Marshalling Detachment Training Manual

Approved by Headquarters July 1, 2005
Updated: April 2014

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I. Marshallers Code of Conduct

I will execute the Marshallers task with professionalism, courtesy, respect, caution and “Esprit de Corps” and I will follow the CAF Code of Conduct.

The pilot is always in command of his/her aircraft and will in all cases make the final judgment.

When in doubt, for any reason, I will halt the aircraft and review the situation.

I will not marshall any aircraft after consuming an alcoholic beverage.

I will keep myself and my equipment in a ready and well maintained condition.

I will not interfere with another marshaller's control unless an unsafe condition is observed.

II. History of the Detachment

The annual CAF detachment was held in Harlingen, Texas in the seventies. The popularity of the shows was such that each year more aircraft arrived for the show. After the 1976 show in Colorado Springs, a group of CAF colonels began to park the aircraft, organize the ramp, and provide safety to the crowds. A majority of these colonels lived in the Dallas/Fort Worth area and were long time members of the DFW Wing. In 1981, The CAF Marshalling Detachment was formed with 16-chartered members. Detachment by-laws were written and approved by headquarters.

The first detachment leader was Col. Mike Clark. In the 28 years of the detachment's history there have been a lot of new faces, with members from coast to coast. Some of the original sixteen have become CAF pilots.

After the detachment was formed, the need for a patch was recognized. Col. Ron Cox designed the Marshalling Detachment patch. The propeller indicates the main type of aircraft we work. The motto is Latin for “To Serve and Defend”. The flag has sixteen squares for the sixteen original members. The color gray is for the CAF and the orange and white are the standard airport safety colors. The only change we have had is the changing of Confederate Air Force to Commemorative Air Force.

III. Qualifications

1. Current dues paid colonel.
2. Current dues paid member of the detachment.
3. Willingness to work hard and share camaraderie.
4. Able to take constructive criticism.

IV. Equipment

1. Good pair of leather shoes. Nylon does not breathe and will become uncomfortable after 14 or more hours on the ramp.
2. Leather gloves. You may get hot oil or hydraulic fluid on them and cloth gloves will absorb those fluids.
3. Orange cap with black CAF. These can be ordered through the detachment newsletter.
4. Trainees are asked to wear black cargo pants or shorts with a **gray** t-shirt and orange safety vest. This will help pilots out if there are other people on the ramp wearing orange vests.
5. Qualified marshallers should wear either the orange jumpsuit or the orange shirt with CAF FLIGHT LINE on the back and detachment patch on the front. These can be ordered through the detachment newsletter. Shirt will be worn with black cargo pants or shorts.
6. Motorola TalkAbout 250 radio. (Or equal) and spare batteries
7. Pen/Pencil and notepad for briefing notes.
8. Sunglasses, sunscreen, lip balm
9. Whistle with neck strap or lanyard.
10. Dzus tool or short flat blade screwdriver.
11. Knife
12. Driveway chalk to mark aircraft positions on the ramp.
13. Stride chart (you can download this from our website: http://www.marshallingdetachment.org/default.htm
14. Hand towel, rag or bandana

V. Marshalling Instructions

The objective of this training is to construct a firm foundation in the marshalling basics for all new members and a refresher for qualified marshallers.

By the end of this training you will demonstrate the ability to control the movement of aircraft on the ramp using **CAF** approved hand signals, recognize the inherent dangers in ramp operations and plan ways to minimize them.

The marshallers are a separate detachment not associated with any other wing or squadron and are responsible only to headquarters. Our job is to ensure a safe environment for members, aircraft, and visitors at airshows.

The basic function of a marshaller is to control movement of aircraft prior to and after flight. This function is performed mainly on the ramp at an airport, occasionally on a taxiway, and on the ramp of a wing or squadron hanger. We do this before, during and after the waiver period at airshows, fly-ins, static shows or a wing or squadron open house. This function is accomplished using **CAF APPROVED** marshalling hand signals, exercising due care and ensuring that the movement area is clear of vehicular and pedestrian traffic. **WE DO THIS BECAUSE IT NEEDS TO BE DONE AND WE WANT TO DO IT!** The primary motto of the Marshalling Detachment is **"TO SERVE AND DEFEND."** We also subscribe to **'FROM CRISIS TO CRISIS WITH ENTHUSIASM."** Because of our high visibility, we must constantly remind ourselves that we represent the **CAF**, even if no **CAF** aircraft are present at the show we happen to be working at the time.

In order to function as a marshaller, you must be alert, highly mobile, flexible, knowledgeable, decisive, and a good communicator. You must be able to function in extremes of heat and cold, high noise, wind, hunger, uncooperative spectators, and occasionally rude pilots. As a trainee, you must be able and willing to accept instruction and constructive critism from qualified marshallers.

Marshalling an airshow is a team effort and the team leader is known as the **RAMP BOSS**. The ramp boss is responsible for the overall activity of the marshallers at an airshow. He/she is the coordinator, administrator, final decision maker, and is directly responsible to the airshow sponsor, chairman or coordinator. Problems with uncooperative airshow personnel or pilots, or equipment problems should be brought to the attention of the ramp boss.

As a trainee in the ramp environment, your initial training will mainly be with single engine tail dragger aircraft, keeping in mind that the aircraft commander (pilot) is ultimately responsible for the movement of the aircraft.

As you approach the aircraft you are going to marshall out, look all around, under and behind for anything that may be a potential hazard either to the aircraft or to personnel behind the aircraft. Assume your position in front of the left wing and out of the propeller line. This places you on the pilot's left or throttle side. Make eye contact, pat your head and point to the pilot indicating to him "I am your marshaller." **Remember, if you can't see the pilot, he can't see you**. If a right turn out of the line is anticipated, marshalling from the right side is perfectly acceptable. Your stance should be balanced, legs apart, yet relaxed. Check for fire bottle; look over aircraft

for leaking fuel, oil, and hydraulic fluid or open compartments. Check to ensure civilians and ground crew are out of the way. Do a 360 check and prepare to start the engine. Extend left arm to at least head height with the thumb up to indicate, "clear to start with no visible prime." If prime becomes visible then invert the thumb on left hand to so indicate. Make small circles with your vertically extended right arm and hand to indicate rotate prop (crank engine) (see fig. 14). You need not continue the circling motion with the right hand during the entire cranking process. If starting multi-engine aircraft, indicate with the left hand the number of the engine to be started (not necessarily 1-2-3-4). The pilot will usually indicate the starting order of the engines. When the engine starts, a certain amount of blue-gray smoke will appear. If prime was excessive, a large amount of smoke will appear; this is normal. Check the exhaust stacks for fire (on T-6's walk over to the right side). After start, all external venting should cease. If any malfunction appears, or if venting continues, inform the pilot by holding your nose, and pointing to the malfunction area.

You need to consult with the pilot before engine start for chocks in our out. If the aircraft has been started with chocks removed, prepare to marshall the aircraft out of the parking slot. Again scan the aircraft for any malfunction, signal "chocks removed" if necessary (see fig. 22), raise hands and give the signal to "move forward" (see fig. 3). As the aircraft begins to move, give the signal to "unlock tail wheel" if needed (see fig. 26). Give signal to turn left or right, as appropriate (see fig. 4 & 5). For a normal turn, point to the wheel on which you want the brake applied; for a tight turn, indicate by using a clenched fish with body motion. If in doubt, stop the aircraft (see fig. 13); i.e., you control the situation.

If a pilot appears to be taxing too fast, or you want him to slow for whatever reason, signal him to slow down (see fig. 6). After the aircraft has moved out of its slot onto the taxiway, pass him off to the next marshaller (see fig. 1). **Do not MARSHALL BACKWARDS**! When all appears normal and no further marshalling is necessary, indicate to the pilot by the "belly rub, salute or thumbs up."

If it appears that it will be necessary to continue with this aircraft and no other marshallers are present, move quickly to the point of constriction, then turn and resume normal marshalling.

If you are marshalling an aircraft and it is coming toward you and about to pass you by, **DO NOT** keep control of the aircraft by running backwards. After making sure there is another marshaller further down in a position to take over, signal to the pilot that you're passing control. If you are the marshaller who is to take control, **do not** raise your hand to signal, "I am your marshaller" until **after** the aircraft has officially been passed to you. The same applies to taking control from the "follow-me" vehicle. **Do not** raise your hands to take control until after the "follow-me" has officially handed over control.

Arriving/Recovering aircraft normally have the right-of-way on the ramp. The exception to this is during an airshow with only one-way in and out. In this case, aircraft taxiing out to go "on stage" have priority over aircraft who have already performed, unless an overheat problem is occurring. If for any reason you need to approach a running aircraft, you must get the pilot's attention, point to yourself and then to the aircraft. (see fig. 11) **Proceed with caution!**

After parking, give the cut signal (see fig. 15). Unless it is an emergency shut down, the pilot will normally run the engine for a few seconds before shutdown after receiving the "cut" signal. Remain in position until the engine stops, call "switches off", insert chocks and inform the pilot when chocks are in place (see fig. 21). If you do not have time to wait and must chock or remove chocks with the engine running, obviously remain outboard of prop arc, proceed to the

wing leading edge, keeping in mind the position of the pilot tube, and proceed to the main gear with shoulder touching the leading edge. Place or remove the chocks and back out gracefully the same way you went in, shoulder to the leading edge. **Do not** leave any vehicle without integral brakes on a hard surface without chocks.

If chocks are in short supply and you only have one pair to use on a tail dragger, check the wind. If wind is a factor, place one chock behind the upwind gear and one in front of the downwind gear, then be alert for a wind shift. If wind is not a factor, chock the left main (either main on nose gear aircraft). Do not leave chocks scattered about the ramp. Police the ramp at all times. Put unused chocks under the wing of parked aircraft and lay fire bottles down between aircraft (better to have a wheel hit a bottle than a prop). Pick up trash, bits of safety wire, small nuts and bolts, screws, or anything that could conceivably be blown by prop blast into anyone or anything.

SIGNALS USED ON NAVY AND WING-FOLDING AIRCRAFT

We will touch briefly on the specialized signals used with Navy aircraft and wing folding. Most of the Corsairs now flying have split flaps and can fold with flaps down. However, some Corsairs have solid flaps and must retract flaps prior to wing fold, as do the F6F, TBM/TBF and FM2/F4F. Keeping this in mind, whenever you plan to fold wings on any Navy aircraft up to and including the S2 Tracker, the signal sequence is as follows: Hook up (see fig. 35), Flaps up (see fig. 24), Fold wings (see fig. 32). **Never fold the wings of any aircraft, either manual or hydraulic, with someone standing on the wing!**

The SB2C tail hook must be raised and locked in place manually. Some pilots of the SB2C and TBM/TBF types will want to open the bomb bay to dispel fumes and check hydraulics (see fig. 28).

This covers most of our hand signals. Practice them until they become second nature and above all, **be alert**.

EMERGENCY PROCEDURES

Your primary job in the case of an accident or other emergency is to provide crowd control and to ensure emergency vehicles and personnel can swiftly, easily, and safely get to and from the scene and only the ramp boss or assistant ramp boss should approach the scene of an accident if it seems apparent that emergency personnel will be delayed. Their job will be to stand fire watch and to make sure that anyone injured should stay where they are unless they need to be moved due to fire. When emergency personnel arrive they will return to work crowd control unless asked by emergency personnel to say on hand.
At any time during an accident stay off the radio unless necessary and *DO NO*T talk to the media directly. Refer press to the designated spokesperson. This will usually be the airshow chairman or public information officer (PIO).

VI. PECULIARITIES OF CAF AIRCRAFT

A-26	Nose gear link must be uncoupled to tow.
B-25	Non steer able nose gear has a tendency to cock to one side on shutdown.
B-26	Nose gear has a tendency to jump to side when trying to taxi slowly.
B-24	Nose gear has limited travel; give it as much maneuvering room as possible
JU-52/HE-111	Air brakes have very limited braking; does most of its maneuvering by differential power; easy on the turns.
P-51	Low scoop is susceptible to clogging from cut grass, etc.
Spitfire	Airbrakes; must sit in chocks while engine is running to build air pressure.
P-39	Has hose connection inside nose gear wheel well for cooling water.
T-6	Watch for exhaust stack fire on the right side.
AN-2	Airbrakes; must sit in chocks while engine is running to build air pressure.
F4U	Folding wings. If they have split flaps, they can fold with flaps down. If they have solid flaps, they must be retracted before folding wings.
TBF/TBM	Folding wings, must retract flaps before folding wings. Pilot may want to open the bomb bay to dispel fumes and check hydraulics.
F4F/FM2	Folding wings, must retract flaps before folding wings.
F6F	Folding wings, must retract flaps before folding wings.
SB2C	Tail hook must be raised and locked in place manually. Pilot may want to open the bomb bay to dispel fumes and check hydraulics.

VII. PACING WINGSPANS

Some people have an uncanny ability to look at a parking space and say "that aircraft will fit in that parking space with 6 feet to spare". Consider yourself lucky if you can do it consistently. For the rest of us mere mortals, we have devised a system that works just as well. We rely on a system of "pacing" to determine how large a space really is. Here is how it works:

First, find out how long your pace is. On your sidewalk, take 10 slightly exaggerated steps, then measure that distance and divide by 10. Your pace may be 30", 34", 35", etc. Keep doing this until you can **consistently** take the same size step every time.

