

Discussing the K.W. “Valiant”

**SIX-BAND FIXED
OR MOBILE
CW/PHONE TRANSMITTER**

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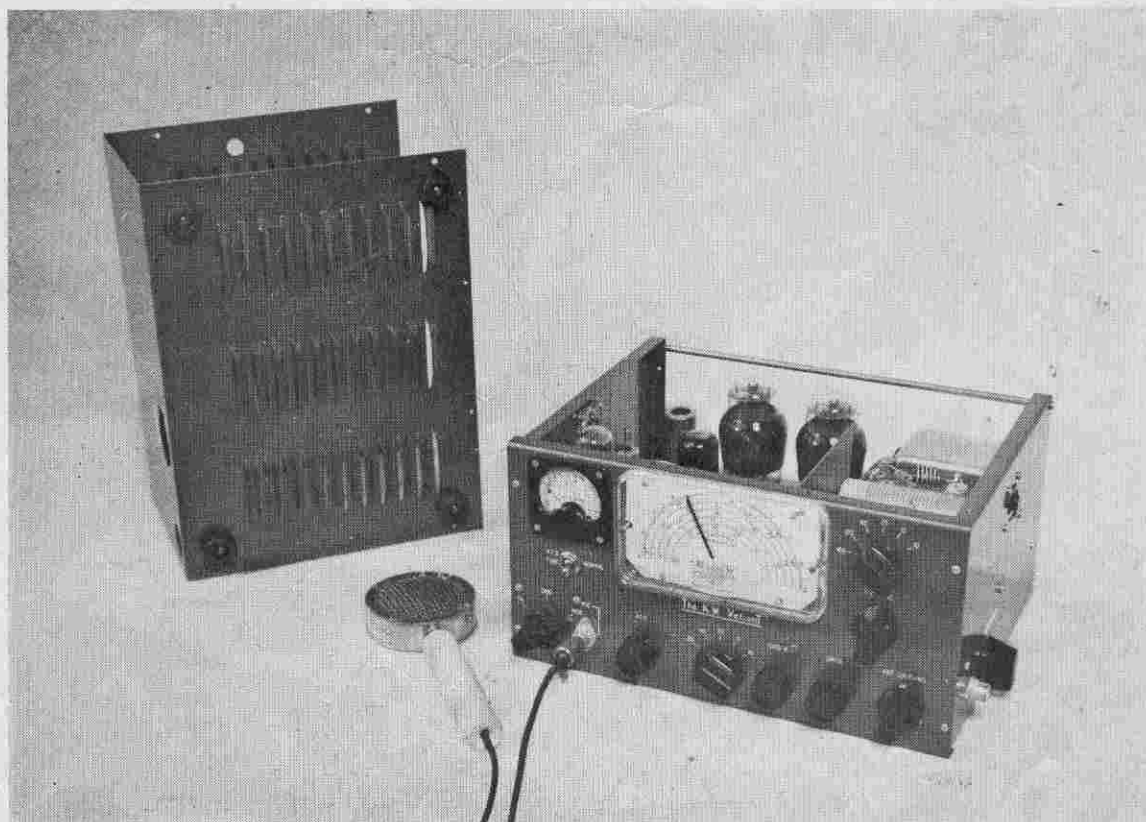
SIX-BAND FIXED OR
MOBILE CW/PHONE
TRANSMITTER

THE new K.W. Electronics "Valiant" is an exceptionally attractive piece of apparatus from several points of view—although very compact it is capable of 25 watts RF output fully modulated, with six-band performance, and it can be used either as a fixed-station transmitter or as a mobile rig, for which gimbal-type mounts are provided on the cabinet.

