Mission Observer Course
Fort Pickett/Blackstone Army Airfield
CAP Aircrew School
Mission Observer Course

Familiarization & Preparation
(based on NESA revision June 2013)
Welcome!

• Senior Members
1. Safety Current
2. Level One
3. General Emergency Services (taken online)
4. OPSEC (taken online)
5. Aircraft Ground Handling (taken online)
6. FEMA IS100b (taken online)
7. FEMA IS700a (taken online)

• Cadets
1. Age 18+
2. Safety Current
3. Mitchell or higher preferred
4. General Emergency Services (taken online)
5. OPSEC (taken online)
6. Aircraft Ground Handling (taken online)
7. FEMA IS100b (taken online)
8. FEMA IS700a (taken online)
FEMA Course IS100.b

IS-100.B: Introduction to Incident Command System, ICS-100

Course Date
10/31/2013

Course Overview
EMI has revised the ICS 100 course to reflect lessons learned since its release in 2006. This course is NIMS compliant and uses the objectives developed collaboratively by the National Wildfire Coordinating Group, the United States Fire Administration, the United States Department of Agriculture and the Emergency Management Institute.

Note: IS-100.b is an updated version of the IS-100.a course. If you have successfully completed IS-100 or IS-100.a, you may want to review the
FEMA Course IS 700.A


Course Date
10/31/2013

Course Overview
This course introduces and overviews the National Incident Management System (NIMS). NIMS provides a consistent nationwide template to enable all government, private-sector, and nongovernmental organizations to work together during domestic incidents.

Course Objectives:

TAKE THIS COURSE

- Interactive Web Based Course

ADDITIONAL RESOURCES

- Downloads for Classroom

TAKE FINAL EXAM

By: 10/31/13
Use In-Flight Services

Derived from Mission Observer Task Guide, Task O-2010
Task O-2010 Flight Services

Flight Service Stations

Scheduled Wx Broadcasts

Hazardous In-Flight Wx Advisory Service

Automated Wx Observation System/
Automated Surface Observation System

Pilot Weather Report

Citizens Serving Communities
Use In-Flight Services

• Review Of Using In-Flight Services
  – Discuss how to use Flight Service Stations and scheduled weather broadcasts
  – Discuss how to obtain an ATIS report
  – Discuss how you will obtain a HIWAS report
  – Discuss how to obtain an AWOS or ASOS report
  – Give a simulated PIREP report
Plot A Route On A Sectional Chart

Derived from Mission Observer Task Guide, Task O-2013
Task O-2013 Plot The Course

• Step One – Two Points
  – Locate the departure and destination points on the sectional

• Step Two – Read The True Course
  – Lay the plotter edge along a line connecting the departure and destination points, and use a marker to trace the route
  – Slide the plotter left or right until the center point, or grommet, sits on top of a line of longitude (meridian)
True Course 266 degrees
Return course 86 degrees
Task O-2013 Plot The Course

• Step Three – Measure The Distance
  – Place the “zero” end of your plotter at your origin airport, while keeping the edge aligned with the course you just marked off
  – Use the scale on the plotter edge to read off the distance; there is a statute-mile edge and a nautical-mile edge
  – One nautical mile is equal to 1.15 statute miles

• Step Four – Flight Time
  – Elementary-school math! Divide the Distance (in nautical miles) by the proposed Airspeed (in knots)
Task O-2013 Checkpoints

• Step Five – Identify **Good** Checkpoints
  – Use to check your position and timing
  – Choose easily recognizable, large features *unlikely to change* and roughly aligned with tick-marks along your plotter edge
  – **Don’t use** cell towers, private airports, towns/cities (too hard to see from altitude or in haze); in the northeast, towns and cities blend too easily
  – **Instead, use** tall towers, major railroads, lakes, rivers, *major* airports, or VFR waypoints already marked on the Sectional
O-2013: Plot A Route On A Sectional Chart

• Review Of Plotting A Route
  – Plot a course between two points
  – Select checkpoints along the route and discuss why you chose those checkpoints
  – Calculate the time it will take an aircraft to fly the route (120 knots with no wind)
Prepare For A Trip To A Remote Mission Base

Derived from Mission Observer Task Guide, Task O-2107
O-2107 Prepare For A Trip To A Remote Mission Base

