Contest, we thought the following would be very appropriate.

CONTEST, by Joy, VK2EBX.

"CQ Contest, CQ Contest",
Over every band,
Paper lying everywhere,
Pen clutched in my hand.

There's a strange look on the O.M's face,
(Can't think why that should be!)
He says, "How long before the end
Of this insanity?"

"Hey, mum," yells son, "Where is my shirt
I can't find it at all".
"Look among that heap of ironing
In the basket in the hall".

"CQ Contest, CQ Contest",
Way into the night.
(Did I bring the washing in?
I can't remember quite).

"CQ Contest, CQ Contest",
Getting laryngitis!
(Must get a can of flyspray -
Get the mossies 'fore they bite us!)

Time's up - the contest's over;
Try and organise the log;
Check the points and add my score up.
(Better go and feed the dog).

"CQ Contest, CQ Contest",
Hunched up in my chair;
My list of members is somewhere here,
I wish I knew just where.

"I'm pretty handy as you know.
To get a meal I'm able.
But I don't know where to put it
'Cos there's no room on the table".

"CQ Contest, CQ Contest",
Past the fifty mark.
(Better go and feed the chooks
Before it gets too dark!)

"CQ Contest, CQ Contest",
Must be off my head!
Wonder why the lights are out?
Think all have gone to bed!

"CQ Contest, CQ Contest",
Into it once more.
Must be getting writer's cramp,
My fingers are quite sore.

Now to set it all out neatly.
Post off with a stamp or two.
People ask, "Why do you do it?"
Well - I really wish I knew!

ALARA's THOUGHT FOR THE MONTH (& perhaps the YEAR, too!)

There are three kinds of people in the world:

Those who make things happen.

Those who watch things happen.

Those who ask, "What happened?"

Which group are you in??

SO YOU WANT TO CONTACT THE EDITOR?

READ THIS.....READ THIS.....READ THIS.....READ THIS.

Hey, what's going on? Well, your usual Editor thought unless he specially drew your attention to this paragraph, you wouldn't bother to read it - see the Editorial. The fact is that the Editor won't be available for the next couple of months - he's doing a marathon swim round waterlogged Britain. SO - please send all that copy to Peter, VK7ZPK, QTHR and tel. no. 438791 (002). He also joins in on 2m. most afternoons. Let him have your news, articles, comments and letters, and double the size of QRM before your rugged-up and wellie-booted Editor returns.

WOULD ALL ASPIRING CONTRIBUTORS TO QRM PLEASE NOTE THAT THE CLOSING DATE FOR COPY FOR THE OCTOBER ISSUE IS FRIDAY, 27th SEPT.

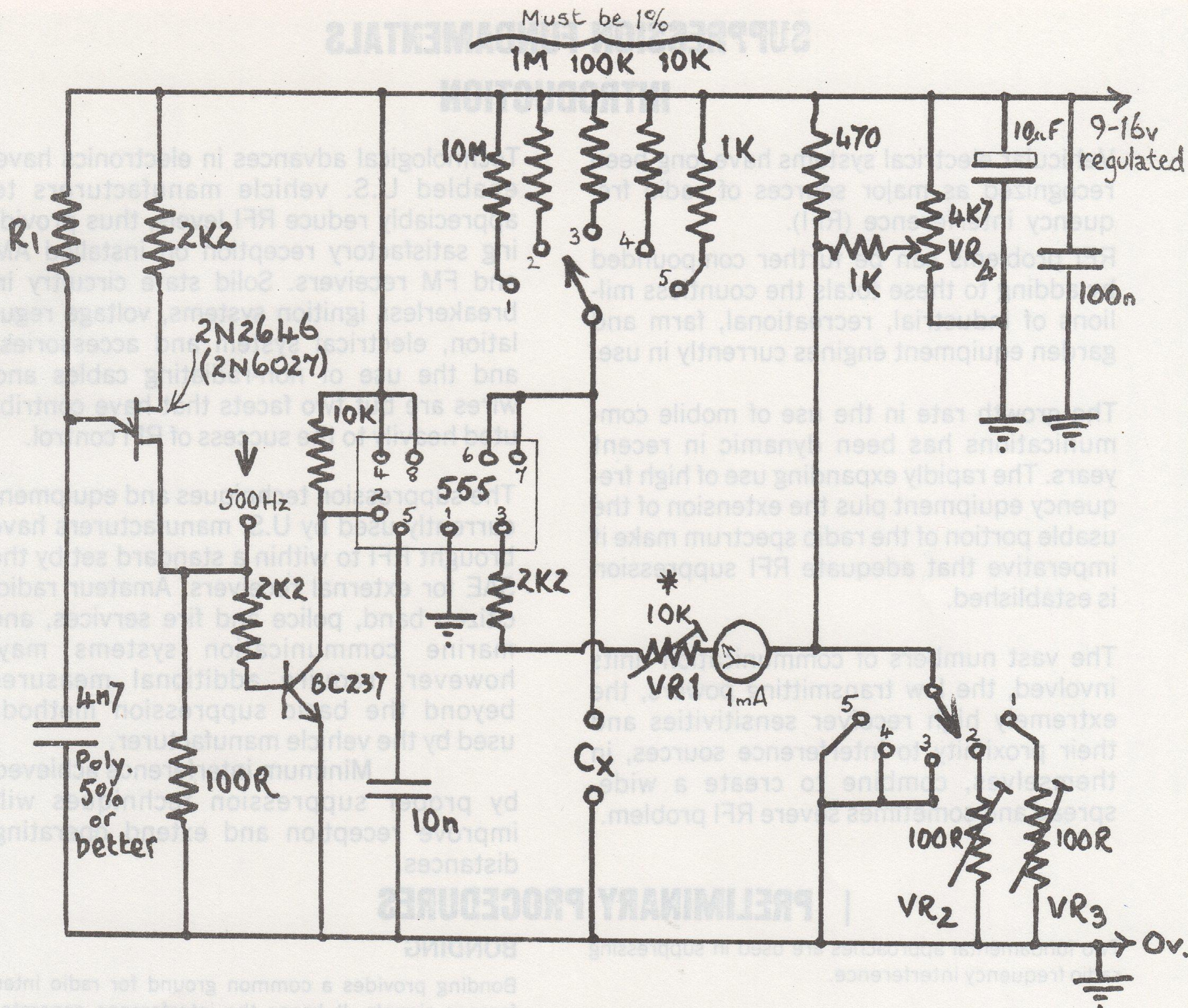
Copies of this newsletter will be distributed to WIA members at Branch meetings and to other interested subscribers by post at purely nominal cost. Anyone who wishes to take up this offer, please contact the Editor.