Next, convert an aircraft's wingspan into inches, and then divide that number by the number of inches in **your** pace. For example, a TBM's span is 54'. 54' x 12 (inches in a foot) = 648", 648"/36" (my pace) = **18** paces. In this example, you must have 18 paces plus 2 more paces to allow for wingtip clearance. If you do not have a space 20 paces wide, do not try parking a TBM there. Smaller planes can get by with 3' of wingtip clearance on each side, larger planes should be allowed more. You decide how close together you can safely park aircraft.

Once you have determined that a particular aircraft will, in fact, fit the spot you have selected, divide the number of paces required in half to get the distance from the wingtip to the fuselage centerline. Standing even with the adjacent aircraft's wingtip (or the adjacent obstacle) take a step or two to allow wingtip clearance, then step off the number of paces needed to get to the aircraft's centerline. That is the spot where you direct the pilot to put his "nose".

Once he has started his turn in on your centerline mark, step to the side and make sure you have your necessary tip clearance, making minor adjustments as needed as the plane moves closer to you. Pre-arrange to have a fellow marshaller watch the opposite wingtip if you cannot see it yourself (**very** necessary on larger aircraft).

Remember: You must develop a consistent pace. Plan ahead, you cannot wait until the aircraft is 50' away before you start your pacing. Allow reasonable wingtip clearance. If something is not right, stop the aircraft and ask for help. It is much better to apologize to the pilot for your goof-up than it is to pay out big dollars to fix his crumpled wingtip. **Always think safety first!**

On being a "wing watcher", only one marshaller at a time should be acting as a wing watcher. If two ore more marshallers are in position, they should decide in advance who will have the honor. Those not helping should move back or squat down, so that there will be no confusion as to who is the wing watcher. The wing watcher should advise the marshaller in control how close the tip clearance is, not only by giving "thumbs up" or "thumbs down", but by holding his hands apart to simulate the actual clearance.

NOTE: Once you have your paces down put them on an index card and laminate it to keep in your pocket or put them on the back of your gloves in a fine tip Sharpe.

The paces for the other aircraft have been rounded up so several of the strides have the same number of paces.

Marshallers Stride Guide, WW2

AC	Span	Your Stride In Steps									
		30		31		32		33		34	
		Span	C/L	Span	C/L	Span	C/L	Span	C/L	Span	C/L
A-20 Havoc	62’	25	12	24	12	23	11	22	11	21	11
A-26 Invader	70’	28	14	27	14	26	13	25	13	25	12
B-17 Flying Fortress	104’	42	21	40	20	39	20	38	19	37	18
B-24 Liberator	110’	44	22	43	21	41	21	40	20	39	19
B-25/PBJ Mitchell	68’	27	14	36	13	26	13	25	12	24	12
B-26 Marauder	71’	28	14	27	14	27	13	26	13	25	13
B-29 Superfortress	142’	57	28	55	27	53	27	52	26	50	25
BT-13/BT-15/SNV	42’	17	8	16	8	16	8	15	8	15	7
C-45/SNB/Twin Beech	48’	19	10	19	9	18	9	17	9	17	8
C-46 Commando	98’	39	20	38	18	37	18	36	18	35	17
C-47/53/R4D/DC-3/Skytrain	95’	38	19	37	18	36	18	35	17	34	17
C-54 Skymaster	118’	47	24	46	23	44	22	43	21	42	21
C-60 Lodestar	66'	26	13	26	13	24	12	24	12	24	12
F4F/FM-2 Wildcat	38’	15	8	15	7	14	7	14	7	14	7
F4U/FG-1 Corsair	41’	16	8	16	8	15	8	15	7	14	7
F6F Hellcat	43’	17	9	17	8	16	8	16	8	15	8
F7F Tigercat	52’	21	10	20	10	20	10	19	9	18	9
F8F Bearcat	36’	14	7	14	7	14	7	13	7	13	6
Hurricane	40’	16	8	16	8	16	8	16	8	14	7
L-2 Grasshopper	36’	14	7	14	7	14	7	13	7	13	6
L-3 Grasshopper	35'	14	7	14	7	13	7	13	7	12	6
L-4/J-3 Cub	35'	14	7	14	7	13	7	13	7	12	6
L-5 Stinson	34'	14	7	13	7	13	6	12	6	12	6
Me-108 Taifun	35'	14	7	14	7	13	7	13	7	12	6
Me-262 Schwalbe	41’	16	8	16	8	15	8	15	7	14	7
Mosquito	54’	22	11	21	10	20	10	20	10	19	10
N3N	34'	14	7	13	7	13	6	12	6	12	6
P-38 Lightning	52’	21	10	20	10	20	10	19	9	18	9
P-39 Airacobra	34’	14	7	13	7	13	6	12	6	12	6
P-40 Warhawk	38’	15	8	15	7	14	7	14	7	13	7
P-47 Thunderbolt	41’	16	8	16	8	15	8	15	7	14	7
P-51 Mustang	37’	15	7	14	7	14	7	16	7	13	7
P-63 Kingcobra	38’	15	8	15	7	14	7	14	7	13	7
PBY Catalina	104’	42	21	40	20	39	20	38	19	37	18
PT-17/N2S Kaydet	32’	14	7	14	7	12	6	12	6	12	6
PT-19/23/26	36’	14	7	14	7	14	7	13	7	13	6
PT-22 Recruit	30’	12	6	12	6	12	6	12	6	10	5
PV-2 Harpoon	75’	30	15	29	15	28	14	27	14	26	13
SBD Dauntless	42’	17	8	16	8	16	8	15	8	15	7
SB2C Helldiver	50’	20	10	19	10	19	9	18	9	18	9
Spitfire	37’	15	7	14	7	14	7	13	7	13	7
T-6/SNJ Texan	42’	17	8	16	8	16	8	15	8	15	7
T-50/UC-78 Bobcat	42’	17	8	16	8	16	8	15	8	15	7
TBF/TBM Avenger	55’	22	11	21	11	21	10	20	10	19	10
Yak-50/52	33’	13	7	13	6	12	6	12	6	12	6
Zero A6M	39’	16	8	15	8	15	7	14	7	14	7

Marshallers Stride Guide, WW2 Continued

AC	Span	Your Stride In Steps									
		35		36		37		38		39	
		Span	C/L	Span	C/L	Span	C/L	Span	C/L	Span	C/L
A-20 Havoc	62’	21	11	21	10	20	10	20	10	19	10
A-26 Invader	70’	24	12	23	12	23	11	22	11	22	11
B-17 Flying Fortress	104’	36	18	35	17	34	17	33	16	32	16
B-24 Liberator	110’	38	19	37	18	36	18	35	17	34	17
B-25/PBJ Mitchell	68’	23	12	23	11	22	11	21	11	21	10
B-26 Marauder	71’	24	12	24	12	23	12	22	11	22	11
B-29 Superfortress	142’	49	24	47	24	46	23	45	22	44	22
BT-13/BT-15/SNV	42’	14	7	14	7	14	7	13	7	13	6
C-45/SNB/Twin Beech	48’	16	8	16	8	16	8	15	8	15	7
C-46 Commando	98’	34	17	33	16	32	16	31	15	30	15
C-47/53/R4D/DC-3/Skytrain	95’	33	16	32	16	31	15	30	15	29	15
C-54 Skymaster	118’	40	20	39	20	38	19	37	19	36	18
C-60 Lodestar	66'	22	12	22	12	22	10	20	10	20	10
F4F/FM-2/Wildcat	38’	13	7	13	6	12	6	12	6	12	6
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F6F/Hellcat	43’	15	7	14	7	14	7	14	7	13	7
F7F/Tigercat	52’	18	9	17	9	17	8	16	8	16	8
F8F/Bearcat	36’	12	6	12	6	12	6	11	6	11	6
Hurricane	40'	14	7	14	7	14	7	14	7	12	6
L-2 Grasshopper	35'	12	6	12	6	12	6	11	6	11	6
L-3 Grasshopper	35'	12	6	12	6	12	6	11	6	11	6
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L-5 Stinson	34'	12	6	11	6	11	6	11	5	10	5
Me-108 Taifun	35'	12	6	12	6	12	6	11	6	11	6
Me-262 Schwalbe	41’	14	7	14	7	13	7	13	6	13	6
Mosquito	54’	19	9	18	9	18	9	17	9	17	8
N3N	34'	12	6	11	6	11	6	11	5	10	5
P-38 Lightning	52’	18	9	17	9	17	8	16	8	16	8
P-39 Airacobra	34’	12	6	11	6	11	6	11	5	10	5
P-40/Warhawk	38’	13	7	13	6	12	6	12	6	12	6
P-47 Thunderbolt	41’	14	7	14	7	13	7	13	6	13	6
P-51 Mustang	37’	13	6	12	6	12	6	12	6	11	6
P-63 Kingcobra	38’	13	7	13	6	12	6	12	6	12	6
PBY Catalina	104’	36	18	35	17	34	17	33	16	32	16
PT-17/N2S Kaydet	32'	12	6	12	6	10	5	10	5	10	5
PT-19/23/26	36’	12	6	12	6	12	6	11	6	11	6
PT-22 Recruit	30'	10	5	10	5	10	5	10	5	10	5
PV-2 Harpoon	75’	26	13	25	13	24	12	24	12	23	12
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Spitfire	37’	13	6	12	6	12	6	12	6	11	6
T-6/SNJ/Texan	42’	14	7	14	7	14	7	13	7	13	6
T-50/UC-78 Bobcat	42’	14	7	14	7	14	7	13	7	13	6
TBF/TBM Avenger	55’	19	9	18	9	18	9	17	9	17	8
Yak-50/52	33’	11	6	11	6	11	5	10	5	10	5
Zero A6M	39’	13	7	13	7	13	6	12	6	12	6

Marshallers Stride Guide Modern Military

AC	Span	Your Stride In Steps									
		30		31		32		33		34	
		Span	C/L	Span	C/L	Span	C/L	Span	C/L	Span	C/L
A-1 Skyraider	50’	20	10	20	10	20	10	18	9	18	9
A-4 Skyhawk	28’	12	6	12	6	12	6	10	5	10	5
A-6 Intruder/Prowler	53’	22	11	22	11	20	10	20	10	18	9
A-7 Corsair II	39’	16	8	16	8	16	8	14	7	14	7
A-10 Thunderbolt II	58’	24	12	22	11	22	11	22	11	20	10
An-2 Colt	60'	24	12	24	12	23	12	22	12	21	11
B-1 Lancer-Extended	137’	56	28	54	27	52	26	50	25	48	24
B-1 Lancer-Swept	79’	32	16	32	16	30	15	30	15	28	14
B-2 Spirit	172’	70	35	68	34	66	33	64	32	62	31
B-52 Stratofortress	185’	74	37	72	36	70	35	68	34	66	33
C-5 Galaxy	223’	88	44	86	43	84	42	82	41	78	39
C-17 Globemaster III	170’	68	34	66	33	64	32	62	31	60	30
C-130 Hercules	133’	54	27	52	26	50	25	50	25	48	24
CM 170 Fouga	40’	16	8	16	8	16	8	16	8	14	7
E-2A Hawkeye	81’	32	16	32	16	30	15	30	15	28	14
E-3A Sentry	146’	58	29	58	29	56	28	54	27	52	26
F-4 Phantom	39’	14	7	14	7	12	6	12	6	12	6
F-5 Tiger	27'	11	6	11	5	10	5	10	5	10	5
F-5 w/ wingtip missiles	30’	12	6	12	6	12	6	12	6	10	5
F-15 Eagle	43’	18	9	18	9	16	8	16	8	16	8
F-16 Falcon	30’	12	6	12	6	12	6	12	6	10	5
F-16 w/ wingtip missiles	33’	14	7	14	7	12	6	12	6	12	6
F-18 Hornet	40’	16	8	16	8	16	8	16	8	14	7
F-22 Raptor	43’	18	9	18	9	16	8	16	8	16	8
F-86 Sabre	37’	16	8	14	7	14	7	14	7	14	7
L-17 Navion	34’	14	7	14	7	14	7	12	6	12	6
L-19/O-1 Birddog	36'	14	7	14	7	14	7	13	7	13	6
L-29 Delfin	34’	14	7	14	7	14	7	12	6	12	6
L-39 Albatros	31’	12	6	12	6	12	6	12	6	12	6
Mig-15 Faggot	33’	14	7	14	7	12	6	12	6	12	6
Mig-17 Fresco	32’	14	7	14	7	12	6	12	6	12	6
O-2 Skymaster	38’	16	8	16	8	14	7	14	7	14	7
OV-1 Mohawk	48’	20	10	20	10	18	9	18	9	18	9
OV-10 Bronco	48’	20	10	20	10	18	9	18	9	18	9
S-3A Viking	69’	28	14	28	14	26	13	26	13	24	12
T-2A Buckeye	38’	16	8	16	8	14	7	14	7	14	7
T-6 Texan II	34’	14	7	14	7	14	7	12	6	12	6
T-28 Trojan	40’	16	8	16	8	16	8	16	8	14	7
T-33 Shooting Star	39’	14	7	14	7	12	6	12	6	12	6
T-34 Mentor	33’	14	7	14	7	12	6	12	6	12	6
T-37 Tweet	39’	16	8	16	8	16	8	14	7	14	7
T-38 Talon	25’	10	5	10	5	10	5	10	5	10	5
T-41 Mescalero	36'	14	7	14	7	14	7	13	7	13	6
T-45 Goshawk	31’	12	6	12	6	12	6	12	6	12	6
TS-11 Iskra	33’	14	7	14	7	12	6	12	6	12	6

