

ADDING F.S.K. TO THE FT200

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● It is a very simple matter to add FSK to your very popular FT200 Transceiver, without changing the circuit or printed boards in any way, thus not affecting the re-sale value.

The method¹ used to key the transmitter by shifting the frequency of the v.f.o. is to make use of the existing clarifier varicap diode normally used for the receiver offset tuning. This article deals specifically with the FT200 but could be applied to other transceivers with similar circuitry.

The receiver clarifier control VR6 allows the receiver frequency to be offset from the transmit frequency by up to ± 5 kHz, if required, by controlling the d.c. voltage on the varicap diode 1S145 (D401) on the v.f.o. board. Incidentally, the source of this voltage is from the 9v. regulator board. Normally, during transmit, the bias on the varicap diode is taken from the centre connection of the voltage divider R39 and R40 so that the transmit frequency is not varied by the setting of the clarifier control. This is automatically done by the send/receive change-over relay contacts PL1.

When the clarifier is switched in for receiving, another voltage divider network comprising R37, VR6, R38 and VR7 is paralleled with R39 and R40

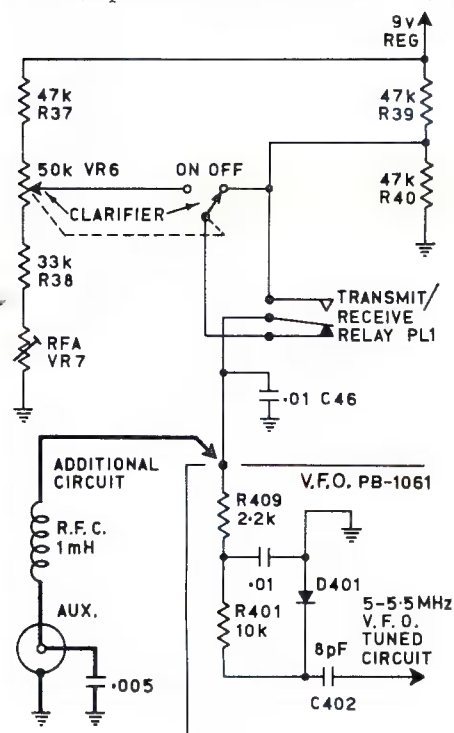


FIG 1
FT200 CLARIFIER CIRCUIT

(see Fig. 1). The circuit to be added is actually another voltage divider in parallel externally (in the f.s.k. adaptor) that shifts the v.f.o. during r.t.t.y. operation, using the internal varicap D401, in such a way as to allow the "receiver offset tuning" (or clarifier) and the "frequency shift" adjustment to remain as completely independent controls.

TRANSCIEVER MODIFICATION

Lay the cabinet on its left side on a piece of felt and remove five PK screws and washers from the bottom of the cabinet. Slide the cabinet away from the chassis, out forwards, and place the chassis bottom side up on the bench.

Now checking Fig. 1, the simple "modification" (shown in heavy lines) is simply to mount an R.C.A. phono-socket (chassis type) in the vacant hole at the rear of the chassis marked "Aux." mount a single or double tag strip at the socket, solder the r.f. choke between the centre connection of the socket and tag strip, and by-pass the centre of the socket to earth with the disc ceramic condenser (to by-pass any strong r.f. going past the socket in either direction).

Run a short length of hook-up wire from the tag strip at the other end of the r.f. choke round and up through the chassis to the clarifier connection on the side of the v.f.o. box as per Fig. 2.

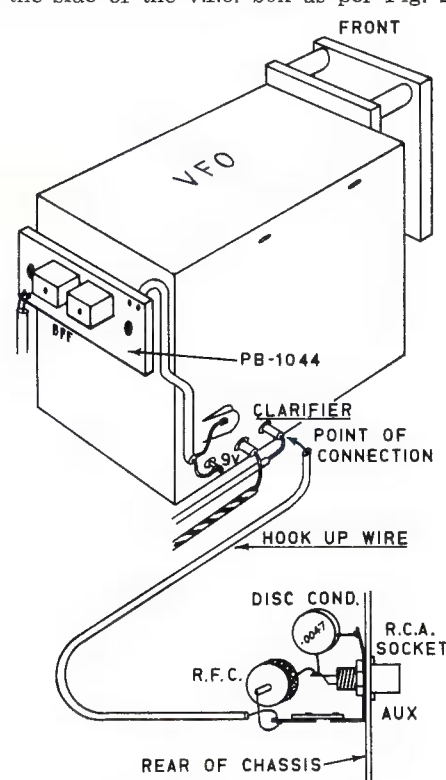


FIG 2
FT 200 V.F.O. CONNECTIONS

There are no component changes to the FT200. This completes the transceiver "modification". The control box may now be assembled. The transceiver v.f.o. alignment is not affected.

