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MFJ-1278 Multi-Mode Data Controller--Revisited

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Editor's Note: We published our review of the MFJ-1278 in July 1989 *QST*. After the purchase of that unit (March 1988), MFJ made substantial changes and improvements to both the hardware and firmware of the '1278.

We received several questions about that review, so we'll take this opportunity to clarify a few things. Because of factors such as *QST*'s lead time, products reviewed sometimes aren't the latest available versions, although we make every effort to ensure that the most recent units are reviewed—and that any late updates are discussed in the review. Comments on the MFJ-1278 reviewed in the July issue were based on the unit that we purchased, which—as received—contained circuit-board revision 6 and firmware version 1.5. (ARRL purchased one subsequent firmware update from MFJ [version 2.1] *based on an advertisement* in *QST*. ARRL received no notification of that or of subsequent updates to the '1278.)

In this issue, we revisit the MFJ-1278. Our intent is to provide the League membership with accurate information on all reviewed equipment. Secondly, our July 1989 '1278 review did not reflect MFJ's recent efforts to improve the '1278. League members should be confident that *QST* reviews are based on the latest available versions of reviewed equipment. Therefore, in this case, we feel that it's in the best interests of ARRL membership, MFJ and ARRL to revisit the MFJ-1278—in its *current* form (June 1989 manufacture)—in this month's Product Review column.

The current-production MFJ-1278 contains circuit-board revision 8 and firmware version 2.3; the unit reviewed here is of the current model. Some comments concerning the next revision, due out this month (September), are included in this review. For background on the previously reviewed MFJ-1278, see "Product Review" in July 1989 *QST*. This month's review mainly covers features that have been added or substantially improved since the release of the version reviewed in July *QST*, and doesn't cover most of the unchanged features of the '1278. Of course, where necessary, I'll discuss features germane to the old and new '1278s.

Setup

Connecting the newer '1278 to a radio is much simpler than doing so with the unit previously reviewed. (The original review unit had an incorrect-value coupling capacitor in the audio-input line, which made it impossible to get enough receive-audio drive from the AFSK OUT jack on my Kenwood TS-440S. This problem has been corrected in the newer units; I had no trouble driving the '1278 with the '440.)

Connecting the '1278 to a computer is simple and straightforward. I used the '1278 with both an Apple® Macintosh® and an IBM® PC. The IBM PC software available from MFJ in the IBM PC Starter Pack is further developed and more refined than MFJ's Macintosh software. Although both software packages work, the Macintosh software crashes too often for serious work. (This may be a compatibility problem with my Macintosh; my computer has the original 64-kbyte ROM. It's possible that the software was developed on a newer Macintosh, and that incompatibility with the ROM routines may account for the problems that I experienced with my Mac.)

Packet-Radio Operation

The unit first reviewed performed well on VHF packet radio, but gave less than optimal results in HF packet-radio operation. I'm glad to report that the new '1278 does very well on VHF *and* HF packet radio. I operated extensively on the HF bands using packet radio, and I'm impressed by the '1278's performance. Even on a crowded channel and/or with fairly weak signals, I was able to carry on QSOs and access packet-radio bulletin-board systems (PBBSs) without difficulty.

I was especially impressed by the new '1278's DCD (data carrier detect) circuit performance. This function, vital to HF packet-radio operation, performs admirably. (The DCD function is what allows reduced packet-collision rates, improving channel throughput.) Refinements such as this go a long way toward improving the viability of HF packet-radio operation with a multimode communications processor!

One of the '1278's new features is the Personal Mailbox, which allows those who connect to your station via VHF packet radio to send and receive messages, list messages, and delete messages left in the Mailbox for them. The '1278's Personal Mailbox feature makes your station into something of a VHF packet-radio-message clearinghouse. Able to store up to about 3 kbytes and a maximum of 30 messages, the Personal Mailbox is an interesting feature.

Yet another of the '1278's added capabilities allows for direct, real-time transfer of pictures (generated by packet radio, SSTV or FAX), to your printer when your station is connected via VHF packet radio to another '1278-equipped station. The IBM PC software provided in the MFJ-1284 Starter Pack allows display of these pictures on your computer screen. Any '1278-received FAX, SSTV or packet-radio pictures that you've stored on disk may be transferred between '1278s in this way.

