

PANEL-MOUNT PICKIN'S

Getting up close and personal with intercoms

BY PETER A. BEDELL

OF all the innovations that have come to aviation in the past 20 years, it would be tough to point a finger at one all-important, yet taken-for-granted breakthrough. Standby vacuum systems, loran, and GPS are a few that ring a bell, plus one less obvious possibility—the intercom. ■ These days, it seems nearly every airplane with an electrical system has an intercom system. The use of headsets and an intercom protects hearing against the assaulting noise that general aviation

airplanes have the potential to produce. The headset/intercom combination also allows more precise communication between the pilot and controller, as well as the pilot and passengers. Unlike most of the airplanes in which they fly, modern intercoms have advanced significantly, with manufacturers cramming every conceivable feature or option into these tiny boxes. ■ Recently, there has been a move toward stereo intercoms to allow the airplane's occupants to listen to music through high-quality stereo

headsets. Take the music from a compact disc or cassette player and pipe it to passengers and pilot, or isolate the crew, or The possibilities seem endless with some of today's systems.

Considered by many to be the father of the GA intercom system, Frank Sigona of Sigtronics Corporation pioneered the intercom system as we know it today. In 1972, Sigona was engineering manager of a computer company and was commuting by airplane in the Los Angeles area. Sigona, who used a headset, got tired of lifting an earcup and shouting to his passenger, meanwhile missing ATC calls. Seeing a need for an intercom system, Sigona designed and developed an intercom for his own use and soon figured that other pilots could benefit from such a unit; by 1974, Sigtronics had been formed.

Since then, a number of players have entered the intercom business; some have survived, some haven't. Nevertheless, there are still a number of manufacturers out there, and the competition is heated.

At the Sun 'n Fun EAA Fly-In this past April and at the Aircraft Electronics Association convention in May, we were able to try most of these systems. A noisy convention offered a good test site for the units' voice-activated (VOX) mic systems. The days of push-to-talk buttons for intracockpit communications are gone. Today's VOX circuits are convenient and lessen cockpit clutter. Beyond the basic specs that almost every modern intercom has, there are still plenty of options. Among the most common issues a buyer of a panel-mount intercom will encounter:

- Independent VOX circuits for each microphone in the loop are said to keep background noise to a minimum, especially with four to six people on the air. The independent-VOX theory says that when all mics are opened in a standard single-VOX intercom, there is additional background noise. Independent VOX circuits, however, open only the mic that is being spoken into, supposedly reducing the background noise. It sounds believable on paper. However, according to those who sell



an input-muting function? This is more for the audiophile who happens to be a pilot and flies in fairly uncongested airspace. Many pilots enjoy music in the cockpit, but the music should be played through an intercom that

the single-VOX intercoms, it's a false claim. In our experience, listening to both types of systems did not reveal a significant difference in background noise. Makers of single-VOX intercoms claim that the background noise of one mic is equivalent to the background noise of six mics.

What independent VOXs do accomplish well is to make possible the use of different quality headsets. Since the squelch is set for a particular individual, whether he is using an inferior headset or has the mic five inches from his lips, a highly sensitive squelch setting for the entire cabin is not required.

- There should be no "clipping" of the first spoken word. Inferior systems often clip out the beginning of the first word spoken because the VOX needs time to detect the first evidence of speech. When someone starts speaking at a normal conversation level, the VOX should open the circuit immediately without clipping that first syllable.

- Does the unit have a fail-safe capability that will allow the radios to continue to be utilized in case of an intercom failure? With many intercoms, if the unit fails without detection, the radios will be unusable through the headset.