- Check for Proper Uniform, Credentials & Equipment
  - Flying clothing, “dress to egress,” CAP ID card, current 101 card printout, safety currency
  - Clothing changes, light toiletries, cell phone, spare cell charger, battery
  - CAP equipment FMC, with batteries; tie-downs, etc.
  - Review aircraft logs, grab starting Tach and Hobbs times; review discrepancy log on WMIRS
O-2107 Prepare For A Trip To A Remote Mission Base

• Aircrew Duty Period & Limits
  – From reporting to engine shut-down, max is 14 hours
  – May not exceed 9 hours of flight time between crew-rest periods
  – WG/CC or higher (or designee) may waive in extraordinary circumstances

• Crew Rest
  – 10 hours required (8 sleep, 2 personal/prep time)
  – Refueling, uploading imagery, etc., don’t count
O-2107 Prepare For A Trip To A Remote Mission Base

• Assist In Checking The Aircraft
  – Check for required equipment (e.g., tie-downs, survival kit, POH, etc.)
  – Clean windows as necessary

• Assist In Completing CAP Form 104
  – W&B upload, ORM worksheet, mission objectives

• Receive A Briefing From Mission Pilot
  – Fuel assumptions/fuel stop; Airspace restrictions, NOTAMs, destination airport diagrams; ORM, CRM
O-2107 Prepare For A Trip To A Remote Mission Base

• Upon Arrival At The Mission Base
  – Secure the aircraft and arrange for refueling
  – Sign yourself and the aircraft into the mission
  – Assist in completing your “inbound” CAP Form 104
O-2107 Prepare For A Trip To A Remote Mission Base

• Review Of Prep
  – Proper uniform, credentials & equipment
  – State the flight time and duty limits per CAPR 60-1
  – Assist in checking the aircraft
  – Receive a briefing from the Mission Pilot
  – Upon arrival at base, secure aircraft, sign yourself and aircraft into the mission, assist in completing your inbound CAP Form 104
Discuss Mission Observer Duties & Responsibilities

P-2007 Mission Observer

Duties

• Mission Pilot
  – Primary responsibility for the safe operation of the aircraft
  – Sole legal authority as to the safe operation of the aircraft
  – Must fly precisely to improve odds of mission success

• Mission Observer
  – Plans the CAP mission
  – Operates CAP radios, maintains contact with Mission Base and Ground Teams
  – Records pertinent data
  – Maintains situational awareness
  – Right-side scanner
P-2007 Mission Observer
Duties

1. Wear appropriate dress for the mission (e.g., gloves, sunglasses, and uniform appropriate for climate and terrain)
2. Assist in mission planning, with particular attention to mission-objective related criteria (target, grid, Air Boss’ desired outcomes, etc.) (This is related to, but different from, flight planning)
3. Co-pilot duties as PIC directs (assist in setting up and operating aircraft radios, nav equipment, monitoring fuel status, etc.)
4. Assist in setting up and operating CAP radios
5. Assist in enforcing Sterile Cockpit rules
6. Monitor electronic search devices aboard the aircraft and advise the pilot when making course corrections in response to ELT signals
7. Coordinate Mission Scanner assignments, ensure proper rest breaks (in planning and in flight), monitor for fatigue
8. Maintain a chronological flight log of all observations of note
9. Report with Mission Pilot for debrief upon return to base
Sterile Cockpit
Sterile Cockpit

- No talking during **critical** phases of flight
- Only **mission-critical** communication once on-target

**Figure 9-8.** Workload is highest during takeoff and landing, which increases the chance for error.
P-2007 Mission Observer
Duties

• Primary Roles Of The Observer
  – Enroute: navigation and communication assistance, assistance in enforcing Sterile Cockpit, maintains situational awareness (alertness for traffic and hazards)
  – In Search/Target Area: Observer becomes a Right-Side Scanner, whose primary role is performing an effective visual search maintaining constant eye contact with the ground while flying over the search area
P-2007 Mission Observer

Duties

• Review Of Duties
  – State the primary role of the Observer, particularly when in the search area
  – General duties and responsibilities
  – Basic airport security precautions
  – Pre-flight duties and responsibilities
  – In-flight duties and responsibilities
  – Post-flight duties and responsibilities
  – What should be logged in the Observer Log?
Let’s Take A 10-Minute Break
Discuss The Dangers Of Icing

Derived from Mission Observer Task Guide, Task P-2008
The Dangers Of Icing

Citizens Serving Communities
The Dangers Of Icing
• Frost
  – Condensation that forms when the ground cools at night; dew if above freezing, and *frost* if below freezing
  – Frost should always be removed before flight
  – If frost is expected, considering hangaring the aircraft overnight
Airframe Icing