Marshallers Stride Guide Modern Military Continued

AC	Span	Your Stride In Steps									
		35		36		37		38		39	
		Span	C/L	Span	C/L	Span	C/L	Span	C/L	Span	C/L
A-1 Skyraider	50’	18	9	16	8	16	8	16	8	16	8
A-4 Skyhawk	28’	10	5	10	5	10	5	8	4	8	4
A-6 Intruder/Prowler	53’	18	9	18	9	16	8	16	8	16	8
A-7 Corsair II	39’	14	7	14	7	14	7	12	6	12	6
A-10 Thunderbolt II	58’	20	10	20	10	20	10	18	9	18	9
An-2 Colt	60'	20	11	20	10	20	10	19	10	19	9
B-1 Lancer-Extended	137’	46	23	46	23	44	22	44	22	42	21
B-1 Lancer-Swept	79’	28	14	26	13	26	13	26	13	26	13
B-2 Spirit	172’	60	30	58	29	56	28	54	27	52	26
B-52 Stratofortress	185’	64	32	62	31	60	30	58	29	56	28
C-5 Galaxy	223’	76	38	74	37	72	36	70	35	68	34
C-17 Globemaster III	170’	28	14	56	28	56	28	54	27	52	26
C-130 Hercules	133’	46	23	44	22	44	22	42	21	42	21
CM 170 Fouga	40’	14	7	14	7	14	7	14	7	12	6
E-2A Hawkeye	81’	28	14	28	14	26	13	26	13	26	13
E-3A Sentry	146’	50	25	48	24	48	24	46	23	46	23
F-4 Phantom	39’	14	7	14	7	14	7	12	6	12	6
F-5 Tiger	27'	10	5	9	5	9	4	9	4	8	4
F-5 w/ wingtip missiles	30’	10	5	10	5	10	5	10	5	10	5
F-15 Eagle	43’	16	8	14	7	14	7	14	7	14	7
F-16 Fighting Falcon	30’	10	5	10	5	10	5	10	5	10	5
F-16 w/ wingtip missiles	33’	12	6	12	6	12	6	12	6	10	5
F-18 Hornet	40’	14	7	14	7	14	7	14	7	12	6
F-22 Raptor	43’	16	8	14	7	14	7	14	7	14	7
F-86 Sabre	37’	14	7	14	7	12	6	12	6	12	6
L-17 Navion	34’	12	6	12	6	12	6	12	6	10	5
L-19/O-1 Birddog	36'	12	6	12	6	11	6	11	6	11	6
L-29 Delfin	34’	12	6	12	6	12	6	12	6	10	5
L-39 Albatros	31’	12	6	10	5	10	5	10	5	10	5
Mig-15 Faggot	33’	12	6	12	6	12	6	12	6	10	5
Mig-17 Fresco	32’	12	6	12	6	10	5	10	5	10	5
O-2 Skymaster	38’	14	7	14	7	12	6	12	6	12	6
OV-1 Mohawk	48’	16	8	16	8	16	8	16	8	16	8
OV-10 Bronco	48’	16	8	16	8	16	8	16	8	16	8
S-3A Viking	69’	24	12	24	12	24	12	22	11	22	11
T-2A Buckeye	38’	14	7	14	7	12	6	12	6	12	6
T-6 Texan II	34’	12	6	12	6	12	6	12	6	10	5
T-28 Trojan	40’	14	7	14	7	14	7	14	7	12	6
T-33 Shooting Star	39’	14	7	14	7	14	7	12	6	12	6
T-34 Mentor	33’	12	6	12	6	12	6	12	6	10	5
T-37 Tweet	39’	14	7	14	7	14	7	12	6	12	6
T-38 Talon	26’	8	4	8	4	8	4	8	4	8	4
T-41 Mescalero	36'	12	6	12	6	11	6	11	6	11	6
T-45 Goshawk	31’	12	6	10	5	10	5	10	5	10	5
TS-11 Iskra	33’	12	6	12	6	12	6	12	6	10	5

VII. SIGNALS USED FOR AIRCRAFT MOVEMENT ON THE RAMP

Where possible signals comply with North Atlantic Treaty Organization (NATO) Standardization Agreement 3117, Air Standardization Coordinating Committee Air Standard 44/42a, the International Civil Aviation Organization (ICAO), and the Federal Aviation Administration (FAA) signals.

The marshaller will signal facing the aircraft while standing in one of these positions:

1. Fixed-wing aircraft. The marshaller will stand forward of the aircraft to the pilots left. **Remember if you can not see the pilot he can not see you!**
2. Helicopters. The marshaller will stand in front in full view of the pilot.

During night operations, the marshaller will use a pair of same color light wands. During taxiing or parking, the pilot must stop immediately if one or both of the marshaller's wands fail.

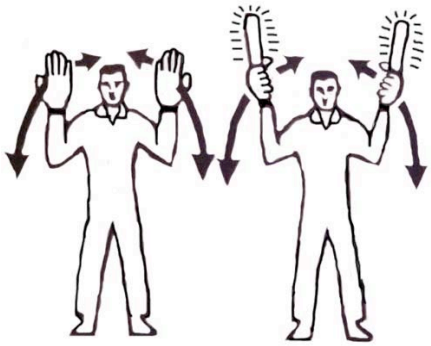
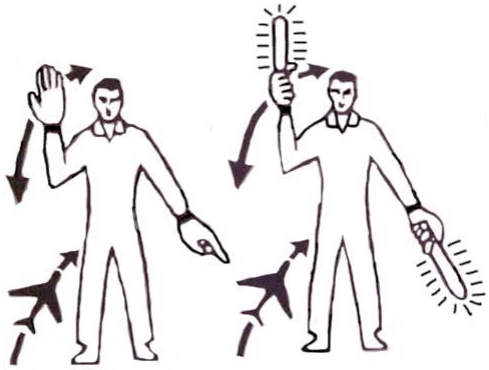
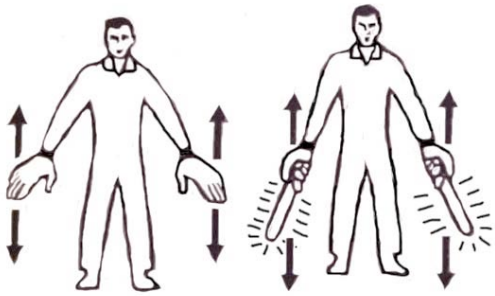
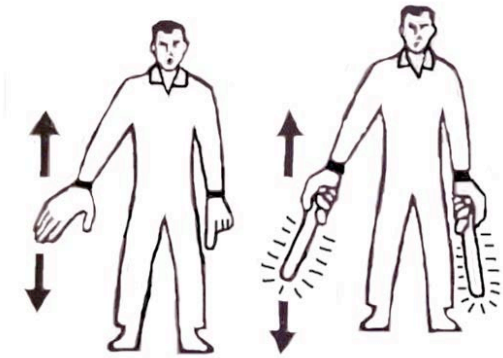
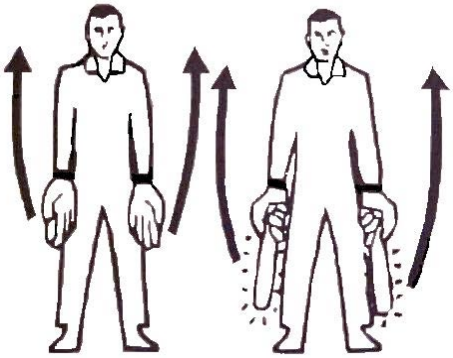
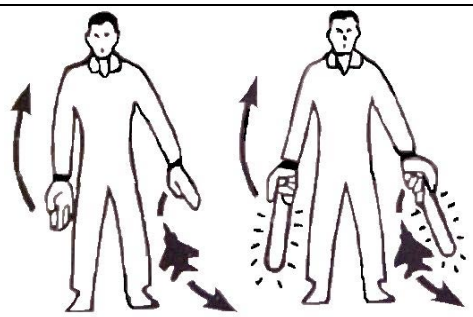
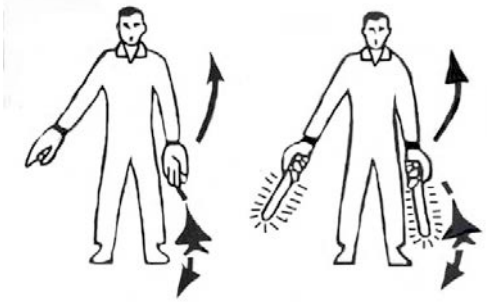
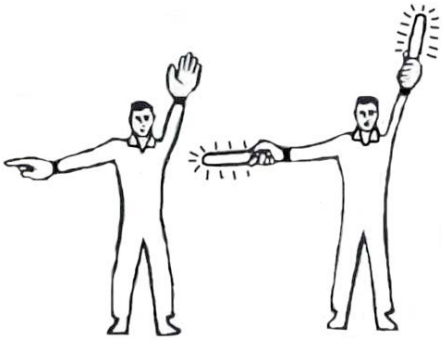
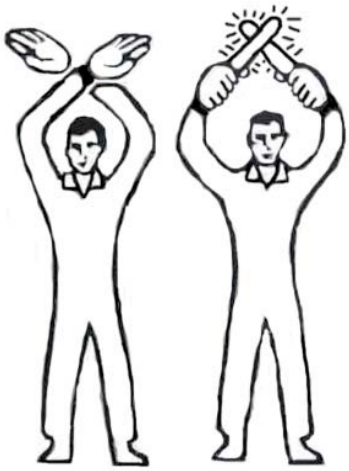
	Fig. 1 **PROCEED TO NEXT MARSHALLER** Right or left arm down, other arm moved across body and extended to indicate direction of next marshaller.
	Fig. 2 **THIS MARSHALLER** Arms above head in vertical position with palms facing toward aircraft.
	Fig. 3 **MOVE FORWARD** Arms a little aside, palms facing backwards and repeatedly moved upward-backward from shoulder height.

	Fig. 4 **TURN TO THE LEFT** Point right arm downward, left arm repeatedly moved upward-backward. Speed of arm movement indicating rate of turn. Make fist in right hand to indicate apply break.
	Fig. 5 **TURN TO THE RIGHT** Point left arm downward, right arm repeatedly moved upward-backward. Speed of arm movement indicating rate of turn. Make fist in left hand to indicate apply break.
	Fig. 6 **SLOW-DOWN** Arms down with palms toward ground then moved up and down several times.
	Fig. 7 **SLOW-DOWN ENGINE(S) ON SIDE INDICATED** Arms down with palms toward ground, then either hand moved up and down several times to indicate which side should be slowed down.
	Fig. 8 **MOVE BACK** Arms by sides, palms facing forward, arms swept forward and upward repeatedly to shoulder height. Do not bend arms at the elbow.

	Fig. 9 **TURN WHILE BACKING-TAIL TO THE RIGHT** Point left arm down and right arm at side with palm facing forward, is swept forward and upward repeated to shoulder height. Do not bend arms at the elbow.
	Fig. 10 **TURN WHILE BACKING-TAIL TO THE LEFT** Point right arm down and left arm at side with palm facing forward, is swept forward and upward repeated to shoulder height. Do not bend arms at the elbow.
	Fig. 11 **CLEARENCE FOR PERSONNEL TO APPROCH AIRCRAFT** A beckoning motion with right hand at eye level.
	Fig. 12 **PERSONNEL APPROCH AIRCRAFT** Left hand raised vertically overhead, palm towards aircraft. The other hand indicates to personnel concerned and gestures towards aircraft.
	Fig. 13 **STOP** Arms crossed above the head, palms facing forward. This is the FAA signal for emergency stop.