- Is the unit stereo? If so, does it have

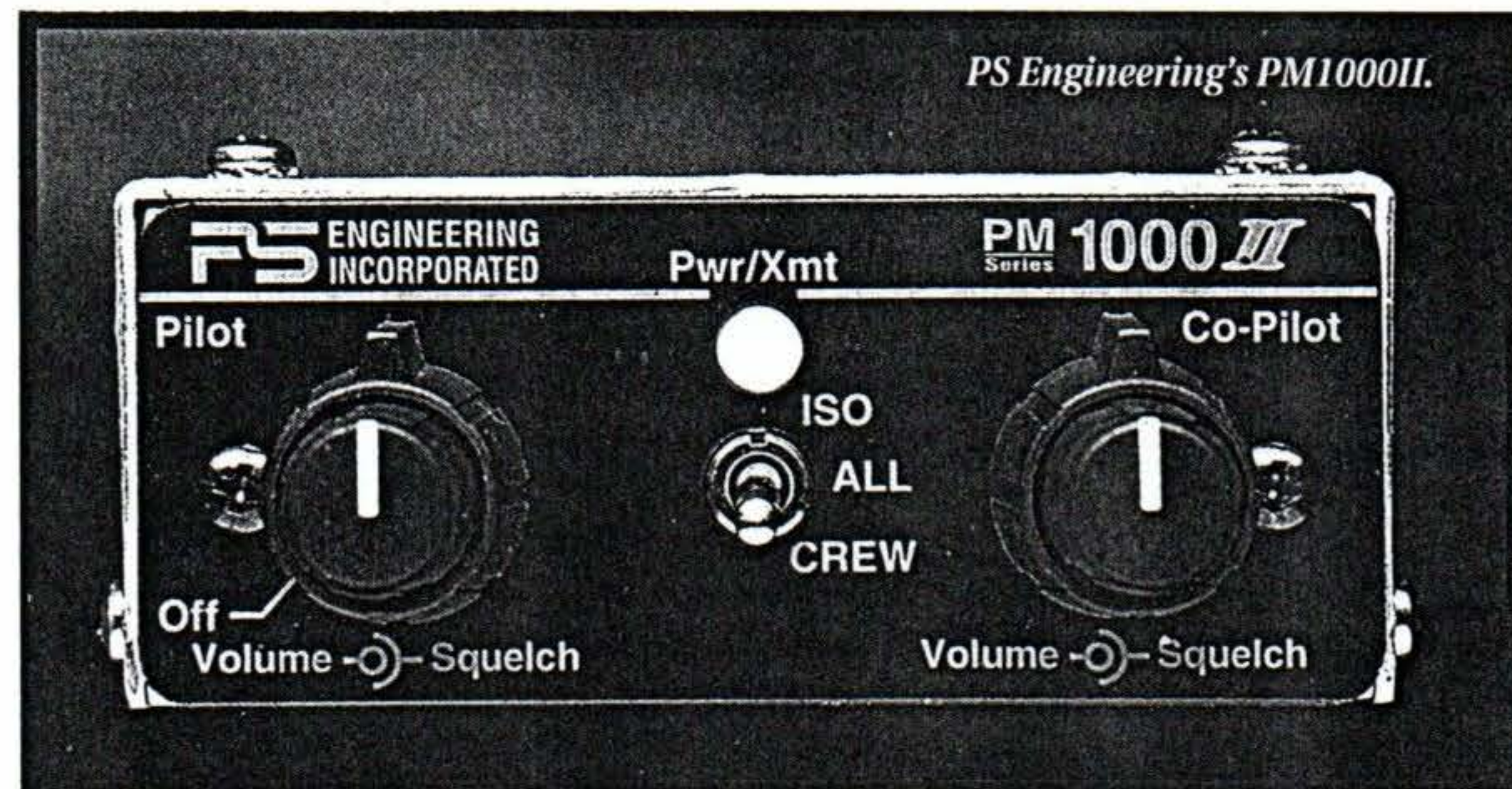
will automatically mute the music when someone (especially ATC) speaks.

- Is the unit FAA approved under Technical Service Order (TSO) C50? If the intercom is to be installed in an FAR Part 135 aircraft, it must meet the TSO. The approval process tests the unit's resistance to extreme environmental and electrical conditions. If the unit is to be used in a Part 91 aircraft, the TSO is not necessary, but it's nice to know a unit has been tested in an aviation environment.