A HOME BREW CAPACITANCE METER,
by Ian, VK7ZBQ

Following the Editor's comments in the August Editorial about the vagaries of marking components Ian has submitted the design given below. If you have any problems in construction, please call him on 951865. Thanks, Ian - it's good to get a positive response to a QRM request!

Vero board can be used for this project and all wiring must be short and rigid, especially round the test terminals. The accuracy of this instrument is that of the meter movement, so be wary of low cost Taiwanese meters which are sometimes very non-linear - e.g. 2½% FSD but often 5% mid-scale!! A large scale meter is an advantage, enabling a minimum capacitance of 1pF to be read on the 100pF range. A flat mounting (no holes) taut band movement is available from VK7ZBQ for \$23.00 (2% F.S.D.) to Club members only. Size: 86 x 75 x 14.6 mm.

→ NEXT PAGE.



If using a 100 μ A meter, use 100K pot for VR1.

Ranges: 1. 100pF 2. 1nF 3. 10nF 4. 100nF 5. 1 μ F F.S.D.

Note: R1 - use 1M Ω pot to find 500Hz $\pm$ 10%, then replace with the correct value 1% resistor.

Calibrate with VR1 on range 3 or 4 (10nF or 100nF) using a 10nF or 100nF 1% capacitor (see VK7ZBQ if you want to borrow one of these).

Ranges 1 and 2 are calibrated with VR2 and VR3 using 100pF and 1 μ F 1% capacitors.

VR4 is used to zero the meter on ranges 1 and 2. Use 1% resistors throughout for long term stability, and GOOD QUALITY SEMICONDUCTORS!

TASMANIAN DIVISION OF W.I.A.

VK7WI BROADCAST ROSTER.

August 1985 - Northwest Branch.

September 1985 - Southern Branch.

October 1985 - Northern Branch.

November 1985 - Northwest Branch.

December 1985 - Southern Branch.

January 1986 - Northern Branch.

February 1986 - Northwest Branch.

March 1986 - Southern Branch.

Issued by VK7 Divisional Broadcast Officer,

Date - VK770V

SUPPRESSION FUNDAMENTALS

INTRODUCTION

Vehicular electrical systems have long been recognized as major sources of radio frequency interference (RFI).

RFI problems can be further compounded by adding to these totals the countless millions of industrial, recreational, farm and garden equipment engines currently in use.

The growth rate in the use of mobile communications has been dynamic in recent years. The rapidly expanding use of high frequency equipment plus the extension of the usable portion of the radio spectrum make it imperative that adequate RFI suppression is established.

The vast numbers of communication units involved, the low transmitting powers, the extremely high receiver sensitivities and their proximity to interference sources, in themselves, combine to create a widespread and sometimes severe RFI problem.

Technological advances in electronics have enabled U.S. vehicle manufacturers to appreciably reduce RFI levels, thus providing satisfactory reception on installed AM and FM receivers. Solid state circuitry in breakerless ignition systems, voltage regulation, electrical system and accessories, and the use of non-radiating cables and wires are but two facets that have contributed heavily to the success of RFI control.

The suppression techniques and equipment currently used by U.S. manufacturers have brought RFI to within a standard set by the SAE for external receivers. Amateur radio, citizen band, police and fire services, and marine communication systems may, however, require additional measures beyond the basic suppression methods used by the vehicle manufacturer.

Minimum interference achieved by proper suppression techniques will improve reception and extend operating distances.

PRELIMINARY PROCEDURES

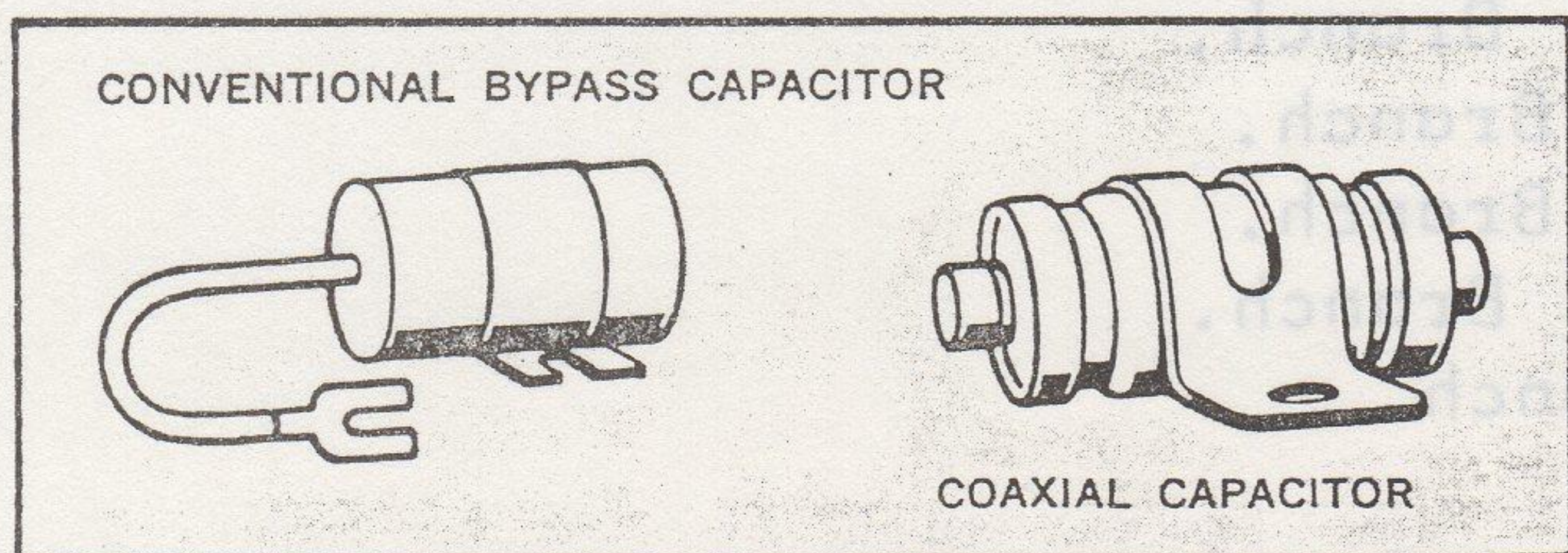
Two fundamental approaches are used in suppressing radio frequency interference.

