

international Morse code, Pam studied at home exclusively, using the Heath course. Her interest increased as she progressed, and she's now on the air. The once pristine loose-leaf binder containing the written material is a little tattered, the pages dog-eared. Two cassette tapes included with the course are still functional. Thanks in part to the Heath Novice course, the ARRL Technical Department is now 100 percent licensed, and it looks as if we won't get our \$25 back! This course *works* and is recommended to prospective amateurs who must "go it alone." Available from Heath, Inc., Benton Harbor, MI 49022. — *KITX*

LOW-COST COLLINS MECHANICAL FILTER

Amateurs who build their own ssb generators and receivers will be heartened to learn that Collins Radio now has available a modestly priced mechanical filter. The component is intended primarily for the CB market, but the specifications indicate that amateurs should find many practical uses for the filter.

Actually, two filters of this type are available — upper- and lower-sideband types. The upper-sideband unit bears the number 526-9897-010. Center frequency is 456.45 kHz. The lower-sideband filter is designated 526-9939-010. Its center frequency is 453.55 kHz. There is also an a-m type of mechanical filter available, 526-9920-010, center frequency 455 kHz.

In terms of tolerance, the 3-dB bandwidth of the ssb filters is 1.95 to 2.2 kHz. The typical 60-dB bandwidth is rated at 4.5 kHz. The characteristic impedance for the sideband filters is 2700 ohms. A value of 12,000 ohms is specified for the a-m filter. The 3-dB bandwidth for the latter is 5 to 5.5 kHz. Insertion loss for the ssb filters is specified as 3.5 dB. For the a-m filter it is 8 dB. The typical passband ripple is 1 dB and 2.5 dB for the a-m unit. Resonating capacitors (two each) for all three filters are required. The correct value is 360 pF. The filters are designed with a balanced input for use with a balanced modulator and an unbalanced input.

Rockwell states that the lower-sideband

filters are available off the shelf at a price class of \$32. The international price class is \$39 plus duty. These are band-pass types of mechanical filters, so upper- and low-sideband operation is possible by proper selection of the BFO frequency. The filters measure approximately 18 × 71 mm, and the height, excluding pins, about 21 mm. The manufacturer is Rockwell International, Electronics Devices Division, 4311 Jamboree Rd., Newport Beach, CA 92663. — *W1FB*

CLEGG FM-28 2-METER FM TRANSCEIVER

The Clegg FM-28 is a fully synthesized radio for 2-meter fm, covering the range of 144.0 to 147.995 MHz in 5-kHz steps. Featuring a power output of 25 watts "HI" and 0.25 to 4 watts "LO" (adjustable), the FM-28 provides versatile mobile as well as fixed-station capability.

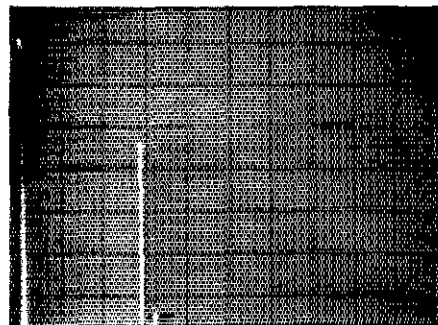
Mobile use of the FM-28 is enhanced by its solid construction and such operator-oriented features as the mic jack located on the left side to maximize cord length. The illuminated frequency readout (four-digit LED plus two back-lighted permanent numbers) is also oriented toward mobiling. The speaker is mounted pointing toward the bottom of the case for under-dash installation.

For fixed-station use the mobile bracket stays in the car, and a radio with clean rectangular lines goes indoors. A wire stand enables the user to "aim" the radio up from a desk or tabletop.

Inside the FM-28

The FM-28 is packed with circuitry, much of the room taken up by the 25-watt amplifier and the readout board. All circuits are well shielded and boards are easily accessible for servicing. The instruction manual provides a board-by-board description of purpose, design and location within the radio.

The synthesizer, a standard TTL design, utilizes a crystal-oscillator/mixing arrangement for switch selection of one of four 1-MHz ranges. Tens and hundreds of kilohertz are selected by means of BCD switches going to a



Spectrum-analyzer display of the FM-28 transmitter output (high power position). The vertical pip on the far left is generated internally in the analyzer. The vertical scale is 10 dB per division and the horizontal scale is 50 MHz per division. Measurements were made at 20 watts output, with the unmodulated carrier (tall pip) notched to enhance the dynamic range of the analyzer system. All spurious outputs are 75 dB down or greater, meeting current FCC regulations.

programmable divider; the BCD output is also fed to decoder drivers for the LED display. The 5-kHz switch turns on the last LED digit as a five (it is normally off) and provides a voltage across a diode in the basic oscillator to change the frequency to produce a 5-kHz shift in frequency.

The FM-28 receiver is of straightforward design with a dual-conversion superhet layout for fm reception, a signal-strength meter and an output for a discriminator meter via the accessory plug on the back. The test unit did exhibit a slight hiss when the receiver was squeaked in a quiet environment.

Output power from the transmitter is adjusted by limiting drive to the final amplifier and can be set for fairly low output. T-R switching is all solid state; there are no relays to be found. The final is SWR protected.

It's Convenient, Too

Operator convenience is excellent in the FM-28. Offset is selected by one switch and activated by another, handy if the operator does not move from one "split" to simplex to another split often. The kHz selector switches go 'round and 'round, which is nice when going from '88 to '91. As may be evident from the photo, all the controls are standard for 2-meter units. The radio can be turned on and used by someone unfamiliar with it with a minimum of head-scratching.

The FM-28 is manufactured by Clegg Communications Corp., 208 Centerville Rd., Lancaster, PA 17603. Their toll-free sales and service number is 800-233-0250. Price class of the FM-28 is \$360. — *WA6RBE*

Big knobs and easy-to-read LEDs highlight the operator-oriented Clegg FM-28.



Clegg FM-28 2-Meter Transceiver

Dimensions (HWD) and Weight: 2-5/8 × 6-5/8 × 10-3/4 inches (67 × 168 × 273 mm), 7 pounds (3.18 kg).

Power requirements: 13.8 V dc at 7 A high-power transmit.

Frequency range: 144 to 147.995 MHz in 5-kHz steps, fm only.

Power output: 25 W (HI) or 0.25-4 W (LO).

Receiver i-f bandwidth: 14 kHz at -3 dB, 25 kHz at -70 dB.

Transmitter deviation: Factory-set at 5 kHz, adjustable from 3 to 15 kHz.