Now that we know what's important in an intercom system, let's take a look at what's out there. All the units that we tested seemed adept at the task of virtually eliminating clipping. Two have TSO approval, and a handful are stereo or are stereo upgradeable. Many companies have given in to the individual VOX circuit technology to enjoy bragging rights, if nothing else—and, if it works as claimed, we wouldn't doubt that before too long, all will incorporate it into at least one model.

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Sigtronics, a longstanding staple of the intercom industry, had its new SAS-440 on display at Sun 'n Fun. The SAS-440 looks similar to the timeless TSOd SPA-400, which is still available.



The -440 reaches two inches deeper into the panel, however. Although it is a single-VOX intercom, the system uses what Sigtronics calls "mic summing" to set the squelch level to any headset, eliminating the headset inferiority complex. The squelch is automatic after a button is pushed.

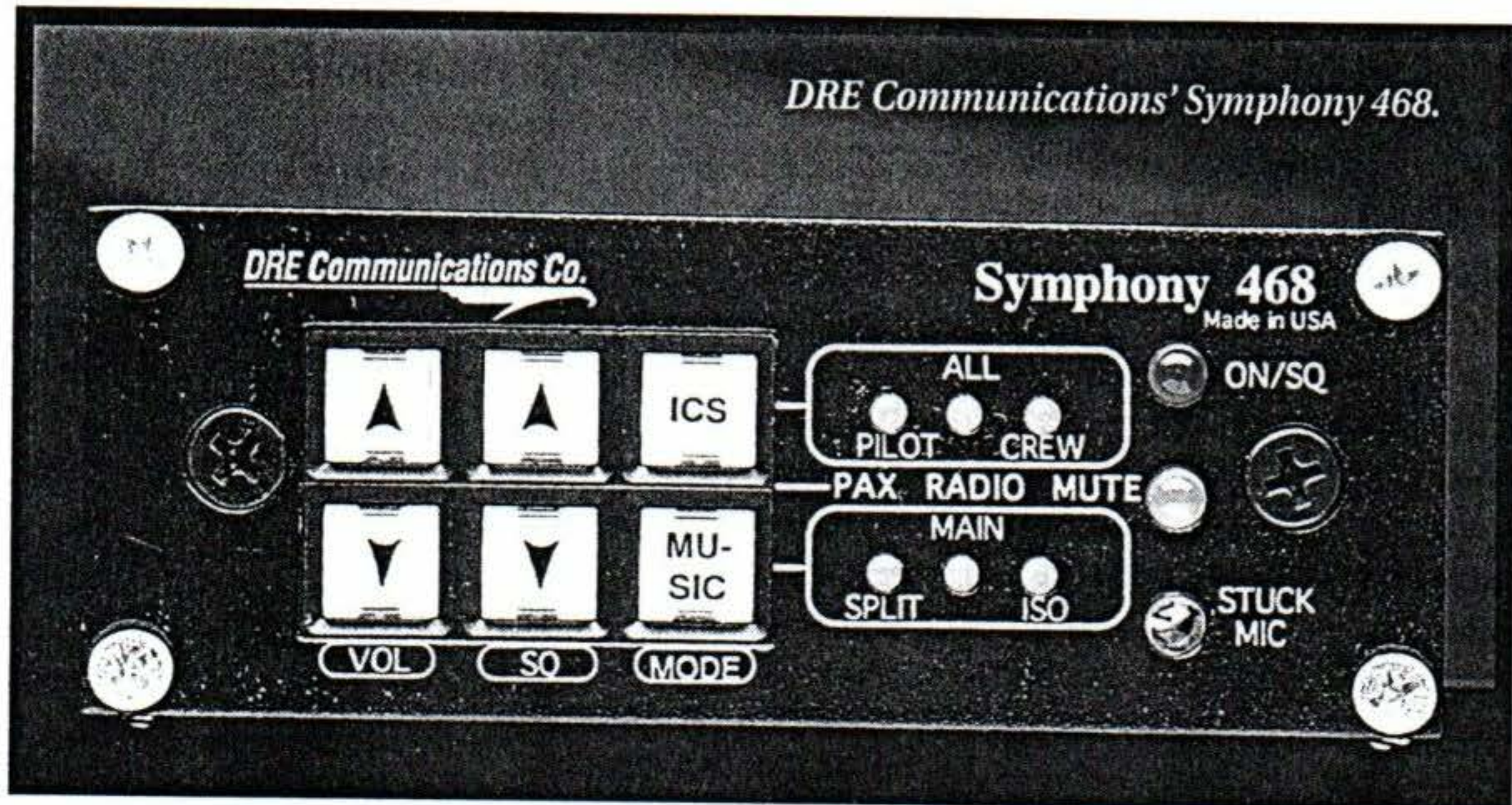
Skeptics question what happens when you set the squelch on the ground with the engines idling and then begin the takeoff. Sigona says that it acts the same as the knob-type squelch on the old -400 which, when set with common headsets, never needed setting throughout all flight envelopes. The difference is noticed most when you have two or more people who bring different headsets of varying quality.