1. Reduce the strength of the interference from each individual source as much as possible.
2. Confine the interference . . . make the engine compartment an efficient shield box.

Basic components and techniques used in RFI suppression include capacitors, bonding, routing of wiring and suppressors in the high voltage circuit.

CAPACITORS

A capacitor will, in effect, pass alternating current but block the flow of direct current. Since interference is an alternating or impulse signal, a capacitor will bypass most of it to ground without affecting the direct current circuit. Conventional bypass capacitors are satisfactory for broadcast-band suppression, but they are not very effective at higher frequencies. Communications frequencies up into the UHF range make the use of coaxial capacitors necessary.



BONDING

Bonding provides a common ground for radio interference signals. It keeps the interference generated by the ignition and charging systems from traveling throughout the vehicle, reduces intercoupling, and prevents re-radiation. It also minimizes RFI radiation from the vehicle by connecting the metal parts together to form an effective shield.

ROUTING OF WIRING

Vehicle wiring must be carefully routed to avoid transfer of interference from one circuit to another, particularly from the high voltage ignition cables.

HIGH VOLTAGE SUPPRESSORS

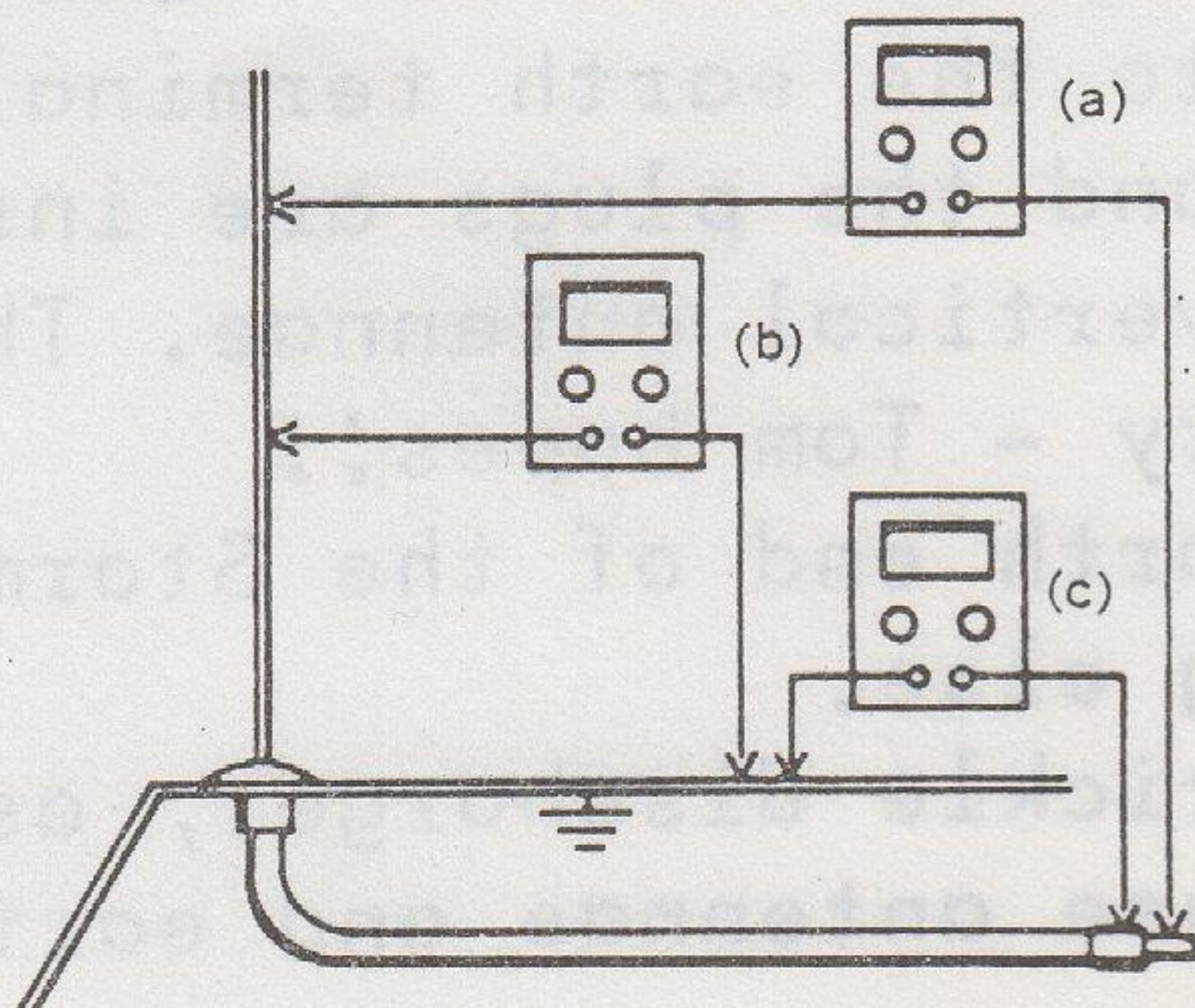
Resistors in various forms are used in the high voltage ignition circuit to reduce the level of radiated interference. This subject is of utmost importance because the ignition system is by far the greatest offender.