RTTY and AMTOR

The modem improvements made to the '1278 by MFJ greatly improved not only the 1278's HF packet-radio reception, but also Baudot and ASCII RTTY. I made a lot of RTTY contacts, and even under less-than-optimum conditions, the '1278 provides relatively clean—and entirely usable—copy. Operating RTTY with the '1278 is now a pleasure—it quickly became one of my favorite modes!

Similarly, AMTOR operation shows a

marked improvement in the newer '1278. Although AMTOR is not one of my favorite operating modes, I did a lot of listening and made some contacts, and I'm pleased with the unit's performance.

Incidentally, there has been some confusion with regard to AMTOR operation with the '1278, aroused by the July 1989 '1278 review. The '1278 that ARRL first purchased for review (circuit-board revision 6/firmware version 1.5), which was not capable of AMTOR operation, was photographed for the first review. Before the unit was reviewed, however, it was sent to MFJ for an update to firmware version 2.1, which is AMTOR-capable. Thus, my comments on AMTOR with the earlier '1278.

The latest version of the MFJ-1278, due for release in September, has a revised cabinet, gray-scale capability in FAX and SSTV modes, and side-panel adjustable audio levels for both radio ports. Older versions of the '1278 can be upgraded by MFJ to include the features in this latest version.

CW Operation

CW reception is also considerably improved in the current '1278s. Even with relatively weak signals, the unit provides good copy of machine-sent CW. It also provides good copy of well-timed, hand-sent CW. With poorly sent CW, copy is not always acceptable, but that's attributable to the poor sending—not '1278 performance.

Using the unit as a CW keyboard is still a pleasure, and the buffers provide a convenient way to send standard information (rig, QTH, etc), and are good for contesting. The '1278's automatic serial-number incrementing is also handy in contests. The ability of the '1278 to function as an iambic keyer is an additional bonus.

Facsimile and NAVTEX

The old '1278's facsimile reception was quite disappointing, but in the latest version, FAX reception is so good that it is irresistible to tune around for interesting FAX transmissions. The current '1278 provides good copy of all seven supported FAX formats (1, 1.5, 2, 3, 4, 6 and 8 lines per second). Even though the current '1278 doesn't provide gray-scale capability (FAX pictures are displayed in black and white), I received some excellent pictures. I most enjoyed copying news-photo transmissions. Some of these were outstanding, with crisp, clean reproduction and a surprising amount of detail. MFJ even provides a list of frequencies, by mode and format, where FAX activity is common, to help get you started on FAX. An Epson®-compatible graphics printer is required for making printouts of FAX transmissions. FAX operation with the current '1278 is not the mere curiosity it was in early '1278s, but a mode which can easily become an obsession.

The current MFJ-1278 allows disk storage and printing of received FAX pictures—but only if you have software that has provisions to do so. (The software included in the IBM PC Starter Pack has such provisions.) Also, FAX pictures can be *transmitted* with the '1278. There are two catches, though: (1) Only previously received and disk-stored FAX pictures can be retransmitted, and (2) FAX pictures can be transmitted only at the rate (in lines per second) at which they were received. Even with these conditions, the '1278's FAX-transmission capability is interesting, and doesn't limit the '1278's performance in other areas, because FAX operation doesn't require special connections to the radio or computer, and it doesn't restrict operation on other modes.

NAVTEX-reception capability is also provided by the '1278. NAVTEX, an acronym for Navigational Telex, is a relatively new service in which several stations in North America transmit weather advisories, navigational warnings, ice reports, search-and-rescue information, pilot-service messages, LORAN and other information, including NAVTEX transmission schedules, on 518 kHz. NAVTEX is, in effect, a special case of FEC TOR. The '1278 allows you to select the NAVTEX stations which you want to receive (the default is all), and the information categories that you want to hear. Although I was able to hear the NAVTEX station in Boston, atmospheric conditions kept me from being able to test the NAVTEX capabilities of the '1278. Based on the '1278's performance on other modes, I'm confident that NAVTEX performance is good—under the right atmospheric conditions.

Table 1

MFJ-1278 Multi-Mode Data Controller, Serial no. 3016550

Power requirements: 12 V dc at 500 mA, provided by wall-cube supply (included).

