

# KMA 24 and KMA 24H Bendix/King Audio Control Systems



## Compact TSO'd consoles make audio control "push button simple"

Push button simplicity puts complete, flexible audio control right at your fingertips with Bendix/King's easy-to-use KMA 24 and KMA 24H systems.

Each is self-contained, all solid-state and stands only 1.3 inches high in your Silver Crown stack. The "slant top" package tailors it for the top slot in your instrument panel.

The KMA 24 controls as many as three transceivers and six receivers, including the internal marker beacon receiver and its automatically dimmed 3-light presentation. The KMA 24H controls up to five transceivers and five receivers, or four transceivers and six receivers.

The KMA 24H replaces the internal marker beacon receiver with an intercom, which provides unprecedented flexibility. The intercom features capability for hot mike, voice activation (VOX), or keyed activation of up to five intercom stations. In hot mike operation all intercom microphones remain active at all times whether the operator is talking on intercom or not. Voice activated operation has the microphone active only when the operator begins to talk. In keyed operation, the operator may depress a separate intercom switch to activate the microphone for intercom usage.

When two KMA 24H's are installed, dual transmit flexibility is provided—allowing the pilot and copilot or another crew member to talk on different transmitters simultaneously while providing pilot priority if the same transmitter is keyed by both crew members at the same time.

The KMA 24H also includes voice recorder compatibility and an emergency mode, which connects the pilot's headphones and microphone directly to COMM 1 in the event of a KMA 24H failure or a power interruption to the KMA 24H.

The KMA 24 and KMA 24H provide transceiver and receiver outputs to speaker or headphones or both. A separate isolation amplifier for headphones maintains constant, noise-free volume levels, even when several receivers are monitored at once. Keying a mike mutes all receivers automatically to eliminate feedback.

The KMA 24 is offered in four configurations and the KMA 24H in two configurations, so you can choose the one that best matches your requirements.

You'll find more detailed information, specifications, and a convenient tear-off Pilot's Guide for both units on the following pages.

### Audio Control With The KMA 24

Two rows of alternate-action push buttons on the KMA 24 console control all receiver audio distribution functions.

The top row of push buttons selects receivers for the cockpit speaker, the bottom row for headphones. Both rows are completely independent of each other, allowing selection of speaker or headphones, or both, for all combinations of receivers.

The rotary selector switch on the right side of the console connects the microphone to either COMM 1 or COMM 2. An additional switch position allows selection of radiotelephone on some KMA 24 models, or of HF on other models of the KMA 24. Other switch positions are for cabin address and ramp hauler.

Turning the microphone selector switch to OFF cuts power to the speaker amplifier and the marker beacon receiver. The headphone amplifier remains in operation.

The AUTO feature, when engaged, automatically matches the corresponding receiver audio with the selected transmitter, such as COMM 1, COMM 2, TEL or HF transmitter. An option allows the AUTO feature to be replaced by a second ADF receiver position.

The unit operates on either 13.75 volts or 27.5 volts without the use of adapters or converters.

### Built-In Marker Beacon

The KMA 24 has a built-in, crystal controlled, superheterodyne marker beacon receiver with a three-light display. Its excellent selectivity eliminates interference from FM radio and TV stations. Dimming circuitry automatically adjusts the brightness of the lamps to a level appropriate for ambient cockpit light.

The lower push button next to the marker lamps selects high and low sensitivity; the upper push button tests the lights.

The unit can also drive remote marker beacon lights, such as those in Bendix/King Autopilot Annunciator Panels or the KA 40 Remote Marker Light display.

### Five-Station Voice Activated Intercom

In the KMA 24H, a five-station intercom replaces the KMA 24's integral marker beacon receiver and lights. The intercom includes three modes of operation: hot mike, voice activated (VOX) or keyed activation for up to five intercom stations.

In single KMA 24H installations, the pilot's microphone has priority over the crew member's microphone in the vent both are trying to transmit at the same time.

In a dual KMA 24H installation the pilot and a crew member can talk on different transmitters at the same time; however, the pilot will automatically have priority if he keys the mike while another crew member is using the same transmitter.