Various types of suppressor resistors have been manufactured. Some are separate components for use at the distributor towers or spark plug terminals. They have often been moulded into the distributor rotor, towers, and even the center contact button. They are used to some extent as original equipment or European vehicles, but are available in the United States mainly as service items.

When installing or servicing two-way radio equipment, these procedures will help to insure quiet operation.

1. Check to see if all suppression components specified by the vehicle manufacturer are still in place. The resistor cables may have been replaced with non-resistor types. A bonding strap may have been lost, a tooth-type lockwasher may be missing or a connection may be loose. Make sure all of the components are in good condition. Broken resistor cables or corroded bonds will not help suppress RFI, but may very likely make it worse.
2. If the engine has not been tuned recently, have it done by a qualified ignition serviceman. Include new spark plugs, breaker points, and condenser. The engine must be in top operating condition to guarantee optimum radio performance.
3. Connect the radio directly to the battery. Do not tap into the accessory-ignition switch because intercoupling between the car's electrical system and the radio circuit may cause interference.
4. Route low voltage wires away from the ignition system . . . keep all suspected circuits separated. Dress the wires against grounded metal areas where possible . . . do not bundle them. If a problem persists where original wiring is bundled, try connecting that circuit with a separate wire outside the bundle.
5. Make certain the antenna lead-in shield is grounded at both ends. Insulation should be inspected, and all connections must be clean and tight.

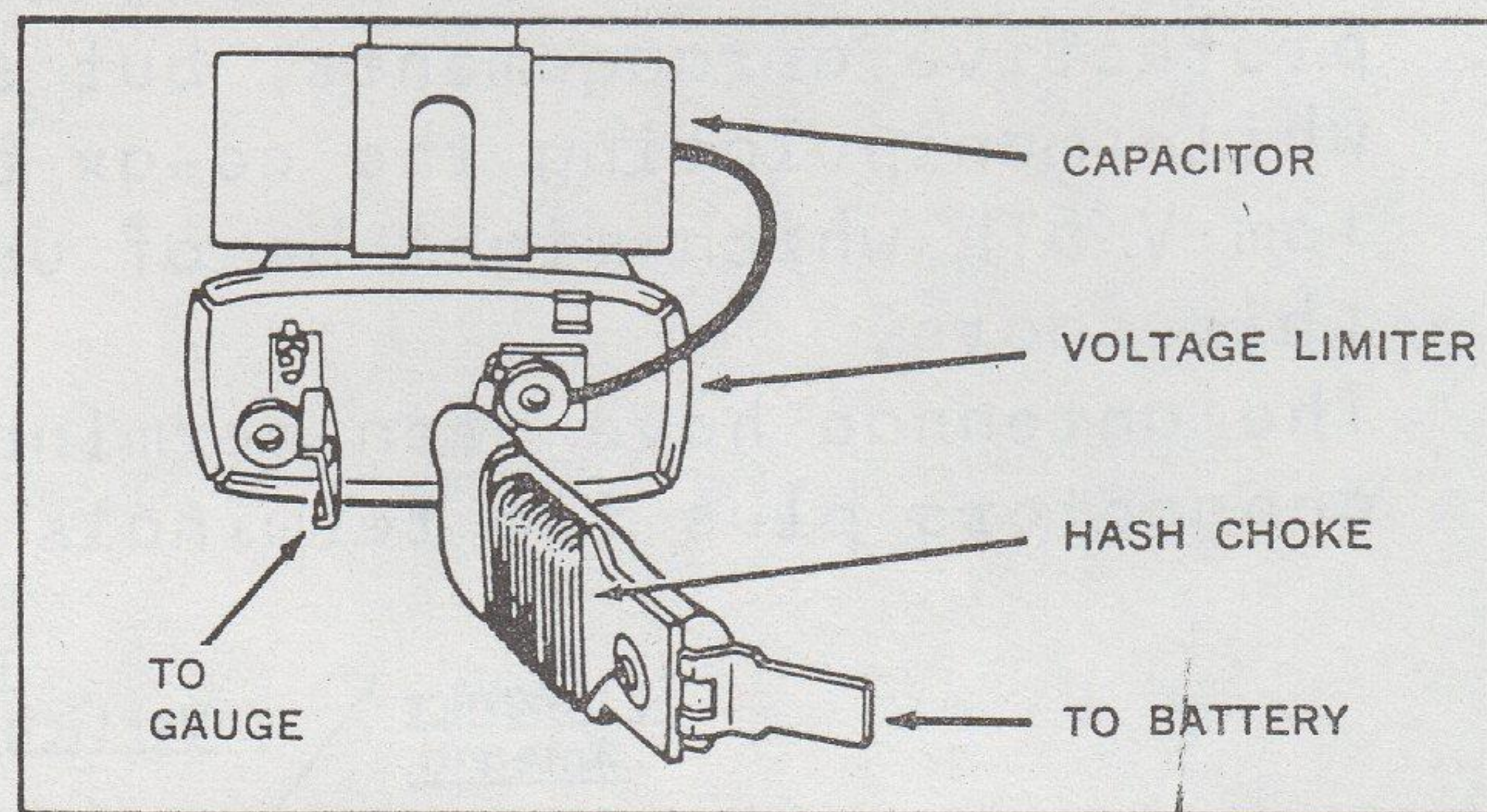
Here are three ohmmeter checks you should make on an antenna:



(a) On lowest scale, touch probes to antenna rod and center contact of plug. Resistance should be a fraction of an ohm. (b) On highest scale, touch probes to antenna rod and vehicle ground. You should read open circuit on most antennas. Some high gain antennas with built-in matching transformers will be short-circuited. (c) On lowest scale, touch probes to outside of antenna plug and vehicle ground. It should measure zero resistance.