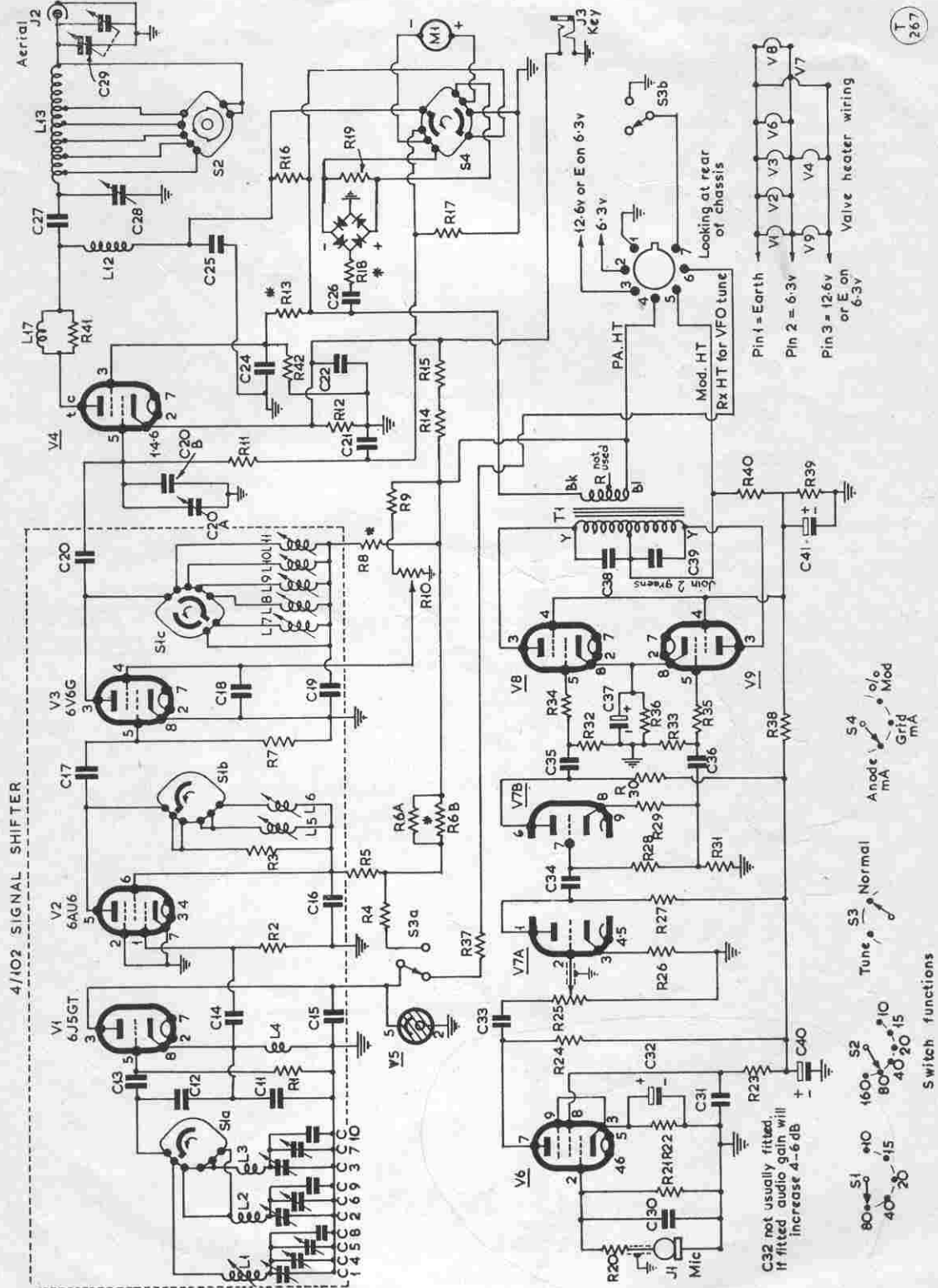
Because it is designed for this dual role—calling for two different types of power supply

—the Valiant is not self-powered. On the bench, it can be run off any available power unit capable of giving up to 425v./150 mA for the modulator and 470v./200mA for the RF side, with LT at either 6.3 or 12.6 volts for the heaters. This is for full-power operation. HT voltages down to 300v. may be used on modulator and RF section, with correspondingly reduced output.

The model as illustrated here was supplied to us factory-built and tested, with the 160-metre modification incorporated, to give the full coverage 160-10 metres inclusive. When it is stated that for a size overall of 12in. wide by 9½in. deep by 6¼in. high, and a total weight of just over 16 lbs., an RF output of fully 25w. can be obtained on five bands and a good 8 watts on Top Band, it will be realised that the Valiant is a sound proposition as the transmitter for a very good mobile installation. The PA output is at low impedance, so that



General view of the K.W. Electronics "Valiant" six-band transmitter, with the cover removed. On the right-hand panel are the 160-metre change-over switch and the aerial connector. This transmitter will give 25 watts RF output, fully modulated, on all bands 10-80 metres, and is suitable for either fixed station or mobile working. The switches are in the 80-metre position.