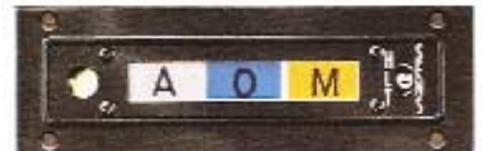
An emergency position (EMG) on the microphone selection switch connects the pilot's mike and headphones directly to COMM 1 as a means of fail-safe communication in the event of a failure within the KMA 24H.

Since the KMA 24H has an integral intercom, a "PA" position replaces the "INT" position on the microphone selection switch. In aircraft equipped with a cabin speaker, this position allows the pilot or copilot to make announcements to the passengers.

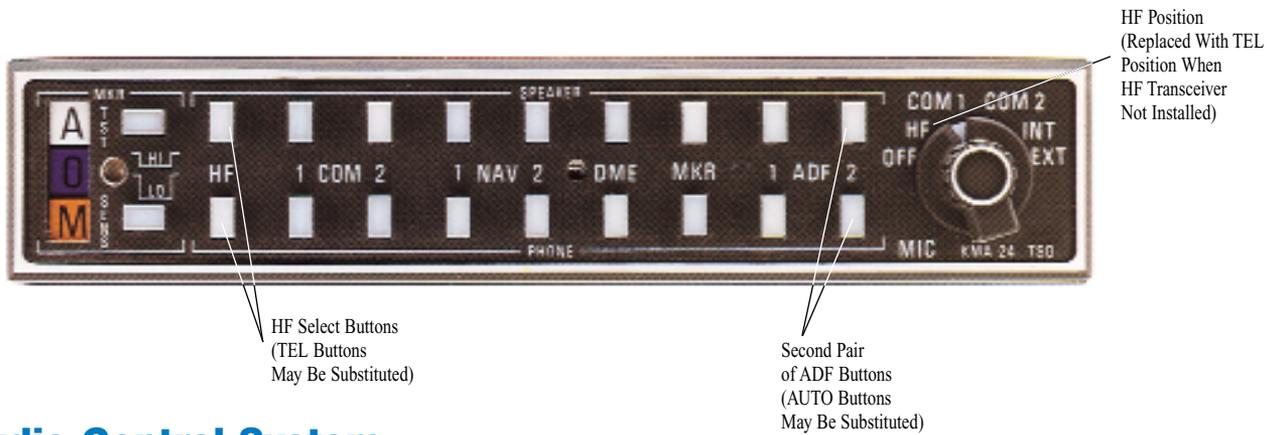
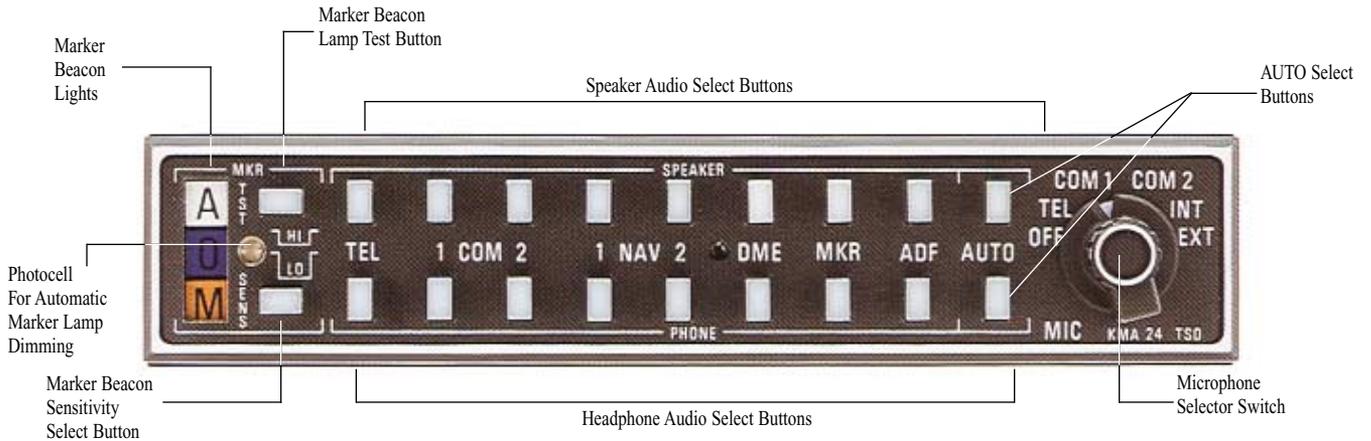
### KR 21 Marker Beacon Receiver

The cockpit can easily have marker beacon reception and display as well as the convenience of the KMA 24H's built-in five-station intercom. The TSO'd Bendix/King KR 21 Marker Receiver provides marker beacon audio signals to the KMA 24H and has a marker light display similar to that in the KMA 24.