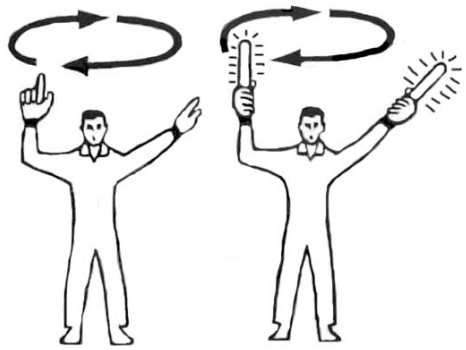
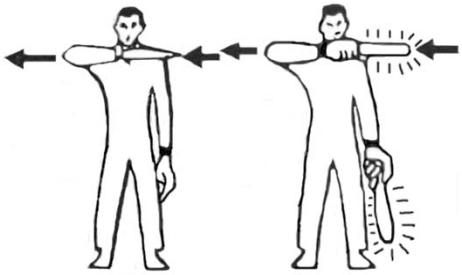
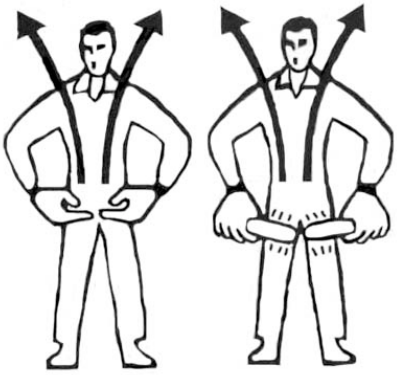
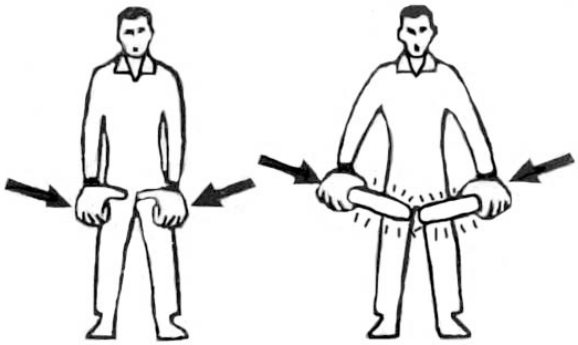
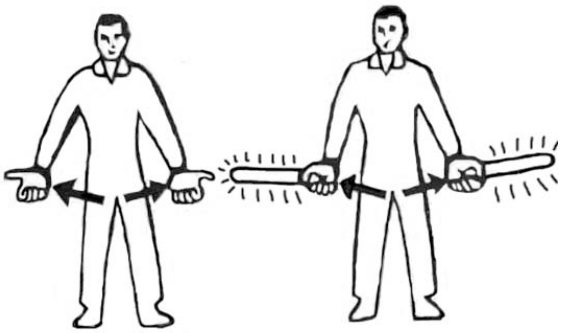
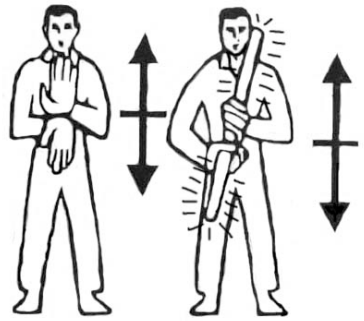
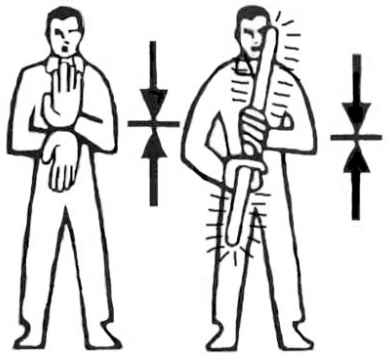
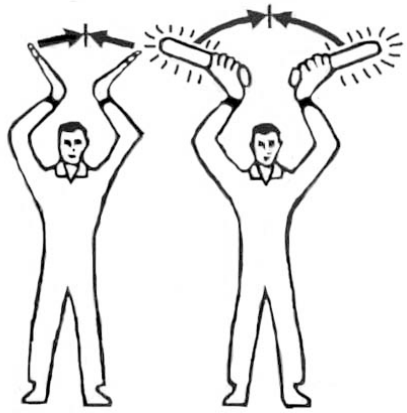
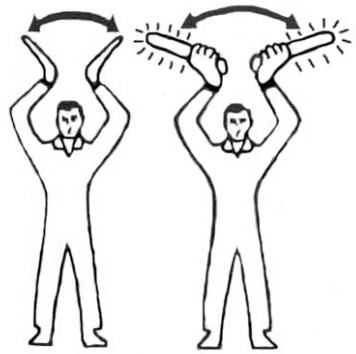
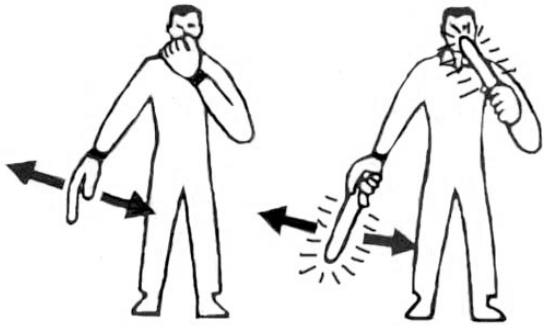
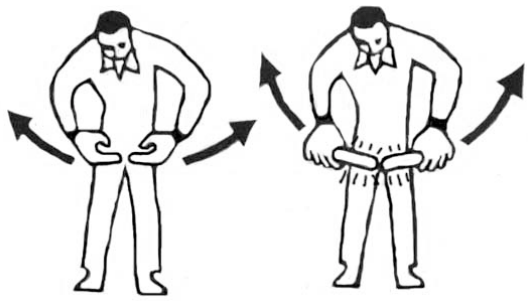
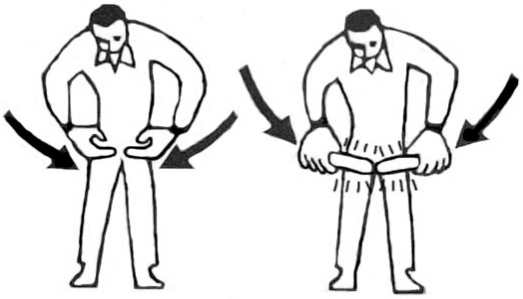
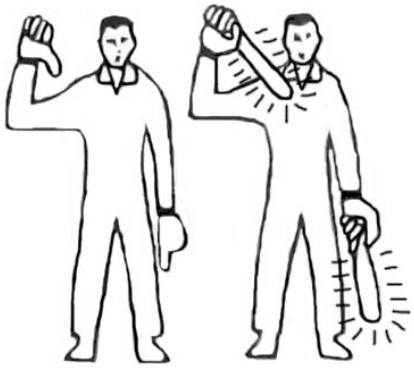
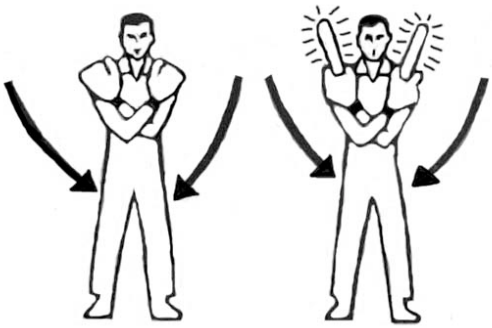
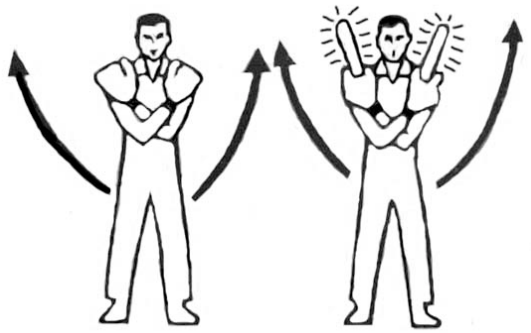
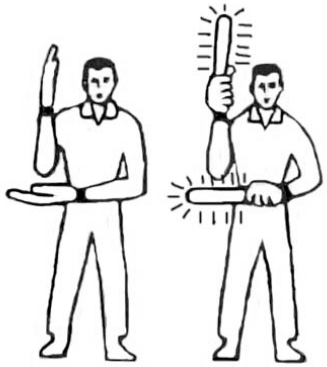
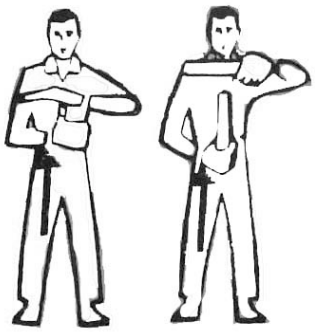
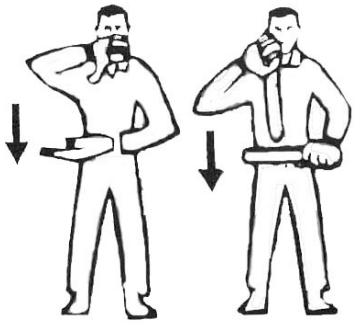
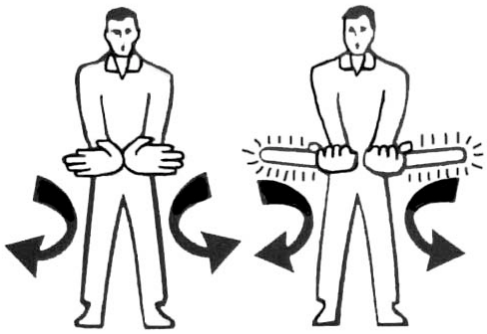
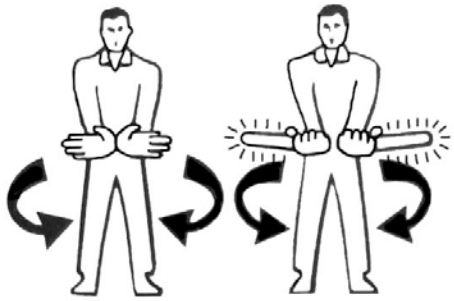
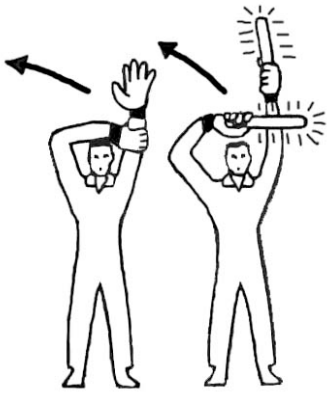
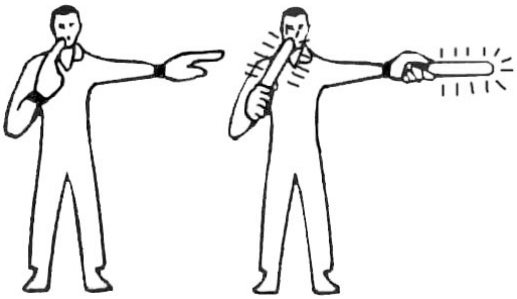
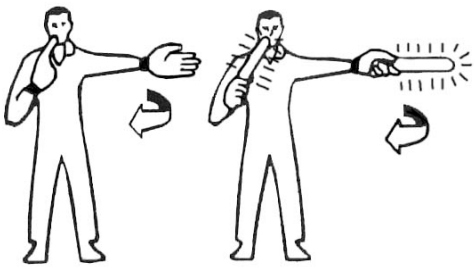
	Fig. 14 **START ENGINES** Circular motion of right hand at head level with left arm pointing to engine. Number of fingers extended on left hand indicates engine to be started. Thumb of right hand extended to indicate prime.
	Fig. 15 **CUT ENGINES/ROTOR** Both arm and hand level with shoulder, hand moving across throat, palm downward.
	Fig. 16 **ABANDON AIRCRAFT** Simulate unfastening seat belt and shoulder straps and throwing them up and off.
	Fig. 17 **APU CONNECTED** Hands above head, left fist partially clenched, right hand moved in direction of left hand with first two fingers extended and inserted into the circle made by fingers of the left hand.
	Fig. 18 **APU DISCONNECTED** Hands above head, left fist partially clenched, right hand moved away from left hand, withdrawing first two fingers from circle made by fingers of the left hand.

	Fig. 19 **EXTERNAL STARTING AIR CONNECTED** Hands above head, left hand cupped, right fully clenched, right fist moved in direction of left hand and inserted into cup made by left hand.
	Fig. 20 **EXTERNAL STARTING AIR DISCONNECTED** Hands above head, left hand cupped, right fist moved away from left hand withdrawing fist from cup made by left hand.
	Fig. 21 **CHOCKS - INSERTED** Arms down, fists closed, thumbs extended inwards, swing arms from extended position inward.
	Fig. 22 **CHOCKS - REMOVED** Arms down, fists closed, thumbs extended outwards, swing arms outwards.

	Fig. 23 **LOWER WING FLAPS OR FLAPS ARE EXTENDED** Hands in front, palms together horizontally then opened from the wrist.
	Fig. 24 **RAISE WING FLAPS OR FLAPS ARE UP** Hands in front, horizontally, with palms open from the wrists, then closed.
	Fig. 25 **TAIL WHEEL/NOSE WHEEL LOCKED** Hands together overhead, palms open from the wrist in a vertical V, and then closed.
	Fig. 26 **TAIL WHEEL/NOSE WHEEL UNLOCKED** Hand overhead, palms together then opened from the wrists to form a vertical V.
	Fig. 27 **TILLER BAR/STEERING ARM IN PLACE** Hold nose with left hand, right hand moving horizontally at waist level.