INSTRUMENTS

Install a .5 mfd. capacitor at the battery terminal of the voltage limiter . . . or try a .1 mfd. radio-type pigtail capacitor directly across the limiter terminals. A stubborn case may require a hash choke in series with the battery lead.

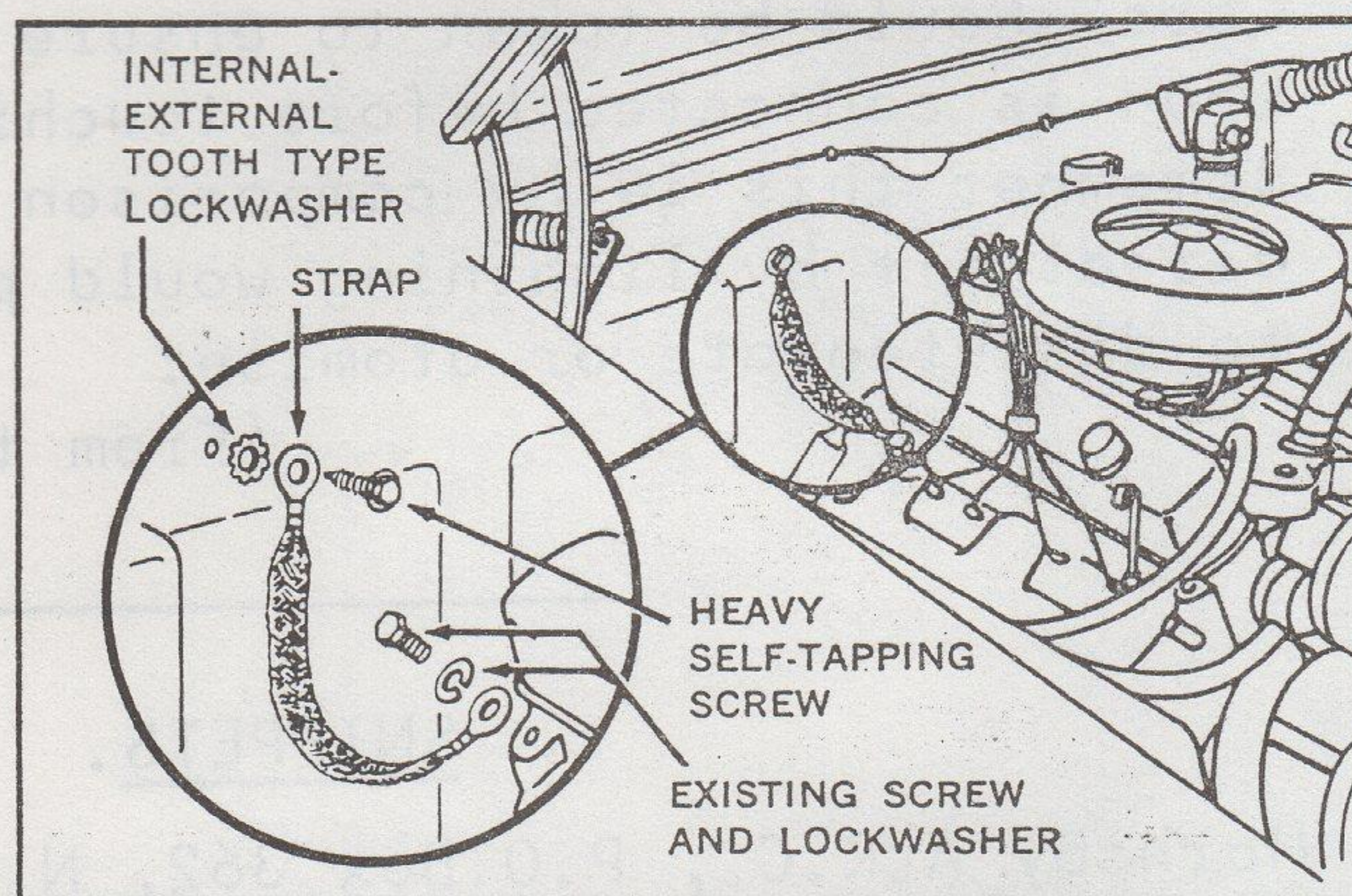


BONDING

Add bonding in suspected areas. Unfortunately, there is often no better than a cut-and-try proposition. Experience is the best teacher in choosing bonding locations for maximum effectiveness. Location is sometimes highly critical, and a few inches either way can make the difference between good results and none at all. Bonding kits are often furnished by the radio manufacturers. Follow their directions carefully.

Typical bonding locations are:

1. Corners of engine to frame
2. Exhaust pipe to frame and engine
3. Both sides of hood
4. Both sides of trunk lid
5. Coil and distributor to engine and fire wall
6. Air cleaner to engine block
7. Battery ground to frame
8. Tail pipe to frame
9. Steering column, oil gauge and other lines when they pass through firewall
10. Front and rear bumper supports
11. Radiator to supports



In general, any adjacent metal parts which are separated by mastic or paint must be connected together electrically.

(To be continued)