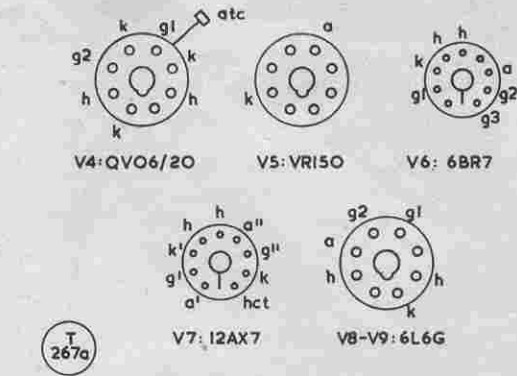
Circuit complete of the K.W. Electronics "Valiant" six-band transmitter, designed for bench or mobile operation. It requires an external power supply, as explained in the text.

any sort of current-fed aerial system can be loaded up using the normal pi-coupler tuning procedure.

As shown in the circuit diagram, the VFO is a standard Gelo 4/102 unit, with a QV06-20 as PA, modulated on plate-and-screen by a pair of 6L6's; this ensures full modulation at the maximum safe carrier input, which can be up to 60 watts or so with 470-500v. on the plate of the RF amplifier. The 4/102 "signal shifter" gives ample drive for all bands, and there is a variable drive control, R10 in the circuit diagram, for correct adjustment of PA grid current from band to band.

Panel Controls

In a mobile transmitter, normally a band is set up and left so set for an operating session, the only transmitter adjustments called for being small frequency changes—if the aerial will accommodate them, or can be resonated from the operating position. The front-panel controls of the Valiant include VFO/PA band



Base connections for the valves used in the K.W. Valiant.

selector switches, VFO tune, Drive adjust, PA tune, with a separate selector switch (on the side of the panel) for 160-metre working; this switch also brings in the series resistor for cutting power to 10 watts on Top Band. Additional panel items include a VFO-net switch and a meter-range selector switch; as is now usual in the K.W. Electronics transmitter designs, one position of this latter is for the modulation-level indicator circuitry, enabling the depth of control to be read off on the meter dial as an (approximate) percentage of modulation.

On the rear chassis drop is the power inlet socket and the keying jack. The microphone—which can be any standard crystal type—plugs in on the front panel, and the aerial socket is on the right hand wall of the cabinet.