	Fig. 28 **WEAPON BAY OPEN** Body bent forward at the waist, hands held with fingertips touching in front of body and elbow bent at approx. 45 degrees then arms swing downwards and outwards.
	Fig. 29 **WEAPON BAY CLOSED** Body bent forward at the waist and arms extend horizontally, then arms swung downwards and in until fingertips touch in front of body and elbows bent at approx. 45 degrees.
	Fig. 30 **AFFIRMATIVE (ALL CLEAR)** Hand raised and thumb up.
	Fig. 31 **NEGITAVE (NOT CLEAR)** Arm held out and thumb down.
	Fig. 32 **FOLD WINGS/HELO BLADES SWEEP WINGS BACK** Arms straight out at sides, then swept forward and hugged around shoulders.

	Fig. 33 **SPREAD WINGS/HELO BLADES SWEEP WINGS FORWARD** Arms hugged around shoulders, then swept straight out to the sides.
	Fig. 34 **LOCK WINGS/HELO BLADES** Hit right elbow with palm of left hand.
	Fig. 35 **TAIL HOOK UP** Right fist, thumb extended upward raised to meet horizontal palm of left hand.
	Fig. 36 **TAIL HOOK DOWN** Right fist, thumb extend downward lowered to meet horizontal palm of left hand.
	Fig. 37 **AIRSPEED BRAKES OPEN** Hands in front, palms together vertically, then opened from the wrists.

	Fig. 38 **AIRSPEED BRAKES CLOSED** Hands in front, vertically with palms open from the wrists, then closed.
	Fig. 39 **LANDING GEAR PINS INSTALLED** With arms above head, the right hand clasps left forearm.
	Fig. 40 **LANDING GEAR PINS REMOVED** With arms and hands in the “INSTALLED” position, the right hand unclasps left forearm.
	Fig. 41 **ENGAGE NOSE GEAR STEERING** Point to nose with the index finger while indicating direction of turn with the other index finger.
	Fig. 42 **DISENGAGE NOSE GEAR STEERING** Point to nose with the index finger, lateral wave with open palm of other hand at shoulder height.

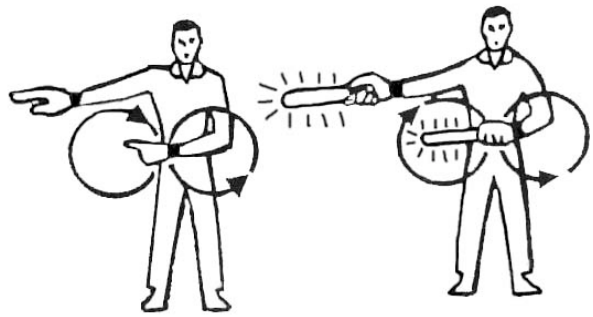
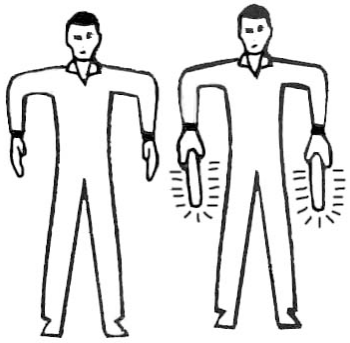
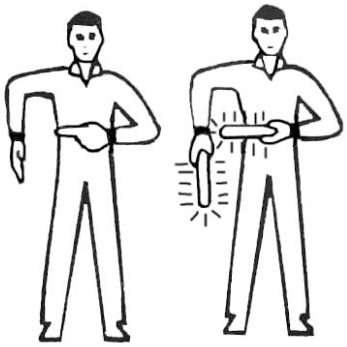
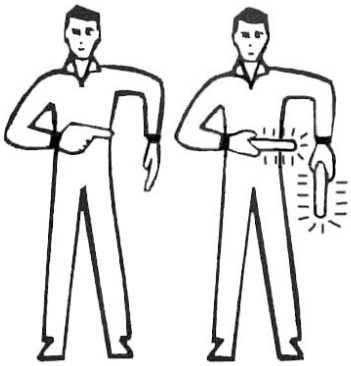
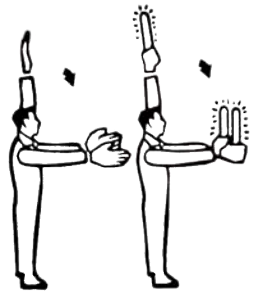
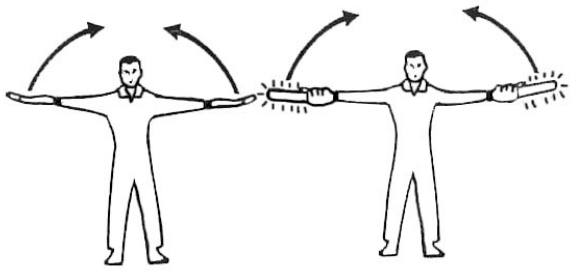
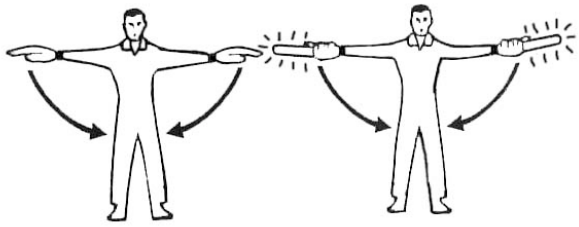
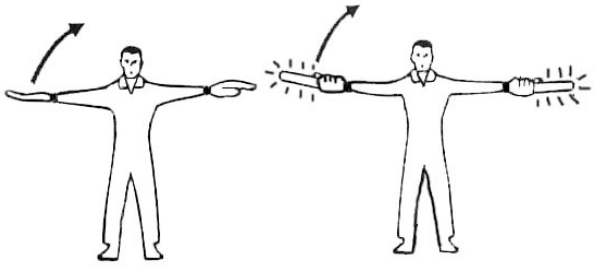
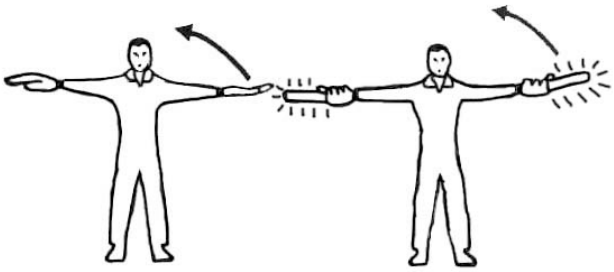
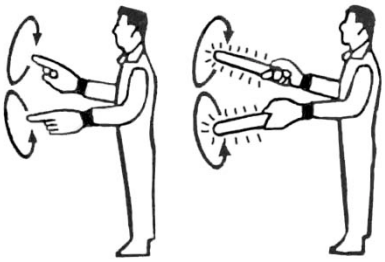
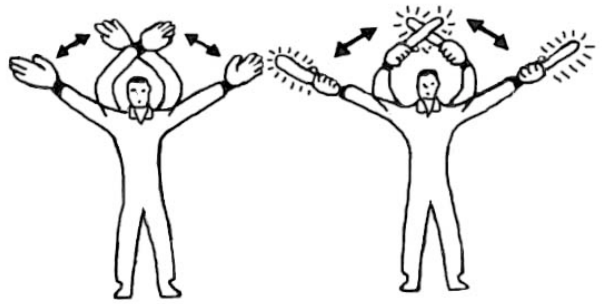
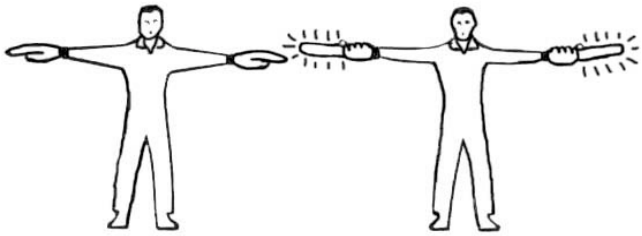
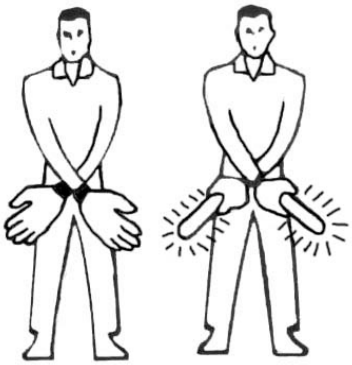
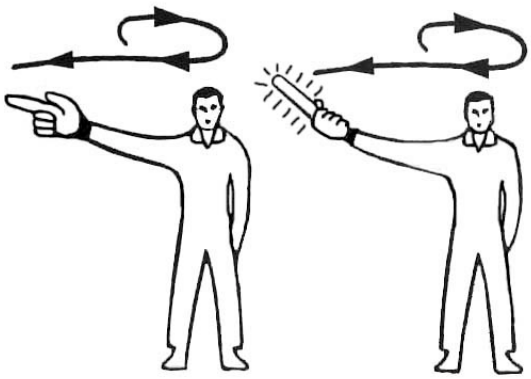
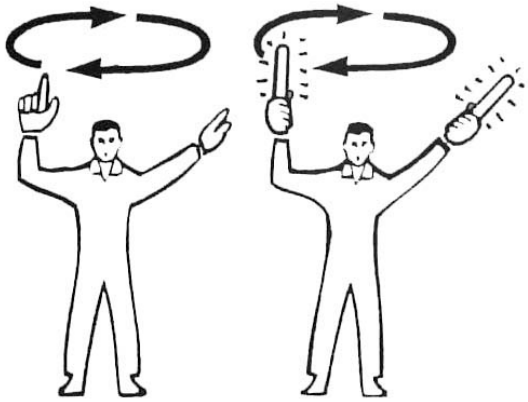
	Fig. 43 **FIRE IN ENGINE OR APU** Make rapid horizontal figure-eight motion at waist level with either arm, pointing at source of fire with the other hand.
	Fig. 44 **HOT BRAKES** Arms extended with forearm perpendicular to ground. Palms facing body.
	Fig. 45 **HOT BRAKES LEFT SIDE** Arms extended with forearm perpendicular to ground. Gesture indicates left side.
	Fig. 46 **HOT BRAKES RIGHT SIDE** Arms extended with forearm perpendicular to ground. Gesture indicates right side.

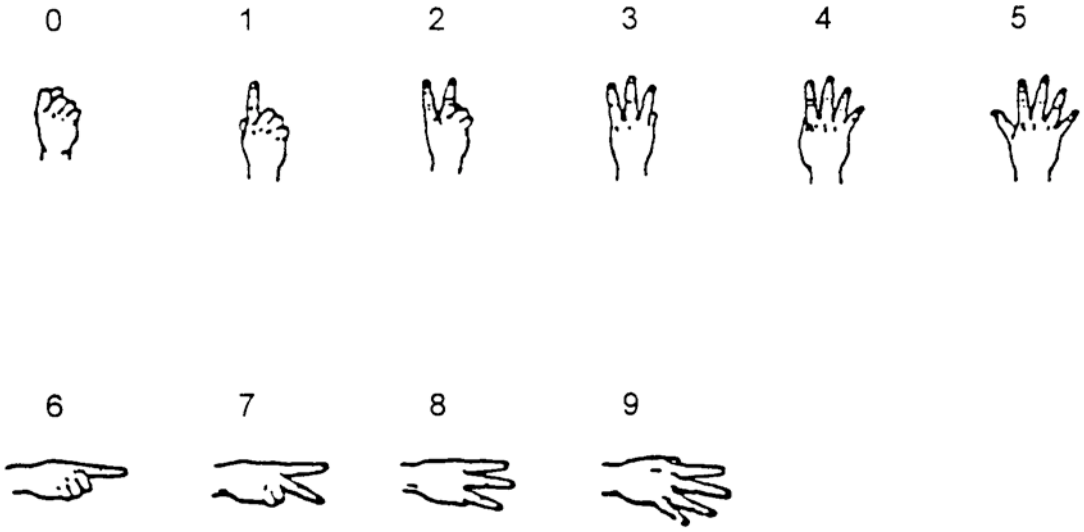
 Fig. 58 **NEED FUEL**	 Fig. 59 **LIGHTS ON**	

SIGNALS USED FOR HELICOPTERS

	Fig. 47 **LANDING DIRECTION** Marshaller turns and faces toward point where aircraft is to land, the arms are lowered repeatedly from a vertical position to a horizontal position, stopping finally in the horizontal position.
	Fig. 48 **VERTICAL MOVEMENT UPWARD** Arms extended horizontally sideways beckoning upwards, with palms turned up. Speed of movement indicates rate of ascent.
	Fig. 49 **VERTICAL MOVEMENT DOWNWARD** Arms extended horizontally sideways beckoning downwards, with palms turned down. Speed of movement indicates rate of descent.
	Fig. 50 **VERTICAL MOVEMENT TO THE RIGHT** Left arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction, in a repeating movement.
	Fig. 51 **VERTICAL MOVEMENT TO THE LEFT** Right arm extended horizontally sideways in direction of movement and other arm swung over the head in same direction, in a repeating movement.
	Fig. 52 **LOWER WHEELS** When helo approaches with landing gear retracted, marshaller gives signal by side view of a cranking circular motion of the hands.