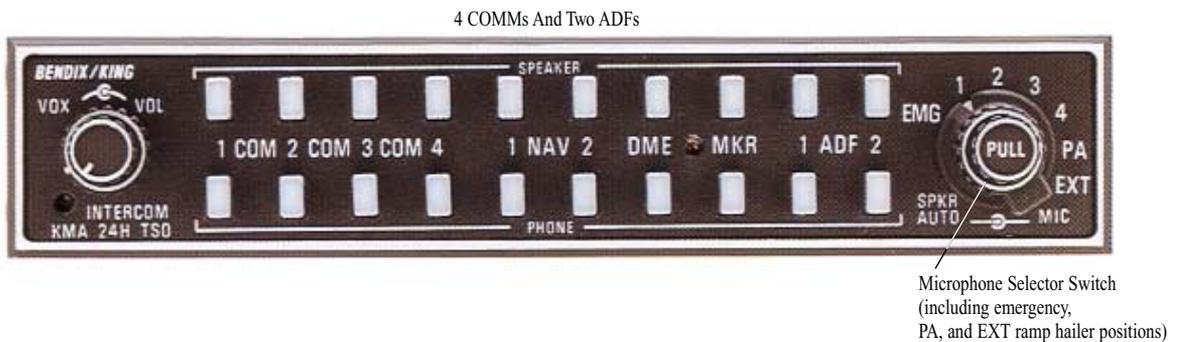
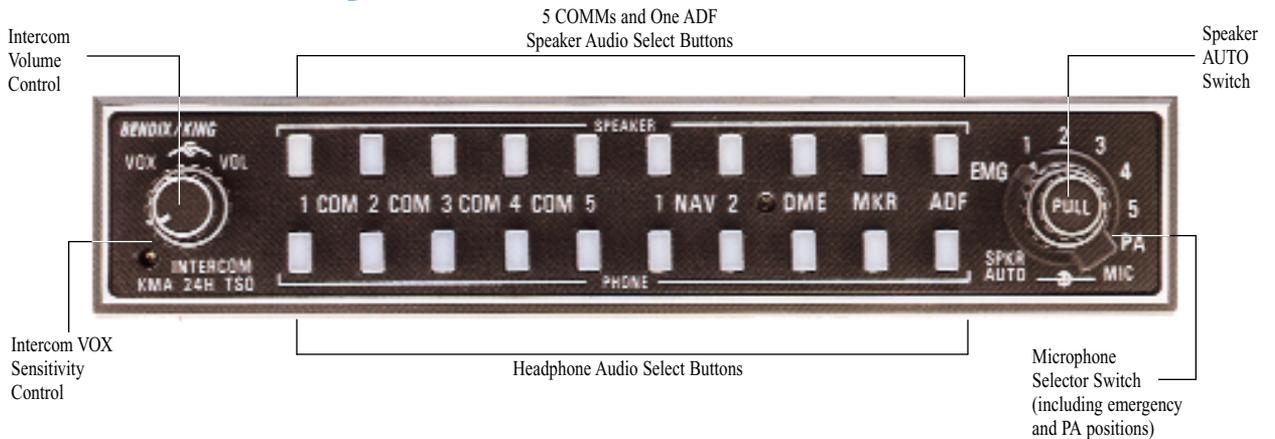
The KR 21 is self-contained and can be mounted anywhere in the panel, either horizontally or vertically. It is all solid-state and has its own self-test and automatic dimming.