Besides automatic squelch, the SAS-440 adds a pilot-isolate function to let the pilot concentrate on the task at hand. The SAS-440 has a music

tions, PS Engineering is the original equipment manufacturer (OEM) intercom supplier for new Piper Saratogas, Malibus, and Senecas.

Music can be fed in through two inputs. If in the "Crew" mode, the PM1000II could send classical music to the front passengers while the rear seaters listen to country, for example. Music input mutes when ATC or a passenger speaks. Music slowly comes back to its original volume after the transmission stops. The PM1000II currently does not meet TSO requirements, but that will soon change, says company President Mark Scheuer.

PS Engineering offers the Intercom Recording System (IRS) digital recorder that can be added for \$130. IRS can be used to record a clearance, for example, but requires that a separate switch or button be installed to start the playback. IRS continually records the last minute of radio or



input module (RES-400) that allows two separate music sources to be piped in to pilot and passengers. The -440 has an automatic fail-safe system like that of its predecessor. TSO approval on the new unit was still pending at press time. Sigtronics' SAS-440 lists for \$449 but can be had for \$300-\$350 through retailers. The SPA-400 lists for \$299 but can be had for \$155 to \$170 through the dealers.

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Tennessee-based PS Engineering's PM1000II is the company's top-of-the-line mono intercom that offers individual VOX circuits, automatic fail safe, crew and pilot isolation, and an optional Intercom Recording System. PS Engineering intercoms are touted for their "set-it-and-forget-it" simplicity—a good quality to have in a non-essential aircraft system. To gauge the company's acceptance in GA applica-

intercom chatter. The PM1000II prices start at \$330, but the system can be had for around \$260 through retailers.

For those looking to replace a stack of radios or just in need of an audio panel, the electronics of the PM1000II are integrated into PS Engineering's new PMA6000 audio selector panel/marker beacon/intercom system and lists for \$995 (see "Pilot Products," p. 163). If you're looking for a stereo application, check out PS's PM2000, which, for \$440, includes many of the same features as the PM1000II.

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DRE Communications of San Jose, California, is known for having intercoms chock full of features, but expectedly, they come at a price. At Sun 'n Fun, DRE was demonstrating its top-of-the-line offering, the Symphony 468. To touch on all the features the Symphony offers would

require a few magazine pages in itself. Instead, we will look at a few of the most notable features.

At first glance, you will notice that there are no knobs on the Symphony. Volume and squelch controls are digi-

where they should be. Rod de los Reyes, president of DRE, says that TSO approval is pending.

DRE intercoms are more of a hands-on system, demanding occasional attention from the pilot. One owner of

another DRE system complained that the volume on his set had to be reset every time the unit was turned on, but he said de los Reyes graciously offered to fix the problem free of charge. The owner says that product support has been excellent.