	Fig. 53 **WAVE OFF** Waving of arms over the head.
	Fig. 54 **HOVER** Arms extended horizontally, palms downward.
	Fig. 55 **LAND** Arms crossed and extended downwards in front of the body.
	Fig. 56 **TAKE OFF THIS WAY (at pilot's discretion)** Marshaller conceals left hand and makes circular motion of right hand over head in horizontal plane ending in a throwing motion of arm towards direction of take off.
	Fig. 57 **ENGAGE ROTOR(S)** Circular motion in horizontal plane with right hand above head.

Hand Signals



IX. Ground Vehicle Operations

This guide provides a general overview of safe procedures for driving on an airport. It is not intended to cover specific conditions at all airports. (Provided by FAA)

1. Airport Basics

The following information explains the basic features of any airport. There may be important unique aspects to the airports on which you drive, such as dedicated vehicle lanes, areas not visible to controllers, or nonstandard traffic patterns. Be aware and know the rules of the airport.

Runways (see item A in the Appendix)

Runways have specific markings on them that are white. They will have numbers on each end and stripes down the middle with white lines on the edges. Runways that are served by an instrument approach will have more elaborate markings such as those shown in the figure. The most important thing to remember about a runway is that it is meant for aircraft use, so never drive your vehicle on it unless you are authorized to do so.

Taxiways (see item A in the Appendix)

Taxiways are areas used by the aircraft to get to and from the ramp and the runway. Taxiways look similar to runways, but are usually not as wide and they do not have the same kinds of markings. Taxiway markings are yellow and use letters instead of numbers. Like runways, taxiways are meant for aircraft use. Authorization is normally required before you operate a vehicle on a taxiway. Most aircraft cockpit windows are designed for pilots to see other aircraft. It can be difficult or impossible for the flight crew of larger aircraft to see vehicles, particularly behind wings or under the nose of the aircraft. Aircraft have the right of way so you will need to move off the taxiway and stop outside the wingtip. You may proceed after the aircraft passes.

Aprons or Ramps

Aprons or ramps are the areas where aircraft park, load, and unload. Watch out for aircraft that are moving and unless you are the follow me vehicle or helping to clear the ramp then you will yield the right-of-way. Don't assume the pilot can see you. They may be busy with other things like radio communications, checklist items, or watching the follow-me vehicle or the marshallers.

Signs

The color and sizes of signs are important. If the sign has white numbers on a red background, it is a runway holding position sign. These signs are important because they mean you are on the edge of the protected area around a runway and must have permission to proceed.

A yellow sign with black letters is a guidance sign. A black sign with yellow letters is a location sign. The taxiway at your airport may have these signs next to them. Examples are CARGO or TERM with an arrow to identify the parking area and direction to find that area.

A taxiway sign with yellow letters and a black background will tell you which taxiway you are on and helps you determine your location. Some airports have these signs painted on the taxiways. Other airports have geographic position markings to use in determining a point on a taxiway. Not all airports have implemented location signs and geographic position markings.

Lights

Runways are edged with white lights and taxiways have blue lights. Just be careful if you must leave the taxiway as these will be very low and might be out of your line of sight.

Markings

Runways are painted white while taxiways are painted yellow. The center of the taxiway has a solid yellow stripe. The sides may have one or two solid stripes along the edge. Again, not all airports have these markings. As a taxiway comes up to the edge of the runway, you may see a "hold short" line. It is two solid yellow stripes followed by two broken yellow strips. Along the side of the taxiway next to the hold line, there may be a runway holding position sign. This would be a red and white with the runway number. ILS hold markings is a solid horizontal stripe with pairs of vertical solid lines topped by another horizontal solid stripe. ILS hold markings advise pilots and vehicle operators where to stop to avoid interfering with aircraft navigational signals. At tower-controlled airports, a clearance is required to pass either of these markings and enter or cross the runway. Be certain to cross the markers on the other side before stopping your vehicle.

Some airports have designated helicopter-landing areas. This is depicted with an "H" inside of a square. Be especially careful when you drive near these and be sure to look up for landing helicopters.

Ramps may have a solid yellow line to indicate the way to exit the ramp to the taxiways.

2. Controlled Airport

If your airport has an air traffic control tower, it is called a "controlled" airport whenever the tower is operating. Aircraft on the ground and vehicles must get permission from the controller to be on the runway or taxiways. These areas are called movement areas. As an operator of a vehicle, you must get the controller's permission before you go onto a runway or taxiway, their associated safety areas, or any other part of the movement area. There are at least two ways to get permission, by radio or advanced coordination with ATC. Check your airport diagram and be sure of the location of the movement areas.

Radio Communications Procedures

1. Use a transceiver with the airports ground frequency on it. Each vehicle should have a call sign identifying the vehicle. (i.e. Orange 1, Orange 2, etc.)
2. Know the proper phraseology and never use Citizen's Band (CB) lingo or law enforcement "Ten" codes.
3. Think about what you are going to say before calling the controller.
4. Use the proper sequence in calling the controller.
    a) say who you are calling and who you are. (Ground, Orange 1)
    b) wait for the controller to respond. Sometimes it may take awhile if they are busy. When the controller responds, state where you are and where you want to go. (Orange 1 is on CAF ramp and would like to proceed to the general aviation ramp (heavies)).
    c) The controller will either approve or deny your request, or issue special instructions. Acknowledge that you have heard the controller. The section titled "Aviation Phraseology" lists ground control phrases and definitions. You should know what they mean before going onto any taxiway or runway. **Note: Use extreme caution when you hear the phrase "go ahead". Controllers use this to mean "state your request" not to proceed to where you want to go.**

Communications are not difficult with a little practice. If you are ever unsure what the controller said, or if you don't understand an instruction, **ASK THE CONTROLLER TO REPEAT IT WITH "SAY AGAIN"**. A controller, even one who is busy would rather repeat and explain something than have a misunderstanding lead to an accident or runway incursion. Don't proceed thinking that the instructions will become clear once you go a little further.

3. Non-towered Airports

When the tower is closed or if there is no tower, the airport is called non-towered. At a non-towered airport you don't have to get a controller's permission before going onto a taxiway or runway. You should, however, always carry a radio tuned to the airport's common traffic advisory frequency (CTAF) usually called UNICOM. When you get near the taxiway or runway, **SLOW DOWN** or **STOP.** Look both ways, and then look up for aircraft that may be in the pattern. Always yield the right-of-way to taxiing aircraft and give them plenty of room. If an aircraft is on the same taxiway as you and headed your way, move out of the aircraft's way. Be careful not to hit taxiway lights. If an aircraft is about to land or takeoff on a runway you need to cross, stop and yield to the aircraft until it has taken off or landed and taxied clear of the runway. Then proceed. Sometimes the runway gradient makes it impossible to see the entire length of the runway and an aircraft can suddenly appear when you are crossing. It is best to cross runways at the end.

Extra vigilance is key at non-towered airports. Aircraft do not have to communicate or announce their position in the pattern or on the surface. Some aircraft may not have radios. You can be lulled into complacency at non-towered airports because they aren't usually busy. If you are used to not seeing any other traffic, don't expect this to always be the case. If your vehicle has a rotating beacon, be sure to turn it on anytime you are on the airport surface. If you do not have a beacon then use your emergency flashers.

4. Aviation Phraseology

Definitions

Acknowledge – Let me know you have received and understand this message.
Advise intentions – Tell me what you plan to do.
Affirmative – Yes
Confirm – My version is .. is that correct?
Correction – An error has been made in the transmission and the correct version follows.
Go ahead – State your request.
Hold – Stop where you are.
Hold short of .. – Proceed to, but hold short of a specified point.
Negative – No, permission not granted, or that is not correct.
Proceed – You can begin or continue moving.
Read back – Repeat my message back to me.
Roger – I have received all of your last transmission. (It should not be used to answer a yes or no question)
Say again – Repeat what you just said.
Standby – Wait.. I will get back to you.
Unable – I can't do that.
Verify – Request confirmation of information.
Wilco – I have received your message, understand it, and will comply.

Aviation Alphabet

Alpha	**B**ravo	**C**harlie	**D**elta	**E**cho	**F**oxtrot
Golf	**H**otel	**I**ndia	**J**uliet	**K**ilo	**L**ima
Mike	**N**ovember	**O**scar	**P**apa	**Q**uebec	**R**omeo
Sierra	**T**ango	**U**niform	**V**ictor	**W**hiskey	**X**-ray
Yankee	**Z**ulu				

Light Signals

Air traffic controllers have a backup system for communicating if their radios fail. They have a light gun with different colors to let you know what to do. If you are ever working on a runway, taxiway or ramp and your radio quits, you should turn your vehicle towards the tower, start flashing your headlights and the controller will signal you with the light gun.

This may take some time if the controller's attention is directed towards another part of the airport. **BE PATIENT!** Even a failed radio is not an excuse for proceeding without a proper clearance.

Light signals and their meaning:

Steady green – OK to cross runway or taxiway, proceed or go.

Steady red – Stop

Flashing red – Clear runway or taxiway.

Flashing white – Return to starting point.

Alternating red & green – General warning signal. Use extreme caution. This can be followed by another signal as circumstances permit.

X. Aircraft Ground Handling

This guide provides information and guidance for the handling of aircraft on the ground. The aviation industry has found through experience that firm safety practices deter accidents. This guide contains generally accepted information and safety practices, which may help, prevent injuries to personnel and damage to aircraft. (FFA Document AFS-340)

Direct movement of aircraft. The person directing an aircraft that is being taxied should be far enough ahead and to the pilots left so that the pilot has an unobstructed view of him.

a. Use standard hand signals as applicable.
b. When directing aircraft during darkness or inclement weather the marshaller should use illuminated or reflective wands.
c. Movement of aircraft in congested areas should be avoided. However, when necessary, additional marshallers or security should be stationed near the aircraft wing-tips to ensure that adequate clearance is maintained.

Parked Aircraft. When an aircraft is parked, the main gear wheels should be chocked fore and aft. If the aircraft is to remain overnight or if winds are expected, flight control locks should be used and the aircraft tied down.

Visual check of aircraft. If it is possible you should make it a habit of visually inspecting the aircraft before the crew boards or leaves the aircraft. Advise them of any unsafe condition that may have been observed. This procedure may prevent unwarranted delays of the next departure. Examples of conditions observed: low or flat tires, cracked windows, loose propeller spinners, oil and fuel leaks, damaged flight surfaces, etc.

CAUTION: Many people have been injured by propellers in a moment of carelessness. When it becomes necessary to position propellers, they should be handled as if the engine is going to start. Before moving a propeller, always check to be sure the ignition switches are in the "off" position, and the throttle and mixture control levers are in the "closed" position. Always stand clear of propeller blade path, particularly when moving the propeller, because of a possible inadvertent engine start. Particular caution should be around warm engines.

Tie-down aircraft. It is a good practice to always tie-down small aircraft after each flight and large aircraft when unusually high winds are expected. When not in use, wheel chocks, tie-down ropes, or chains, and other equipment, may be stored safely near the wing tie-down anchor points

on the ramp. These are usually located outside of the aircraft wheel traffic pattern. Wheel chocks should be painted a bright color so they can be easily seen.

Towing of aircraft. Persons performing towing operations should be thoroughly familiar with the procedures that apply to the type of aircraft being moved. Particular care must be exercised when pulling or pushing an aircraft with a tow vehicle.

a. One should never tow an aircraft in congested areas without guidemen or marshallers to assist in determining that there is adequate clearance.
b. No less than two people should be used to tow large aircraft, including a qualified person in the cockpit to operate the aircraft breaks, and a qualified tow vehicle operator.
c. The man operating the tow vehicle should assure that the nose wheel or tail wheel lock is disengaged where applicable. He should also make certain that the nose wheel swiveling limits are not exceeded during the towing operation.
d. The aircraft engines should not be operated during towing operations.
e. The tow vehicle operator should avoid sudden starts and stops Aircraft brakes should be applied only in an emergency, on command from the tow vehicle operator or his clearance man.
f. Clearance must be obtained from the airport control tower, either by appropriate radio frequency or by prior arrangement through other means, before moving aircraft across taxiways or runways.

Taxiing of aircraft. Only rated pilots or other qualified persons should be authorized to taxi aircraft. Persons authorized to taxi aircraft should be familiar with the airport control communications procedures and radio frequencies.

Aircraft fueling. The FAA requires a 50 foot minimum distance between the aircraft and other personnel. Only essential crew members and the fueling crew should be near the aircraft.

BY-LAWS OF THE
MARSHALLING DETACHMENT
COMMEMORATIVE AIR FORCE

ADOPTED OCTOBER 19, 2002

ARTICLE I

Aims and purposes

1. The Marshalling Detachment shall at all times endeavor to perpetuate the aims and objectives of the Commemorative Air Force and all activities and actions shall be thus directed.

2. The Marshalling Detachment shall act as a specialized support unit of the Commemorative Air Force during airshow activities sponsored by or authorized by the Commemorative Air Force.

3. The Marshalling Detachment shall be directly under the command of Headquarters, Commemorative Air Force.

4. The Marshalling Detachment shall insure that its membership is adequately trained and maintains the highest standards of preparedness in the safe ground operations of aircraft of all types and sizes which may be encountered at Commemorative Air Force airshows. These aircraft shall include propeller-driven, rotor-craft and jet.