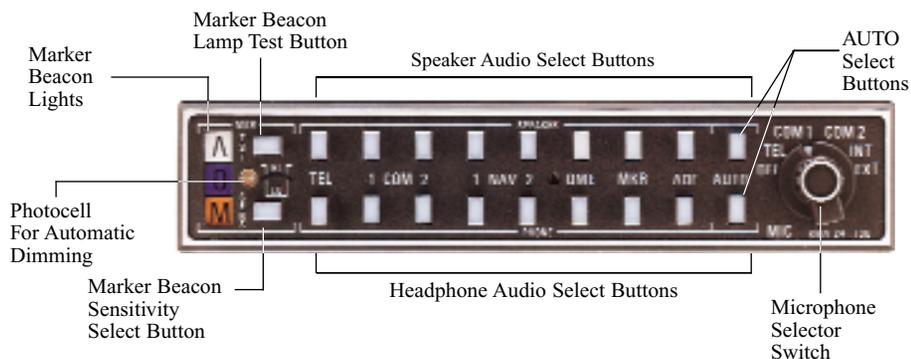
# KMA 24 Audio Control System



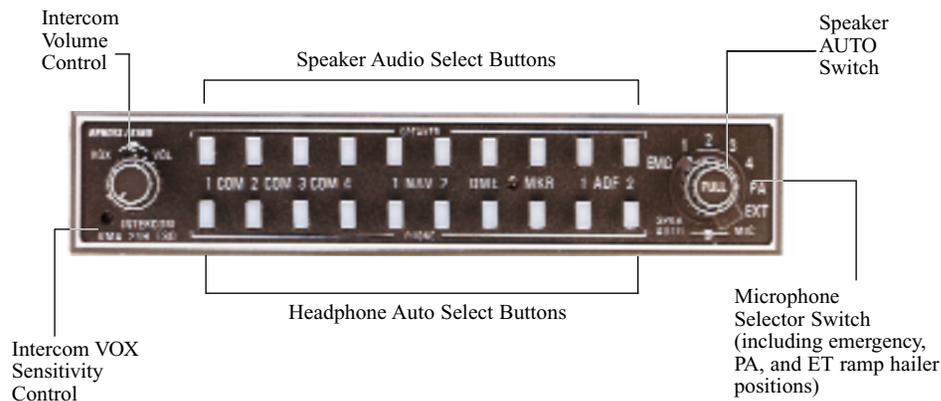
# KMA 24H Audio Control System



KMA 24 With “Auto” Feature And Radiotelephone



KMA 24 H With Second ADF and Ramp Hailer



## Operating the KMA 24/24H Audio Control Systems

### “Auto” Receiver Audio Select

For KMA 24 models equipped with the “AUTO” receiver Audio select feature, the transmitter selected with the microphone selector switch will be matched automatically with the appropriate COMM receiver audio on either headphone or speaker, or both, by simply pressing the desired headphone and/or speaker “AUTO” push button. (COMM 1 and COMM 2 push buttons should be disengaged unless it is desired to additionally listen to a COMM receiver other than the one selected with the microphone selector switch.)

Thus, on “AUTO” you may change the rotary microphone switch back and forth, as needed, without having to reselect the corresponding COMM, TEL, or HF receiver buttons in order to hear the receiver.

Both models of the KMA 24H have “AUTO COMM” capability and always provide automatic headphone audio selection to match the transceiver in use. The selection of speaker audio can either be made automatically by pulling out the speaker “AUTO” switch or manually with the row of speaker audio select push buttons.

### Marker Beacon Receiver (KMA 24)

The complete TSO'd 3-light marker beacon receiver built into the KMA 24 gives you an accurate visual and aural signal when you pass over a 75 MHz beacon. The blue, amber, and white lights on the faceplate—as well as the

audio tone—identify the beacon type (outer, middle or airway/inner marker).

Either the speaker or headphone MKR buttons or both must be “in” for the marker beacon receiver to provide an audio signal at beacon passage.

The horizontal push button labeled SENS on the lower left side of the console gives you the choice of two receiver sensitivities. When the button is “in,” the sensitivity is on HI. During an approach, this setting should permit you to hear the outer marker tone about one mile out. At this point you may select LO to dampen the tone. It will start to sound again when you are closer to the marker, giving you a more precise indication of its location.

Pressing the top horizontal button marked “TST” simply applies voltage to all three lamps to show that they are functioning.