Operating modes: AMTOR, ASCII and Baudot RTTY, CW, facsimile, HF and VHF packet radio, NAVTEX, slow-scan television.

Terminal/computer interface: RS-232-C serial interface with DB25 connector; 8-pin TTL serial port.

Computer/'1278 data rates: 300, 1200, 2400, 4800 and 9600 bauds.

Radio interfaces: 5-pin DIN connectors (two). Each provides connections for audio input and output, PTT, ground and squelch (optional).

SSTV

The MFJ-1278's slow-scan-television operation continues to present some difficulties. According to MFJ Vice President Steven Pan, KF5C, this is caused by synchronization problems related to the current '1278's lack of gray-scale capability (received pictures are displayed in only black and white) in the '1278. In pictures that have gray areas, the '1278 has trouble detecting the synchronization signals. The next update of the '1278 (see "Updates" later in this review) will be capable of displaying received pictures in four shades (black, white and two more in between). This hardware/firmware improvement will also help solve the synchronization problem.

I tested a preliminary version of the '1278 (version 9 hardware/version 3.3 firmware) using some recorded SSTV pictures with gray areas, and the unit performed well. Not only is the synchronization problem solved, but the four-shade pictures from the printer look quite nice. I was not able to test the unit with on-the-air signals, but based on its performance with recorded signals, I'd say it should do well.

MFJ is working on IBM PC software that will allow the display of four-shade SSTV images on screen, as well as that of multishade FAX images. This capability will be worth having, because printing SSTV pictures on a printer is time consuming. You can easily miss several pictures

while waiting for one to finish printing.

The Manuals

Two manuals come with the current MFJ-1278. One primarily covers packet-radio operation; the other also covers some aspects of packet-radio operation, and all of the '1278's other modes. At first glance, the manuals don't appear to be much different than the original documentation, although some errors and typos have been corrected. The indexing is still somewhat difficult to use, but I found most of the information that I looked for by checking the tables of contents, index and/or by looking in the appropriate general section of the documentation. Often, the information presented in the Commands chapter (which lists commands in alphabetical order) is complete enough to answer most questions about a particular operation. There are several (mostly minor) errors in the documentation, but these problems (incorrect page references, typos and such) are not major inconveniences.

Overall Impressions

I was impressed by the current version of the '1278—it offers good performance, on a lot of modes, for a reasonable price. It offers a substantial improvement in performance over earlier versions; in the current '1278, each mode (except SSTV) provides truly usable operating capability. If you are interested in a unit which offers more than just packet-radio operation, the '1278 merits careful consideration. Even if you're only interested in packet radio, you may decide otherwise after experimenting with other modes! When you consider the variety of operating possibilities the '1278 offers, including its ability to serve as an iambic keyer, it definitely deserves a second look when shopping for a multimode communications processor.

Updates

MFJ has sweetened the deal for new MFJ-1278 buyers: When you buy a '1278, you'll receive a coupon for one free firmware upgrade. MFJ won't notify you of the availability of such upgrades, but when you contact MFJ and find that a firmware upgrade is available, or when you see one advertised, you can redeem your free-upgrade coupon.

The newest '1278, circuit-board revision 9/firmware version 3.3, is scheduled to be ready for shipment in September. This unit offers a number of improvements over the circuit-board revision 8/firmware version 2.3 unit, and will be documented in a single, new manual. Among the improvements are the SSTV upgrades and multi-shade FAX displays (with a computer running the appropriate software). Other refinements include independent transmit-audio-level controls (for radio ports 1 and 2) located on the side of the cabinet.

According to MFJ, '1278s with serial nos. above 03010508 (firmware version 2.2 or earlier) may be upgraded by the user for $24.95 plus $2 shipping and handling by sending in the old EPROM. This does not include hardware or firmware support for the multi-gray-level modem. Factory-installed multi-gray-level modem and supporting firmware is $49.95 (plus $5 s&h).

For '1278s with serial nos. below 03010508, the factory-installed firmware upgrade for units with firmware version 1.1 or earlier is $24.95 (plus $5 s&h); for units with firmware version 2.1 or later, the user-installed firmware upgrade is $24.95 (plus $2 s&h). This does not include hardware or firmware support for the multi-gray-level modem. Contact MFJ for details on the multi-gray-level modem and firmware for units with serial nos. below 03010508.