ARTICLE II
Membership

Requirements for membership in the Marshalling Detachment shall be stringent due the inherent dangers and responsibilities involved during routine airshow operations.

1. Marshalling Detachment members shall be members in good standing of the Commemorative Air Force.

2. All Detachment members shall maintain his/her annual membership dues in the Marshalling Detachment.

3. New members shall be admitted into the Marshalling Detachment under the following conditions:

    a. The Marshalling Detachment has an operational requirement for additional manpower.

    b. Upon acceptance and receipt of a candidates' Marshalling Detachment application forms and dues, the candidate may be admitted into the Detachment on a trial basis for on-the-job training, to be conducted by the Marshalling Detachment Training Officer or his/her designated alternate(s), and/or by a Regional Training Officer.

c. A trainee must attend at least one ground school conducted by the Marshalling Detachment Training Officer or his/her designated alternate, or by a Regional Training Officer, as well as a minimum of six (6) officially approved events, before he/she is eligible to be considered for "qualification" (outlined in Article VI-3). Notification of such training events shall be sent to all Detachment members.

d. Each year prior to the CAF Headquarters Airsho, each Regional Qualifying Board (outlined in Article III-11) shall review the progress of all trainees. Based on their critiques and observations, trainees will either be recommended for "qualification", "carry over", or "disqualification".

e. Upon being declared "qualified", the approved Detachment uniform (described in Article VIII) must be acquired.

f. A Marshaller is not considered "current" if he/she has not worked three airshows (or other approved events) in the previous 12 months. A Marshaller in such case will be required to work with a currently "qualified" Marshaller until observed and approved by the Regional Training Officer.

4. The performance of each member of the Marshalling Detachment shall be reviewed annually by the Regional Qualification Board and/or the Marshalling Detachment Training Officer.

5. A member of the Marshalling Detachment may be removed from the Detachment roster by a 2/3 vote of both the Regional Detachment Staff <u>and</u> the National Detachment Staff, or by directive from Commemorative Air Force Headquarters, if:

   a. A member demonstrates unsafe habits.

   b. A members' activities casts discredit upon the Detachment and/or the Commemorative Air Force.

6. A member of the Marshalling Detachment may be disciplined (short of removal from the Detachment roster) for reasons stated in Article II-5a/5b by a 2/3 vote of the Regional Detachment Staff <u>or</u> a 2/3 vote of the National Detachment Staff.

7. Members who are delinquent in their Commemorative Air Force membership dues shall immediately be removed from the Detachment roster upon notification from Headquarters with no action required by the Detachment Staff.

8. Members who are 60 days delinquent in their Marshalling Detachment dues shall be removed from the Detachment roster with no action required by the Detachment Staff.

9. Members who are dismissed and removed from the roster or disciplined for reasons stated in Article II-5a/5b shall be notified in writing by the Marshalling Detachment Staff.

10. Members who have been dismissed and removed from the Detachment roster or disciplined under Article II-5a/5b may appeal their dismissal or disciplinary action to the

Commemorative Air Force by following the procedures outlined in the CAF Unit Manual.

11. Members who have been dismissed and removed from the Detachment roster under Article II-5a may petition the National Detachment Staff for a special review after a 90-day waiting period.

12. Members who have been dismissed and removed from the Detachment roster under Article II-5b are ineligible to apply for reinstatement.

13. Members who have been dismissed and removed from the Detachment roster under Article II-7 or Article II-8 may petition the National Detachment Staff for reinstatement upon proof of correction of their delinquencies.

ARTICLE III
Organization

1. The National Marshalling Detachment (hereafter referred to as the "Marshalling Detachment") shall be a sub-unit of the Commemorative Air Force.

2. The Marshalling Detachment shall have three (3) elected officers:

    a. Detachment Leader: Shall be responsible for the overall leadership and organization of the Marshalling Detachment into a coherent and fully trained operational unit of the Commemorative Air Force. Shall be the primary liason with Headquarters and other CAF Units. Shall be responsible for the dissemination of Detachment news at least six times per year by way of newsletter or electronic medium, (or any other medium deemed appropriate by the Staff).

    b. Adjutant/Finance Officer: Shall be responsible for maintaining a current roster of all Detachment members in good standing, and shall submit this roster to Headquarters semi-annually, or as otherwise directed by Headquarters. Shall handle all Detachment matters of a financial nature. Shall countersign, along with at least one other Staff officer, all checks written against the Detachment account(s). Shall keep Detachment bank account(s) balanced at all times, and shall disseminate this financial data to the membership through the regularly published newsletter. Shall make all Detachment financial data available to any Detachment member in good standing upon request. Shall submit all Headquarters required financial reports in a timely manner. Shall certify that election ballots are sent only to those CAF and Detachment members in good standing as of 30 days prior to a Detachment election. Shall assume the duties of the Detachment Leader in his/her absence.

    c. Training Officer: Shall oversee the training of all Marshalling Detachment members. Through coordination with Regional Training Officers shall insure that uniform training standards are being consistently and universally applied. Shall be responsible for preparing, updating, amending and distributing all training materials. Shall observe all trainees at the annual CAF Headquarters Airsho, and shall officially "qualify" those who have exhibited safe working habits and been

recommended for such status by their Regional Qualifying Boards. Shall appoint (non-voting) Assistant Training Officers as needed.

3. All Officers, National and Regional, must be "qualified" members of the Marshalling Detachment.

4. The Marshalling Detachment Staff shall have the following non-voting member(s) in an advisory capacity:

    a. Immediate-past Detachment Leader

    b. Assistant Training Officer(s)

5. The Marshalling Detachment shall be divided into regional Sub-Units. Initially:

    a. Members in those areas west of the US Continental Divide shall be established as the Western Marshallers.

    b. Members in those areas east of the US Continental Divide shall be established as the Mid-America Marshallers.

6. The Marshalling Detachment may establish additional regional Sub-Units in the future if:

    a. Sufficient manpower resources exist in an area to support an additional Sub-Unit, <u>and</u>,

    b. The establishment of the new Sub-Unit does not substantially weaken the ability of an existing Sub-Unit to carry out its mission.

7. The Marshalling Detachment may dissolve a regional Sub-Unit if its manpower resources decline to the point it is deemed incapable of safely carrying out its mission. In such case, the members of the defunct Sub-Unit would be reassigned to another established Sub-Unit at the discretion of the Detachment Staff.

8. Detachment members who wish to align themselves with a Sub-Unit other than the one established in the area of their home address may do so by making their intentions known at the time their dues are paid each year.

9. Any member found to be "qualified" by the Marshalling Detachment shall be considered "qualified" in all regions.

10. Each regional Sub-Unit shall have three (3) elected officers:

    a. Regional Leader: Shall appoint one person each year to a three (3) year term on the Regional Qualifying Board (outlined in Article III-11) and appoint members to fill any vacancies that may exist on the Qualifying Board. Shall report regional activities to the Detachment Leader. Shall be the contact person for airshow requests for assistance in his/her region. Shall be responsible for the overall activities of his/her Sub-Unit.

b. Regional Training Officer: Shall conduct training seminars and otherwise oversee training in his/her region. Shall Chair the Qualifying Board. Shall certify that his/her regions' training syllabus was in compliance with Marshalling Detachment standards.

c. Regional Communications Officer: Shall coordinate the Units' efforts to accommodate requests for airshow assistance in his/her region.

11. Each Sub-Unit shall establish a "Qualifying Board" composed of three (3) appointed members and Chaired by the Regional Training Officer. Its primary purpose is to observe and critique trainees, and recommend to the Detachment Training Officer trainees who are properly prepared and ready to be considered for "qualification". Its secondary purpose is to observe and report unsafe practices to the regional Staff and the Marshalling Detachment Staff.

    a. In January of each year, the Regional Leader shall appoint one new member to the Qualifying Board for a term of three (3) years.

    b. Qualifying Board members must themselves be "current" and "qualified" and have a minimum of two (2) years tenure in the Marshalling Detachment.

    c. Each year prior to the CAF Headquarters Airsho, each regional Qualifying Board shall review the progress of all trainees. Based on their observations and critiques, trainees will be recommended to the Detachment Training Officer for either "qualification", "carry-over", or "disqualification".

    d. A minimum of ¾ of the members of the Qualifying Board must vote "affirmative' before a recommendation to "qualify" may be sent to the Detachment Training Officer.

    e. A sitting Sub-Unit officer may <u>not</u> serve as a Qualifying Board member.

ARTICLE IV
Elections

1. Marshalling Detachment Staff positions (3) and regional Sub-Unit Staff positions (3 per region) shall be filled by membership elections.

2. Only "qualified" members of the Marshalling Detachment in good standing with the Commemorative Air Force and the Detachment may be elected to Office.

3. All members in good standing with both the Marshalling Detachment and the Commemorative Air Force may vote in Detachment and Sub-Unit elections.

4. Each officer shall be elected for a period of two (2) years. Elections shall be held in the fourth quarter of each year, with newly elected officers taking office January 1st.

5. No member may serve as an officer in the Marshalling Detachment for more than four (4) years in any six (6) year period.

6. No member may serve as an officer in a Sub-Unit for more than four (4) years in any six (6) year period.

7. The offices of Detachment Leader, Sub-Unit Training Officer, and Sub-Unit Communications Officer shall be open for election in even numbered years. The offices of Detachment Training Officer, Detachment Adjutant/Finance Officer, and Sub-Unit Leader shall be open for election in odd numbered years.

8. Each year each sitting Detachment officer shall appoint one (1) person to serve on a Nominating Committee. The Detachment Leaders' nominee shall serve as Committee Chair. This Committee shall recommend by majority vote the member(s) most qualified to run for Detachment Office(s). No sitting Detachment Officer may serve on the Nominating Committee. In addition, any Detachment member who presents the written recommendation of three (3) other members may also have his/her name included on the official ballot.

9. Each year each sitting Sub-Unit officer shall appoint one (1) person to serve on his/her Sub-Unit Nominating Committee. The Sub-Unit Leaders' nominee shall serve as Committee Chair. This Committee shall recommend by majority vote the member(s) most qualified to run for Sub-Unit Office(s). No sitting Sub-Unit officer may serve on the Sub-Unit Nominating Committee. In addition, any Sub-Unit member who presents the written recommendation of three (3) other Sub-Unit members may also have his/her name included on the official ballot.

10. Each year after the CAF Headquarters Airsho, ballots will be sent to all eligible members (as determined by the Detachment Adjutant/Finance Officer). The Detachment Nominating Committee shall be responsible for the preparation and mailing of ballots for all national and regional positions open for election. A minimum of thirty (30) days after mailing must be allowed for the return of ballots. Ballots must be returned to the Nominating Committee Chair who shall open and count the ballots in the presence of at least one other CAF member who is not affiliated with the Marshalling Detachment. The Chair must make returned ballots available for inspection by any member in good standing for a period of thirty (30) days after an election.

ARTICLE V
Vacancies

1. In the event of a vacancy on the Marshalling Detachment Staff (or a Sub-Unit Staff), a replacement may be appointed by the Detachment Leader (or Sub-Unit Leader if the vacancy is regional) if <u>less</u> than one (1) year remained to be served by the vacating officer.

2. In the event of a vacancy on the Marshalling Detachment Staff or on a Sub-Unit Staff where <u>more</u> than one year remained to be served by the vacating officer, the Marshalling Detachment Leader shall call for and oversee a special election.

    a. In such cases, the remaining Marshalling Detachment officers (or Sub-Unit officers if the vacancy is regional), plus the immediate-past Detachment Leader (or immediate-past Sub-Unit Leader if the vacancy is regional), shall serve as the

Nominating Committee, and shall by majority vote recommend the most qualified member to run for the vacated office.

b. In addition, any member who presents the written recommendations of three (3) other members may also have his/her name included on the official special election ballot.

c. The Detachment Leader (or Sub-Unit Leader if the vacancy is regional) may appoint a member to perform the duties of the vacating officer on an interim basis pending the results of the special election.

3. A letter of resignation is required for the record from all officers resigning from office.

4. In the event of a vacancy in the position of Detachment Leader, the Detachment Adjutant/Finance Officer shall automatically assume the office of Detachment Leader. The position of Adjutant/Finance Officer would then be filled by either appointment or special election, depending on the length of term remaining to be served, following guidelines described above.

5. In the event of a vacancy in the position of Sub-Unit Leader, the Marshalling Detachment Leader shall appoint a member of the Sub-Unit to serve as Leader if the term remaining to be served is <u>less</u> than one (1) year. If <u>more</u> than one year remains to be served, the Detachment Leader shall appoint an interim Sub-Unit Leader pending the results of a special election, following guidelines described above.

6. In the event of a vacancy on a Regional Qualifying Board, the Sub-Unit Leader shall appoint a replacement for the remainder of the unexpired term.

ARTICLE VI
Training and Qualifying

1. All Marshalling Detachment members shall receive adequate training and refresher courses necessary to ensure safe handling of all aircraft types, and shall be responsible for maintaining his/her highest level of proficiency.

2. The most current version of the approved Marshalling Detachment Training Manual shall be issued to each member of the Detachment.