Note: The TST button should not be pressed to test the lamps when autopilot coupled on an ILS approach inside the outer marker. This is due to the fact that some autopilots (including Bendix/King autopilots) use the marker annunciation to change the sensitivity of the autopilot.

A photocell in the console automatically dims the lamps for night operation.

The “INT” position on the KMA 24 and the “PA” position on the KMA 24H permit the flight crew to address cabin occupants over the cabin speaker. To do this, select “INT” or “PA” with the microphone switch. When the mike is keyed, the receiver audio is muted and you may talk normally into the microphone to broadcast over the speaker.

The KMA 24H also has an “EMG” position on the microphone selector. This feature bypasses the KMA 24H’s audio amplifier and directly connects COMM 1 to the pilot’s microphone and headphones. This provides a fail-safe method of communication should the unit fail.

The KMA 24 and KMA 24H also have an “EXT” position on the microphone selector switch which connects the microphone to an external ramp hailer speaker, if installed.

### KMA 24H Intercom

The KMA 24H has a built-in five-station intercom with two dedicated amplifiers. Intercom operation may be “hot mike,” in which the intercom is active all the time; voice activated (VOX), in which the intercom becomes active automatically when a crew member begins to speak; or keyed activation, in which a separate microphone switch must be keyed to activate the intercom. Selection of the desired method of microphone activation is accomplished with the intercom VOX sensitivity control (outer concentric knob on left side of unit).

Turn it to the fully clockwise detent position for hot mike operation. Turn the knob all the way counterclockwise past the detent for

keyed microphone operation. (Note: a separate intercom key switch must be included in the installation in order to use keyed intercom operation.) In the middle range, the switch selects VOX, and the rotation of this knob also adjusts the sensitivity of the voice activated switch.

In order to set the proper VOX sensitivity, first turn the VOX sensitivity control clockwise until a hissing sound is heard in the headphones. Next turn the control counterclockwise until the hissing sound stops. The VOX is now properly set for the present noise environment. It is normal to have to reset the VOX sensitivity level whenever the noise in the cockpit/cabin changes, such as when making large power setting changes.

The inner concentric knob is the intercom volume control this adjusts the intercom volume without affecting the volume of the selected receiver audio inputs.

When either the pilot or copilot keys the microphone to transmit, all other intercom microphone inputs are muted, which ensures that the keyed microphone is the single source of transmitted audio. All receiver inputs are also muted during transmissions.

## Optional Intercom Modes

The optional installation of a remote, three-position switch for intercom operations with the KMA 24H provides three modes: Isolate, Normal (NORM) and Private. In Isolate, the pilot takes himself out of the intercom loop while the other four intercom positions remain active. In Normal, all five intercom positions are tied together. In Private, the pilot and copilot positions are linked together for two-station hot mike operation. At the same time, the other three intercom positions have independent three-station intercom operation.

## Receiver Selection

The top row of push buttons on the console controls the audio selection for the speaker, and the bottom row selects audio for headphones. The selections are independent, and any audio input can be selected for speaker or headphones or both. These push buttons allow audio selection independent of the AUTO feature described earlier.

The KMA 24 and KMA 24H can control as many as six receivers. Both units also have two unswitched inputs for uses such as the radar altimeter audio alert or the ring signal from a radiotelephone.

To listen to a specific receiver, simply press the corresponding headphone or speaker

button "in." To disconnect that receiver, press the button again. It will return to the "out" position.

For both the KMA 24 and KMA 24H, volume of audio input from transceivers and receivers is set with the volume controls of each individual radio.

## Transmitter Selection

The rotary switch on the right side of the KMA 24 and KMA 24H consoles selects the desired transmitter for the cockpit microphones. In the KMA 24, the off position shuts off power to the speaker amplifier and marker beacon receiver. (The headphone amplifier operates whenever the aircraft electric power is on.)

With the KMA 24, the next position of the rotary switch may be either "TEL" (radiotelephone) or "HF" (high frequency transceiver.) The former is more likely to be found in aircraft used mostly for domestic operations, the latter for international operations.

The COMM 1 and 2 positions (COMM 1-4 or 1-5 for KMA 24H) are for transmitting on the frequencies set up on those respective communication transceivers.