All upgrade prices are based on exchanging the old EPROM; units should be sent postpaid to MFJ for all factory-installed upgrades.

Price class: MFJ-1278 (hardware version 9/firmware version 3.3) with wall-cube ac supply, $280; Starter Packs, $25 each. Manufacturer: MFJ Enterprises, PO Box 494, Mississippi State, MS 39762, tel 601-323-5869. QST

SOLICITATION FOR PRODUCT REVIEW EQUIPMENT BIDS

[In order to present the most objective reviews, ARRL purchases equipment off the shelf from Amateur Radio dealers. ARRL receives no remuneration for items presented in the Product Review or New Products columns.—*Ed.*]

The ARRL-purchased Product Review equipment listed below is for sale to the highest bidder. Prices quoted are minimum acceptable bids, and are discounted from the purchase price(s).

Sealed bids must be submitted by mail and must be postmarked on or before September 27, 1989. Bids postmarked after the closing date will not be considered. Bids will be opened seven days after the closing postmark date. In the case of equal high bids, the high bid bearing the earliest postmark will be declared the successful bidder.

In your bid, please clearly identify the item you wish to bid on, using the manufacturer's name, model number, or other identification number, if specified. Each item requires a separate bid and envelope. Shipping charges will be paid by the successful bidder, FOB Newington. The successful bidder will be advised by mail. No other notifications will be made, and no information will be given by telephone to anyone regarding final price or identity of the successful bidder.

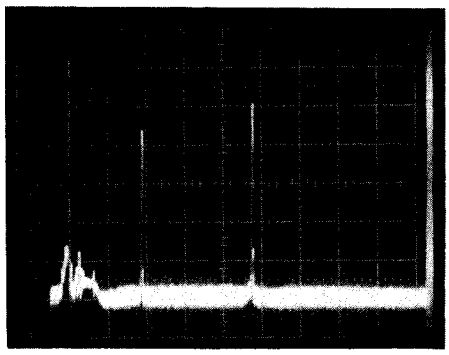
Please send bids to Kathy McGrath, Product Bids, ARRL, 225 Main St, Newington, CT 06111.

Yaesu FT-747GX MF/HF transceiver, s/n 8D040384, including FP-757HD power supply/speaker and *FT-747GX Technical Supplement* (see Product Review, August 1989 *QST*). Sold as a package only. Minimum bid: $680. QST

New Products

VIDEOSMITH SPECTRUM PROBE

☐ VideOsmith's Spectrum Probe allows you to measure RF signal levels and frequencies on an oscilloscope display, effectively converting the scope into a spectrum analyzer. The Probe provides the amplitude-v-time to amplitude-v-frequency conversion necessary to display the frequency domain on a scope screen. The photo shows a typical Spectrum Probe display with 21.2- and 50.2-MHz input signals.



Spectrum Probe display with 21.2- and 50.2-MHz input signals. The dc pip (generated in the Probe) is visible at the second-from-left vertical graticule line. Only the 21.2- and 50.2-MHz signals were applied to the Spectrum Probe for this test; all other visible signals were generated in the Spectrum Probe.

The 7½-inch-long × 1-inch-diameter, two-ounce Spectrum Probe has a 10-pF input-coupling capacitor, and can be used in 50- and 75-Ω systems. Key manufacturer-claimed specifications are as follows: usable frequency range, 1 to over 100 MHz; dynamic range, >50 dB; vertical logarithmic linearity, ± 3 dB; horizontal linearity, ± 10%, typ; vertical gain, 5 mV per dB typ; spurious responses, −40 dB typ; maximum CW input, +15 dBm, 1 V @ 100 MHz; sweep rate, 6 ms per 100 MHz typ; power requirement, 120 V ac @ 35 mA (wall transformer supplied). With a delayed-sweep scope, improved frequency resolution can be had; minimum usable bandwidth is about 500 kHz.

Price: $380. For more information, contact videOsmith, 1324 Harris Rd, Dresher, PA 19025, tel 215-643-6340.—*Rus Healy, NJ2L* QST