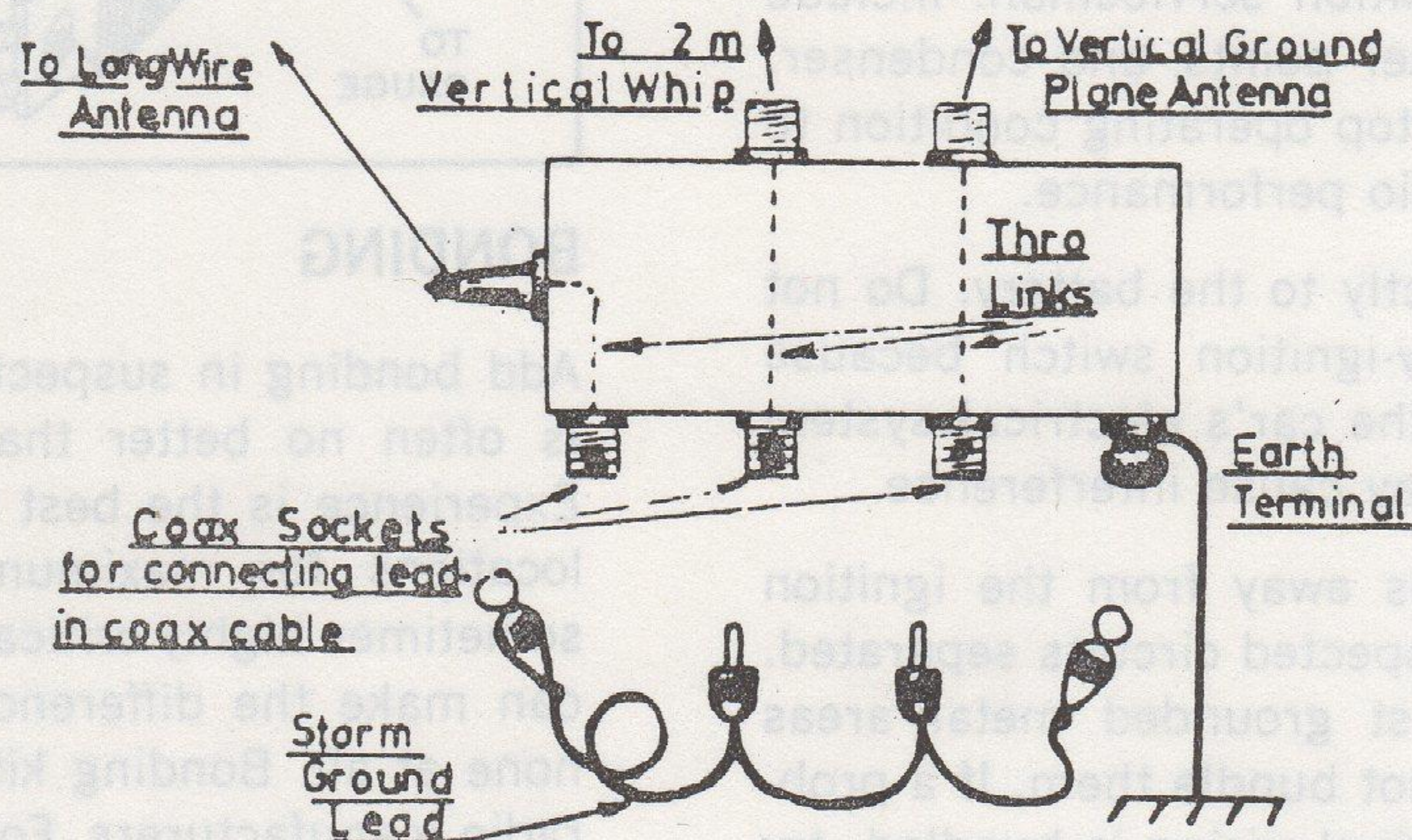
WANTED!

Does anyone have the October 1983 copy of "Amateur Radio" (U.K.) either for sale or loan? Please contact the Editor.

A SHOCKING INTERLUDE.

A conversation recently heard between two amateurs in another state outlined some of the effects of static electricity in antennae. One operator had worn a welding glove while making the necessary protective arrangements, but still felt a "tingling" in his fingers while manipulating the co-ax connectors. Here is an idea from Tom VK5TL which might be of use in preventing further problems on this score.

The antennae have been terminated in a small box fitted with co-ax connectors plus two terminals as shown:



The box end of the Lead-in Co-ax to the shack's operations area is left lying well clear when the antennae are not in use. An earth wire leads to the box. A short length of suitable wire fitted with battery style clips on each end, and suitable plugs in the middle, (4mm banana plugs fit nicely into SO239 centre pins) enables direct earthing of the antennae.

At the first suggestion of an electrical storm, real or forecast, fitting takes place as follows: one clip to the earth terminal, the other to the long wire antenna terminal, and the plugs are inserted into the co-ax sockets which lead to the vertical antennae. This prevents any build-up of static electricity - Tom hopes!!

Care should be taken to ensure that the earth end of the Storm Ground Lead is connected before touching anything else.

Remember this is by comparison a static trickle discharger, as a direct hit by lightning would probably cause antennae and earth wire to disintegrate or atomise!

(From the S.A. W.I. Journal, June 1985)