3. New Detachment members, regardless of prior experience, shall be considered “trainees”, and shall undergo extensive on-the-job training under the supervision of the Detachment Training Officer (or his/her designated alternate), a Sub-Unit Training Officer, or other “qualified”, experienced Marshallers.

    a. Before being eligible to be considered for “qualification”, a trainee must attend at least one “ground school”, as well as work at least six (6) airshows or other officially approved events. In addition, a trainee must show proficiency working with <u>all</u> types of aircraft likely to be encountered at CAF airshows or other approved events.

b. Prior to each years' CAF Headquarters Airsho, each Regional Qualifying Board shall, by a minimum ¾ vote, recommend to the Marshalling Detachment Training Officer those trainees who have met all prerequisites for "qualification".

c. Candidates for "qualification" shall attend the CAF Headquarters Airsho, where they shall be observed by the Marshalling Detachment Training Officer or his/her designated alternate. If the candidate performs his/her duties in a safe and responsible manner, the Training Officer or his/her designated alternate shall officially declare the candidate to be "qualified".

d. The Marshalling Detachment Training Officer or his/her designated alternate may deny "qualification" to a candidate only if unsafe behavior or insubordination is observed and documented. Such documentation must be presented to both the candidate and the Marshalling Detachment Staff. If the documentation is challenged, the Detachment Staff shall be the final arbiter.

e. The Marshalling Detachment Staff may allow "qualification" to be finalized at a location other than the CAF Headquarters Airsho if unusual situations demand. These situations will be considered on a case-by-case basis.

ARTICLE VII
Finance

1. Annual dues shall be assessed each Detachment member every January 1st.

2. Annual dues shall be $25 per calendar year. The dues amount may be changed if:

   a. The Marshalling Detachment Staff so recommends, and

   b. A minimum of ¾ of the membership agrees.

3. The Marshalling Detachment Adjutant/Finance Officer shall be responsible for all Detachment funds and financial records. This information shall be made available to any member in good standing within fifteen (15) days of receipt of request.

4. The Marshalling Detachment Adjutant/Finance Officer shall respond to all requests from CAF Headquarters regarding membership and financial records within fifteen (15) days of receipt of request.

5. The Marshalling Detachment Adjutant/Finance Officer's signature and at least one other Detachment Officer's signature shall be required on all checks drawn against Detachment account(s).

6. All funds received by either the Marshalling Detachment or Sub-Units shall be deposited in the Detachment account(s).

7. Fifty percent (50%) of all dues collected shall be credited to the Marshalling Detachment, and shall be available for Detachment use. The remainder of dues collected shall be reserved for the sole use of the Sub-Units.

a. The allocation-of-dues formula may be amended if approved by a majority of the Marshalling Detachment Staff and a majority of each Sub-Unit Staff.

b. The amount credited to each Sub-Unit shall be prorated based on the number of members in each Sub-Unit.

c. Additional donations to Sub-Units received during the year shall be deposited in the Detachment account(s), but shall be available only for use by the Sub-Unit receiving the donation.

d. The Detachment Adjutant/Finance Officer shall submit a statement to each Sub-Unit Leader on a bi-monthly basis detailing the income credited and the expenses debited to their Sub-Unit.

8. Requests for the expenditure of Detachment funds shall be presented to all Marshalling Detachment officers for approval. Only after a vote has been called for and approved by a majority of the Detachment Staff can a check be drawn against the Detachment account(s).

    a. Sub-Unit Leaders may access their Sub-Unit account balance without seeking Detachment Staff approval by submitting a request, approved by a majority of their Sub-Unit Staff, directly to the Detachment Adjutant/Finance Officer.

ARTICLE VIII
Uniform Regulations

1. The Marshalling Detachment patch and crest(s) shall be worn only by "qualified" members in good standing.

2. The preferred "qualified" Detachment members' flight line uniform shall consist of a bright orange jumpsuit of uniform style and in good repair, an orange baseball cap with "CAF" on the front, and black leather shoes. As an option, a "qualified" Detachment members' flight line uniform may consist of a bright orange oxford style shirt of uniform style and in good repair, black shorts with black belt, an orange baseball cap with "CAF" on the front, and black leather shoes.

    a. Either approved uniform style shall be adorned with an official CAF Ghost Squadron patch on the right shoulder, a CAF issue American flag on the left shoulder, an official Marshalling Detachment patch above the right breast pocket, and a name tag or patch above the left breast pocket. In addition, the back of the jumpsuit or shirt shall have embroidered in bold, black, block letters, "CAF" on one line, and "FLIGHT LINE" on a second line.

    b. One (1) CAF Wing or Squadron patch may be worn on the upper right side of the jumpsuit or shirt, immediately below the Marshalling Detachment patch, if desired.

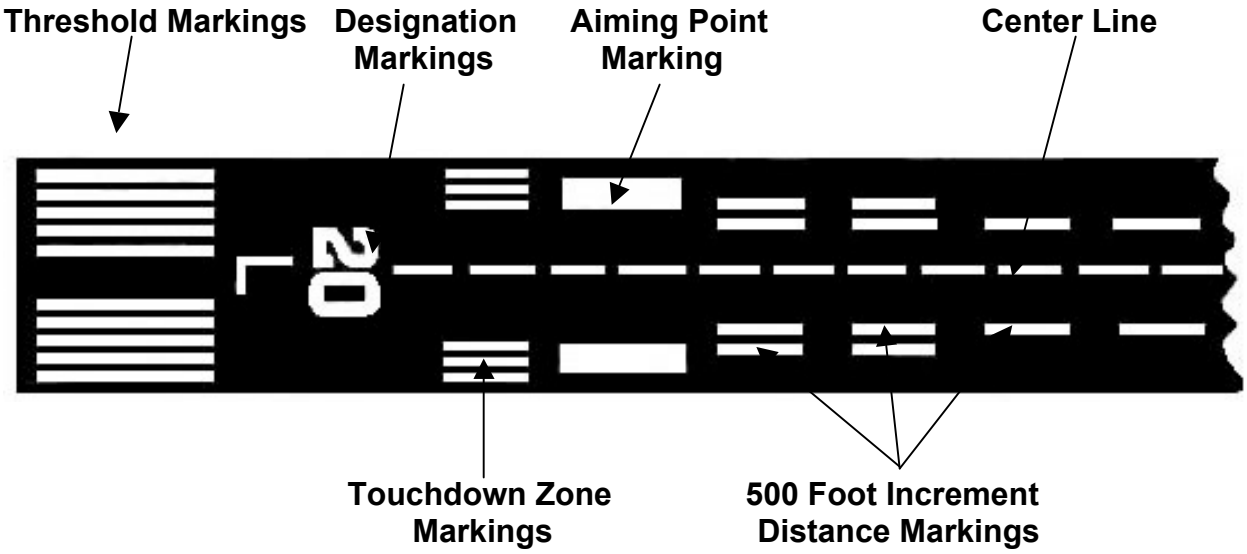
3. "Trainees" shall wear a bright orange vest over their choice of comfortable clothes, an orange baseball cap with "CAF" on the front, and leather shoes.

4. All Marshalling Detachment members should remember that they are representing the Commemorative Air Force, and are highly visible due to their bright orange uniforms. Care should be taken to be properly groomed, and to present themselves in a professional manner at all times.

XII. Appendix

A. Runway Markings
B. Ramp Boss Check List
C. Trainee Evaluation Form
D. Trainee Feedback Form

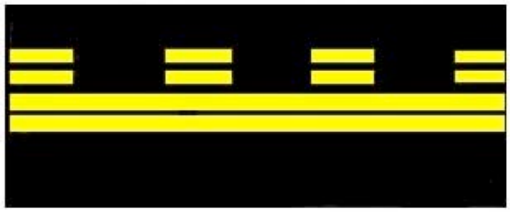
RUNWAY AND TAXIWAY MARKINGS



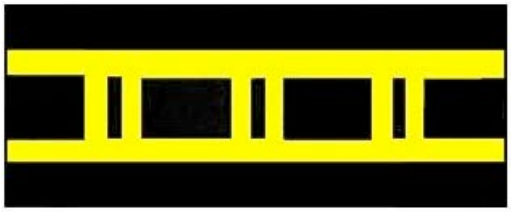
Signage when on taxiway A
Holding short of runway 16R

Guidance Sign

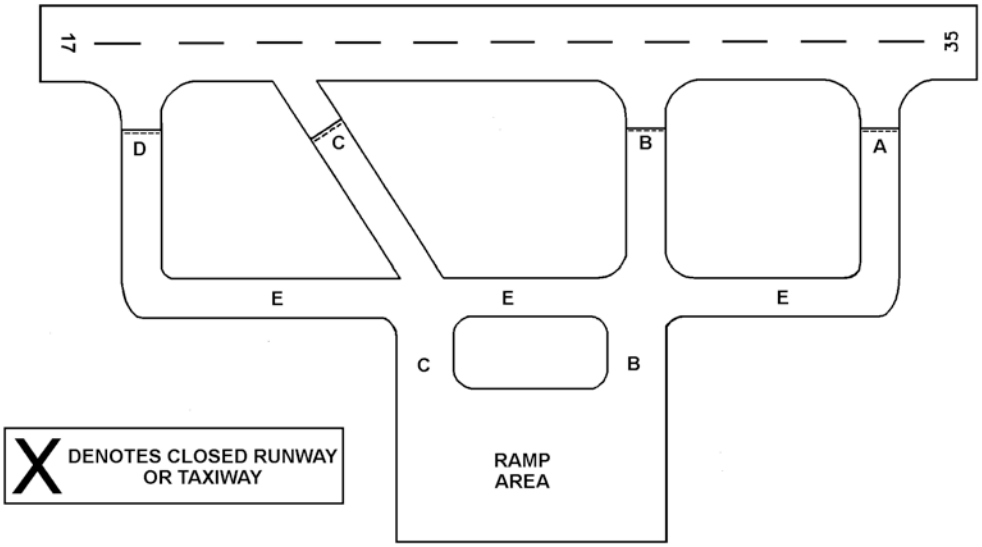
Location Sign



Hold Line Marking



ILS Holding Mark



MARSHALLING DETACHMENT RAMP BOSS CHECK LIST

FUNCTION	NAME	CELL PHONE
Air Boss		
Tower Chief		
A/P Manager		
FAA Monitor		
Security		
Maintenance		
Fuel & Oil		
First Aid		

COMMUNICATIONS			
Air Boss Freq.		Backup Freq.	
Ground Freq.		UNICOM Freq.	
Tower Freq.			

RAMP EQUIPMENT			
Fire Bottles		Water Cart	
Chocks		Nitrogen	
Follow Me Vehicle		Tow Bars	
Golf Carts		A/P Layout	
Ramp Passes			

MARSHALLERS			
Trainers	Fighters	Heavy	Other
AC:	AC:	AC:	AC:

Notes:

(BLANK)

CAF MARSHALLER TRAINEE EVALUATION FORM

Trainee's Name:			
Evaluator's Name:			
Airshow or Traron Location:		Date:	

	ALWAYS	FREQUENTLY	OCCASIONALLY	NEVER	CANNOT COMMENT OR DID NOT OBSERVE
Is trainee enthusiastic about Marshalling?					
Does trainee show up on time?					
Does trainee stay until all planes are secure?					
Is the trainee properly uniformed? (Black pants, Gray t-shirt, Orange vest and hat)					
Does the trainee have gloves available?					
Does the trainee have a reliable radio?					
Does trainee show good ramp awareness?					
Does the trainee have the proper ramp equipment awareness? (Chocks, Fire Extinguisher etc.)					
Does the trainee check for control locks and pitot tube covers?					
Does trainee do a 360 ramp check before starting aircraft?					
Does trainee do a 360 ramp check before moving an aircraft?					
Does the trainee watch for stack fires during startup and shutdown?					
Does trainee look to see where the next marshaller is?					
Does trainee show good hand signals that are clear and sharp?					
Are the correct signals used?					
Does the trainee check for chock placement during A/C movement?					
Does the trainee use a stride guide for pacing aircraft?					
Does the trainee have good pacing skills?					
Does the trainee use the same techniques every time?					
Does the trainee have good people skills?					
Are they courteous and attentive to the pilots?					
Are they courteous and attentive with the public?					
Do they respond well to constructive criticism?					

COMMENTS:

If more space is needed use back of sheet.

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CAF MARSHALLER TRAINEE FEEDBACK

Trainee Name:	
Assigned Marshaller:	
Airshow/Traron Location:	Date(s):

	ALWAYS	FREQUENTLY	OCCASIONALLY	NEVER	CAN NOT COMMENT
Did the ramp boss / area chief brief all members before the event?					
Do you know who your assigned marshaller is?					
Did the marshaller work with you before any aircraft are moved?					
Did the marshaller point out good techniques when it is performed by you as soon as it is safe to do so?					
Did the marshaller critique you consistently and demonstrate accepted methods when needed?					
Do you receive critiquing directly from other marshallers?					
When I question my assigned marshaller about a technique performed by another marshaller do I get a direct answer?					
Do you feel that you are learning and developing as a marshaller?					

Comments:

If more space is needed use back of sheet.

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