- Two prerequisites for in-flight icing: flight through visible water and temps 32 degrees F or below (either the droplets or the surface)
- Ice greatly increases drag and retards lift; one-half inch on a wing leading edge can cut lift in half
- Also, ice is heavy, and decreases propeller efficiency
- We DO NOT fly into regions of possible or known icing!
P-2008 The Dangers Of Icing

- Carburetor Icing
  - Most likely in high humidity or visible moisture with temps between 45-85 degrees
  - Particular problem at low power settings, i.e., descents and approaches to landing
  - Applying carb heat solves the problem
P-2008 The Dangers Of Icing

• Review Of Icing Dangers
  – Discuss freezing level and its significance
  – Discuss how airframe frost and icing affects aircraft performance
  – Explain how carburetor icing affects aircraft performance
Discuss The Dangers Of Reduced Visibility Conditions

P-2009 The Dangers Of Reduced Visibility Conditions

- Fog
- Haze
- Snow
- White out
- Blowing dust
- Affected by sun angle and direction
• Each member of the aircrew must be vigilant during all phases of flight
  – Assign each an area to watch

• Characterize visibility in the search area to establish the proper scanning range
  – May be different than assumed

• Visibility conditions or turbulence may increase fatigue
P-2009 The Dangers Of Reduced Visibility Conditions

• Visual Flight Rules (VFR)
  – Must have at least three miles of visibility
  – If clouds cover more than half the sky, cloud bases must be no lower than 1,000 feet above the terrain
  – Search aircraft must remain at least 500 feet below the cloud deck

• Aircrew Establish Proper Scanning Range
  – Adjust search pattern if necessary; report to Base
P-2009 The Dangers Of Reduced Visibility Conditions

FOG
P-2009 The Dangers Of Reduced Visibility Conditions

DUST STORM
P-2009 The Dangers Of Reduced Visibility Conditions

HAZE
P-2009 The Dangers Of Reduced Visibility Conditions

CLOUDS & HAZE
P-2009 The Dangers Of Reduced Visibility Conditions

• Review Of Reduced Visibility
  – Discuss reduced visibility conditions and effects on aircraft operation
  – Discuss basic reduced visibility minima
  – Discuss reduced visibility effects on search operations (as distinct from aircraft operation)
Discuss The Dangers Of Wind & Thunderstorms

Derived from Mission Observer Task Guide, Task P-2010
P-2010 The Dangers Of Wind & Thunderstorms

- Earth’s Rotation
  - As air leaves a high-pressure area it deflects to the right, and as it flows toward a low-pressure area it deflects counter-clockwise
P-2010 The Dangers Of Wind & Thunderstorms

• Convection Currents
  – Plowed ground, sand, rocks, barren land give off a lot of heat; water and vegetation absorb and retain heat
  – Uneven heating makes for “convection currents,” and a bumpy ride
  – Updrafts over pavement/downdrafts over vegetation
  – Can cause landing difficulty
Convection Currents

- **Earth's Rotation**
  - As air leaves a high-pressure area it deflects to the right, and as it flows toward a low-pressure area it deflects counter-clockwise.
• Cold and Warm Fronts
  – **Cold, Unstable Air:** cumulus and cumulonimbus clouds; unlimited ceilings and excellent visibility (except during precip); pronounced turbulence at lower levels; occasional local thunderstorms or showers (hail, sleet, snow flurries)
  – **Warm, Stable Air:** stratus and stratocumulus clouds; generally low ceilings; poor visibility (fog, haze, smoke, etc., at lower levels); little to no turbulence; slow, steady precip or drizzle
Cold Front

Cloud development because of frontal lifting of warm moist air

Advancing cold air behind cold front

Receding warm air ahead of cold front

Direction of frontal movement

Cold front map symbol
Warm Front

Cloud development because of frontal lifting of warm moist air

Advancing warm air behind warm front

Receding cold air ahead of warm front

Warm front map symbol

Direction of frontal movement
• Windshear
  – **Defined:** a change in wind direction and/or speed within a very short distance
  – Turbulence may or may not exist during windshear conditions
  – Most dangerous when dramatic shears are present near the ground
P-2010 The Dangers Of Wind & Thunderstorms