When used either mobile or as a fixed station

Table of Values

C1, C20 = As fitted	R6A, R6B, R6C, R6D, R6E, R6F, R6G, R6H, R6I, R6J, R6K, R6L, R6M, R6N, R6O, R6P, R6Q, R6R, R6S, R6T, R6U, R6V, R6W, R6X, R6Y, R6Z, R6AA, R6AB, R6AC, R6AD, R6AE, R6AF, R6AG, R6AH, R6AI, R6AJ, R6AK, R6AL, R6AM, R6AN, R6AO, R6AP, R6AQ, R6AR, R6AS, R6AT, R6AU, R6AV, R6AW, R6AX, R6AY, R6AZ, R6BA, R6BB, R6BC, R6BD, R6BE, R6BF, R6BG, R6BH, R6BI, R6BJ, R6BK, R6BL, R6BM, R6BN, R6BO, R6BP, R6BQ, R6BR, R6BS, R6BT, R6BU, R6BV, R6BW, R6BX, R6BY, R6BZ, R6CA, R6CB, R6CC, R6CD, R6CE, R6CF, R6CG, R6CH, R6CI, R6CJ, R6CK, R6CL, R6CM, R6CN, R6CO, R6CP, R6CQ, R6CR, R6CS, R6CT, R6CU, R6CV, R6CW, R6CX, R6CY, R6CZ, R6DA, R6DB, R6DC, R6DD, R6DE, R6DF, R6DG, R6DH, R6DI, R6DJ, R6DK, R6DL, R6DM, R6DN, R6DO, R6DP, R6DQ, R6DR, R6DS, R6DT, R6DU, R6DV, R6DW, R6DX, R6DY, R6DZ, R6EA, R6EB, R6EC, R6ED, R6EE, R6EF, R6EG, R6EH, R6EI, R6EJ, R6EK, R6EL, R6EM, R6EN, R6EO, R6EP, R6EQ, R6ER, R6ES, R6ET, R6EU, R6EV, R6EW, R6EX, R6EY, R6EZ, R6FA, R6FB, R6FC, R6FD, R6FE, R6FF, R6FG, R6FH, R6FI, R6FJ, R6FK, R6FL, R6FM, R6FN, R6FO, R6FP, R6FQ, R6FR, R6FS, R6FT, R6FU, R6FV, R6FW, R6FX, R6FY, R6FZ, R6GA, R6GB, R6GC, R6GD, R6GE, R6GF, R6GG, R6GH, R6GI, R6GJ, R6GK, R6GL, R6GM, R6GN, R6GO, R6GP, R6GQ, R6GR, R6GS, R6GT, R6GU, R6GV, R6GW, R6GX, R6GY, R6GZ, R6HA, R6HB, R6HC, R6HD, R6HE, R6HF, R6HG, R6HH, R6HI, R6HJ, R6HK, R6HL, R6HM, R6HN, R6HO, R6HP, R6HQ, R6HR, R6HS, R6HT, R6HU, R6HV, R6HW, R6HX, R6HY, R6HZ, R6IA, R6IB, R6IC, R6ID, R6IE, R6IF, R6IG, R6IH, R6II, R6IJ, R6IK, R6IL, R6IM, R6IN, R6IO, R6IP, R6IQ, R6IR, R6IS, R6IT, R6IU, R6IV, R6IW, R6IX, R6IY, R6IZ, R6JA, R6JB, R6JC, R6JD, R6JE, R6JF, R6JG, R6JH, R6JI, R6JJ, R6JK, R6JL, R6JM, R6JN, R6JO, R6JP, R6JQ, R6JR, R6JS, R6JT, R6JU, R6JV, R6JW, R6JX, R6JY, R6JZ, R6KA, R6KB, R6KC, R6KD, R6KE, R6KF, R6KG, R6KH, R6KI, R6KJ, R6KL, R6KM, R6KN, R6KO, R6KP, R6KQ, R6KR, R6KS, R6KT, R6KU, R6KV, R6KW, R6KX, R6KY, R6KZ, R6LA, R6LB, R6LC, R6LD, R6LE, R6LF, R6LG, R6LH, R6LI, R6LJ, R6LK, R6LL, R6LM, R6LN, R6LO, R6LP, R6LQ, R6LR, R6LS, R6LT, R6LU, R6LV, R6LW, R6LX, R6LY, R6LZ, R6MA, R6MB, R6MC, R6MD, R6ME, R6MF, R6MG, R6MH, R6MI, R6MJ, R6MK, R6ML, R6MM, R6MN, R6MO, R6MP, R6MQ, R6MR, R6MS, R6MT, R6MU, R6MV, R6MW, R6MX, R6MY, R6MZ, R6NA, R6NB, R6NC, R6ND, R6NE, R6NF, R6NG, R6NH, R6NI, R6NJ, R6NK, R6NL, R6NM, R6NN, R6NO, R6NP, R6NQ, R6NR, R6NS, R6NT, R6NU, R6NV, R6NW, R6NX, R6NY, R6NZ, R6OA, R6OB, R6OC, R6OD, R6OE, R6OF, R6OG, R6OH, R6OI, R6OJ, R6OK, R6OL, R6OM, R6ON, R6OO, R6OP, R6OQ, R6OR, R6OS, R6OT, R6OU, R6OV, R6OW, R6OX, R6OY, R6OZ, R6PA, R6PB, R6PC, R6PD, R6PE, R6PF, R6PG, R6PH, R6PI, R6PJ, R6PK, R6PL, R6PM, R6PN, R6PO, R6PP, R6PQ, R6PR, R6PS, R6PT, R6PU, R6PV, R6PW, R6PX, R6PY, R6PZ, R6QA, R6QB, R6QC, R6QD, R6QE, R6QF, R6QG, R6QH, R6QI, R6QJ, R6QK, R6QL, R6QM, R6QN, R6QO, R6QP, R6QQ, R6QR, R6QS, R6QT, R6QU, R6QV, R6QW, R6QX, R6QY, R6QZ, R6RA, R6RB, R6RC, R6RD, R6RE, R6RF, R6RG, R6RH, R6RI, R6RJ, R6RK, R6RL, R6RM, R6RN, R6RO, R6RP, R6RQ, R6RR, R6RS, R6RT, R6RU, R6RV, R6RW, R6RX, R6RY, R6RZ, R6SA, R6SB, R6SC, R6SD, R6SE, R6SF, R6SG, R6SH, R6SI, R6SJ, R6SK, R6SL, R6SM, R6SN, R6SO, R6SP, R6SQ, R6SR, R6SS, R6ST, R6SU, R6SV, R6SW, R6SX, R6SY, R6SZ, R6TA, R6TB, R6TC, R6TD, R6TE, R6TF, R6TG, R6TH, R6TI, R6TJ, R6TK, R6TL, R6TM, R6TN, R6TO, R6TP, R6TQ, R6TR, R6TS, R6TT, R6TU, R6TV, R6TW, R6TX, R6TY, R6TZ, R6UA, R6UB, R6UC, R6UD, R6UE, R6UF, R6UG, R6UH, R6UI, R6UJ, R6UK, R6UL, R6UM, R6UN, R6UO, R6UP, R6UQ, R6UR, R6US, R6UT, R6UU, R6UV, R6UW, R6UX, R6UY, R6UZ, R6VA, R6VB, R6VC, R6VD, R6VE, R6VF, R6VG, R6VH, R6VI, R6VJ, R6VK, R6VL, R6VM, R6VN, R6VO, R6VP, R6VQ, R6VR, R6VS, R6VT, R6VU, R6VV, R6VW, R6VX, R6VY, R6VZ, R6WA, R6WB, R6WC, R6WD, R6WE, R6WF, R6WG, R6WH, R6WI, R6WJ, R6WK, R6WL, R6WM, R6WN, R6WO, R6WP, R6WQ, R6WR, R6WS, R6WT, R6WU, R6WV, R6WW, R6WX, R6WY, R6WZ, R6XA, R6XB, R6XC, R6XD, R6XE, R6XF, R6XG, R6XH, R6XI, R6XJ, R6XK, R6XL, R6XM, R6XN, R6XO, R6XP, R6XQ, R6XR, R6XS, R6XT, R6XU, R6XV, R6XW, R6XX, R6XY, R6XZ, R6YA, R6YB, R6YC, R6YD, R6YE, R6YF, R6YG, R6YH, R6YI, R6YJ, R6YK, R6YL, R6YM, R6YN, R6YO, R6YP, R6YQ, R6YR, R6YS, R6YT, R6YU, R6YV, R6YW, R6YX, R6YY, R6YZ, R6ZA, R6ZB, R6ZC, R6ZD, R6ZE, R6ZF, R6ZG, R6ZH, R6ZI, R6ZJ, R6ZK, R6ZL, R6ZM, R6ZN, R6ZO, R6ZP, R6ZQ, R6ZR, R6ZS, R6ZT, R6ZU, R6ZV, R6ZW, R6ZX, R6ZY, R6ZZ	Transmitter														
R34, R35 = 47,000 ohms	R36 = 250 ohms	R37 = 10,000 ohms 2w.	R39 = 47,000 ohms 1w.	R40 = 4,700 ohms 5w.	R41 = 33 ohms	R42 = 100,000 ohms 1w. 4/102	L1, L11 = As fitted Gelo	L12 = RF choke	L13-L16 = Gelo 50w. pi-tank assembly, modified 160m.	L17 = 5 t. 18g. on R41, APC	V1-V3 = As fitted Gelo	V4 = QV06-20 (6146)	V5 = VR-150/30	V6 = 6BR7	V7 = 12AX7	V8, V9 = 6L6G