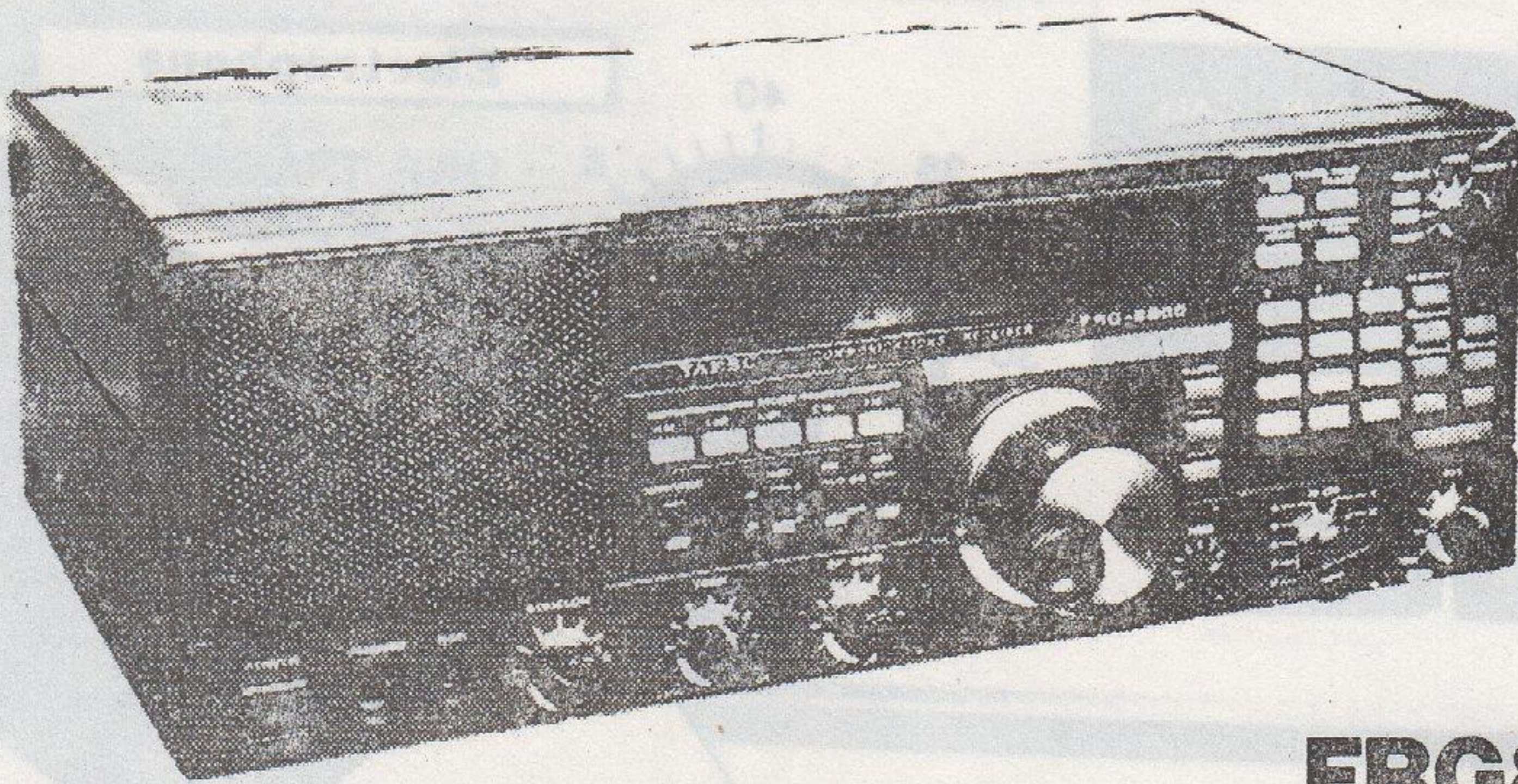
SNIPPETS.

Hornsby A.R.C., P.O.Box 362, N.S.W. 2077 are running continuous Morse transmissions on 3.699KHz using 15 watts output with a crystal locked Tx. They would appreciate listener reaction.

The Customs 2% Tax is now consolidated so long as transmitters brought into the country are useable only on amateur bands. You should be able to bring in items from overseas without difficulty but consult "Information Leaflet for Tourists no. R.83/160".

HOBBY ELECTRONICS

477 NELSON ROAD,
MT. NELSON 7007
Telephone (002) 23 6751



FRG8800

General Coverage

Continuous coverage from 150KHz to 30MHz. Two speed spin tuned VFO plus keyboard plus computer interface control.

All mode

The FRG8800 demodulates SSB (USB & LSB) CW, AM (Wide and Narrow) and FM narrow as standard. This, complemented by an all mode squelch, produces the most practical receiver available. The FM narrow is useful for 10M, CB and for VHF with the optional VHF converter.

Memory

The FRG8800 comes fully equipped with twelve memories programmed and scanned at the touch of a single button. Any of the memory channels will accept a frequency within the whole range of the receiver including the VHF range (with the optional VHF unit). The mode is also stored in the memory eliminating the need for inconvenient manual mode change, when hopping from one memory to the next.

Selectivity & Sensitivity

Four filters are fitted as standard (SSB/CW, AM, AM-NAR and FM-NAR) with bandwidths chosen for optimum performance, these combined with switchable AGC and variable tone control provides maximum enjoyment despite today's crowded bands.

High input sensitivities are obtained by the latest in RF stages, making the most of inefficient aerials and difficult locations, and a continuously variable RF attenuator control overcomes problems encountered with very powerful stations.

LCD Display

The back-lit green LCD display incorporates easy to read 'any angle' 10mm digits.

A twelve function display indicates the transceiver's status at a glance. It includes memory channel number, mode, and frequency to a resolution of 100Hz. Also included is a two dimensional LCD, graphical SIMPO and 'S' meter, which is conventionally calibrated at 1-5 and 0-9, +20dB, +40dB, +60dB respectively.

Keyboard

A 12 button keyboard is fitted as standard allowing quick accurate changes of frequency and band (MHz and KHz programmed individually). The keyboard also has nine control buttons to allow rapid changes from memory to VFO, memory to memory and VFO to memory. Memory channels can also be recalled at the turn of a knob, ideal for storing calling/working channels or broadcast reception.

The keyboard is complemented by an opto-coupled, two speed, VFO drive: fast for rapid tuning of a band or slow for accurately tuning in a signal. In addition a fine tune control compensates for drift in the received signal. The dial can be electronically locked preventing accidental change in frequency.

Clock/Timer

Dual accurate 12 hour clocks, with AM/PM indicators are ideal for log keeping (GMT/Local). The clock uses the main digital display and features full back-up facilities in the event of a mains failure or disconnection. The timer can activate the receiver or tape recorder via the relay contacts provided. A snooze facility allows up to 59 minutes of listening.

VHF Converter (optional)

The FRV8800 extends coverage to include 118-174MHz all within the main frame, thereby allowing monitoring of: PMR, marine and air bands, as well as 2M.

The FRG8800 is operated as before via the keyboard or VFO, and the memory still holds any frequency and mode. The actual VHF frequency is displayed on the main LCD to a resolution of 100Hz.

Worldwide

At 6.1Kg (excluding converter) the FRG8800 is ideal for taking on any trip. The power supply is easily adjustable from 240-220 VAC to 110-120V, 50/60Hz mains and 12VDC operation is available as an option.