• Thunderstorms
  – Any storm with thunder and lightning; usually includes some form of precipitation. Also turbulence, icing, poor visibility, hail, windshear, microbursts, lightning, tornados
  – During the cumulus stage, rapid growth makes climbing over impossible; flying beneath can be deadly; diverting around is possible, but dangerous
  – Avoid t-storms by at least 20 miles laterally
  – Safest alternative? Land, tie-down, wait it out
P-2010 The Dangers Of Wind & Thunderstorms

- Review Of Wind & Thunderstorms
  - Discuss the effects of convection currents, particularly during landing
  - Discuss wind patterns around high- and low-pressure areas
  - Discuss the characteristics of cold and warm fronts
  - Discuss the dangers of windshear
  - Discuss the dangers of thunderstorms
Discuss The Effects Of Density Altitude On Aircraft Performance

Derived from Mission Observer Task Guide, Task P-2011
P-2011 Density Altitude

• **Defined**: Pressure altitude corrected for non-standard temperature (altitude plus pressure combine to determine pressure altitude)

• Three Factors
  – Pressure
  – Temperature
  – Humidity

• Effects
  – Drag, lift, power available and true airspeed
True Airspeed

versus

Density Altitude
Density Altitude Plotted
P-2011 Density Altitude

• Pressure falls with higher altitudes, creating pronounced effects:
  – Engine (hp) and prop are less efficient
  – Take off distance, climb rate, and landing distance impaired
  – Take-off distance almost doubles with a 5,000-ft. elevation increase
  – Rate of climb slows with higher elevation
  – Landing distance increases with higher elevation

• *Higher Humidity, Heat, Height* reduce performance
### Density Altitude versus Rate-of-Climb

#### PRESSURE ALTITUDE 4,000 FEET

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<th>ROC @ 2,100 Pounds</th>
<th>ROC @ 2,400 Pounds</th>
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#### PRESSURE ALTITUDE 6,000 FEET

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#### PRESSURE ALTITUDE 10,000 FEET

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<tr>
<td>100°F</td>
<td>15,000</td>
<td>200</td>
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Reduced Performance

Takeoff Roll at Sea Level  Takeoff Roll at 5,000 ft Density Altitude

Climb at LOWER Density Altitude  Climb at HIGHER Density Altitude
P-2011 Density Altitude

• Don’t fly at high elevation during the hottest part of the day
• *Carefully* calculate density altitude and weight
• Reduce load:
  – Less fuel
  – Crew reduction or personnel swap
  – Less gear
• Remember “High to Low, Look Out Below”
• Update date altimeter setting hourly
P-2011 Flight Near Mountainous Terrain

• Considerations
  – Ensure your search never takes you over terrain that rises faster than the airplane can climb.
  – Avoid narrow valleys or canyons with rising floors, unless the aircraft can be flown from the end of higher elevation to the lower end, or the pilot is certain that the aircraft can climb faster than the terrain rises.
  – Approach ridges at a 45-degree angle and cross at least 2,000 feet above.
  – Enter terrain from above and always have an escape route in mind.
Flight Near Mountainous Terrain

WIND FLOW AROUND A MOUNTAIN – TURBULENCE ENCOUNTERED ON BOTH SIDES AND THE LEE SIDE
Flight Near Mountainous Terrain

Wind speed can double or triple through a pass.

- 30 knots
- 90 knots
P-2011 Density Altitude

• Review Of Density Altitude Effects
  – Discuss atmospheric pressure, pressure altitude and density altitude
  – Obtain local altimeter setting and enter it into an aircraft altimeter (*do this during one of your training sorties*)
  – Discuss how high density altitude degrades aircraft performance
  – Discuss strategies for mitigate high density altitude on search operations
  – Discuss mountainous terrain precautions and strategies
Let’s Take A 10-Minute Break
Identify Controlled & Special-Use Airspace On A Sectional

Derived from Mission Observer Task Guide, Task P-2012
• Controlled Airports
  – Be alert for required communications when a search will be conducted within 40 miles of a major airport or 5 miles of an airport with an operating control tower
  – These are color-coded **blue** on sectionals
  – Sterile Cockpit takes on special importance here

• Special-Use Airspace
  – Military airspace, typically; either **blue-** or **magenta-** hatched lines
  – Named, numbered, or both (i.e., Pickett 3 MOA)
• Prohibited Areas
  – Marked in **blue-hatched** lines; e.g., White House, Camp David, etc.