Note: Coil L13 incorporates L13-L16.

Voltage Dropping Resistors

V. R.	Normal	300	350	400	450	500	570
R6	2-15k 2w. in Para'l.	2-15k + 3.3k 2w. in Para'l.	2-15k + 4.7k 2w. in Para'l.	2-15k 2w. in Para'l.	2-15k 2w. in Para'l.	2-15k 2w. in Para'l.	ONE 15k 5w ONLY
R8	3.3k 2w	3.3k 2w	3.3k 2w	3.3k 2w	3.3k 2w	3.3k 2w	6.8k 5w
R13	27k 2w	27k 2w	27k 2w	27k 2w	27k 2w	27k 2w	33k 3w Carbon
R18	33k 1w	18k 1w	22k 1w	27k 1w	33k 1w	39k 1w	43k 1w

Note: HT voltage on modulator section not to exceed 425v. Values of R6A, R6B, R13, R18 vary with applied HT voltage. Select values as table above.

transmitter, external on-off control and change-over switching must be provided—as would normally be the case when working with alternative power supplies.

VFO Stability

In the past, the Geloso Signal Shifter, or VFO, designs have been open to criticism for instability or “judder” when used mobile, or otherwise where the mounting has not been too rigid. So long as the cabinet is mounted so that the whole transmitter “moves as one,” carrier stability in the Valiant is quite adequate, even on the higher-frequency bands. It is possible to shake the note by knocking the transmitter about—but it should never be treated like that anyway. Careful instructions about stable mounting are given in the manufacturer’s leaflet, and if these are followed, there should be no complaint about “judder” under mobile conditions.

The RF stability of the Geloso 4/102 is

inherently good and it will be noted that in this Valiant design in which it is incorporated, a voltage stabiliser is provided for the oscillator stage.

Audio Side

The speech-amplifier/modulator is a voltage multiplier arrangement, with a 6BR7, as first stage, into a 12AX7 driving the 6L6’s. The audio gain control is R25, but this is *not* brought out to the front panel—a normal setting is about two-thirds in, a hole in the cabinet providing for pre-set adjustment by screw-driver as may be necessary. The audio side gives an excellent speech characteristic and, as already mentioned, the 6L6 modulator will swing the PA fully at maximum carrier input.

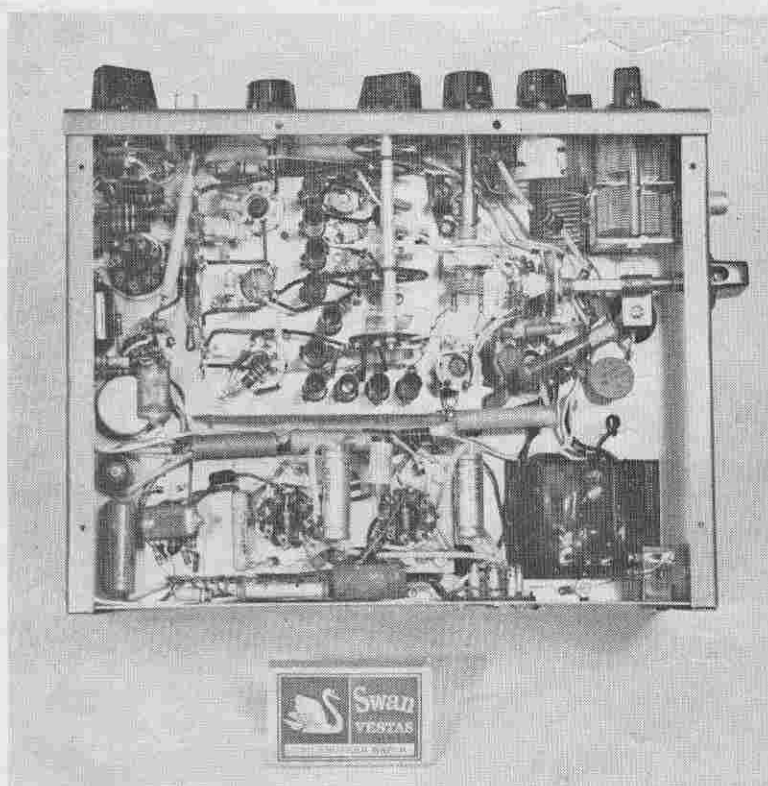
Using a normal bench power supply having adequate smoothing and regulation, the carrier was absolutely quiet and hum-free; it was not possible to detect any change in beat-note quality or background at resonance tune on the monitor receiver when switching the audio side in and out.