F.S.K. ADAPTOR

The f.s.k. adaptor control box can be contained in a die-cast box or similar. The 500K pot. and the d.p.d.t. switch are mounted on the front of the box, and three jacks are mounted on the rear. See Fig. 3 for the circuit. Wiring is not critical, as we are dealing only with switching of d.c. potentials. Suitable patching cables, preferably shielded, must be made up to match your choice of jacks.

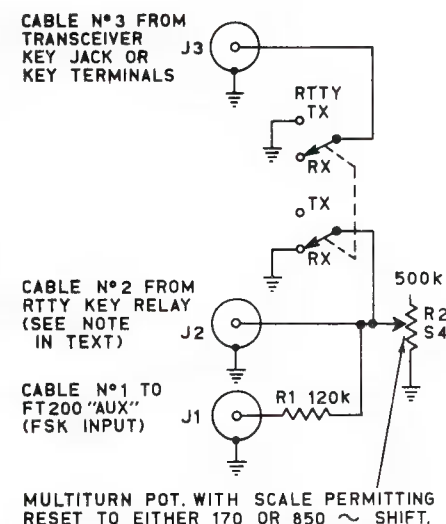


FIG 3
CONTROL BOX CIRCUIT

Cable No. 1 from J1 on the control box runs to the FT200 "Aux." socket just fitted for frequency shift (f.s.k.). Cable No. 2 runs from J2 to the r.t.t.y. transmit keyer.

Warning Note. This circuit should be keyed only by a polar, keying or mercury relay, or directly from the keyboard alone. **Do not** attempt to key directly from the normal d.c. loop to the printer magnets. Any voltage on the key line may damage S145 diode.

See Fig. 4 for a suitable keying circuit. The author used a plug-in "keying" relay from a Wireless Set No. 11 (similar outwardly to a Ferrocart vibrator).

Cable No. 3 from J3 may be plugged into the FT200 key jack, or can be clipped across the c.w. key terminals at the key.

ALIGNMENT

Alignment of the control circuit is merely a matter of setting the shift pot., R2, for the desired frequency shift.

(Continued on next page)

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With the FT200, this adjustment will hold for all bands as the v.f.o. is of the heterodyne type.

With all the patching cables connected, turn on the transceiver and check the receiver for proper operation. Whilst the plug is in the "Aux." jack, the transceiver "Cal." locking knob has to be used to re-set dial calibration in conjunction with the 100 kHz. calibrator, as per instruction handbook on page 6.

Tune up the transmitter as you normally would for a.m. operation, as c.w. operation would exceed the rated 150 mA. plate current. I use a small fan at the rear of the FT200 for f.s.k. and a.m. operation to circulate air around the final tubes. Even during long transmissions no overheating takes place. Remember that r.t.t.y. is continuous carrier, or key-down operation, and things will run very warm indeed unless you provide for increased cooling.

After the transmitter is tuned, throw the switch on the f.s.k. control box to r.t.t.y. transmit position. The transmitter should now be keyed, and the plate current should be the same value that you adjusted for earlier. The frequency shift should now be adjusted by opening and closing the r.t.t.y. key line to the control box J2 and adjusting R2 to the standard wide 850 cycle shift, or the narrow 170 cycle shift.

Use a good quality pot. for the shift control, such as a ten-turn precision potentiometer with a counter dial to allow high accuracy set and re-set. These are now available in Australia.