• Restricted
  – Similar to Prohibited; also printed in **blue**; generally preceded by an “R” (i.e., R-4404)

• Training Routes
  – Military low-altitude training routes, Instrument and Visual, with **medium-weight gray lines** and numbered with a prefix IR or VR (IR-120 or VR-1102)
Sectional

Airports

Airspace

Navaids

Max Elev

Figures (MEFs)
MOA-Military Operations Area
P-2012 Controlled & Special-Use Airspace

• Review Of Controlled & Special-Use Airspace

  – Identify the areas below on a sectional and discuss operations in and near them:

  • Controlled airport
  • Prohibited airspace
  • Restricted airspace
  • Military Operating Area (MOA)
  • Military Training Routes (MTRs)
CAP Aircrew School
Mission Observer Course

Advanced Training Tasks
(based on NESA revision June 2013)
Operate The Aircraft Radios

Quick Comms Review
### Pronouncing Numbers

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<tr>
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<td>TREE</td>
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<td>FOW-ER</td>
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# Pronouncing Letters

<table>
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<td>ALPHA</td>
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Citizens Serving Communities
Prowords

- **Affirmative** – “Yes”
  - Permission granted or “that is correct”
- **Negative** – “No”
  - Permission not granted or “that is not correct”
- **Figures**
  - I’m about to give you numerals or numbers
- **Out**
  - End of transmission to you (no answer required nor expected)
- **Over**
  - End of transmission to you (response is expected, go ahead)
- **Read back**
  - Repeat my message back to me (“Read back is as follows”)
Prowords

• Red Cap
  – Precedence Red Cap
• Roger
  – I have received and understood all of your last transmission
  – Don’t use to answer a question requiring a ‘yes’ or ‘no’
• Say Again
  – Repeat all of your last transmission
• Wilco
  – I have received your transmission, understand it, and will comply
  – Don’t use “Roger” and “Wilco” together (Roger included in Wilco)
Prowords

• All after, All before, Word after, Word before
  – Used to identify a part of a communication
• Break, Correct, Correction
  – Used to identify a break in the flow of a transmission
• Over, Out, Roger, Wilco
  – Used to pass control to another station
• Say again, I say again
  – Used to request retransmission of a message
• Wait, Wait out
  – Used to indicate a pause is expected
• “Rescue” used only when priority handling is critical
  – “Rescue CAP Forty-Five Thirty-One”
O-2002 Operate The Aircraft Radios

Communications

- 720-channel VHF aviation radio, tuned in increments of 50 kilocycles (119.75 or 120.00)

- Pulling out the tuning knob lets you tune in 25 kilocycle increments, but the last digit won’t show in the display

Navigation

- Primary and Standby Frequencies (flip-flop)
- Stuck Mic ("stuck mike") is when the microphone gets stuck in the transmit position, blocking all transmissions
- Look for the “T” symbol or “TX” light to stay on
- Stuck Mic procedure:
  - Momentarily re-key the mic
O-2002 Operate The Aircraft Radios

TDFM-136 Digital/Analog CAP Radio (typically MO is primary)
- Used to communicate with government agencies and our own ground teams; dedicated to air-to-ground comms
- Several freqs are USAF-assigned, and considered FOUO
- Generally selected using Com 3 on the Audio Panel
O-2002 Operate The Aircraft Radios

TDFM-136 Digital/Analog CAP Radio

– Controls and Normal Settings

• The knob above the MN/GD switch is the power switch and controls volume for Main. The knob above the G1/GD switch is the volume control for Guard.

• Do NOT push or use the “Squelch” pushbutton

• MN/GD is a toggle between Main and Guard

• G1/G2 toggle selects the Guard frequency you are monitoring. Normally set to G1.

• The HI/LO toggle selects transmitter power and is normally set to HI.

– The radio should already be set to MN, G1 and HI.
O-2002 Operate The Aircraft Radios

TDFM-136 Digital/Analog CAP Radio

Required FM Radio Reports By Mission Observer

- Radio Check (initial flight of the day)
- Take-off/wheels-up Zulu time
- Zulu time entering search area ("on-station")
- Zulu time exiting search area
- Landing/wheels-down Zulu time
- Operations normal ("Ops Normal") at intervals set by mission staff; typically 30-minute Ops Normal calls
O-2002 Operate The Aircraft Radios

KMA-24 Audio Panel

PMA7000MS Audio Panel
– Overview of KMA-24

• Right-hand knob selects radio you will *transmit* on; it is also what you will *hear* unless one of the switches is pressed

• Top-row pushbuttons are for the overhead *speaker*; bottom row directs to *headset*

• Pushbuttons direct whatever device you select (Tel, Com 1, etc.) to the speaker or headset, *regardless of the right-hand knob setting*