RF Section

This is, of course, essentially the Geloso 4/102 followed by the QV06-20 (6146) RF amplifier in which standard Geloso 50-watt RF components are used. There are some modifications involved in order to cover Top Band, and these must be applied both to the VFO (two stages) and the PA.

The 160-metre modification is fully covered in a secondary instruction sheet issued with the transmitter, together with some suggestions about feeding a whip type of aerial for mobile operation.

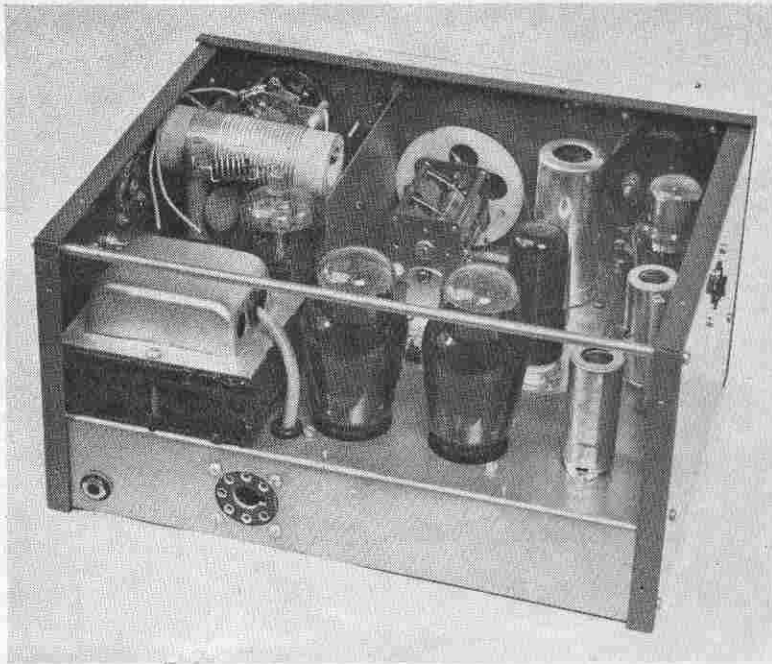
As shown by the photographs, assembly is on a rigid chassis, against a clearly and very neatly marked front panel, with side members having a stiffener across the rear top edge. The final enclosure is a U-shaped cover secured by self-tapping screws. There is ample ven-



Under-chassis view of the “Valiant” as built and supplied from the factory. The Geloso 4/102 unit is upper centre, and the fixed-ratio modulation transformer lower right. On the right-hand panel is the 160-metre switch, with the aerial output connector alongside. At lower left can be seen the audio gain-control (see text) and second from the right along the upper row of knobs is the PA drive control potentiometer.

tilation and, with only the U-cover removed, the transmitter is fully accessible for servicing.

Finally, as a test for stress and component reliability, the transmitter as illustrated here was left running at full load on 20 metres while this article was being written. Set on 14.1 mc. into a calibrated RF load consisting of a non-inductive 75-ohm resistor and ammeter, with BBC modulation into the microphone and the monitor receiver tuned to the carrier, the RF ammeter reading was 0.6 amps at the commencement of the test period. At its conclusion, the carrier was in beat with the receiver and the RF current reading a shade under 0.6 amps; the modulation level indicator was still reading the 100% level to which it had been set at the start of the run. The cover above the modulator valves was hot and the whole cabinet distinctly warm; the cover was quickly slipped off and the temperatures checked; they were found to be well within acceptable limits all round, with the PA section cooler than might have been expected after such an exacting and protracted test. Switched on again from dead cold a few hours later, all the readings repeated at the



Half-rear view of the "Valiant," showing general arrangement above chassis. Nearest are the push-pull 6L6's for the modulator, with the fixed-ratio modulation transformer at left. The QV06-20 PA stage is at upper left, and the APC on the plate of the valve is clearly shown against the fapped Gelson 50-watt coil unit. The variable condenser assembly at centre rear is the Gelson 4/102 VFO tuning control. The slotted spindle for the audio gain control R25 is near the right-hand panel.

same frequency.

The K.W. Valiant is available either in kit form (in two versions, for 10-80 metres or 10-160 metres) or factory wired and tested. The six-band model as shown here costs £43 15s., or by £10 19s. deposit and 12 instalments of £3 3s.

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