Another area of concern with a

David Clark's DC-COM Model 500.



tally controlled by buttons. The stereo Symphony can accommodate up to eight listeners, with each having independent VOX circuits. There are crew and pilot-isolate modes to keep the passengers out of the loop. Two music inputs allow crew and passengers to listen to separate sources. When anyone speaks on the radio or in the cabin, a muting system will lower the music volume and gradually return it to its previous level after the transmission. The sound quality, a partial function of the headset quality, was excellent.

Many of the Symphony's parameters, such as the degree of input muting, can be tailored and programmed by the operator to his or her needs. A stuck-mic monitor lets the user know if the push-to-talk has been depressed for an abnormally long time. There is no true fail-safe mode—it has to be selected by the pilot. Yoke-mounted mode controls keep the pilot's hands

complex intercom is an equally complex installation. DREs come with wiring harnesses, but sometimes they don't help or are simply wrong, said one installation shop.

Gadget freaks will love the DRE, since there are so many features to tinker with. Once the keystrokes are learned, the Symphony 468 can be a real joy to have in the panel. Symphony prices start \$850 for a four-place unit. Expect to find DRE offering a line of products that includes the less-expensive DRE-444 panel mount intercom (\$415).

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Another longtime player in the GA communications business, David Clark, offers its DC-COM Model 500 six-place intercom. Expensive but feature-filled, the 500 includes a true fail-safe mode and stereo capability. A feature not found on any other stand-alone intercom is the 500's simultane-

QuietFlite's Intrepid.



ous radio monitoring and transmitting capability that allows the pilot and copilot to monitor and transmit on two separate radios. This feature would be especially handy for corporate Part 91 operations and for pilots who often fly with other pilots. Since it is not TSO'd, Part 135 operators will have to look elsewhere. As expected with a \$750 intercom (\$635 retail), the 500 has crew and pilot isolating capability, and muting of the music input during com or intercom transmissions.

QuietFlite's most recent offering is the Intrepid. It offers independent squelches for up to six mics,

highlights.

Like the DRE, QuietFlite's Intrepid seems more on target for the audiophile who happens to be a pilot. It is another one of those intercoms that will require some familiarization time before mastering. Installation also may be tricky, with a separate switch required for Crew operation. QuietFlite's six-place Intrepid lists for \$595 but retails for about \$416.

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Telex, another aviation communications veteran, offers its ProCom 4 to the panel-mount arena. Individual VOX circuits, pilot or crew isolation, and muting of the music input is standard fare on the PC-4. The fail-safe mode doesn't automatically take over unless the unit is turned off. There are

three separate volume controls for pilot, copilot, and passengers, but only one squelch control for everyone. The four-place PC-4 lists

for \$425 but retails as low as \$289.

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Flightcom is the OEM intercom manufacturer for Commander Aircraft, which installs the 403 in the Commander 114B. The panel-mount 403 and 403d lack independent VOX circuitry but feature pilot isolate and music muting. The 403d adds the Digital Clearance Recorder for an addi-

adjustable music muting with a gradual return to the selected volume, pilot/crew isolation, and selectable priority for either ATC or intercom transmissions. This last feature allows the pilot to select intercom priority over ATC communications, which means that instead of muting the intercom chatter when ATC transmits, it mutes ATC when someone on the intercom speaks.

QuietFlite's Winston Slater states that the feature is most useful during flight instruction. Overall, we were impressed with the sound quality of the unit through QuietFlite's own stereo headsets.

Muting is variable on the Intrepid, which allows the user to adjust the degree of muting from no muting to full muting. A stuck-mic detector, which gives an audible alert, two separate music inputs, and automatic fail-safe operation are other



Telex's PC-4.