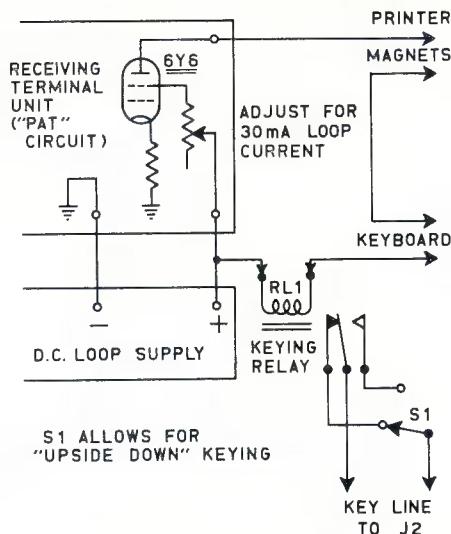


FIG 4
KEYING CIRCUIT

If you want to use the FT200 transceiver without the r.t.t.y. control box, make up a jumper plug consisting of a R.C.A. phono plug with a 120K 5% resistor connected from the centre pin to the plug case, or ground. Simply insert this in this f.s.k. jack ("Aux.") on the rear of the transceiver. The jumper plug maintains v.f.o. alignment.

This arrangement has been in use here for nearly a year and enjoyable contacts have been made with excellent

reports received. Using the receiver for receiving f.s.k. will be covered in a future article. See you on r.t.t.y. f.s.k. soon.

REFERENCE

1. "FSK for the Transceiver," W9TKR, "CQ," Dec. 1969.

BOOK REVIEW

73 DIPOLE AND LONG WIRE ANTENNAS 73 VERTICAL, BEAM AND TRIANGLE ANTENNAS

Edward M. Noll, W3FQJ

Two of a series of books designed to encourage Amateurs to construct some of their equipment. Each book presents seventy-three variations of the types listed in the titles using a minimum of theory and calculation. Commonly available materials and simple hand tools are used for construction. An appendix describes simple measuring methods and inexpensive instruments essential to ensure maximum performance. Types to suit every Amateur from flat dwellers to graziers are described.

Australian Price: \$5.60 and \$6.00 respectively. Available from McGill's Authorised Newsagency (see advertisement).

"RADIO DATA REFERENCE BOOK"

3rd Edition

Modern Radio and Electronics techniques requires the use of a large and increasing amount of reference data. One of the publications which has stood the test of time in filling the needs of Engineers, Technicians and Amateurs is the "Radio Data Reference Book," the third edition of which is now available. This particular edition is noteworthy for the inclusion of improved design information pertaining to Pi and LPi couplers to ensure proper matching of valves and semiconductors.

Publisher: Radio Society of Great Britain. Compiled by G. R. Jessop, C.Eng., M.I.E.R.E., G6JP. Available from Magpubs, Box 67, East Melbourne, Vic., 3002, or from technical book sellers.



NEW TRANSCEIVER FROM YAESU!

MODEL FT-75 - Compact, Solid State, 80-10 mx, SSB and CW

This small size transceiver, with a choice of AC power supply or DC-DC converter, enables home station or mobile installation in a minimum of space. All solid state except transmitter driver 12BY7 and PA 12DQ6 valves. PEP output, 30 watts max. Tappings on the power transformer HT secondary enable transceiver power to be reduced if required. The transceiver is crystal controlled, with VXO to pull crystal frequency a few kHz., from approx. 3 kHz. on 80 mx to 15 kHz. on 10 mx. Optional VFO, type FV-50C, available for full coverage home station use.

Pre-tuned driver and PA circuits reduce controls to a minimum; just switch on, press the mic. button and talk! Simple and safe mobile operation. Noise blanker and squelch incorporated.

Makes an ideal exciter for VHF transverter.

Three crystal channel capability for each band, with three push button channel selector switches, plus one for VFO selection. One crystal is provided for each band except 20 mx. Extra crystals available.

Sidebands are automatically selected: LSB 80 and 40 mx. USB 20, 15 and 10 mx.

Front panel: Bandswitch, eight push buttons for crystal selection, ext. VFO, and power control switching; VXO control, meter, mic. socket, noise blanker, squelch, AF gain, and RF gain.

Rear panel: Antenna, power, and VFO sockets; meter switch.

Meter functions as S meter on receive, PA cathode current or relative RF output on transmit. Panel lights indicate channel or switch in use. Separate heater switch enables reduction of current drain on battery operation, when receiving only.

Transceiver includes a PTT mic., antenna plug, key plug, and four crystals for 3565, 7085, 21400 and 28550 kHz. A total of 15 crystals may be installed, three for each band.

PRICES: FT-75 \$296. FP-75 \$53.50. DC-75 \$53.50. FV-50C \$49.90.

Australian Agents—

All prices inc. S.T. 90-day warranty. Freight is extra. Prices and specs. subject to change without prior notice.

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