• Common mistakes: TEL is for CAP FM radio; failure to select COM channel
O-2002 Operate The Aircraft Radios

– Overview of PMA7000MS

• Volume knob also turns power on and off; in the Off position the pilot is connected directly to Com 1 for safety
• Volume only controls loudness for MP and MO
• Pushbuttons select Nav radios, CAP FM radio (COM 3), DME, MKR (Marker beacon tone), ADF (automated direction finding) and SPR (Speaker)
• SPR puts all selected audio into the overhead speaker
– Overview of PMA7000MS (continued)
  • Mic selector knob in Com 1
    – MP and MO connected to Com 1 transceiver
  • Mic selector knob in Com 2
    – MP and MO connected to Com 2 transceiver
  • Mic selector knob in Com 3 MP and MO on CAP FM Radio
  • Pilot’s push-to-talk (PTT) gets priority; if MO is transmitting and MP presses PTT, MP will “step” on MO
– Overview of PMA7000MS Split Mode (continued)

• Mic selector knob in Com 1/2
  – MP on Com 1 and MO on Com 2; MP talks to ATC, MO talks to FSS

• Mic selector knob in Com 1/3
  – MP on Com 1 and MO on CAP FM Radio

• This set up typically isolates MP and MO from each other in the intercom; depress the ICS button to activate a VOX intercom between the two positions
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**VOLUME** - **PUSH ON/OFF** (CHECK FOR AT LEAST 1 LED, UNLESS IN COM3 MODE)

**HIGH/LOW/TEST SWITCH** - **TEST** (CHECK FOR ILLUMINATION OF O M I INDICATORS) **ADJUST SENSITIVITY IF AUDIO IN USE**

**ISO/ALL/CREW TOGGLE SW** – **SET AS REQUIRED** (INTERCOM MODE)

<table>
<thead>
<tr>
<th>MODE</th>
<th>PILOT HEARS</th>
<th>OBSERVER HEARS</th>
<th>SCANNER HEARS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO</td>
<td>A/C RADIOS PILOT SIDETONE</td>
<td>OBSERVER &amp; SCANNER INTERCOM</td>
<td>OBSERVER &amp; SCANNER INTERCOM</td>
<td>ISOLATES PILOT</td>
</tr>
<tr>
<td>ALL</td>
<td>PILOT OBSERVER SCANNER A/C RADIO</td>
<td>OBSERVER PILOT SCANNER A/C RADIO</td>
<td>SCANNER PILOT OBSERVER A/C RADIO</td>
<td>ALL HEAR RADIOS AND CAN COMMUNICATE ON THE INTERCOM</td>
</tr>
<tr>
<td>CREW</td>
<td>PILOT OBSERVER A/C RADIO</td>
<td>OBSERVER PILOT A/C RADIO</td>
<td>SCANNER(S)</td>
<td>ISOLATES SCANNER(S)</td>
</tr>
</tbody>
</table>
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- NAV1-VOR1 RADIO
- NAV2-VOR2 RADIO
- MKR-MARKER BEACON
- ICS-ACTIVATES INTERCOM IN SPLIT MODES
- ADF-ADF RADIO (MAY NOT BE AVAILABLE IN ALL AIRCRAFT)
- COM3-CAP RADIO
- DME-DISTANCE MEASURING EQUIPMENT (DME)
- SPR-CABIN SPEAKER (NOT INSTALLED ON ALL CAP AIRCRAFT)

<table>
<thead>
<tr>
<th>TRANSMITTER COMBINATIONS</th>
<th>NORMAL</th>
<th>SWAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIC SELECT</td>
<td>PILOT</td>
<td>OBSERVER</td>
</tr>
<tr>
<td>Com 1</td>
<td>Com 1</td>
<td>Com 1</td>
</tr>
<tr>
<td>Com 2</td>
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<tr>
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<td>Com 3</td>
</tr>
<tr>
<td>Com 1/2 *</td>
<td>Com 1</td>
<td>Com 2</td>
</tr>
<tr>
<td>Com 1/3 *</td>
<td>Com 1</td>
<td>Com 3</td>
</tr>
<tr>
<td>Com 2/3 *</td>
<td>Com 2</td>
<td>Com 3</td>
</tr>
</tbody>
</table>

*SPLIT MODES MAY RESULT IN AUDIO ‘BLEED OVER’ BETWEEN FREQUENCIES

Note: Swap switch is located on the instrument panel