SPECIFICATION

FREQUENCY COVERAGE:

150KHz - 29.999MHz
118MHz - 173.999MHz*

FREQUENCY RESOLUTION:

100Hz (Digital Readout)

FREQUENCY STABILITY:

<± 300Hz in 30 mins after 1 min on
< 50Hz in 30 mins after warm up

MODES OF RECEPTION:

AM, CW, FM NB, SSB (LSB/USB)
A3E, A1A, G3E, J3E

SELECTIVITY:

SSB/CW (J3E/A1A):

2.7KHz @ -6dB, 8.0KHz @ -50dB

FM (G3E) narrow:

12.5KHz @ -6dB, 30KHz @ -40dB

AM (A3E/H3E) (standard/narrow):

6.0KHz @ -6dB, 15KHz @ -50dB

2.7KHz @ -6dB, 8KHz @ -50dB

SENSITIVITY:

SSB/CW (J3E/A1A) @ 10dB S + N/N:

<0.4uV into 50 ohm, 1.50-30MHz

<3.0uV into 500 ohms, 0.15-1.6MHz

<1.0uV into 50 ohms, 118-174MHz*

FM (G3E) @ 20dB S + N/N:

<1.0uV into 50 ohms, 1.60-30MHz

<2.0uV into 50 ohms, 118-174MHz*

AM (A3E) @ 10dB S + N/N:

<4.0uV into 50 ohms 1.60-30MHz

<3.0uV into 500 ohms, 0.15-1.6MHz

<10uV into 50 ohms 118-174MHz*

SQUELCH SENSITIVITY:

SSB/CW (J3E/A1A):

<2uV, 1.60-30.0MHz

<4uV, 118-174MHz*

FM (G3E):

<0.5uV, 1.6-30.0MHz

<1.0uV, 118-174MHz*

AM (A3E):

<2uV, 1.60-30.0MHz

<4uV, 118-174MHz*

AUDIO OUTPUT:

1.4W in 8 ohms internal @ 10% T.H.D.

4-16 ohms external speaker/phones

Constant level line output (recorder)

POWER REQUIREMENTS:

100/120 220/24V @ 50/60Hz

35VA Rx, 5VA standby

12VDC (nominal)*

1A Rx, 0.020A standby

DIMENSIONS (Ex/Inc projections):

335/350 W, 120/130 H, 235/270 D, mm

Weight 6.1/6.3Kg (w/o, c/w VHF unit)

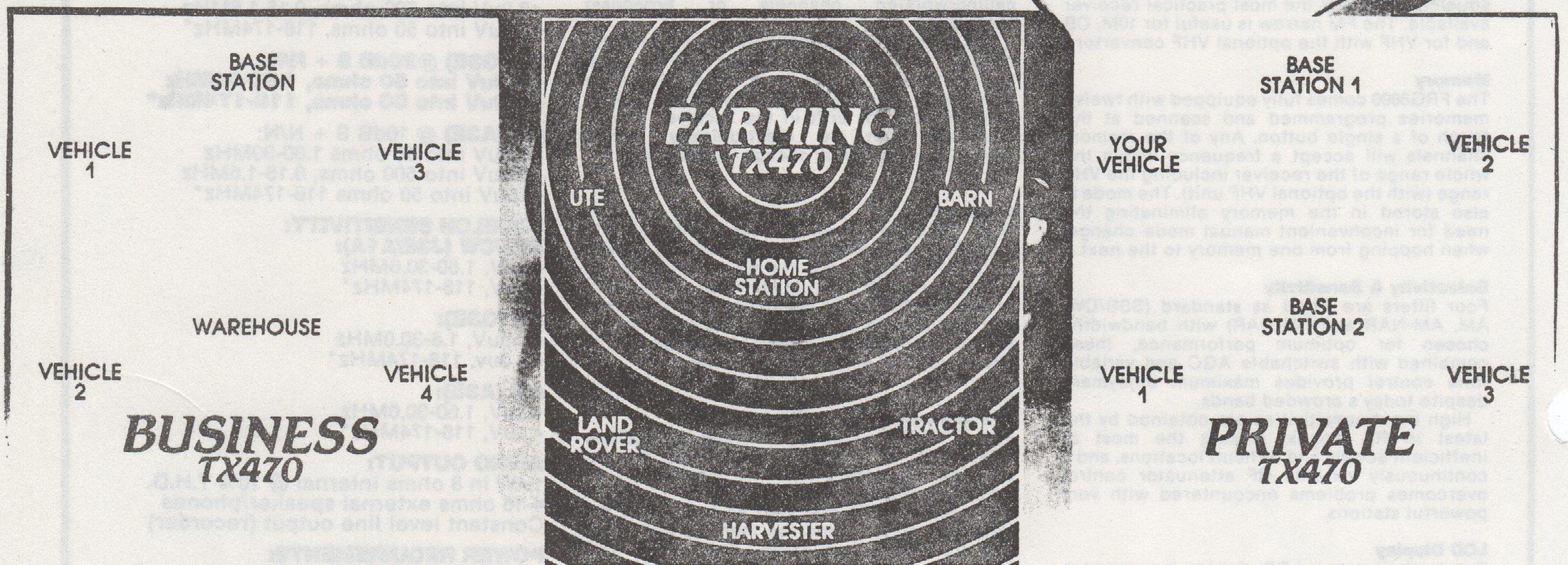
* OPTIONAL UNIT

WANTED: One FT7 or TS120V or TS130.

Please contact the address above.

INTRODUCING

Electrophone::: TX470



wherever you drive, work, live...
TX470...THE ULTIMATE IN TWO-WAY RADIO

Electrophone TX470 UHF 2 way radio brings you your own high quality, professional communication system. The TX470 has been especially designed for Australia's harsh environment, by Japan's leading communication company.

The TX470 incorporates the exclusive Electrophone Interference Shield ... giving you crystal clear reception. Reception that is free of interference from motor ignition, electrical apparatus, or nearby transmissions.

Electrophone:

AVAILABLE FROM GEORGE HARVEY ELECTRIC PTY. LTD.
76, York St.,
Launceston, 7250
003.316533

162-4, Argyle St.
Hobart, 7000.
002.342233