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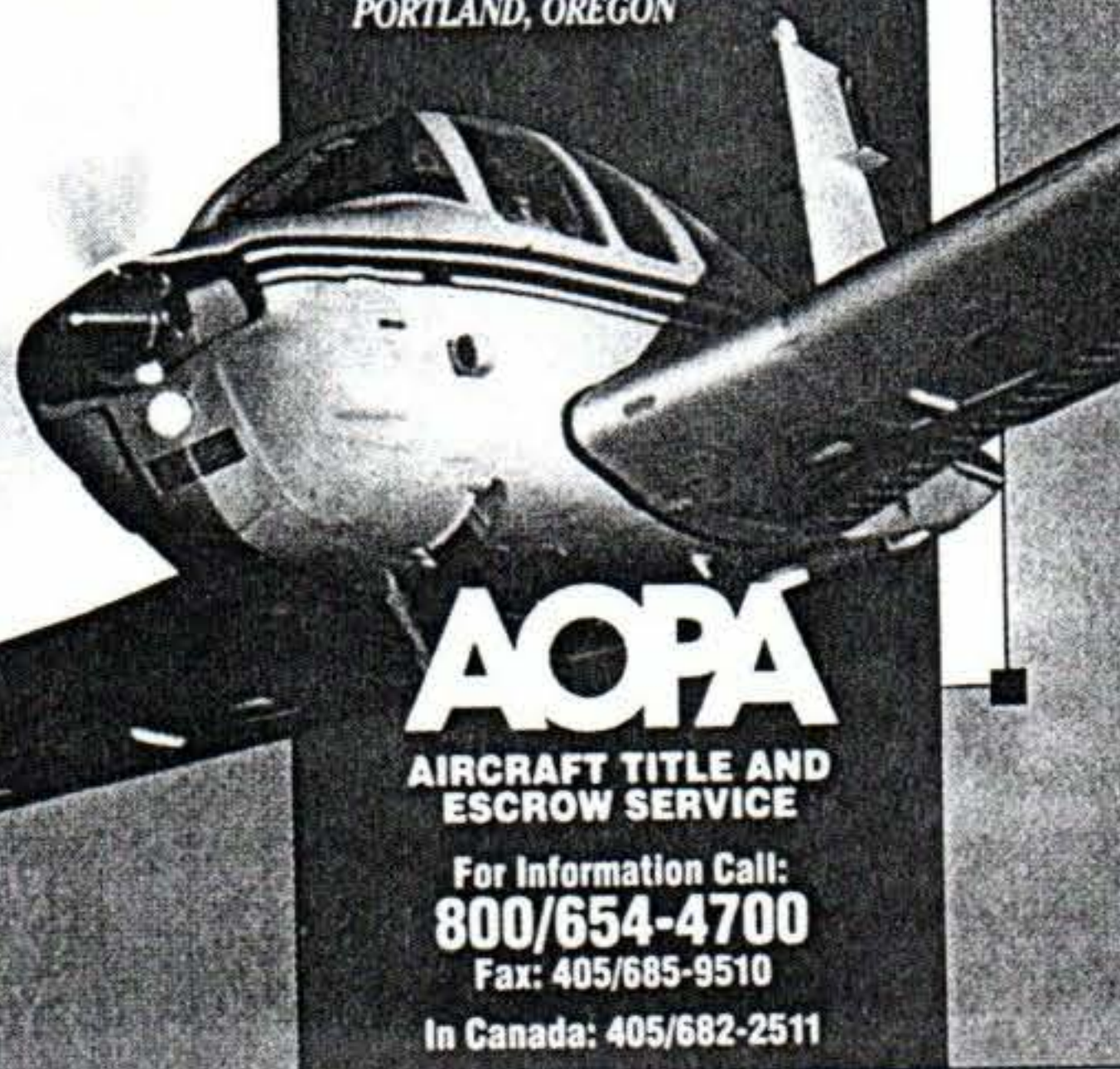
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tional \$70 and a bit more panel space.

The 403 utilizes what we'll loosely term "stereo." While Flightcom labels the 403 as stereo, it does not truly separate the music into two independent channels as does your home stereo. It splits the incoming signal equally between the two headphone speakers. The 403 lists for \$280, the 403M (mono) lists for \$233, and the 403d lists for \$345, but all models can be had for less through avionics retailers.