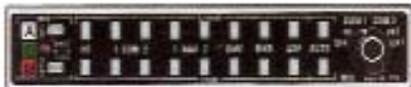
The "INT", "PA" and "EXT", and "EMG" positions are discussed above.

## Other Combinations Of Features

### KMA 24



KMA 24 with TEL and ADF 1 and 2



KMA 24 with HF and AUTO



KMA 24 with HF and ADF 1 and 2

### KMA24H



KMA 24H with 4 COMMs and 2 ADFs



KMA 24H with 5 COMMs and 1 ADF

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## KMA 24 and KMA 24H Bendix/King Audio Control Systems



# BENDIX/KING

## Specifications

### TSO Compliance:

Marker Beacon Receiver: TSO C35d,  
Class A

KMA24—Env. Cat. A1D1/A/PKS/  
XXXXXXXXZBAAA

Audio Amplifier: TSO C50b

KMA 24H—Env. Cat. A2D1/A/KPS/  
XXXXXXXXB/AB/BZ/A

**Weight:** 1.7 lb. (0.77kg)

### Physical Dimensions:

Length behind panel: 6.8 in. (17.30 cm)

Width: 6.25 in. (15.88 cm)

Height: 1.3 in. (3.30 cm)

**Duty Cycle:** Continuous

**Power Requirements** (not including  
instruments lights):

	<b>KMA 24</b>	<b>13.75v</b>	<b>27.5v</b>
Idle current, mike switch on		110 ma	170 ma
Idle current, mike switch off	Less than	8 ma	Less than 16 ma
Max. operating current		1.9 a	1.9 a
<b>KMA 24H</b>			
Idle current		350 ma	500 ma
Max. operating current		1.8 a	1.8 a

**Temperature Range:** -20°C to +55° with  
brief operation at +70°C (KMA 24),  
-20°C to +70°C continuous (KMA 24H)

### Marker Beacon Receiver (KMA 24 only)

**Frequency:** Crystal-controlled at 75 MHz

**Sensitivity:** LO 1,000 $\mu$ v Hard  
HI 200 $\mu$ v Hard

**Selectivity:** 6 db at  $\pm$  10 kHz Min.  
40 db at  $\pm$  200 kHz Max.

**Input Impedance:** 50 ohms

**Output:** Capable of 4 mw into isolation  
amplifier impedance of 500 ohms.

### Isolation Amplifiers:

**KMA 24 Inputs:** KMA 24 models without  
AUTO accommodate three transceivers  
and six external receivers. Models with the  
AUTO function accommodate three trans-  
ceivers and five external receivers. All  
models also have two unswitched inputs.  
(Typical use: radar altimeter aural warning  
and radiotelephone ringer.)

**KMA 24H Inputs:** KMA 24H models  
accommodate five transceivers and five  
external receivers or four transceivers and  
six receivers. All models also have two  
unswitched inputs. (Typical use: radar  
altimeter aural warning and radiotele-  
phone ringer.)

**KMA 24 Input Impedance:** 500 ohms

**KMA 24H Input Impedance:** 320 ohms  
for all ICS inputs, 500 ohms for all  
audio inputs

### Input Isolation:

KMA 24: 40 db between inputs

KMA 24H: 60 db between inputs

**Input Muting** (when mike is keyed):  
At least 55 db

### Speaker Output:

**With 13.75v Supply:**

Into 4 ohm load: 7 w (KMA 24)  
6 w (KMA 24H)

Into 8 ohm load: 4 w

Into 8 ohm load from  
8 ohm tap: 6 w (KMA 24H)

**With 27.5v Supply:**

Into 4 ohm load: 12 w (KMA 24)  
10 w (KMA 24H)

Into 8 ohm load: 6.5 w

Into 8 ohm load  
from 8 ohm tap: 10 w (KMA 24H)

### Headphone Output:

**KMA 24:** 50 mw into 500 ohm load

**KMA 24H:**

With 27.5v supply: 120 mw into each  
500 ohm load

With 13.75v supply: 20 mw into each  
500 ohm load

### Output Characteristics:

Distortion: Less than 5 percent at rated  
output

### Frequency response:

KMA 24: Within 6 db from 350 hz to  
6,000 hz

KMA 24H: Within 3 db from 350 hz to  
6,000 hz

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