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Northern Airborne Technologies is known for traditionally high-tech intercom systems that see heavy use in helicopter medevac and corporate applications. Mooney has been installing NAT intercoms as an option in their line of aircraft for some time. NAT is also the audio panel OEM for McDonnell Douglas and Bell helicopters. NAT's new AA85, which should be available this fall, features independent VOXs, crew and pilot isolation, muting of the music input that gradually returns to its original volume, and a priority-transmit function that allows the PIC or instructor to override the copilot or student. According to avionics dealers and Mooney representatives, NAT has established an excellent reputation for reliability and operation.

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SoftComm's ATC-2P is a single-VOX

WHERE TO PLUG IN

David Clark Company Inc.
360 Franklin Street, Box 15054
Worcester, Massachusetts 01615
508/751-5800

DRE Communications Company
1355 Ridder Park Drive
San Jose, California 95131
408/437-3132

Flightcom
7340 Southwest Durham Road
Portland, Oregon 97224
800/432-4342

Northern Airborne Technologies
#14-1925 Kirschner Road
Kelowna, British Columbia,
Canada V1Y 4N7
604/763-2232

SoftComm's ATC-2P.



of systems in one place. Shopper should ask avionics shops about the best systems in terms of features, operation, reliability, and installation. These are the people who have dealt with the manufacturers and who know how much is involved with installing one of these boxes. Also, talk to other pilots about the functionality of their intercoms. Is it user-friendly, gimmicky, or downright complicated? When the right system is chosen, it will surely make flying easier, more enjoyable, and safer too. □

unit available in two-, four-, or six-place models labeled -2P, -4P, and -6P respectively. The unit features muting, a pre-wired harness, and a stereo option that utilizes dual amplifiers. A remotely-mounted panel is required to utilize music input and recorder output jacks. Pilot isolation allows the passengers to converse and listen to music. There is no automatic fail-safe function, so the user must manually select the Off position to allow use of the radios in the event of an intercom failure. SoftComm's ATC-2P starts at \$190 (add \$20 for stereo) and climbs to \$250 for the six-place ATC-6P.

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Intercom shoppers face many options in choosing the right unit. Trade shows, fly-ins, and conventions are your best bet for trying out a number

PS Engineering Inc.
9800 Martel Road
Lenoir City, Tennessee 37771
615/988-9800

QuietFlite Inc.
109 North Main Street
Algonquin, Illinois 60102
800/237-6752

Sigtronics Corporation
822 North Dodsworth Avenue
Covina, California 91724
818/915-1993

SoftComm Products Inc.
2310 S. Airport Boulevard
Chandler, Arizona 85249
800/255-2666

Telex Communications Inc.
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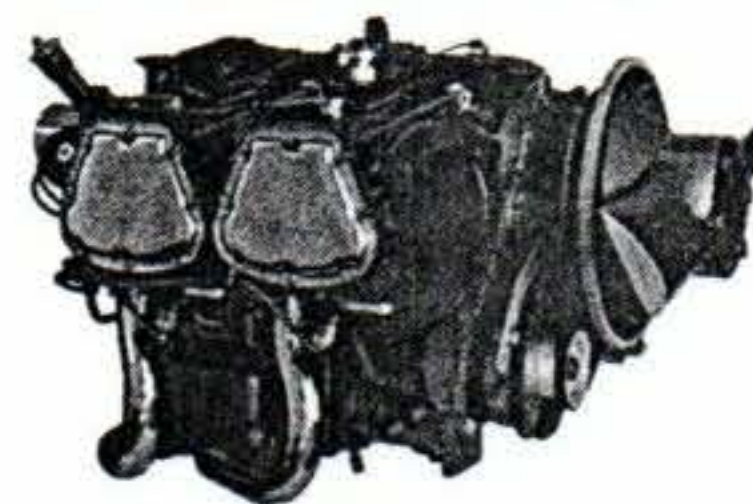


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